Module - 2

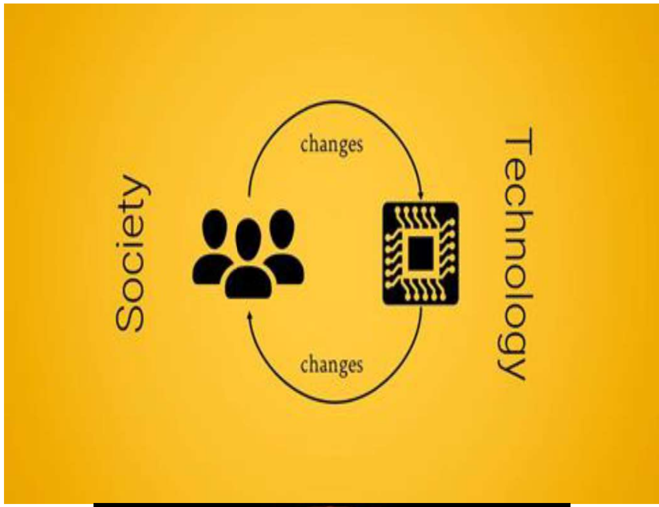
Engineering Design Approaches

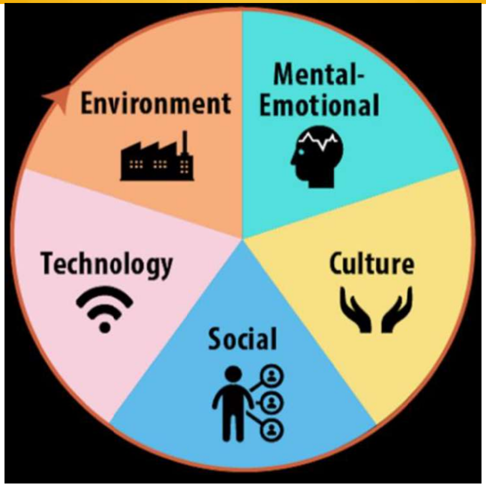
Professional and societal Context of Design

- It is important to understand the role of engineering within our society.
- What is a society: A group of humans broadly distinguished from other groups by mutual interests, participation in characteristic relationships, distinct cultural patterns, shared institution, and a common cultural identity. Or

The totality of social relationships among organized groups of human beings." [Collins English Dictionary]

- As a society, we often take technology for granted. However, we must always be aware of its value and shortcomings.
- Society as we know it, cannot function without technology. It is integral to our lives, and fundamental to our existence.





Engineering, Technology and Society

- Engineers are the members of society that are engaged in “systematic development of technology, and application of that technology to the benefit of society.”
- Your engineering activities can have profound impact on society. Hence, you must become knowledgeable on how society is organized, how it functions, and how it uses/depends on technology.
- What are the challenges :

✓ Effective use of resources.

✓ Healthcare accessible to different society as per their need.

✓ The Youth Bulge and Security Implications.

Professionalism

Engineers are "Professionals", but what does this mean?

Characteristics of any Profession:

- Work involves exercising skills, judgement, and discretion, which is not routine or subject to mechanization.
- Qualification for profession requires extensive formal training.
- A specialized organization exists to set: standards, codes and rules of practice. In addition, these organizations define the extent and nature of training to practice in the field.
- A professional makes a commitment to serve the public good.

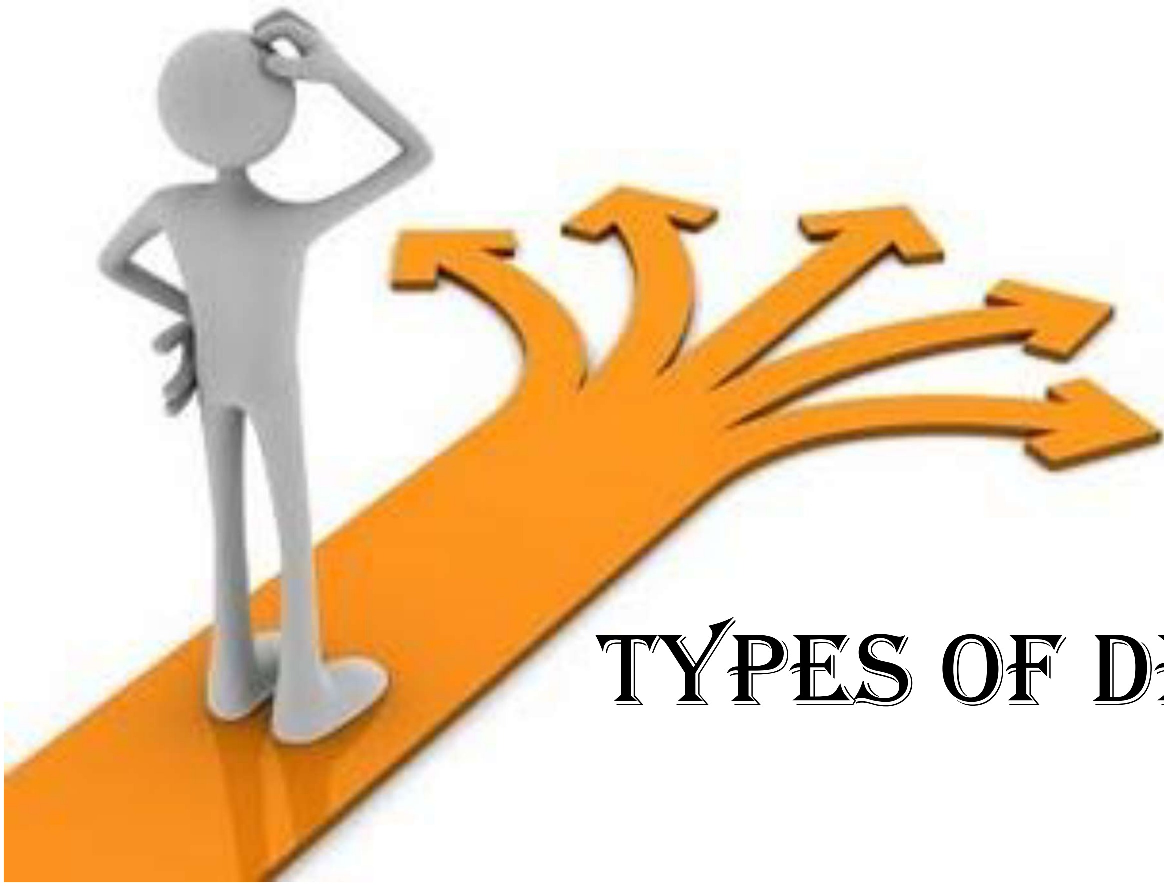
International Professional Engineering Societies/Institutes (non-legal):

ASME - American Society of Mechanical Engineers

IEEE - Institute of Electrical and Electronics Engineers

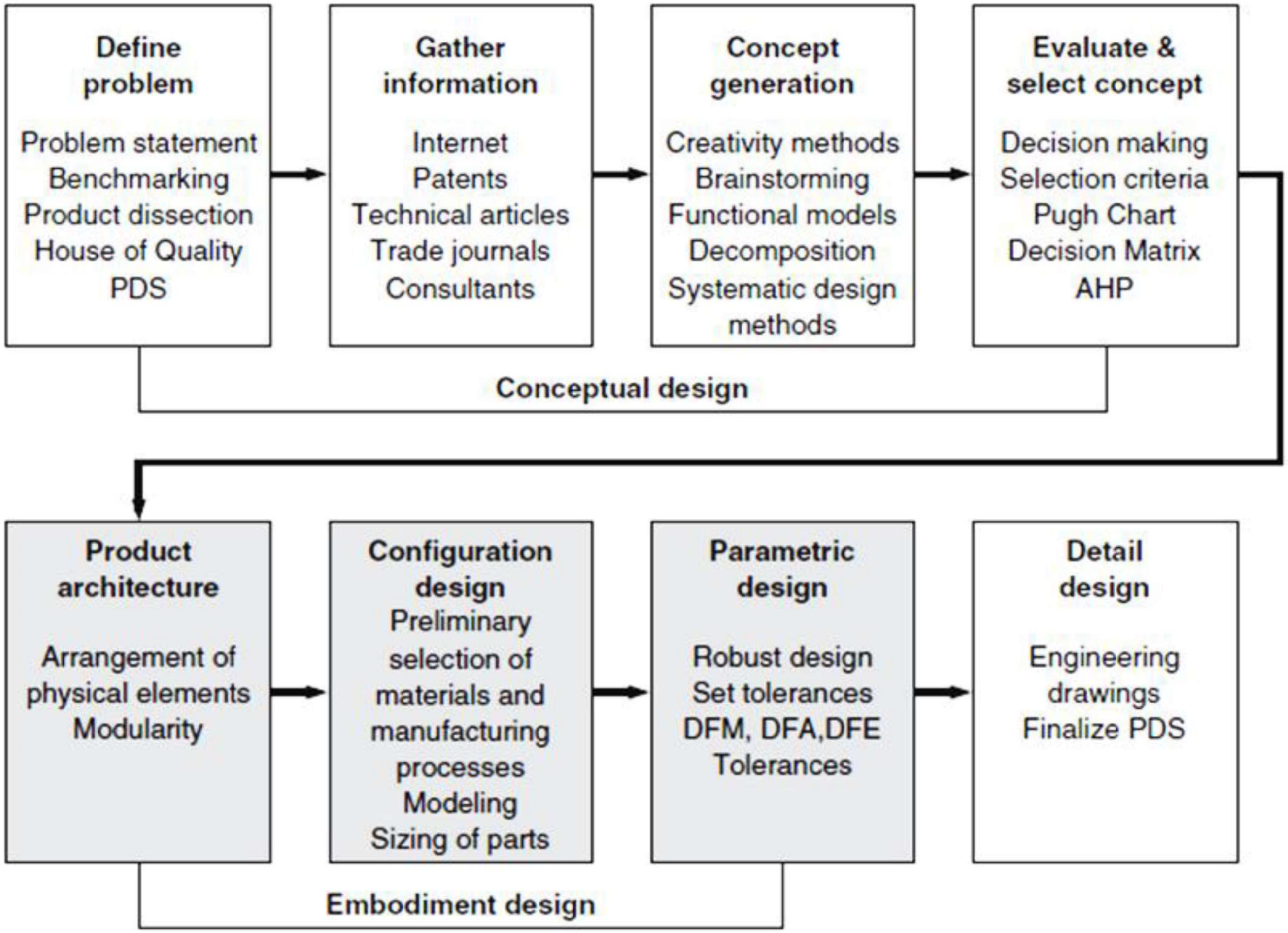
ASCE - American Society of Civil Engineers

