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Design for Reuse

Products are designed, produced and then bought by the end-user, or customer. This is a cycle that flows continuously within a company, product after product. But, did you ever wonder what happens to the product after the customer is through with it? Most often the product is just thrown away and dumped in some landfill where it will eventually harm the environment and the future of generations to come. Here is where the design for reuse concept comes into play.

Design for reuse is exactly what it sounds like. It is basically when a product is designed in a way that it can eventually be recycled or reused to manufacture more products. It is a rather simple concept that began in Germany under their "green manufacturing" project. This was a sort of guideline for companies to base their product designs after. These guidelines told companies to manufacture products so that they were safer for the environment. Germany started this green manufacturing by making packaging requirements for importers. This began a mini life cycle for products, which consisted of design for reuse, design for disassembly, and design for remanufacture. These three concepts all have to do with designing products in a way that they can be easily taken apart and reused in making new products.

The concept of design for reuse is used heavily in countries outside of the U.S., but is slowly beginning to grow within it. Not only is this concept valuable to the environment, but it also has many other benefits that help the company that is using it. Inventory costs will decrease because a component of the design for reuse concept is manufacturing products with fewer parts. And with fewer parts, there is less inventory to

store and as a result a decrease in inventory costs. Also, the costs of waste disposal will decline because the company will be reusing more parts and not be throwing away as much. Another benefit to the company is that design for reuse causes shorter product design cycles. This means that products can be made at a quicker rate and can be brought to the market to be sold a lot sooner than if using all new parts to produce the product. Consequently, the company's profits will increase. So as you can see, not only is design for reuse beneficial to the environment, but it also helps decrease costs incurred during production and increase profits.

To use the design for reuse concept, designers need to be able to look ahead into the future when they are deciding how to design a product. They have to think about the entire useful life of the product at the beginning of the design cycle. The reason for this is that this concept is a critical part of how a company is going to construct its products and what materials they will need to use. Products must be designed so that they can be quickly and easily taken apart and used in the production of another product. Also at the beginning of the design cycle, some sort of guidelines should be made on how to properly disassemble the product and create another one. Design for reuse has a lot of planning involved in terms of what is most cost beneficial to the company and what is not. It can be a very time consuming project but once more and more designers are trained to think in terms of the future and the significant cost benefits to the company, this time commitment will shorten and eventually the benefits will keep growing as designer experience rises.

Design for reuse, along with design for disassembly, are becoming standard in Europe and in many countries besides the U.S. In the U.S., many companies are seeing

resistance from the customers for products made with reusable parts. Many customers want products to be produced with brand new parts only, because they feel that reusable and recyclable parts make products somehow less complete in terms of quality. Some customers also believe that products with new parts will function better and will last a longer time before breaking. This negative thinking needs to be turned around especially if companies want the design for reuse concept to grow in the U.S.

Companies from all different industries use the design for reuse concept, so it is not specific to only certain products. For example, you can go from the automobile making business to computers and cameras and you will find companies that use this concept. In 1994, the big three in the car industry: GM, Chrysler, and Ford, began the Vehicle Recycling Development Center (VRDC). This was formed to find more ways to disassemble and reuse car parts. Once a car completes its life cycle, they are stripped of their unique and valuable parts, which are then sold to be used again. The main frame of the car, which is made of metal is smashed into small pieces and sent to the steel-makers for the ultimate reuse of the steel. There are still problems with the VRDC, however it is a well-needed start for design for reuse.

Kodak is another company who has succeeded in using the design for reuse concept. They do this in particular with their product line of disposable cameras. Kodak designed their disposable cameras in a way that they could reuse them to make future cameras. They are easily disassembled and reused. This has made Kodak friendlier to the environment.

In the computer industry, both Dell and IBM reuse parts for future computers. Both use special buttons and fasteners, which IBM calls darts, that make it easy for

computers to be taken apart. They also use as few screws as possible so that the time to disassemble the product is shortened. The reuse of intellectual property (IP) and system-on-a-chip (SoC) methodology is on the rise in the computer industry. Chip designers are beginning to work on SoC projects where they reuse the basic setup of the chip. This saves the company and designers a lot of time. The trouble is trying to encourage designers to think in terms of reuse. Many designers want to create more impressive products, and they often fail to consider reusing components. Today IP and SoC can be reused within the company, however many companies have found it more profitable to purchase these things externally.

To learn more about design for reuse, there are several places to look. DFE, which stands for Design for Environment, is a great software tool that companies can use to evaluate and improve their environmental and economical aspects of their product designs. DFE helps to reduce the end of useful life costs and increase benefits. Also, www.designreuse.com and www.rapid.org are websites where information about product reuse and suppliers of these products can be found. And finally, Qualis offers a reuse guide online to help companies develop and reuse parts for SoC design. They will also consult with companies on these matters.

Design for reuse is a concept that many industries and companies are using. Reusing components of one product to help manufacture another one is safer for the environment and also benefits companies by decreasing inventory costs, increasing time-to-market and increasing profits. Design for reuse works for many products and has been quite effective in the real world. With the benefits to the environment and the company, this concept will continue to grow throughout all industries of the world.

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