

Lab1: FRs and DPs

This exercise is designed to help you to think in terms of functions that a design needs to satisfy (the Functional Requirements, or FRs) and how these functions are addressed by the solutions implemented in the design, i.e. its features. In class we will introduce the phrase “Design Parameters”, or DPs, to refer to features of a design.

Functional Requirements and Design Parameters

Each team will be given two pens, a low cost model (Pen A) approx \$0.1, and a high cost model (Pen B), approx \$1-3.

First, as a customer, what functions would you expect a pen to have? Create a list. There are some not-so-obvious functions, such as “a way to look at your ink level”, etc. Each team should come up with 6 or more functions.

Secondly, for each pen, make a list of features that you have seen.

Finally, compare the list of features for each pen to the list of functions. Are all of the functions addressed by these features? If not, which ones? What features would you add/change to address these functions? Compared to the low cost pen, what are the additional features that the high cost pen has? Justify the cost of the expensive pen.

Functional Decomposition and Functional Hierarchy

Identify the key subsystems for the high cost pen. These subsystems correspond to the primary FRs.

Now for each subsystem, identify the features that make up the design solution for that subsystem.

Organize the FRs and DPs as shown in the textbook Figs. 6.12 and 6.13.

Report

Teams are formed in a random manner (see the next page). Each team should hand in a brief report of 1-3pages. Please indicate your group and group members at the top. Take pictures of the two pens your team has investigated and include them in the report.

Due date: Friday 12pm, Oct. 8. Electronic submissions to both TA’s only and indicate your group in the subject.

A1 Andrews, Nicholas Bailey, John Barbero, Kelsey Gowri, Vivek	A2 Chun, Valerie Elston, Cassius Faulkner, Ryan Favilla, Stephan	A3 Campbell, James Gaber, Jemma Cox, Brian	A4 Burkhardt, Matthew Conchi, Paola Ghysels, Nicholas Glaser, Zachary
B1 Lambe, Peter Liang, Jiafeng Lo, Curtis Mamiya, Megan	B2 Kim, Yoon Baek Mulder, Jeremy Nicholes, Travis	B3 Moser, Todd Mottaz, Nathanael Mow, Brandon	B4 Nurdin, Felix Onevathana, Samson Reinecke, Kort Sakuda, Shelley
C1 Blank, Molly Campbell, Timothy Choi, Yongsuk Dumbrava, Andrei	C2 Hannan, Patrick Hoffman, George Horst, Thomas	C3 Knutzen, Jared Kreiger, Stephen Lewis, Charisse	C4 Dekeyser, Yonina Hsieh, Kevin Jelle, Michael Johnson, Anthony
D1 Sakuma, Nicholas Sells, Christopher Stoker, Sean	D2 Vandeusen, James Wilder, Kara Wilson, Daniel Wiramihardja, Fabian	D3 Songstad, Shelly Sutanto, Leonardo Tandoi, Scott Tarleton, Anders	D4 Tooley, Wes Turner, Dylan Vawter, Paul