Abstracting design, designing abstractions…

Use of computer graphics in early stages of architectural design

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The use of digital technology in architecture has certainly become pervasive in recent years, resulting in innovative architectural solutions unimaginable just ten years ago. These innovations are often a direct result of embracing this technology as a new means for exploration and execution of design concepts.

The most visible element of this shift is the computer visualization of buildings and spaces with photo realistic accuracy. The study of materials, tectonics, light and shadows. These accurate representations are highly effective in presenting final designs to the client or in marketing the project to prospective users. Despite its great success in these areas, computer visualization does not necessarily bring a new qualitative improvement to the design but merely serves as an effective selling tool.

However there is an opportunity to use architectural computer graphics in a way that interacts with a designer and informs the design. In the way that goes beyond 'simple' computer graphics version of traditional hand sketches or physical models and become a visually attractive and intellectually stimulating partner. This is achieved by emphasizing a design process not a design product — an abstract rather than real vehicle for creative ideas. The search for the abstract is not an escape from reality, but comes from the need to structure, prioritize and layer the design in a way that maintains its integrity. This emphasis is especially critical in the early stages of design when ideas are formed, tested and developed. During this time, an unrestricted flow of possibilities, undeterred by logistics of reality, helps to foster a creative process.

The following examples illustrate projects that have used digital imagery techniques as a driver for conceptualization.

Sketching Relationships

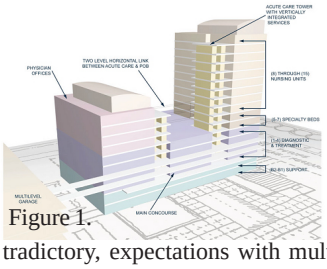

Figure 1.

Diagramming functional relationships within a building (fig.1) may appear to be a simple exercise in connecting various uses expressed in the form of a two-dimensional sketch. However, this task quickly becomes more complex when we realize that the design has to fulfill various, often contradictory, expectations with multiple superimposed interests and demands. In such a situation, the use of three-dimensional diagrams becomes a necessity and perhaps the only tool in resolving these relationships through the inherent ability of the 3D model to depict the project as a spatial composition and take into consideration all horizontal and vertical adjacencies.

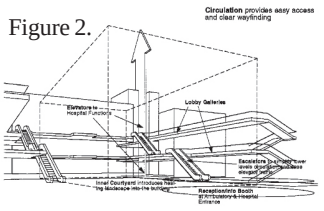

Figure 2.

The perspective view (fig. 2) of the spatial diagram begins to inform the space of the building by using a simple hidden lines representation of the previously discussed functional diagram. This subtle change of the view allows a diagram to read more architecturally and less diagrammatically.

Abstracting Design

While working with digital imagery it is easy to get seduced by it and consequently stray away from the path of design intent. Thus, it is useful to step back and evaluate the design. An example of this reevaluation is to take a three-dimensional digital model and render it in white, flat material. From this exercise we can learn how the building works on a purely tectonic level, where all architectural expressions are achieved by the play of lights and shadows. This is an important step because architects too often rely in their design on material and color patterns and not on the massing and sculptural aspect of its form.

Figure 3.

Sketching Space and Light

'Writer's block' is evident in any creative discipline, including architecture and design. While working within a virtual environment, it is often necessary to take paper printouts of a digital image and sketch over the rendition to further develop design. (fig. 4) This technique for moving ideas between the traditional drawing and computer representation often results in imagery that is far richer and more evocative than conventional media would normally aspire to, at the same time, preserving the dynamic nature of hand sketching.

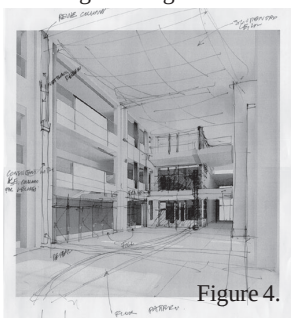

Figure 4.

An important part of any interior rendition is a realistic sunlight study. (fig. 5) The purpose of this study was to understand and better design space where light plays a significant role as a form-defining element. A series of black-and-white renditions were developed which focus on early morning and late afternoon conditions. These digital study images, while they may be used in presentations, are not treated as renderings in the traditional sense. They resemble study models, disposable exercises, the purpose of which is to facilitate decision-making.

Figure 5.

Sketching Impressions

The following example (fig. 6) investigates what the architectural form wants to be. Doing so, it embarks on a search for the virtual *genus loci*. Through abstract ideas and interrelating virtual forms we are able to read more into them and derive meaning from their ambiguity. This set of digital sketches began as a quick massing study and developed into the pursuit of maximum synergy within a virtual architectural environment. The result is composition that sustains itself through the pure quest for meaning and perfection.

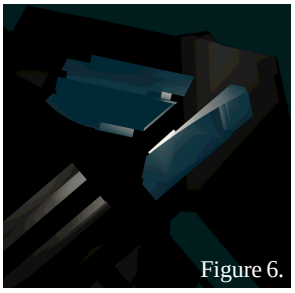

Figure 6.

Unlike the traditional manual methods designers used to explore during the design, ideas generated with the tools of digital technology often result in images that are entirely unexpected. On some occasions, these unexpected images are uninteresting, but oftentimes, they turn out to be visually attractive and intellectually stimulating. However, they are not products on their own, they result from a very close, almost intimate, relationship between a tool and a mind that uses the tool, not as a random permutation of possible solutions.