and others...



TYPES OF DESIGN

Conceptual Design and Embodiment Design



Embodiment design is also called preliminary design/ system-level Design.

- We have now brought the engineering design process to the point where a set of concepts has been generated and evaluated to produce a single concept or small set of concepts for further development. It may be that some of the major dimensions have been established roughly, and the major components and materials have been tentatively selected. Some of the performance characteristics and design parameters have been identified as being critical to quality (CTQ).

  At this point a feasibility design review is usually held to determine whether the design concept looks promising enough that resources should be committed to develop the design further.

- The next phase of the design process is often called **Embodiment Design** . It is the phase where the design concept is invested with physical form, where we "put meat on the bones.

Embodiment Design

We have divided the embodiment phase of design into three activities:

Product architecture— Determining the arrangement of the physical elements of the design into groupings, called modules.

Configuration design—The design of special-purpose parts and the selection of standard components, like pumps or motors.

Parametric design— Determining the exact values, dimensions, or tolerances of the components or component features that are deemed critical-to-quality.

Product Architecture

- Product architecture is the arrangement of the physical elements of a product to carry out its required functions.
- The product architecture begins to emerge in the conceptual design phase from such things as diagrams of functions, rough sketches of concepts, and perhaps a proof-of-concept model.
- However, it is in the embodiment design phase that the layout and architecture of the product must be established by defining the basic building blocks of the product and their interfaces.
- The physical building blocks that the product is organized into are usually called modules (often called subsystem, subassembly, cluster, or chunk).
- Each module is made up of a collection of components that carry out functions.

Product Architecture

- There are two entirely opposite styles of product architecture: modular and integral.
- In a modular architecture, each module implements only one or a few functions, and the interactions between modules are well defined.
- In an integral architecture the implementation of functions is accomplished by only one or a few modules.

In an integral architecture the implementation of functions is accomplished by only one or a few modules. In integral product architectures, components perform multiple functions. This reduces the number of components, generally decreasing cost unless the integral architecture is obtained at the expense of extreme part complexity.

Systems with modular architecture are most common; they usually are a mixture of standard modules and customized components.

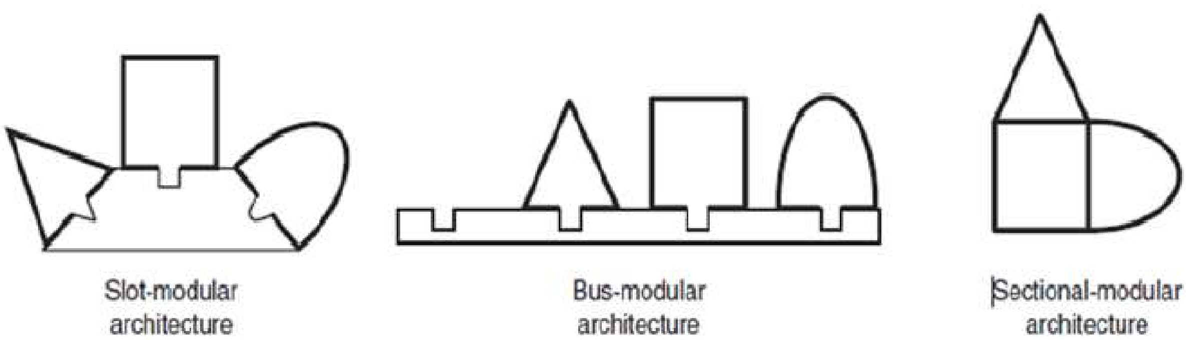
Modular design may even be carried to the point of using the same set of basic components in multiple products, creating a product family. This form of standardization allows the component to be manufactured in higher quantities than would otherwise be possible, achieving cost savings due to economy of scale.

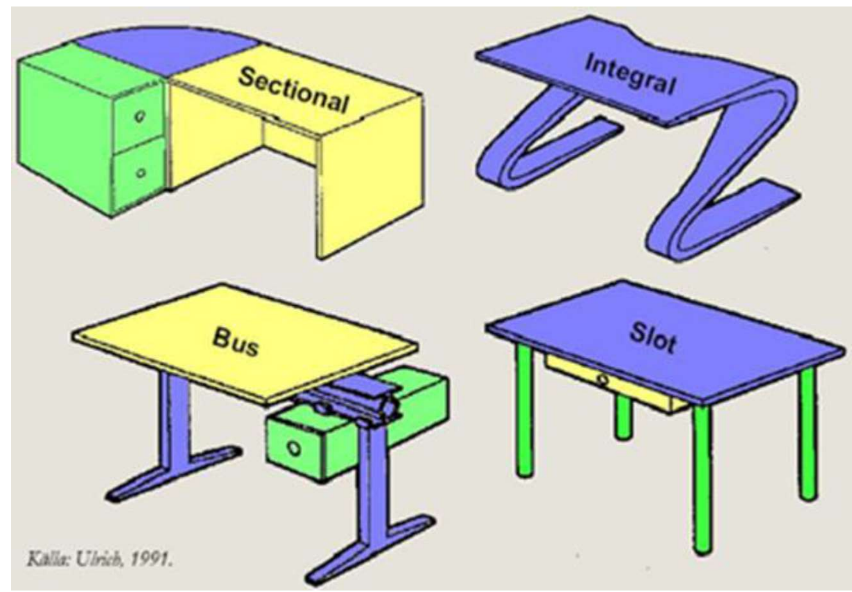
An excellent example: the rechargeable battery pack that is used in many electrical hand tools, garden tools, and other sorts of devices.

- ✓ Integral product architecture is often adopted when constraints of weight, space, or cost make it difficult to achieve required performance.
- ✓ Another strong driver toward integration of components is the design for manufacturing and assembly (DFMA) strategy, which calls for minimizing the number of parts in a product.
- ✓ There is a natural trade-off between component integration to minimize costs and integral product architecture. Thus, product architecture has strong implications for manufacturing costs.
- ✓ The trade-off is that with integral architecture design, parts tend to become more complex in shape and features because they serve multiple purposes.
- ✓ A modular architecture also tends to shorten the product development cycle because modules can be developed independently provided that interfaces are well laid out and understood.

Types of Modular Design

There are three types of modular architectures defined by the type of interface used: slot, bus, and sectional.





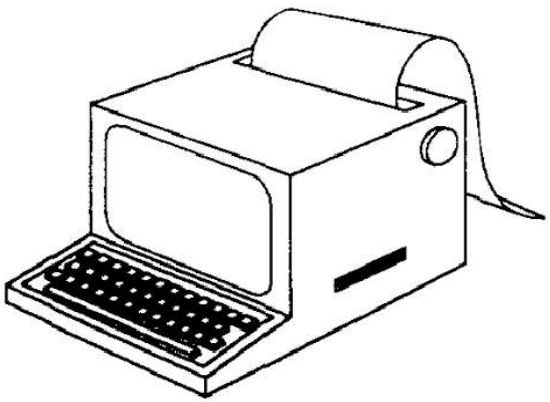
Types of Modular Design

Slot-modular. Each of the interfaces between modules is of a different type from the others. This is the most common situation for modular architecture since typically each module requires a different interface to perform its function with the product.

