Product Design

Product design basically is the culmination of ideas into the tangible product or the products in their physical form. So, any set of ideas may lead to a product. Similarly, the products may not be tangible or may not be physical in nature. Sometimes the product can be software a product which is a mobile app. So, different types of products can come because of the generation of the different type of ideas. So, there is idea generation and the final products.

The steps for converting this idea into the final product: Product Design Steps

1. Synthesis
2. Sketching
3. Analysis
4. Selection
5. Basis Engineering
6. Detailed Design
7. Prototype
8. Manufacturing
9. Operation
10. Product Development

First is Synthesis is try to develop different alternatives.

Sketching is may be the use of different alternatives here can be the various ideas that you have related to the product. In sketching a designer generates some idea sketch or some conceptual design or conceptual shape.

So, initially synthesis, then sketching and then analysis which means developing or comparing the various ideas that may be 4 ideas, 5 ideas and out of those 5 ideas only one or two ideas will go further. Different alternatives are analysed with respect to operability, maintainability, inspection, assembling and dismantling issues, cost parameters, production methods. Even legal methods copyright issue, IPR issues and then environmental concerns, waste disposal, recycling etc. any issue it can be covered under analysis. You have the ideas you can analyse those ideas based on number of parameters and then you will be left with a few of them because some of the ideas would get eliminated because of the criteria we have chosen for selection or analysis.

Therefore we can say that in Analysis there is a scrutiny of ideas out of which the best idea is selected. May be the ideas may be compared based on the technical merit, based on their economic feasibility, based on the safety features, based on the environmental factors, they can be compared on the bases of legal factors. So, there can be different parameters of comparison as well as evaluation and not all ideas will reach the next stage very few ideas will reach next stage.

According to idea mortality rate if we generate 100 ideas only 2 or 3 ideas will reach the market means they will be converted into a physical or a tangible product. So, therefore, there is a need to generate lot of idea so that some of them could be converted into the final product.

So, their analysis or evaluation of the ideas will take place at stage 3 followed by the **Selection** of the most appropriate or most relevant idea.

After this next is the basic engineering step in which we make a rough design of a product using the engineering skills. This leads to the development of the detailed design.

What is detailed design? In order to understand this lets consider an example of developing a chair. We will consider all specification of it related to the dimension of the product.

In detailed design we have all the dimension that what would be the length of the chair what would be the width of the chair what would be the foam height what would be the backrest, type of backrest, dimensions of backrest, material of backrest all those designs the type of support system below the chair whether it will castor wheels or it will be the fixed frame. So, all those design with the exact dimension as well as material will be finalized during the detailed design stage. The detailed engineering drawing of each component will be prepared. It can be done with the help of the engineering drawing or engineering graphics or computer aided design. This gives different views of the object or the product even the bill of materials is also there, the number of screws and bolts and other things are also finalized the material that is going to be used to fabricate that job is also finalized and fixed and frizzed. It is important to focus on detailed design so that we come up with the design which is feasible which is technical as well as economically feasible and which is profitable for the organization

So, in detailed design your design is now ready for manufacture you have found out or you have designed the product as per the customer requirement and as per the technical feasibility as per the engineering basics, may be as per the engineering you can say application we have designed the product completely

Once your detail design is ready next stage is the prototyping stage in prototyping stage we will try to develop a prototype. One of the most common methods used these days for prototyping is rapid prototyping in which small prototypes or the prototype of a complete model that we are going to use for further testing is developed. It can be a functional testing; it can be a non-functional testing we just want to see that how the product would look like that can be made using any technique of rapid prototyping.

Then comes the manufacturing process in which one can manufacture the product full scale, in prototype you will only make few models, but in manufacturing it will be a full scale manufacturing in which the complete factory will be used and the product will be manufactured as per the design and as per the customer requirement or the demand in the market.

Then after the manufacturing the product will undergo in service operation for example, now the product is conceptualize, synthesized, evaluated, prototyped manufactured and now it’s in use. So, in use we will say that it is now in operation, so whether it is the operating successfully or it is not operating successfully that will be tested during the operational time or during the operation.

So, this is the standard process therefore, we will try to iron out or smooth out or solve all the manufacturing problem assembly problem during the manufacturing stage, but these things can be eliminated or reduced if we make use of the product design tools at the very basic design stage of the product design process.

Then the operation once the manufacturing is done, product is launched in the market user start to use the product after that there is a operation collect feedback during a actual operation of the new product if any problem exit try to a provide design based solution also implement lessons in the future design.

Then there arises the scope of continues feedback from the customers. Many a time we have seen that the automobile companies they take their vehicles back and do some retrofitting change of a component why because the component is faulty and that design is not as per the requirement and it is creating problem for the customer. So, they call the thing back and then they replace it that is what is highlighted here if any problem persist try to provide design based solution also implement the lessons in the future design. And finally, the product development if any modification can be done implement the same in the next generation product. So, product development process is a continues process and it will continue with passage of time.