DESIGNING ARCHITECTURAL EXPERIENCES:

Using Computers To Construct Temporal 3d Narratives

by

Julio Bermudez

Graduate School of Architecture
University of Utah
Salt Lake City, Utah

JULIO BERMUDEZ

is an Assistant Professor at the university of Utah, Graduate School of Architecture. He teaches beginning and advanced courses in architectural design, representation and theory. Dr. Bermudez's research interest focuses on virtual environments/objects/experiences and the relationship between electronic media and design process/representation. He is the author and co-author of many papers on these areas and has recently published 'Visualize!', an interactive software teaching 3D visualization.

ABSTRACT

Computers are launching us into a representational revolution that fundamentally challenges the way we have hitherto conceived and practiced architecture. This paper will explore one of its fronts: the *simulation of architectural experiences*. Today's off-the-shelf softwares (e.g. 3D modeling, animations, multimedia) allow us for first time in history to depict and thus approach architectural design and criticism truly experientially. What is so appealing about this is the possibility of shifting our attention *from the object to the experience of the object* and in so doing *reconceptualizing architectural design as the design of architectural experiences*.

Carrying forward such a phenomenological proposition requires us to know (1) how to work with non-traditional and 'quasi-immersive' (or subject-centered) representational systems, and (2) how to construct temporal assemblages of experiential events that unfold not unlike 'architectural stories'. As our discipline lacks enough knowledge on this area, importing models from other fields appears as an appropriate starting point. In this sense, the narrative arts (especially those involved with the *temporal representation of audio-visual narratives*) offer us the best insights. For example, *principles of cinema and storytelling* give us an excellent guidance for *designing architectural experiences* that

have a structuring theme (parti), a plot (order), unfolding episodes (rhythm), and special events (details).

Approaching architecture as a temporal 3D narrative does transform the design process and, consequently, its results. For instance, (1) phenomenological issues enter the decision making process in an equal footing to functional, technological, or compositional considerations; (2) orthographic representations become secondary sources of information, mostly used for later accurate dimensioning or geometrization; (3) multi-sensory qualities beyond sight are seriously considered (particularly sound, texture, and kinesthetic); etc.

On Representation

Architects depend on representations for the design, communication, and criticism of architecture. There are at least two reasons for this. First, architectural designs cannot be developed and tested in full scale for obvious economic and practical problems. Second, the human mind has clear limitations in generating, sustaining, and transmitting credible simulations of architecture without external recordings. By using representations to articulate and communicate architectural actions and thoughts, architects not only give solution to these problems but also create a *language without which no architectural work would be conceivable* [Schön, 1983]. *In other words,* architectural representations are not 'just' working tools but the very *universe of discourse* (i.e., language, symbolic and conceptual space) wherein architectural work must unfold.

If depictions are so essential to architectural work, then the type of representational media and technique one uses has a direct and lasting effect in architectural making and thinking. This principle poses quite challenging implications to today's architects. For the dramatic changes in architectural representations being brought about by electronic technologies make unavoidable to expect a comparable degree of change in architectural practice and thought. In fact, we should be ready for significant, perhaps revolutionary transformations in the way we do architecture.

Thus an essential issue before us today is *how the representational techniques and technologies of the information age do and will affect architecture.* Eluding this question means to fall trap in an uncritical utilization of the new tools of depiction. Trying to answer it requires to frame our inquiry carefully.

Considering that it is the qualitative differences of one mode of depiction from another what define the nature and value of that type of representation [Akin and Weinel, 1982], our questioning ought to be directed to what is special or unique about electronic media. We should not spend much time in investigating the computer's power to do

what we already know how to do — only faster, more efficiently, or 'sexier' (e.g. renderings and drafting). Instead we should focus our inquiry in how today's and near-future electronic representations will help us carry out *significant* aspects of architectural work in *new* and *more advanced ways* than traditional representations. We need to deal with the unique way(s) in which electronic depictions address architectural issues, elements, ideas and design problems.

Research and work on electronic representations reveal that computers offer *at least* two great unmatched representational benefits to architectural work:

> (1) the instantaneous and flexible articulation of several traditional and non-traditional representations (e.g. orthographics, modeling, animations), and
> (2) the simulation of the architectural experience, that is, the temporal modeling of architectural orders.

It is this last property the one we will explore next.

Beyond Synchronic Representations

The impossibility of still representations to depict the temporal dimension of architectural artifacts is a much larger problem than usually considered because it places architects in the situation of having to deal with that which they have no representation for and is therefore beyond their familiar conceptual and operational reach. We have grown accustomed to this shortcoming in the light of the cost, limitations, and inflexibility of alternative diachronic representations of architecture (e.g. sequential sketches, photographs, film, video). Yet there remains the fact that the synchronic nature of traditional architectural representation has made very difficult to deal with the phenomenology of architectural orders [Zevi, 1993].