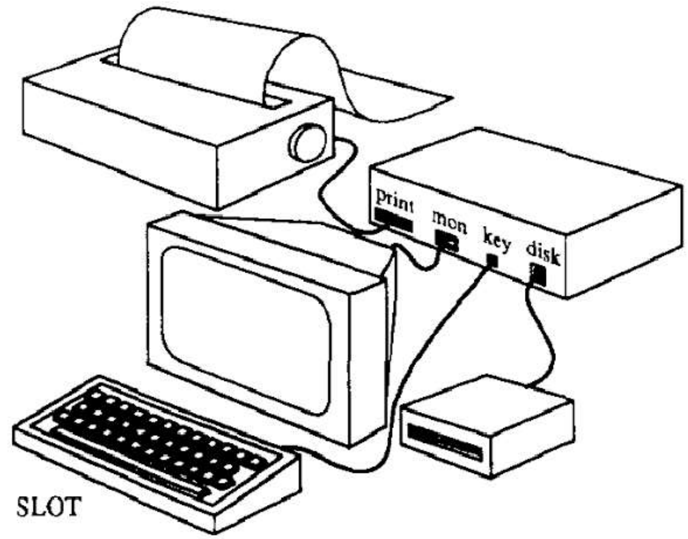
For example, an automobile radio cannot be interchanged with the DVD player.

Bus-modular. In this type of modular architecture the modules can be assembled along a common interface, or bus. Therefore, interchange of modules can be done readily. The use of a power bus is common in electrical products, but it can also be found in such mechanical systems as shelving systems.

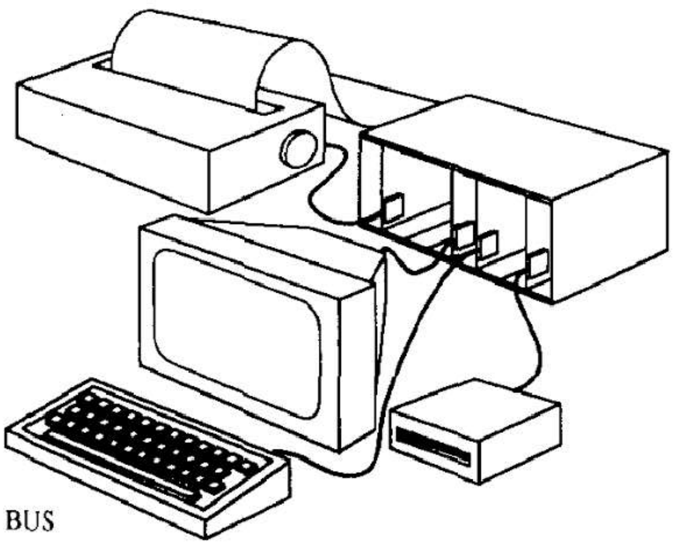
Sectional-modular. In this type of modular architecture all interfaces are of the common type, but there is no single element to which the other chunks attach. The design is built by connecting the chunks to each other through identical interfaces, as in a piping system.



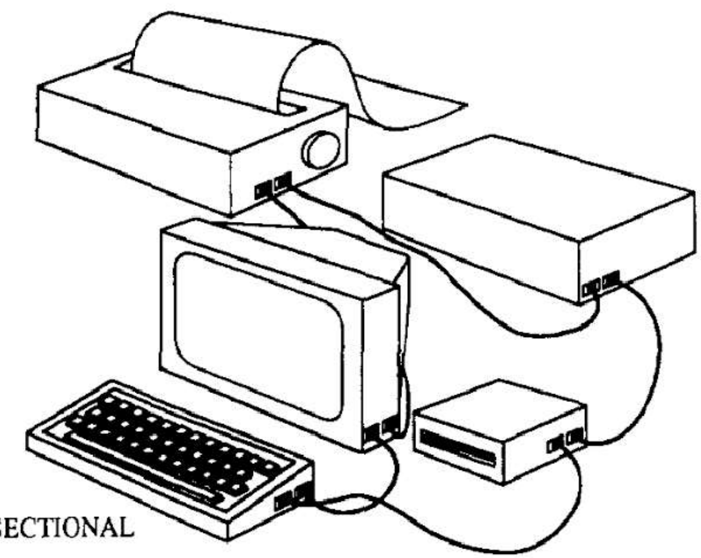
INTEGRAL



SLOT



BUS



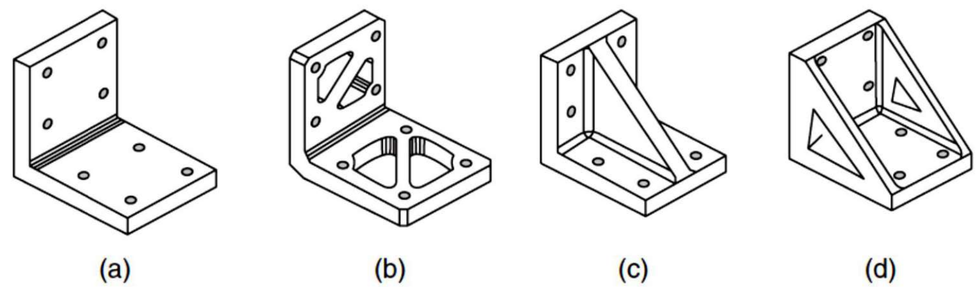
SECTIONAL

Configuration Design

- In configuration design the shape and general dimensions of components are established. In configuration design the shape and general dimensions of components are established.

- The term component is used in the generic sense to include special-purpose parts, standard parts, and standard assemblies.

- A part is characterized by its geometric features such as holes, slots, walls, ribs, projections, fillets, and chamfers.The *arrangement of features* includes both the location and orientation of the geometric features

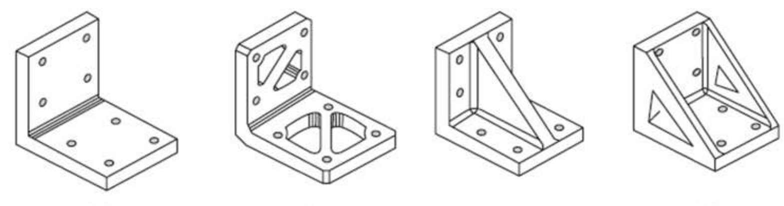


Four possible physical configurations for a component (right-angle bracket) whose purpose is to connect two plates at right angles to each other (a) Bent from a flat plate. (b) Machined from a solid block. (c) Bracket welded from three pieces. (d) Cast bracket

Configuration Design

- A standard part is one that has a generic function and is manufactured routinely without regard to a particular product.
- A special-purpose part is designed and manufactured for a specific purpose in a specific product line.
- An assembly is a collection of two or more parts.
- A subassembly is an assembly that is included within another assembly or subassembly.
- A standard assembly is an assembly or subassembly that has a generic function and is manufactured routinely

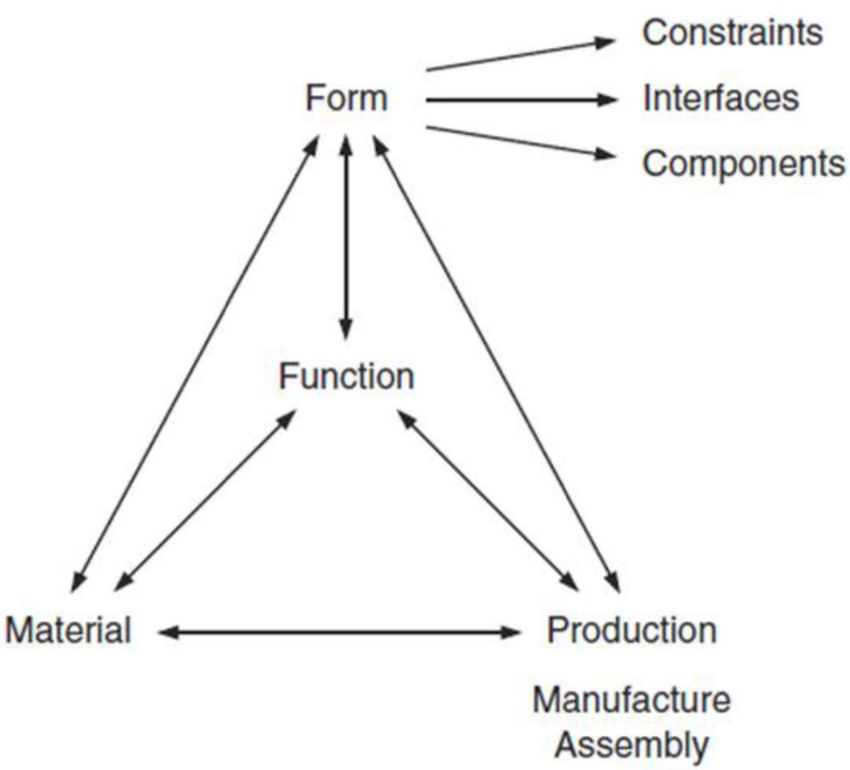
Example: electric motors, pumps, and gearboxes



Configuration Design Steps

- Review the product design specification and any specifications developed for the particular subassembly to which the component belongs.
- Establish the spatial constraints that pertain to the product or the subassembly being designed (product architecture).
- Create and refine the interfaces or connections between components. (product architecture). Much design effort occurs at the connections between components.
- Before spending much time on the design, answer the following questions: Can the part be eliminated or combined with another part? Studies of design for manufacture (DFM) show that it is almost always less costly to make and assemble fewer, more complex parts than it is to design with a higher part count.
- Can a standard part or subassembly be used? While a standard part is generally less costly than a special-purpose part, two standard parts may not be less costly than one special-purpose part that replaces them.

