Application of reverse engineering in computer aided designing

Engineering

A brilliant method of taking an object apart and disassembling all of its mechanical components and analyze every bit of detail, enough to recreate a duplicate without fully understanding the original. Reverse engineering is used for many reasons, for example; a military obtains an enemy tank that is in good enough condition to be operated, they can have their engineers take the machinery apart and gain the knowledge on how to duplicate the same class tank without having to develop their own techniques.

Another group of people that benefit greatly from reverse engineering are those who work with Computer-aided design, after disassembling a part and taking all the precise measurements they will have the ability to recreate the original part as a CAD Model. " Reverse engineering is the process of analyzing a subject system to create representations of the system at a higher level of abstraction. It can also be seen as " going backwards through the development cycle". (Eldad Eilam, 2005) Reverse engineering has also greatly influenced software modernization, software maintenance and product analysis, and has also been used for many other reasons, some being; teaching/learning purposes, recreating unlicensed replicas or maybe just your curiosity.

A world super power and one of the most technology advanced militaries is the Soviets. They displayed good engineering with the release of the automatic Kalashnikov model year 1947, not only is it accurate more so than the other rifles in its class, it was also durable like no other, the materials used in the development in the ak-47 were of great quality and the design was even better.

The soviet military turned a well-engineered rifle into a legacy by selling the blue print of the ak-47 to other countries like China, Yugoslavia, Romania and Bulgaria saving them the time because they could have developed their own ak-47 by reverse engineering an original one, the Soviets simply left out the correct metal to use in the barrel and other components therefore not allowing them of having a same quality rifle as them.

This ensured the Soviets that even if they were to go to war with one of the countries that was well equipped with their own versions of the ak-47, they still wouldn't be as high quality as the Russian ak-47. There is a way the other counties could have obtained the complete design for the ak-47 or many of the other things that were replicated, it was nearly impossible because Russia knew what technology and what laboratory capabilities the other countries had and it could not compare to those that they had.

Today when engineers design a piece of machinery for the military, whether it be a fighter jet or assault rifle, one of their objectives is to make it as difficult as possible to reverse engineer the structure keeping the design a mystery. One who is proficient with CAD programs can create and reverse engineer most objects. The procedure they would go through would require for the object to get measured using 3D scanning technologies like laser scanners or structured light digitizers, the data is than measured and processed in the right format and it appears as a CAD model.

The 3D scanners are used to analyze an object and collect all the data on it in order to recreate a model that can be inserted in movie clips and video games, and still have an authentic and realistic appearance, there are applications for the iPhone that allow u to 3D scan using the iPhone camera.

Businesses are using the 3D CAD models to understand the product fully and see what it consist of, they can also estimate costs and try and spot out some potential issues that might occur.

Many businesses use reverse engineering to take apart a current product and find alternate ways of making it work by cutting out old techniques and introducing new ones in order to cut down on the cost of the product. The Japanese used reverse engineering in the 1950's after Texas instruments of Dallas had built the first transistors to recreate their own they did it legally and they obtained the paperwork that gave them the right to make their own transistors, the Japanese company that did this is Sony.

Shortly after entering the market Sony of Japan had easily over taken the market and was the lead developer. A decade later Sony had set its mind on televisions, rather than the vacuum tubes that were being used in that day's television sets Sony had used a transistor, shortly after Sony had manufactured and sold their new technological televisions the vacuum tubes became a thing of the past and out dated.

Sony which at one point was the best brand television you could get because it dominated the market it has seen many competitor's; Panasonic, Philips, Sharp many other Asian companies until Vizio reverse engineered the best television sets out there and developed a method on how to do it better. It is human nature to have curiosity and wonder how things work, this is how reverse engineering was originated and why it will always survive.

Whether you are studying a 3D model of an object in order to developed a new redesigned version or whether you are taking apart a captured fighter

jet, the disassembling of the object will teach us enough in order for us to recreate a duplicate model. If reverse engineering was never used or applied it would be much more difficult for us to expand on an already great idea because if you already have an efficient product but you have the desire for better you do not need to start all over, a complete analysis of all the data and different variables can be incorporated into the design to estimate the costs and efficiency.