Today, however, this situation may change forever. Thanks to ever more powerful electronic simulations (e.g. 3d animations, multimedia), we are for the first time in history able to directly, affordably, and flexibly simulate the temporal dimension of architecture during the design process. While not yet fully immersive[1], electronic media also manage to deliver unmatched representations of architecture at 'full

scale' (i.e., simulation of a building as if one were within it). The combined capacity to depict architecture in time *and* at 'full-scale' means that *electronic representations are able to simulate actual architectural experiences*. What is so appealing about this representational innovation is not its obvious practical application: the experiential testing and validation of design products. Rather it is the possibility of shifting our attention *from the object to the experience of the object* and in so doing *reconceptualizing architectural design as the design of architectural experiences*.

Designing Architectural Experiences

What does it mean to design 'architectural experiences' instead of 'buildings'? How does one do it? Which new representations are necessary to accomplish it? What kind of design process results from using these representations? Does the use of experiential simulations lead to a new type of architecture?

To begin answering these questions requires a basic understanding of architecture as an experiential construct. Phenomenological studies show that architectural experiences unfold as an organized, more or less continuous series of dynamic perceptions clustered around particular 'events' and 'episodes'. In other words, architecture discloses itself in experience as a *multi-sensory (though largely audio-visual) 'narrative'*. Hence, the experiential design, communication, or critique of architecture literally means to deal with the *narrative nature of architecture* [Rakatansky, 1992].

In this respect, I have argued elsewhere [Bermudez, 1994, 1990] that

1. a multi-sensory narrative approach to architecture requires an understanding of (a) how to work with non-traditional and subject-centered representational systems, and (b) how to construct temporal assemblages of experiential events that unfold like 'architectural stories'.

2. importing models from other fields is appropriate considering that our discipline lacks enough knowledge on this area. The narrative arts (especially those involved with the *temporal representation of audio-visual narratives— cinema, storytelling, theater*) offer us the best ideas, principles and techniques to organize architectural experiences into memorable architectural narratives [AD, 1994].

3. the conceptual and practical difficulties of bringing together separate disciplines can be bypassed by using John Dewey's concept of 'aesthetic experience' [1934]. According to Dewey aesthetic experiences are 'complete', structured (ordered) and thematic (meaningful) stories that unfold through two overlapping rhythms —(1) between past (memory), present and future (expectation) experiences, and

(2) between movement (body, action) and perception (sensation, thought-feeling). This concept is general enough to establish a common ground among diverse experiential narratives yet specific enough to guide our practical work with it.

IMPLEMENTATION

I tried to implement these ideas in the computer Design Studio I directed at the University of Utah Graduate School of Architecture. Following are the highlights of this experience.

1. The design objective was geared towards the construction of temporal 3d narratives (and away from making of a 'building'). This meant to focus the design work on the *creation of an architectural story*. This was done using two parallel methods focusing in:
   a. the development of *individual experiences (the part):* architectural experiences were designed and then clustered in particular *episodes (rhythm)* and *events (details)*.
   b. the development of *the story (the whole):* storyboards were used to summarize the whole architectural narrative, paying particular attention to its
      - *theme*, that is, the 'design parti' of the story, or what provides the underlying logic and meaning to the whole
      - *plot*, that is, the *formal order* upon which the theme unfolds and the rhythms/events are organized. Five general stages were used: preparation, beginning, transition-crescendo, resolution, and end.

   The storyboards depicted key-frames summarizing the essential experience(s) of an episode or event. Please, refer to figures 1, 2, and 3 at the end of the paper.

2. There was a careful selection and utilization of electronic representations. The main software/hardware combination (upFRONT 2.0[2]/Macintosh) was chosen to encourage the use of *diachronic and experiential* depictions (animations, immersive perspectives) over the *traditional synchronic and orthographic* representations (plan, elevations). The ultimate goal was to (a) discover an immersive (i.e., from within) approach to architectural design and (b) use diachronic depictions (i.e., animations as experiential simulations) to judge the value of in-progress 3d narratives. Orthographic representations were mostly used afterward, to support previous investigations in terms of dimensioning, precision and geometry.

3. As a rule the designer was
   a. required to ask whether or not what they were doing could be done without computers (i.e., through drawing, physical modeling, etc.). An affirmative answer would automatically put into question or invalidate the move.
   b. asked to use immersive perspectives and animations as their 'home' views from where the major design decisions were made. However, it quickly became apparent that it was not possible to work solely from the experiential viewpoint even though there was no software constrain. Other views (notably plan and

aerial views) were necessary for reference and sometimes design work. This meant that the design process required the use of several representations at once. For example, it was common to see the computer screen filled with 2 or 3 windows showing different depictions (e.g. an 'immersive' perspective, a test animation, an old version animation, an orthographic view).[3] Please, refer to figure 4 at the end of the paper.