Configuration Design Steps



The configuration design is developed from the functions and it strongly depends on the availability of the materials and production techniques that would be used to create the form from the material. Usually the decisions about the design of a component cannot proceed further without making the decisions about the material from which the product (or the components) will be made and the manufacturing process that will convert a raw material to a functional part of component or product. There is a close interrelationship among the functions and form and the dependency between the material and the method of production which is schematically shown,

Parametric Design

The parametric design is primarily concerned with the specific values and attributes of various design elements that are found in the configuration design. These are also known as *design variables*.

The design variable is an attribute of a part whose value is under the control of the designer. These typically include dimensions or tolerances, material, shape, manufacturing processes, assembly and finishing processes, and so on that must be undertaken to create the part. The objective of parametric design is setting values for the design variables that will produce the best possible design considering both the performance and the manufacturability.

Parametric Design Steps

A systematic parametric design takes place in five steps:

Step 1. Formulate the parametric design problem. The designer should have a clear understanding of the function or functions that the component to be designed must deliver. This information should be traceable back to the product design specification (PDS) and the product architecture. From this information we select the engineering characteristics that measure the predicted performance of the function. These solution evaluation parameters (SEPs) are often metrics like cost, weight, efficiency, safety, and reliability.

Next we identify the design variables. The design variables (DVs) are the parameters under the control of the designer that determine the performance of the component. Design variables most influence the dimensions, tolerances, or choice of materials for the component. The design variables should be identified with variable name, symbol, units, and upper and lower limits for the variable.

Step 2. Generate alternative designs. Different values for the design variables are chosen to produce different candidate designs. Remember, the alternative configurations were narrowed down to a single selection in configuration design. Now, we are determining the best dimensions or tolerances for the critical-to quality aspects of that configuration. The values of the DVs come from your or the company's experience, or from industry standards or practice.

Parametric Design Steps

Step 3. Analyze the alternative designs. Now we predict the performance of each of the alternative designs using either analytical or experimental methods. Each of the designs is checked to see that it satisfies every performance constraint and expectation. These designs are identified as feasible designs .

Step 4. Evaluate the results of the analyses. All the feasible designs are evaluated to determine which one is best using the solution evaluation parameters. Often, a key performance characteristic is chosen as an objective function ,
and optimization methods are used to either maximize or minimize this value. Alternatively, design variables are combined in some reasonable way to give a figure of merit, and this value is used for deciding on the best design.

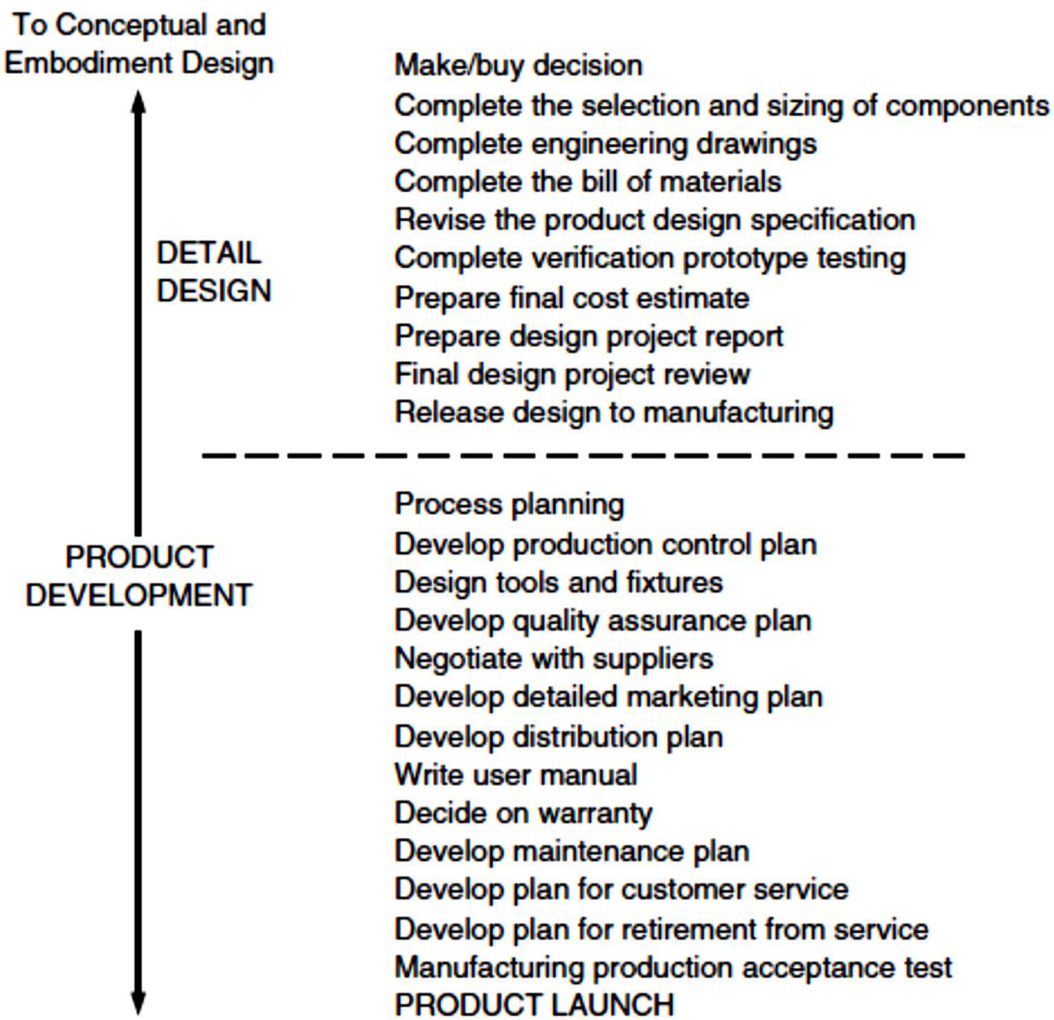
Step 5. Refine/Optimize. If none of the candidate designs are feasible designs, then it is necessary to determine a new set of designs. If feasible designs exist, it may be possible to improve their rating by changing the values of the design variables in an organized way so as to maximize or minimize the objective function.

Detailed Design

Product Design Specification: The product design specification, or PDS, should contain all the facts relating to the product. It should not lead the design by presupposing the outcome, but it must contain the realistic constraints on the design. Mainly we look into the following aspect while writing PDS.

1. Performance
2. Environment (during manufacture, storage and use)
3. Target Product Cost
4. Competition
5. Materials
6. Quantity and Quality
7. Standards
8. Aesthetics and ergonomics
9. Market Constraints
10. Company Constraints

After finalizing the PDS we can go for engineering drawing to generate the blue print of the product



Good design is ________.

detail + design

Figure: Chief activities and deliverables of detail design. Listed below the dashed line are activities that extend beyond detail design until product launch

Codes and Standards

Standardization considered as the unification and determination of solutions, for instance in the form of national and international standards (BSI, DIN, ISO), of company standards, or of generally applicable design catalogues, and also of data sheets, is becoming of increasing importance in systematic design.

The objectives of standardization are to limit the range of possible solutions in no way conflicts with the systematic search for a multiplicity of solutions, because standardization is largely confined to the determination of individual elements,

Standardization is therefore not simply an important complement to but a prerequisite of the systematic approach, in which various elements are combined as so many building blocks.

