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

"This entry would be likely to receive a score of 3, based on the EDPPSR. The project designer(s) include a few detailed and salient recommendations that could be followed if the same or similar project were to be conducted in the future. Among improvements recommended are to conduct more research to find a suitable supplier of the correct size of buckle, and to change production methods whereby the elastic would be molded into the dense foam sole. However, plans for the implementation of those improvements are only somewhat detailed for some—but not all—of the recommendations. The questions of "how so?" or "in what ways, for example?" are likely to arise for those who read and reflect on these recommendations. On the other hand, references to the observations and experiences of test subjects enhance this entry, as does the brief summary with which it concludes; based on these features and the scope of recommendations, some raters might be inclined to assign an even higher score."

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 L: Presentation of designer's recommendations

5 The project designer includes consistently detailed and salient recommendations regarding the conduct of the same or similar project in the future; recommendations include caveats as warranted and specific ways the project could be improved with consistently detailed plans for the implementation of those improvements

4 The project designer includes generally detailed and salient recommendations regarding the conduct of the same or similar project in the future; recommendations include caveats as warranted and specific ways the project could be improved with generally detailed plans for the implementation of those improvements

3 The project designer includes a few detailed and salient recommendations regarding the conduct of the same or similar project in the future; recommendations include some specific ways the project could be improved along with what may be only minimally detailed plans for the implementation of those improvements and may also include one or two caveats for others

2 The project designer includes recommendations regarding the conduct of the same or similar project in the future; recommendations may include some specific ways the project could be improved but plans for the implementation of those improvements may be missing OR the recommendations (with or without plans) may be partial and/or overly general.

1 The project designer includes one or two overly general and/or questionably relevant recommendations regarding the conduct of the same or similar project in the future; any plans for implementation included are vague/unclear or minimally related to the recommendations provided

0 The project designer includes one or two recommendations (with or without plans) that bear little/no relation to the conduct of the same or similar project in the future OR fails to offer any recommendations or plans regarding the conduct of the same or similar project in the future.

In retrospect, the following design modifications would be performed on the Palm Phantom palm rejection device if time permitted and further market testing opportunities would be available:

1. In the process of making the prototype, it was difficult to find adequate sized buckles (either in fabric stores or in general internet search). For the prototype, several cat collars were purchased at the dollar store and modified. More in depth research to find the manufacturer of these buckles would be warranted.
2. The material of choice for the sole of the device would have been a light weight dense foam, similar to Butterboard. Although 1/4" dense foam coupons were available, it was difficult to belt sand them to a more proper (1/8") thickness, and the effort to prototype with that material was abandoned in favor of the available ABS plastic of the Rapid Prototyper. In regular use, the ABS would be slightly uncomforable and heavy.
3. Early product testing (with the mockups and preliminary prototype designs) showed that the size and shape of the device was appropriate. As final testing was done on the finished prototype, it became more apparent that the device would have to be marketed in as many as three sizes. This was anticipated, but it was not anticipated that the person with average sized hands would hold the stylus in as many ways as was found. Minor shape modifications might make it possible to serve a wider variety of consumers with less sizes.
4. In final testing, it was found that the little finger could slip off the sole and make a few spurious marks on the tablet. The problem with this was minimal, but was reported by two independent persons testing the device. A simple upturn on one edge of the product might create a "subconscious" reminder for the user to keep their entire hand on the device. Contradictory to this, this upturn might make the device uncomfortable for the left handed user.
5. One independent test subject reported problems with their wrist dragging on the tablet when working at the top of the screen. Upon further investigation, it appears that the problem was either the cuff of his shirt or hairs from his forearm which were making spurious marking. Extending the sole down the wrist, but with soft material for flexibility, would solve this problem, however again, this would make the product incompatable with the left handed user. Further testing would be needed to find an optimum shape for the sole that would solve both the previous problems.
6. In manufacturing, the elastic was fed through slots in the sole. Although this resulted in a product which had firm locations for the elastic without "bumps" either above or below the sole, it was labor intensive to feed the elastic through the slots. Open slots on the bottom of the sole were tried (such that the elastic was flush with the bottom of the sole), but they were found to be less reliable. Perhaps a hot process in final production could be tried where the elastic is molded into the dense foam sole.
7. The ABS plastic was stiff and uncomfortable to some users. Even dense foam would be similarly uncomfortable. Although molding the foam to a hand shape would be possible, it would not fit all hands. Some consideration should be given to using a softer foam materal, which has the added benfit of distributing any pressure over a wider area of pressure sensitive tablet screens.
8. In this iteration, no consideration was given to style and color as available materials and processes were used. This would occur in the next iteration.
9. One test subject suggested an alternative product. This product would be shaped the same and used the same, but would be a disposable adhesive patch. Further prototyping and testing would be needed to study this possibility.

In summation, for the time and materials available, the team feels that the product performed about 90% successfully, which is acceptable under the time constraints of the project. The product is close enough to being marketable that a further iteration might be performed in the team's spare time with the intent of submitting the design to an organization which promotes student and teacher inventions.