4. In terms of communication, experiential simulations (i.e., animations) proved to provide a great sense of place (i.e., the 'feel' of architecture) but barely (or did not) gave sufficient architectural understanding of the place. As in real life, one or few experiential encounters are not enough to cognitively grasp a building or place. This means that other types of depictions, notably synchronic conventional representations were required.

5. There was universal problems with scale. Designers made their proposal about 20% larger. The reason is simple: virtual environments convey very little sense of scale. In addition, some designers felt trap in the 'magic' or sexiness of technology and worked in representation tricks rather than in design ideas. Bad design was made worse by computers. This points at one of the dangers of electronic technology.

6. There was stiff resistance at designing from within. Designers were much more comfortable at working from above and outside and defended this approach with two common arguments: the whole (and not the part) must be seen at once when making important design moves or eye-level perspectives do not capture the conceptual order of architecture. However, as the designers began to feel more at ease with working at a phenomenological level they started to operate at an immersive level and slowly modify their mindset from the design of a building to the design of a 3d narrative.

CONCLUSIONS

Approaching architecture as a temporal 3d narrative does affects ('deforms' or 'reformulates') architectural thinking and making. For instance, (1) experiential issues enter the decision making process in an equal footing to functional, technological, or compositional considerations; (2) orthographic representations become secondary sources of information, mostly used for later accurate dimensioning or geometrization; (3) multisensory qualities beyond sight are seriously considered (particularly sound, texture, and kinesthetics); etc.

Our studio experience proves misleading the often voiced fear that a full introduction of computers will dehumanize architecture. Quite to the contrary, it is our conclusion that computers may actually further humanize architecture by making us pay attention to experiential issues hitherto hard to visualize and impossible to communicate, manipulate, and test.

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FOOTNOTES

[1] The only fully immersive representation of architecture available is provided by Virtual Reality technology. However the cost (and degree of development) of these hardware and software do not grant their widespread use in offices and schools any time soon.

[2] The choice of upFRONT was based in its capacity (1) to build architectonics from any 3d station point, thus closely simulating an immersive, experiential decision making process; (2) to generate animations easily and flexibly, and (3) to make available several representations at once

[3] The design process took a different direction for the few students that used another software/platform combination (AutoCAD and 3D-Studio / PC computers). Although animations and quick perspective views are easily generated in 3d-Studio, this software does not allow to build representations and therefore forces the designer to go back to the modeling environment (i.e. AutoCAD). This in turn requires the user to take a more traditional, external, orthographic approach and only *then* test decisions with experiential simulations. Although this group of students did not follow the spirit of the studio, it offered valuable insights on what was referred earlier as the other. advantage of computers: the instantaneous articulation of several depictions.

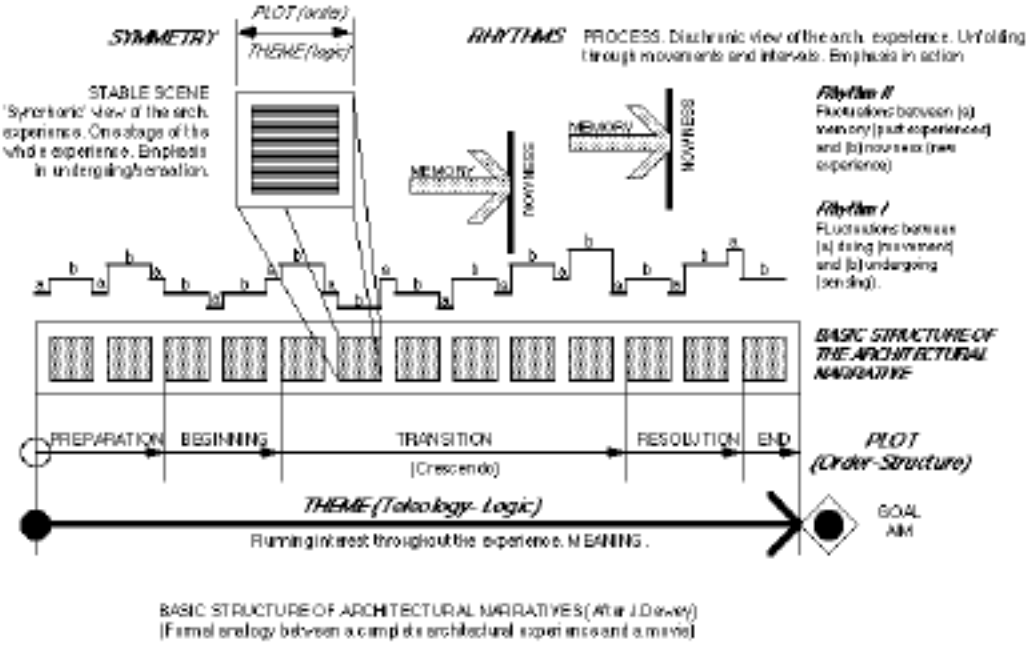


Figure 1
Basic Structure of Architectural Narratives (After Dewey 1934)
(Formal analogy between a complete architectural experience and a movie)