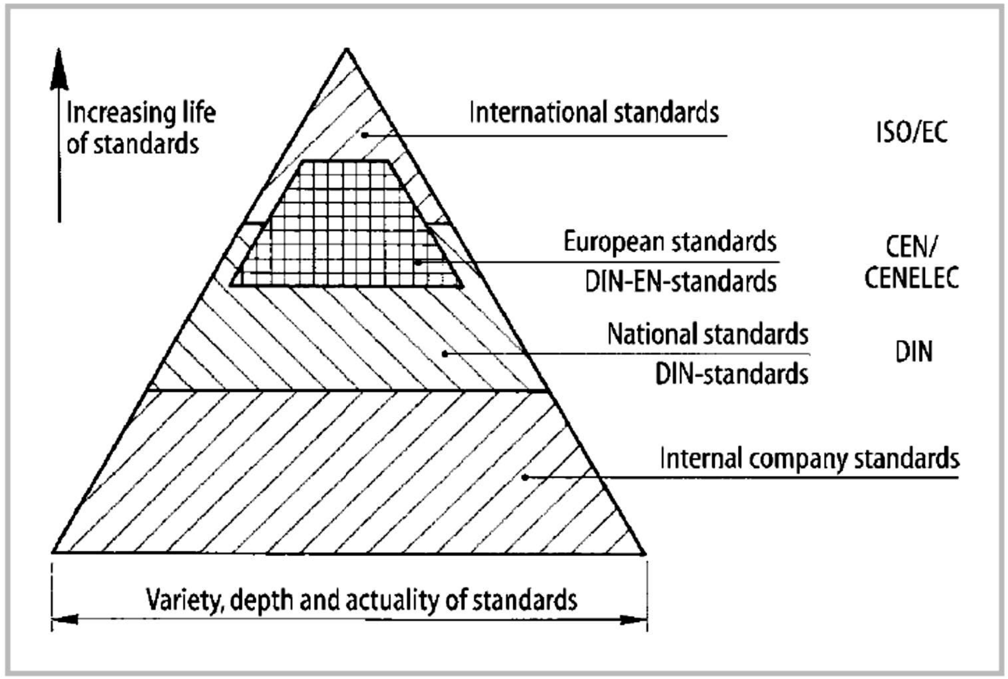


Figure. Relation between company, national, European and international standards based on DIN

Codes and Standards

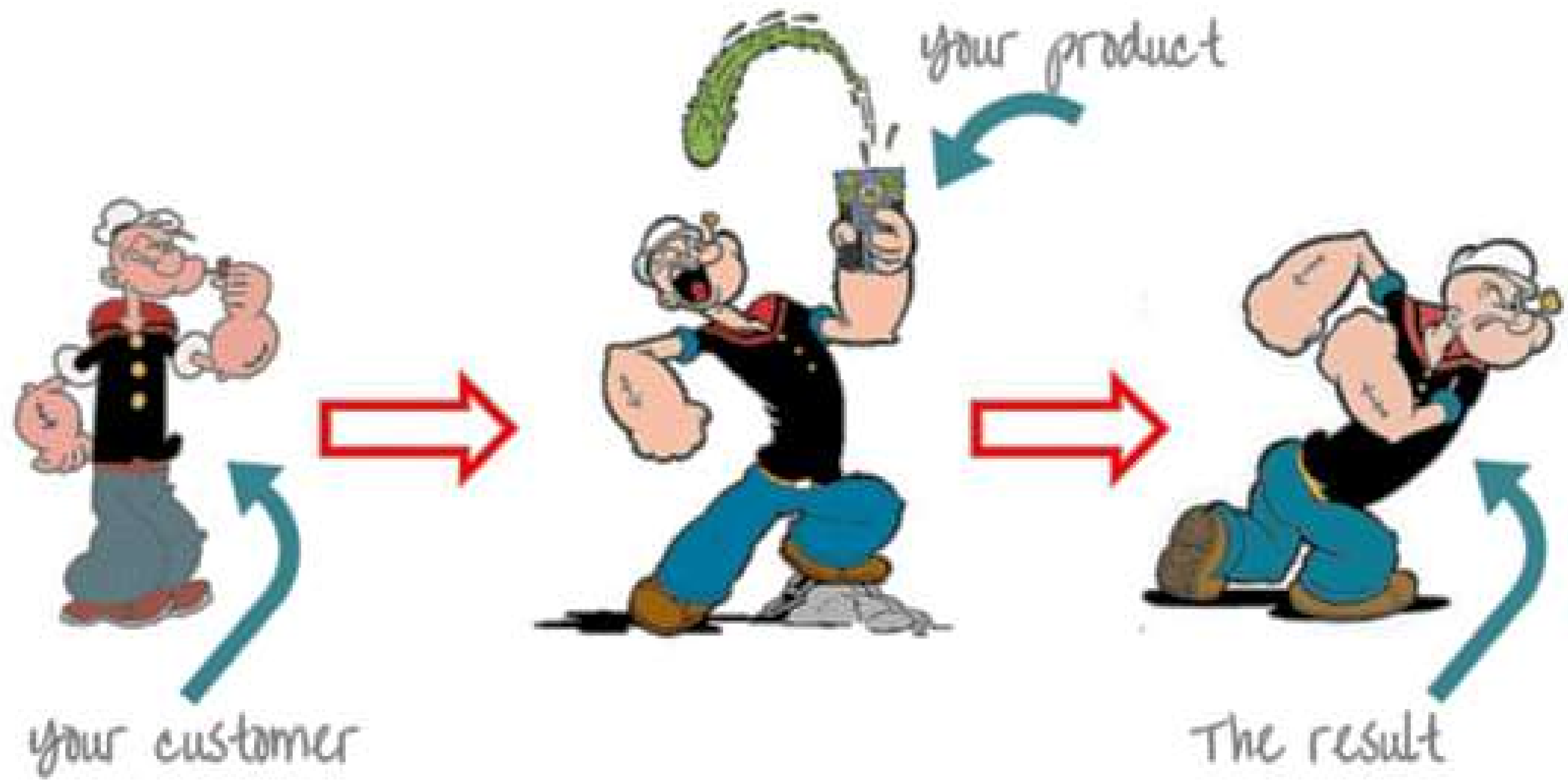
In terms of their origin, we distinguish between:

- National standards of the BSI (British Standards Institution) or the DIN (Deutsche Institut für Normung: the German Standards Institution)
- European (EN) standards of the CEN (Comité Européen de Normalization) and CENELEC (Comité Européen de Normalization Electro technique)
- Recommendations and standards of the IEC (International Electro technical Commission)
- Recommendations and standards of the ISO (International Organization for Standardisation).
- BIS (Bureau of Indian Standards)

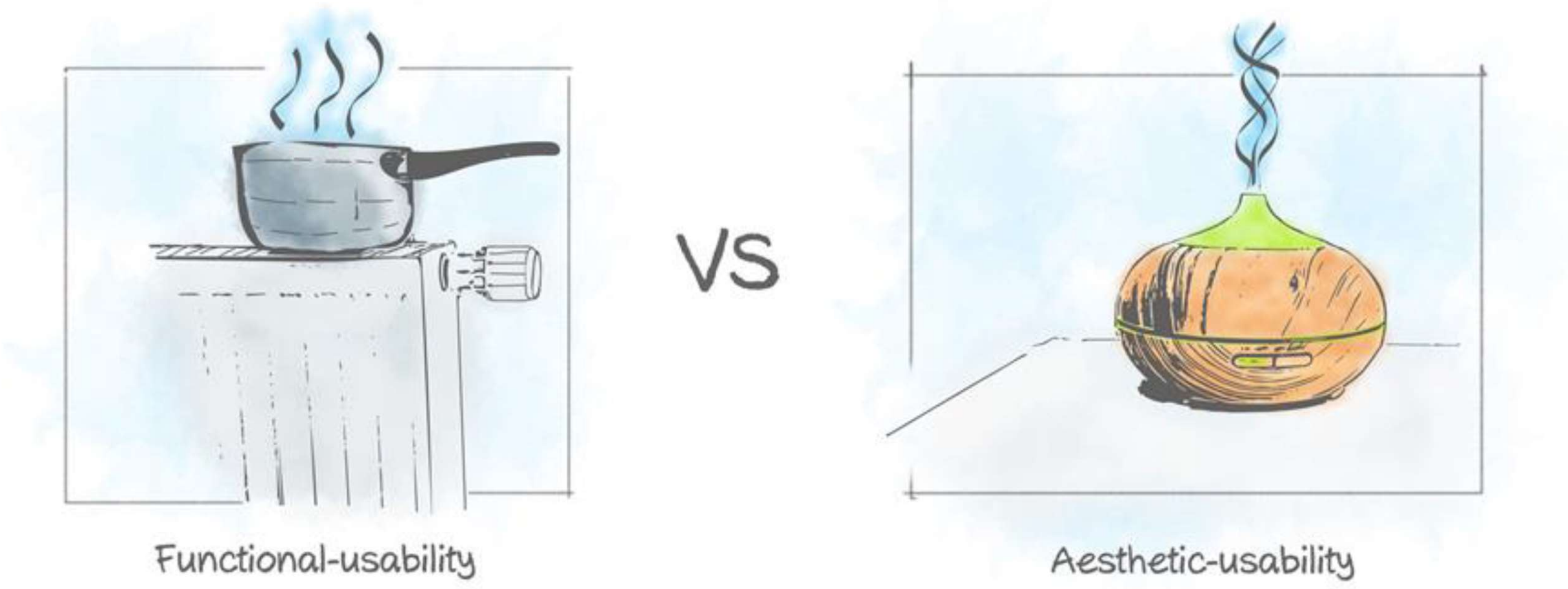
Codes and Standards

- ✓In terms of product content, we distinguish, for instance, between communication standards, classification standards, type standards, planning standards, dimensional standards, material standards, quality standards, procedural standards, operational standards, service standards, test standards, delivery standards and safety standards.
- ✓In terms of their scope, we distinguish between basic standards (general and interdisciplinary standards) and special standards (standards used in specialist fields).
- ✓Besides the national and international standards, designers can also refer to the rules and regulations published by professional engineering institutions, e.g. ASME, IMechE. These are important as they pave the way for further standardization after initial trials.
- ✓Designers can also refer to a variety of internal company standards and regulations.

