
- Traditional functional design does not adequately take account of non-functional aspects of the product.
- Some products are not dominated by the functionality.
- Functional design is good for component level design – shafts, bolts, springs etc.
- System level design requires more than just function because it must incorporate interfacing between components and with the user.
- Question: How to describe and design for problems at a system level?
- Concept: Affordance
  - An affordance is something that a product provides or offers to the user or other interfacing product.
    - Independent of function
  - The affordance method could answer the “why” questions that are developed from customer interviews.
    - Why does the customer need this product? It affords them something x, y, z, etc.
  - An affordance can be positive or negative.
    - For a motor
      - Rotation – positive
      - Excess heat – negative

Review of “Résumé of 12 years interdisciplinary empirical studies of engineering design next term in Germany” - Design Studies, September 1999

- Strategies
  - A wide variety of approaches can be taken which will result in success or failure.
  - There is no design process that is infallible.
  - Design methodologies all have their positives and negatives.
- Clarification of goals
  - A project that is poorly defined will take far more time to gather information and move forward.
  - Persons with little education on design needed to be forced to continue clarifying the problem because they were ignorant to their need for information.
- Sub-dividing tasks into sub-problems
  - Designers approach this in various ways.
Some methodical where each function is performed by a small part of the system and then when all the small parts are combined the design is integrated to accomplish the goals.

Some designers are more creative and start with a concept for each function is built on top of the previous in succession.

This research shows that educated beginners tend to the process oriented design.

Generative solutions start from scratch and develop lots of concepts for solving a problem and is then narrowed down to one solution.
  - Offers opportunities to introduce new and unconventional ideas.

Corrective solutions start from an existing solution and are modified to fit the needs of the problem at hand.
  - If an idea already exists in the designers head or the problem has been previously experienced.

In real life there are typically a mix of these approaches. Maybe for the primary functions the corrective approach is used while for the secondary functions the generative approach is used.

The designer’s experience played an enormous role in the analysis performed.

Engineers tend toward one procedure of the other due to their personal abilities or tendencies. Without however always understanding the advantages and disadvantages or each.

Review of “Design of Everyday Things” – Donald Norman

- Not available at the library until 12/15/2009