

# Design Review Mini-tutorial

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Design review is a tool that can be used to help companies improve the quality of the products they produce, reduce the time to market for a product and reduce the development and scrap/rework costs of the project. It is a general activity that can be applied readily to any industry, and can be used to improve the quality of services as well as products. Design review consists of bringing the designers of a project together with unbiased, external reviewers to analyze the design of the project before any production is started. This allows for a project team to effectively identify problems that may occur with the product early in the design process to help reduce the potential for costly errors later. There are several analytical tools the team can use to help them zero in on these problems, and these tools will be identified throughout the tutorial.

Design review is a simple concept. However, like many simple concepts, implementation can be difficult and frustrating. Project teams will benefit from reviewing methods for building effective teams, facilitating effective meetings, conflict management as well as any technical documentation and current research related to the project. Effective meeting skills are arguably the most important skills to have when implementing a design review process, as those skills will dictate the efficiency and effectiveness of the process.

To begin implementing a design review process, the project team should meet with external reviewers to analyze the design and look for possible errors or omissions. During these meetings, *only the design should be discussed*. Issues related to the project (i.e. staffing, costs, etc.) should be addressed in separate meetings.

The design review function should also be implemented at several stages in the design process. Formal reviews for a project should at minimum consist of specification and architecture review; serviceability, manufacturability and reliability review; and feature/expected performance review. We will now look at these three basic stages separately.

✓ **Stage 1 – Specification and architecture review**

At this stage, designers should be reviewing customer requirements and creating preliminary drawings, schematics and broad functionality requirements to ensure that the rest of the design process will not be wasted on a product no one will purchase.

- Tools available: (Quality Functional Deployment)QFD, marketing analysis.

✓ **Stage 2 – Manufacturability, serviceability and reliability review**

Designers need to communicate with manufacturing to ensure the product will be easy to manufacture. Special emphasis should be placed on trying to utilize existing company processes and products to reduce the impact the new design might have on the production process.

- Tools available: Failure mode and effects analysis (FMEA), Enterprise Resource Planning (ERP), .

✓ **Stage 3 – feature and expected performance review**

Project team should focus on quantitative measures to determine how the product will function. Special emphasis should also be placed on market information for customer requirements to ensure the designers have

applied as many features as possible to the product, and that customer needs have not changed since stage 1.

- Tools available: marketing analysis, focus groups, QFD, .

Raytheon uses a design review process at the system engineering level specifically to ensure that design changes will not ripple through the project. For example, if 2000 changes will need to be made to a project because of 1 change in the architectural design, that could cause serious problems. The thorough design review process employed at Raytheon allows the designers of the various parts to focus on adding features or improving the function of the parts without worrying about the additions working in relation to the rest of the project.

### **Want more?**

The following resources provide excellent information and training to aid in developing a useful design review process.

- ✓ **Saving struggling teams**

- ✓ <http://www.freequality.org/beta%20freequal/fq%20web%20site/Training/Classes%20Fall%202002/Saving%20Struggling%20Quality%20Teams.ppt>

- ✓ **Facilitation**

- ✓ [http://www.freequality.org/beta%20freequal/fq%20web%20site/training/facilitation\[1\].ppt](http://www.freequality.org/beta%20freequal/fq%20web%20site/training/facilitation[1].ppt)

- ✓ **QFD**

- ✓ <http://www.freequality.org/beta%20freequal/fq%20web%20site/Training/Classes%20Spring%202002/Quality%20Function%20Deployment.ppt>
- ✓ Foster, S. Thomas. Managing Quality: An Integrative Approach. Prentice Hall, New Jersey, 2001. Pages 180-186.
- ✓ **FMEA**
  - ✓ <http://www.freequality.org/beta%20freequal/fq%20web%20site/Training/Classes%20Fall%202002/FMEA.ppt>
- ✓ **Design for manufactureability, maintainability and reliability**
  - ✓ Foster, S. Thomas. Managing Quality: An Integrative Approach. Prentice Hall, New Jersey, 2001. Pages 188-203.
- ✓ **Focus Groups**
  - ✓ [http://www.freequality.org/beta%20freequal/fq%20web%20site/training/FocusGroupFacilitation\[1\].ppt](http://www.freequality.org/beta%20freequal/fq%20web%20site/training/FocusGroupFacilitation[1].ppt)