DESIGN FEATURES


your product
your customer
The result

Aesthetic design



Aesthetic design

What is aesthetic design?

Aesthetic is a branch of philosophy that deals with the nature of art, beauty and taste, with the creation or appreciation of beauty. There is a whole branch of philosophy exploring aesthetics.

There is a phenomenon that social psychologists call "the halo effect". It means humans tend to assume that good-looking people have other positive qualities aside from their looks.

The same is valid for product design. Good looking products and user interface are perceived as more valuable and having more qualities.

Aesthetic design

"Beauty is in the eye of the beholder". Aesthetics are in all our senses, not just the sight. There are 4 important categories, which can make or break the aesthetics of our designs.

Vision:

- The most dominant sense in majority of people is our sight. We can't stop ourselves to look at what we find beautiful. It is as if the light that reflects from the beautiful design acts as a magnet for our eyes.
- Visual aesthetics have these key elements: Color, Shape, Pattern, Line, Texture, Visual weight, Balance, Scale, Proximity and Movement. Using these element well will help us achieve good visual aesthetics.

Aesthetic design

Hearing:

Our ears are capable of perceiving a whole another level of aesthetic design. The ability to hear how your car engine works, how the digital product notifies you of new messages and etc. This is the power of sound aesthetics. **Sound aesthetics have these key elements**: Loudness, Pitch, Beat, Repetition, Melody, Pattern and Noise. Using them well will create enjoyable "music" for our users.

Touch:

Skin is the largest organ in human body. It also helps us experience the aesthetics. Material aesthetics are especially important for physical products. Just remember, the last time you were buying cloths and feeling their texture or when you were checking out the latest mobile phone and feeling the frame material. Sometimes people make there buying decisions only based on the material aesthetics. Powerful stuff are these material aesthetics.

Aesthetic design

Touch:

Material aesthetics key elements are: Texture, Shape, Weight, Comfort, Temperature, Vibration and Sharpness. By mastering them we can make our customers adore our products.




Taste and Smell:

Taste and Smell are sense that help us experience aesthetics even more deeply. Especially in food industry and different environment designs, these senses play an important role in experiencing aesthetics.

Key elements are: Strength, Sweetness, Sourness and Texture (for taste). Use these elements when possible to enhance the full picture, so our users can feel the aesthetics even deeper.

Why aesthetic design matters?

- Not long ago user were expecting only functional and usable products when they were buying. Today, users expectations have evolved together with the design field.
- People expect usability by default and are seeking products that are more than functional and usable. We want to experience pleasure, to stimulate our senses. We want the products we use to evoke positive emotion in us. *Aesthetic design is crucial to satisfy these needs.*
- *We all judge the book by its cover.* The better the book cover the more we believe the content is better. This is phenomenon called "Aesthetic-usability". Beautiful products/objects are perceived as easier to use and more valuable than ugly ones. Even if it is not true!

DESIGN FOR PRODUCTION

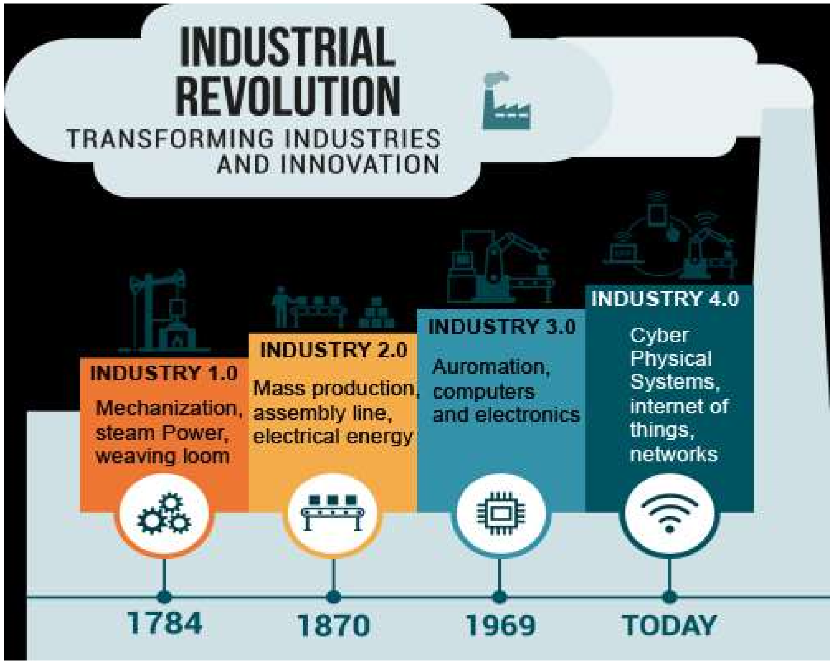
Design for Production

1. Relationship Between Design and Production
2. Appropriate Overall Layout Design
3. Appropriate Form Design of Components
4. Appropriate Selection of Materials and of Semi-Finished Materials
5. Appropriate Use of Standard and Bought-Out Components
6. Appropriate Documentation

1. Relationship Between Design and Production - The crucial influence of design decisions on production costs, production times and the quality of the product. *Design for production means designing for the minimization of production costs and times while maintaining the required quality of the product.*

2. Appropriate Overall Layout Design - The overall layout design, developed from the function structure, determines the division of a product into assemblies and components.

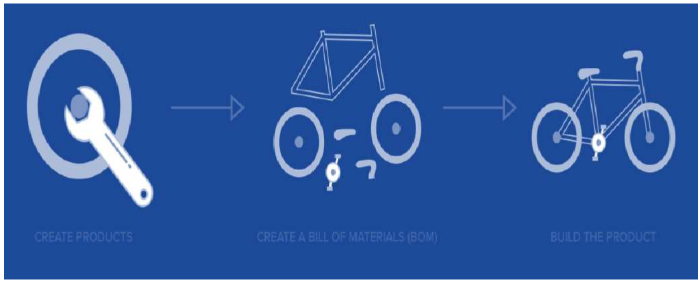
3. Appropriate Form Design of Components - During the form design of components, designers exert a great influence on production costs, production times and the quality of the product. Therefore, their choices of shapes, dimensions, surface finishes, tolerances and fits affect the selection of components.



4. Appropriate Selection of Materials and of Semi-Finished Materials - An optimum choice of materials and semi-finished materials is difficult to make because of interactions between the characteristics of the function, working principle, layout and form design, safety, ergonomics, production, quality control, assembly, transport, operation, maintenance, costs, schedules and recycling. When the material costs of a proposed solution are particularly high, careful material selection becomes of the utmost economic importance

5. Appropriate Use of Standard and Bought-Out Components - Designers should always try to use components that do not have to be specially produced but that are readily available as repeat, standard, or bought-out parts. In this way, they can help to create favorable supply and storage conditions. Easily available bought-out parts are often cheaper than parts made in-house.

6. Appropriate Documentation - The effect of production documents (in the form of CAD models, drawings, parts lists and assembly instructions) on costs, delivery dates, product quality, etc., is often underestimated. The layout, clarity and comprehensiveness of such documents have a particularly marked influence. They determine the execution of the order, production planning, production control and quality control.



DESIGN FOR MAINTENANCE

Design for Maintenance

Design for maintenance should never compromise safety. In principle, the following aims are important:

- Prevent damage and increase reliability.
- Avoid the possibility of errors during disassembly, reassembly and start-up.
- Simplify service procedures.
- Make the results of servicing checkable.
- Simplify inspection procedures.

Design for Maintenance

Service measures usually concentrate on refilling, lubricating, conserving and cleaning. These activities should be supported by embodiment features and appropriate labelling based on ergonomic, physiological and psychological principles. Examples are easy access, non-tiring procedures and clear instructions.

Inspection measures can be reduced to a minimum when the technical solution itself embodies direct safety techniques, and thus promises high reliability.

Technical measures that can reduce the service and inspection effort, include:

- Prefer self-balancing and self-adjusting solutions.
- Aim at simplicity and few parts.
- Use standard components.
- Allow easy access.
- Provide for easy disassembly.
- Apply modular principles.
- Use few and similar service and inspection tools.

Design for Maintenance

To facilitate the execution of service, inspection and repair measures, the following ergonomic rules, supported by appropriate technical embodiments, should be applied:

- Service, inspection and repair locations should be easily accessible.
- The working environment should follow safety and ergonomic requirements.
- Visibility should be ensured.
- Functional processes and supporting measures should be clear.
- Damage localization should be possible.
- Exchange of components should be easy.

Maintenance procedures must be compatible with functional and operational constraints of the technical system, and must be included in the overall cost along with the purchase and operating costs.

Design for Minimum Risk

- Despite provisions against faults and disturbing factors, designers will still be left with gaps in their store of information and with evaluation uncertainties: for technical and economic reasons, it is not always possible to cover everything with theoretical or experimental analyses.
- *Sometimes all designers can hope to do is to set limits.* Thus, despite the most careful approach, some doubt may remain as to whether the *chosen solution invariably fulfils the functions laid down in the requirements list or whether the economic assumptions are still justified in a rapidly changing market situation*. In short, a certain risk remains.
- One might be tempted to always design in such a way that the permitted limits are not exceeded, and to obviate any impairment of the function or early damage by designing a technical system to operate below its potential capacity.

