

# **The Role of Modern Technology in the Design of Contemporary Field Benches**

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## **Abstract**

Science has accelerated its progress in order to produce new environments such as digital media, nanotechnology and information technology. Technology has become a prominent player in the process of design, production and marketing. It worked to develop the technical and cognitive skill of designers in achieving their future ambitions and overcoming the existing difficulties. Technology today has a clear impact on human intellect in general and the intellect of the designer in particular to get his/her artwork to the maximum stages of professionalism and development to suit the constant and rapid change of requirements of times. Radical and dramatic developments in the various computer capabilities of design and manufacturing programs and tools, allowed the designer to deal with an integrated virtual reality to study his product, analyze and modify it and develop an integrated final form for his/her design. Digital technology was able to create a virtual reality in which boundaries and obstacles facing the designer fade away, through which it has become easy to put a design for a seat in the vacuum and show, modify, study, analyze and identify all its characteristics before the implementation of the actual seat, which contributed to enrich the creative ability of the designer. At every moment there was a diversity of programs for design which added the possibility of a direct link between the design process and manufacturing through CAD / CAM programs. Which facilitated the simulation process of the manufacturing process before it started by providing manufacturing codes directly, which further helped to save more time, effort and raw material. Hence, digital control in its various forms of design-only programs (Cad) or manufacturing programs only (Cam) or programs linking design and manufacturing (Cad / cam) is the pillar of all branches of modern industry. Technology of field seat design has transformed design tools from paper and pen to the use of digital software, which in turn created the possibility of combining reality and imagination, prepared for the designer to draw an integrated virtual reality of the field seat for the sake of comprehensive studies; It is well known that the design process always seeks to fulfill human needs in the absolute as a consumer; and good design is to codify the relationship between the problem and the solution to reach the optimal relationship in the best creative form. As we know, the designer is the basis of the design process and creativity from which to start design decisions, using technology to create a true image creation that is not based on the imagination of the designer

only. The interaction between design and virtual reality is an integral one that depends on having techniques of animation, which increased the creative ability of the designer in defining characteristics and components of the design and amendment before implementation in reality; That appears in the design. The researcher presented some models of auxiliary programs in the design process, which qualified the designer and helped him to reach the maximum creative capacity, after making a presentation to identify the types of these programs, poor design programs only (CAD) or drivers and manufacturing only (CAM) or programs that combine design and manufacturing (cad / cam).

### **One of the most important programs that were presented as a two-dimensional design program:**

#### **1-AutoCAD:**

One of the most important features of this program is the creation of models and surfaces which are more conform to specifications, less prone to errors and faster design process, hence it saves time and effort with the possibility of making backup copies of the design and provide ease of storage and circulation.

With the development of virtual reality, the designer was able to draw integrated images of the field seat simulate the reality in the full form but not real, so the design shifted from the physical image to digital and allowed the ease of display and animation to convey the design idea. It also enabled the possibility of experimentation and adjustment, which is not available in the manual sketch, beside the realization of giving the color and texture which are appropriate to the seat. It worked to increase the efficiency of the design process and bridging the gap between the physical world and creative vision of the designer.

#### **2-3D MAX:**

The program helped to get the projections, sectors and binoculars of the seat, it made it easy to modify them and take out the images as close to reality, showing the blocks, colors and raw materials to be implemented.

#### **3- Digital Modeling:**

3D Modeling; With the rapid development of computer capabilities and design programs, 3D modeling has emerged.

#### **4- Virtual Reality:**

. It is a consortium of three different technologies: telephone, television, and video games (telecommuting - watching and enjoying - ease of use).

The role of virtual reality in the sector of field seat design is to represent the reality of the seat but in an interactive manner allowing the designer to interact with it as a reality on the ground.

#### **5- Simulation:**

This technique is based on the time factor and also possesses the techniques of stirring. Catia for this program.

**Through the pre-presentation of the design programs, the researcher presented some important results for the use of these programs, including:**

- Increasing the designer productivity.
- Improving the quality of design, anticipating and avoiding problems before they occur.
- Improving the quality of archiving and documentation so that it is more accurate than manual documentation.
- Save time in the design process and increase production rates.
- Reduce design and production costs and reduce waste resulting from both processes as well.

