

# Image Considerations Across Multi-Purpose Applications

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## Abstract

Within the world of computer graphics, images are often treated as “stand alone” entities that are used for dedicated purposes. Indeed, we tend to categorize images based on their eventual application such as advertising images, manufacturing models, working drawings, or even WWW logos. However, the fact exists that a graphical image can be manipulated into a wide variety of diverse formats from its original database. 3D Models that are generated as conceptual objects may also be used as the foundational information used for rapid prototyping, or even converted into 2D images that will find their way into marketing materials. To view a graphical image solely in the format that it was first designed causes us to limit the applications in which such an image may be used. The true advantage in employing a computer to create an image does not lie in the fact that the computer can perform tasks quickly, but in the fact that it can interpret and transform data into a wide variety of configurations or file formats. This paper will explain and identify the multitude of uses a database can take and the widespread application of data in various forms.

**KEYWORDS:** *File formats, images, design, manufacturing, marketing, soliciting*

## 1. INTRODUCTION

The Computer Graphics Technology Department at Purdue University offers four concentrations to students that are interested in visualization and graphical communication: Animation, Multimedia, Manufacturing, and Construction Graphics. Although these concentrations focus on different aspects of computer generated graphics, each area of specialization cannot be ignorant of the technological foundations of the other areas as their end products more often than not overlap each other. The software that is being utilized at Purdue University, and in industry, is making it easier to integrate digital illustrations into all aspects of the design process. Thus an image is no longer just a static representation of an object, or idea – it is one that may now be used for designing, manufacturing, soliciting, marketing and documentation.

## 2. DESIGN

Perhaps the most commonly recognized product that a company can relate to is its primary identity image, or logo. This logo is likely to be used on every product and every piece of communication that is sent out beyond the bounds of their company walls. The image that is used for their logo needs to be created digitally so that it can be small, large, color, black and white, two-dimensional, three-dimensional, and/or animated in a quick time frame. Therefore, it is no longer just a static image. Today, the graphic designer who creates a logo has the option to export that image in such a diverse number of file formats that the digital representation can be used in a multitude of domains.

To illustrate this point, let us consider this example: A designer can create a two-dimension vector drawing using Adobe Illustrator, Macromedia FreeHand, or Corel Draw. A vector illustration is by definition a graphic consisting of mathematically described objects that usually appear as outlines with control points. These graphics can be scaled to whatever size that is needed; or in other words, they are “resolution independent.” Once this graphic is created the designer could export it as a .tif or an .eps file for printed media, a .jpg or .gif file for interactive media, or an .ai (Adobe Illustrator) file to import into three-dimensional programs such as Rhinoceros and 3D Studio Max. By exporting many different file formats of the same image the designer can now begin using the image for more than just one part of the overall process.<sup>[1]</sup>

Again we could use an example that might best be illustrated as related to the design of a new building. In my capacity as a designer, a committee composed of members of the faculty and staff of Indiana University Southeast approached me to create some visual aids for a building renovation project. The committee asked me to take the ideas that they had already conceived, and create illustrations of what they foresaw one of the campus’ administrative buildings would look like after that edifice had been renovated. Having met many times to brainstorm their ideas, the group was still unable to envision how the outcome of their conceptions would appear in a finished form. After meeting and discussing their numerous ideas, I was then able to create a 3D model of the building that not only incorporated still images of the renovated structure, but also included several animated views. This additional graphical support allowed the group to receive a vindication of their own thoughts in a visual format and enabled

them to more completely present their ideas to the Dean and the core group of workers who were involved in the building's renovation.

### 3. MANUFACTURING

Imaging formats have made an astonishing impact on the world of manufacturing in recent years. Today, before any manufacturing concern can attempt to produce a finished product, a three-dimensional model of that product will be produced in the computer's home environment. Once completed, this database can then be downloaded to a stereo lithography machine in order to create a rapid prototype of the conceived object. A stereo lithography machine, not only has the ability to create a solid model of the 3D geometry by tracing the surface with light beams, but also creates a 3D model of the image that can be tested and analyzed before the object is sent to production. While it will readily be conceded that these models can be very expensive, we must remember that they can also save enormous amounts of time and money, if a problem is found and corrected in the prototype before the production cycle begins.<sup>[2]</sup>

However, the world of manufacturing does not depend solely on the 3D model. Flat images continue to be of great benefit in the manufacturing area. For example, after the initial design of a product or corporate logo is created in a 2-dimensional format, it can be imported into a 3D program as a 2D image. Once inside the 3D software, the vector curves can be extruded into volumetric geometry, the edges filleted, and the image finally receives a smooth and realistic look. The image can also be rotated, scaled, and moved into spatial orientations where it can be viewed in three-dimensions in addition to the original two-dimensional projection created. The logo can now be reproduced as a 3D object to be used for clocks, jewelry, paperweights, etc. All of these uses can be accomplished with just one image that was created in a vector illustration program. Should the company wish to do so, the logo can even be tested within the capabilities of a stereo lithography machine.