Design for Minimum Risk

- Faced with the situation, designers must ask themselves what countermeasures they can take; provided, of course, that the solution was carefully chosen in the first place and that the appropriate guidelines were scrupulously followed. The essential approach is that designers must, on the basis of the analysis of faults, disturbing factors and weak spots, provide a substitute solution to counter the possibility that the original solution might not cover all uncertainties.

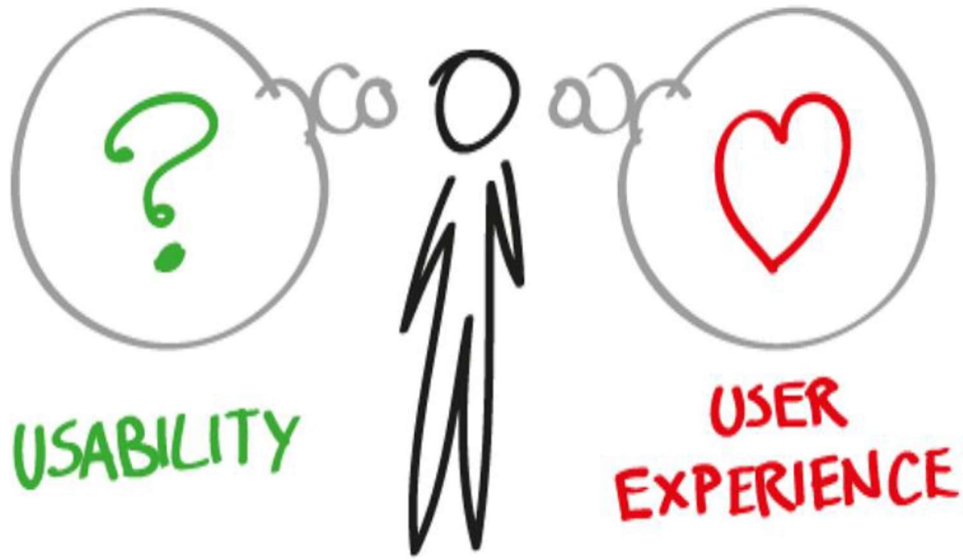
- Through design for minimum risk, designers thus try to balance the technical against the economic hazards and so provide the manufacturer with valuable experience and the user with a reliable product.

Adequate and Optimum Design

- Adequate design refers to satisfying function requirement with undesirable effect being kept in a tolerable limit.

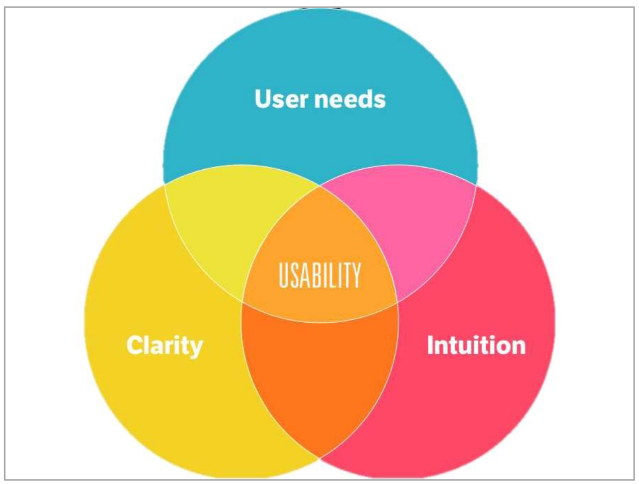
- Optimal or optimum design refers to the selection of the most suitable of all feasible designs. Optimization is the process of maximizing the desired quantity and minimizing the undesired one.

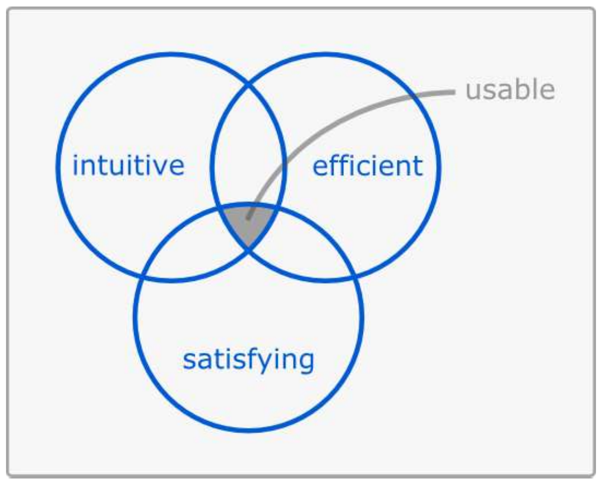
- Objectives of Optimum Design:

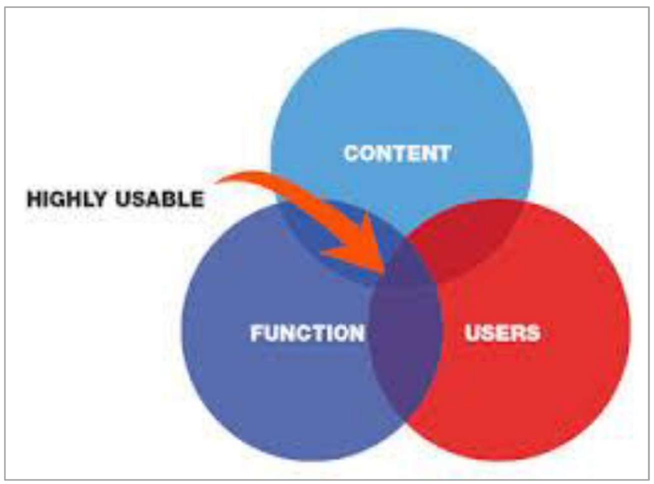

USABILITY
USER
EXPERIENCE

Usability

Usability is the degree of ease with which products such as a device, a software or any web applications can be used to achieve required goals effectively and efficiently.



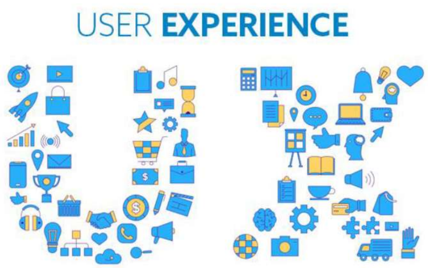


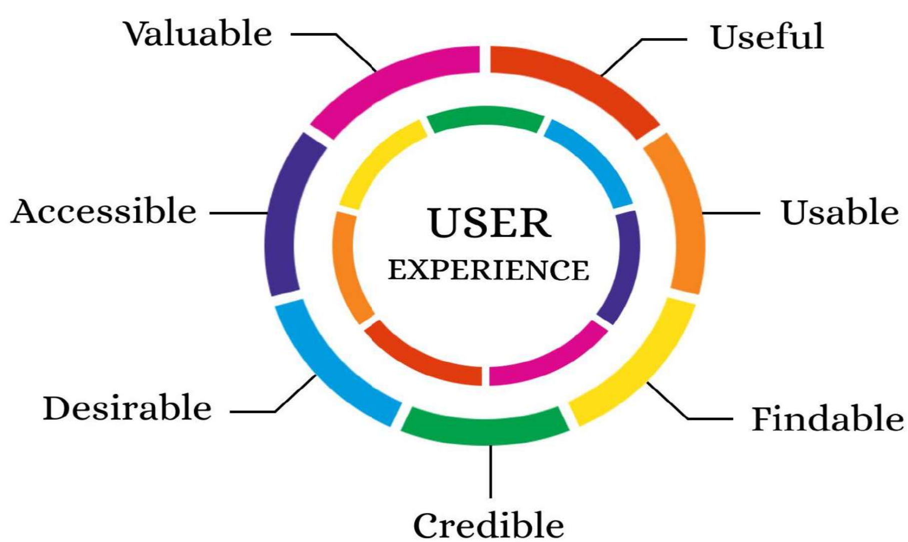


User Experience (UX)

Difference with UX:

- Usability is concerned with the "effectiveness, efficiency and satisfaction with which specified users achieve specified goals in particular environments" (ISO 9241-11) whilst user experience is concerned with "all aspects of the user's experience when interacting with the product, service, environment or facility".
- In terms of a web site, the aim of usability is to make that web site easy to use whilst the aim of user experience is to make the user happy before, during and after using that web site.
- Usability can be modelled as the question "Can the user accomplish their goal?" whilst user experience can be phrased as "Did the user have as delightful an experience as possible?"





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USABILITY TESTING
PRODUCT NAME
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Why Usability Test?

Uncover Problems
in the design

Discover Opportunities
to improve the design

Learn About Users
behavior and preferences

Usability testing is the most common technique to check how usable your interface is from the human center design framework.

The power of this qualitative technique is that it focus on what the user do and not what the user say.