**The researcher then presents some programs that link both design and manufacturing programs:**

By direct drawing on them and converting these drawings into a set of commands that are sent to the numerical control machines and started the production process, the most important of these programs are:

Artcam - Campus –Lmos

**Features:**

- Save time and effort in the design and manufacturing process.
- Provide the use of materials, energy and components in the design and manufacturing process.
- Continuous development of the product with the same accuracy every time.
- Full control of the manufacturing process, speed, and the possibility of stopping and restarting.
- Calculate the time to finish the manufacturing process before starting.
- Issuing orders and operating codes directly from the drawing.

**The most important programs linking design to manufacturing:**

**1- Artcam:**

It is a design and manufacturing program that produces 3D models and creates manufacturing codes for them. It is a specialized program for OWA graphics to draw or scan them with 3D camera then export it to the program to allow the possibility of modification. Then it is transferred to the computer numerical control machine to start the manufacturing process.

**2- Catia Program:**

This program is especially used in structural furniture. Its most important features are simulation of reality and measurement of stresses.

**At the end of the research, the researcher presented some important results of the pre-presentation, the most important of which are:**

**Results:**

- Emphasizing that digital technology has supported the design process at all stages.
- Technology was able to achieve the imagination of the designer and has helped in emerging new generations of field seats with new designs and in the emergence of quantitative production.

- Digital programs helped the designer in; producing the final shape of the product easily, speed of the process of creativity, innovation of the final design and accuracy of implementation.
- The digital revolution has removed the obstacles facing the designer in the full imagination of the seat.
- Technology has changed the concept of field seat design.

### Research Recommendations:

- The researcher recommends the need to pay attention to designers in learning the various design software.
- Identify the importance of linking technological development in design programs and producing field seats that commensurate with the possibilities offered by the technology.

### Reference:

- boghdadi,mostafa: afak gdeda lltknya am tarajue ltkaled elemara ,hal honak taearud ben elfekr w eltknya, mglet elbina' elsaeudi ,2004 ,p161
- **Bell, Daniel:** The Coming of Post- Industrial Society. London: Basic Books, 1976.p 26
- wehba,morad: almoaejam alfalsfi 'dar keba' elhadesa lltebaeua w elnshr w eltwzie ,elkahera ,2007 ,p210
- <https://www.almaany.com/ar/dict/ar-ar/%D9%85%D8%B9%D8%A7%D8%B5%D8%B1%D8%A9/>
- galal' haytham Mohamed Mohamed :altsmem alzakie w tadeimoh lfalsafet altamem ,bahes manshor ,2017 ,p3
- Kymmell, Willem: Building information modeling .New York :McGraw Hill, 2008, P04.
- ahmed ,Mohamed Hassan Khalil :tathir teknologya elmaelumat ala tatawur alfekr almeamari ,kolyet hndasa ,gameat alazhr ,magester ,2011 ,p88
- reyad ,Mohamad mohamad abd elsalam: tahded asaleb bena' w tahlel alnamazeg alrkameya fe mrhalet wade afkar altasmem ,bahs manshor ,2012 ,p4
- [http://www.astucestopo.net/2014/11/blog-post\\_5.html](http://www.astucestopo.net/2014/11/blog-post_5.html)
- [Http://en.wikipedia.org/wiki/Autodesk\\_3ds\\_Max](Http://en.wikipedia.org/wiki/Autodesk_3ds_Max)
- Chris,M. ,Jimmie B.: Cad cam principles ,practice and manufacturing, Addison-Wesley, second edition 2000 ,p7
- ALI,Yossef.: Avirtual reality Applications Gallery:towards amore concrete and dynamic relationship between architecture and virtual reality,Barcellona:Third InternationalCongress:Arquitectura 3000,Spain,2004,p20, Cited in : <http://www.ckk.chalmers.se/vr/arquitectura3000/ws2.html>
- rafat ,ali:tholatheyat alebdae alfekry- emaret almostakebal ,wekalet al-Ahram llnshr w altwzeae ,alkahera ,1999 ,p164
- habak ,aya lofty zakarya: asaleb hadesa fe tasmem w entag asas moaeser bdomyat ,magester ,kolyet fnon tatbikayh ,gameat helwan ,2014 ,p126