While creating a building to scale (in the case of a "manufactured home") using a stereo lithography machine would be time consuming, one might consider the option of exporting the digital 3D model as an IGES file from any CAD or 3D software package, and importing it into various construction software packages such as Argos. Once inside these packages, the data allows other information to be generated and extracted, such as the calculation of construction time, as well as the cost of the required materials and labor that would be required to erect the building.<sup>[3]</sup>

### 4. SOLICITING

Sometimes a company must solicit potential buyers before a product is even manufactured. When this happens it is easier for someone to buy into an idea when they can actually see and/or feel a product. Consider this scenario that is an example of a common occurrence in the world of professional sports franchises:

A prominent NBA team was looking for a new urban center that would provide them with an appropriate sports arena. Each city that was interested in vying for this opportunity was requested to submit documents and images with their proposal showing all aspects of a possible new arena for the team.

The city of Louisville, Kentucky went so far as to have engaged a group of digital imagers to create a virtual 3D model of the new arena that incorporated the model into an animation of the building. This visualization of the building not only allowed the people in that city to see what it would look like, but also allowed the sponsors of the project to start soliciting the funds necessary to build the new arena by presenting this work to prospective investors and other sponsors.<sup>[4]</sup>

What began as a dream to find a new home for the sports club resulted in numerous digital assets being created that would not only serve the purpose for which they were initially intended...the selling of an idea...but also could be used to give the citizens that would be asked to support the team through sales a chance to see what their commitment to season tickets sales, parking facilities, refreshment concessions, etc, would generate. This is to say nothing of how the model and other assets could be used for advertising, construction detailing, and other business concerns.

### 5. MARKETING

When we speak of marketing, we cannot help but acknowledge that images have always played an important role in selling an idea to the public at large. The same image that was originally created as a logo for the company, and possibly only intended for use as a trademark or company sign, can be used in every aspect of marketing that company's product line. The image used in the creation of the logo can now not only be used in the format of the traditional 2D image, but also be included as a 3D illustration in displays. Consider for a moment a product being marketed by a shoe company – the logo could be placed on the shoe somewhere as a 2D image. The logo will most likely appear in the printed advertisements, on the shoebox, and would no doubt also appear on the corporate website. Even a brief glimpse at the clothing many people wear today shows the magnitude of value that a logo has on the names and corporate images. The company logos and the names of those people responsible for the product design appear prominently on all types of merchandise.<sup>[5]</sup>

Due to the fact that the designer has a data rich image with which to work, the logo's image can easily be exported into the different file formats that allow the task of incorporating the logo onto or into diverse applications to be quick and easy. The 3D image of this same logo can also be used in the creation of commercials and as objects that adorn and decorate commercial trade exhibits and information kiosks.

## 6. DOCUMENTATION

Traditionally when we have spoken of documentation over the years perhaps the most common image that springs to our minds is that of hard copy manufacturing and construction drawings. When we discuss this category of images, we are no doubt most familiar with production drawings (also known as detailed drawings) that consist of the necessary views for each part to be made, dimensions and notes. We may even think of assembly drawings that are generated to show how the parts are placed together in the complete product. Patent drawings used by the graphics industry that are used to copyright a design in order to protect the company rights to the product or graphic also fit into this area.<sup>[6]</sup>

Indeed, for years the only way we had of producing images was to construct them on vellum and then create multiple copies via the systems of Ozlid, or "Blu Ray" to generate what were commonly referred to as "blueprints." These drawings were all initiated from the original graphic that was created. Once a product has been approved for production a final set of drawings would be produced and reproduced in a quick manner at relatively low cost.

As digital imaging became possible, images could now be "dumped" to plotters and laser printers that could produce beautifully detailed final drawings on many different styles of media. Images could also be stored electronically or transferred easily to microfilm without the tedious process of chemical baths. Further, files could also be exported from a vector or 3D software program as an IGES or .dwg file and imported into CAD programs via floppy disk or across transfer lines to other computers.

## 7. CONCLUSION

It would be an understatement to say that the need for graphic information is growing daily. In reality it is not merely growing, but multiplying by leaps and bounds. The ability to create images has increased dramatically in direct response to the need of industry and business to meet the needs that the public demands. We desire new and improved products which are more elegant, streamlined, ergonomically acceptable, and unique in their outward appearance than at any other time in history. Products now must not only be functional, but exquisite in their appearance and operation. All these factors require that images of their attributes be created to enhance their appeal to the public.

This ravenous demand for more and more images requires that designers no longer take the time to re-create an image in a different format every time one is needed for a specific application. In order to meet fast-paced deadlines, knowledge of file formats and how they can interact with software ranging from raster, to vector, to 3D is not only a plus for the digital designer, but also a necessity. Such an expertise will not merely support the designer in his or her ability to produce a drawing that can then be used for one area such as print media, but also provide data that will now appear on the Internet, as a component of interactive

multimedia, bolster productions and animations, and identify product branding to all that view its outline.

## 8. REFERENCES

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