The objectives of this technique are:

- Gain insights from our users
- See if we meet user's expectations
- Check if the design is matching business decision to real world use
- Check if the user can perform the tasks we proposed
- Find out if we're on the right track
- Get user reactions and feedback

Core Elements of Usability Testing

Facilitator

Guides the participant through the test process

Tasks

Realistic activities that the participant might actually perform in real life

Participant

Realistic user of the product or service being studied

Usability testing reduces the risk of building the wrong thing. It saves money, time and other precious resources. It finds problems when they are still easy and cheap to fix.

When a designer is working on some assignment, he's so close to the solution that it that you may not realize that something could be improved by testing the proposed solution with real users.

The usability testing is an iterative process, it's not one time blessing, you need to repeat the process until the design is not confusing anymore and your users are able to achieve the scenarios you propose.

Usability testing: what is it and how to do it?

1 Create a test plan

a. Scope of work
b. Recruit users
c. Identify objectives
d. Establish metrics

2 Facilitate the test

a. Observe users
b. Identify issues
c. Identify solutions
d. Interview users

3 Analyze case data

a. Assess user behavior
b. Analyse user click path
c. Identify problem areas
d. Assess navigation

4 Create test report

a. Review video footage
b. Identify design isssues
c. Identify best practices
d. Design recommendations

Step 1. Create a test plan

Creating the test plan is the initial activity you need to perform to do a good usability testing. These following tasks are the ones you need to do before facilitating a test session.

1. Define scope of work

You need to decide the areas that you want to test. Try to think big, list all out and then refine. You should have no more than 12 tasks to test.

2. Recruit users

Recruiting users is a key activity of this initial step. Recruiting can be performed according to their demographics (age, where they live, etc.) or psychographics (cognitive background: if they're used to perform the proposed scenarios). Ideally you will recruit considering both aspects but take into account that with psychographics you can get you more relevant insights about the usage and adoption of your solution.

ok, but how many user should I recruit?

Answer 1 = 5 users per segment (user persona) — Jakob Nielsen, 1993

Answer 2 = 15 users — Laurie Faulker, 2004)

If you want to understand how users behave and gather quick insights then 5 users per segments should be ok. Also if you're working following in Lean UX, 5 users per segment should be enough.

Step 1. Create a test plan

3. Identify objectives

Identify what you want to accomplish with this test, what you are looking for, what you want to demonstrate to your stakeholders.

4. Establish metrics

Metrics give you a common fact-based description of user/task performance upon which to make informed design decisions, they are important because:

1. Make usability recommendations concrete, influence and change opinion
2. Ground teams in reality
3. Help iterate and validate design concepts
4. Provide objectivity to design debates
5. Guide fact-based design decisions

What kind of metric I would need to consider?

Time on a task, task performance, success rate, speed, goal fulfillment, expectation matching are the most common ones but there are many more it will depend on the nature of your project if you select one or another one.

Step 2. Facilitate the test

Being a good facilitator takes time but these are some ideas that could help you to be a good facilitator:

1. Ask your users to externalize thoughts and feelings when interacting with the solution
2. Keep test environment as realistic as possible, don't try to minimize distractions.
3. Takes notes (structured or unstructured)
4. Record the session
5. Do not lead the user
6. Do not jump into any conclusions during the session
7. Last but not least remember that it's not about what we think of what's a good user experience it's about how the user perceives the solution so keep your mouth shut, relax and listen.

Step 2. Facilitate the test

In the test we're looking for:

1. Quantitative information such as time on tasks, success and failure rates, effort (#clicks, perception of progress)
2. Qualitative information such as stress responses, subjective satisfaction, perceived effort or difficulty

ok but what kind of prototype should I test?

It could be lo-fi wireframes as well as hi-fi wireframes it doesn't really matter. In fact it will depend on the objective you define to be tested.

Step 3. Analyze case data

Once you're done with all your testing sessions it's time to sit, analyse the information and jump into conclusions. There's no common rule to do this but when you have all the information in place you need to look for the trends that emerge, make notes of the possible problems and the potential solutions.

Step 4. Create test report

A test report should be created each and every time you perform a usability testing and must be stored with any other testing documentation of your product. It should include at least the following sections:

Background summary: Brief summary of what you tested, the testing team, the material that was utilized and a brief description of all your findings, the goal of the session.

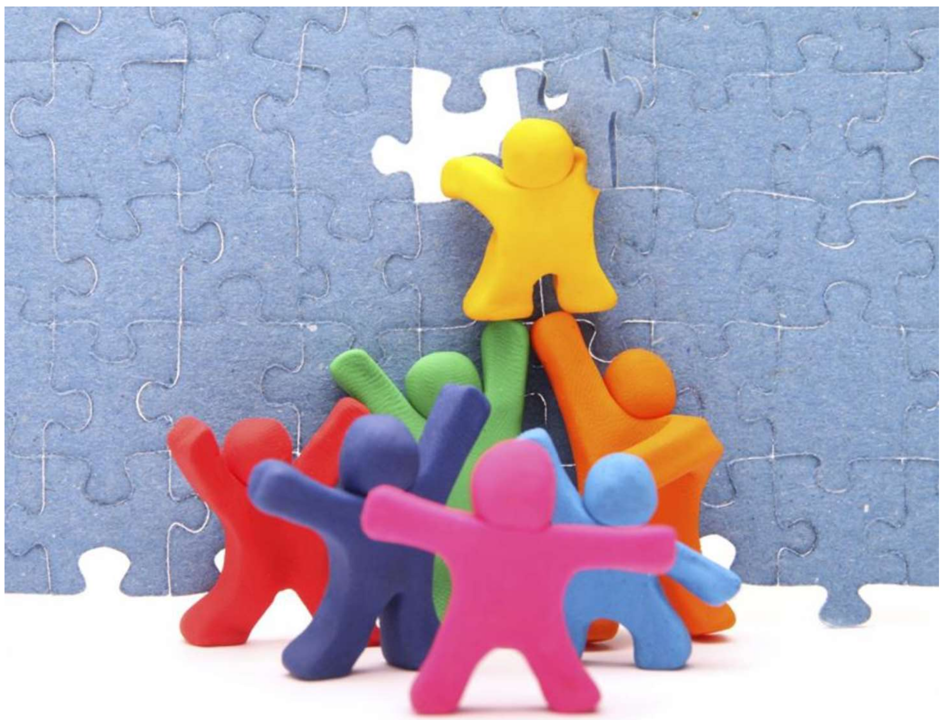
Methodology: explain how the sessions were done, the tasks or scenarios that were tested, the metrics you selected and a brief description of each segment of users.

Test results: summarize all the results from the metrics you have chosen. Our old friend MS Excel can be really useful to summarize all the information.

Findings and recommendations: List all your findings (positives and negatives). Positive findings will help the team to know that they're on the right track, for negative finding provide proposals to solve them.

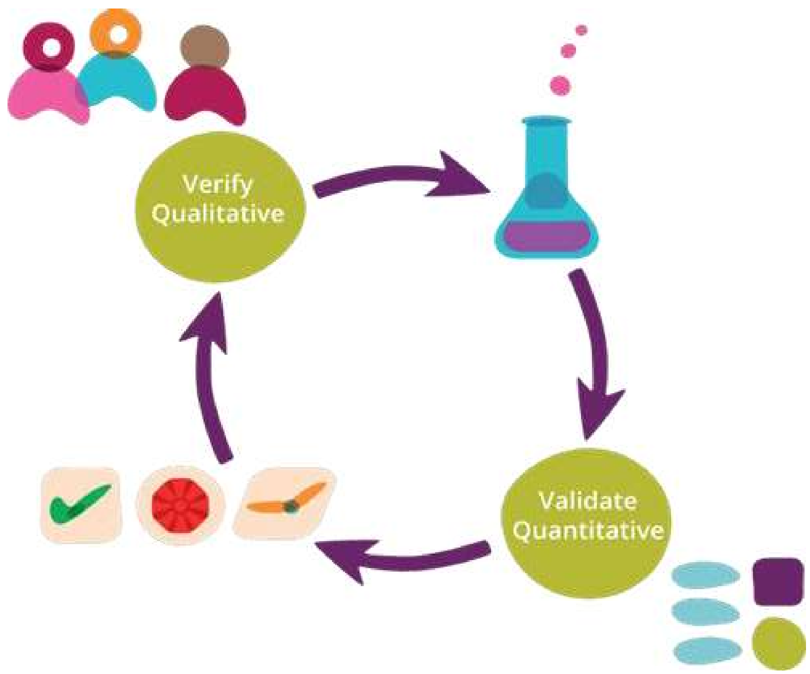
Remember: usability testing it's not to prove yourself that you make the right decisions but to learn how your users perceive and use your product. It's cheap, saves development time and what's most important it saves money.


CUSTOMER

CO
CREATION


CUSTOMER CO-CREATION

Co-creation strategy that aims to bring together different groups of people, typically bringing in a third party, to assist with product development or creative processes. In essence, customer co-creation requires contribution from external parties, be it customers, stakeholders, online crowd forums etc.



Thank you