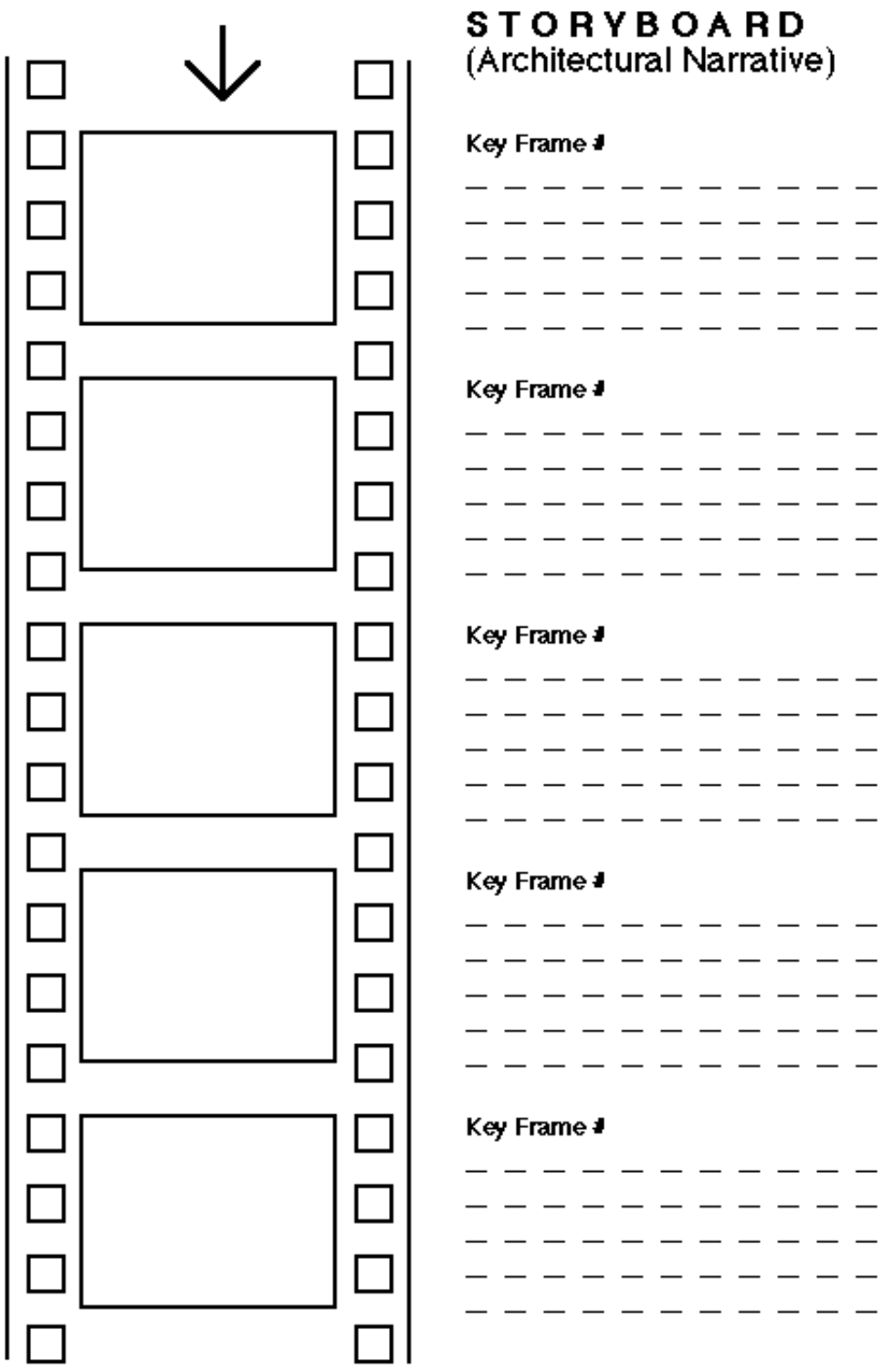


Figure 2
Storyboard Model.
Key-frames summarizing the essential experiences of an architectural episode or event were to be designed by the student.

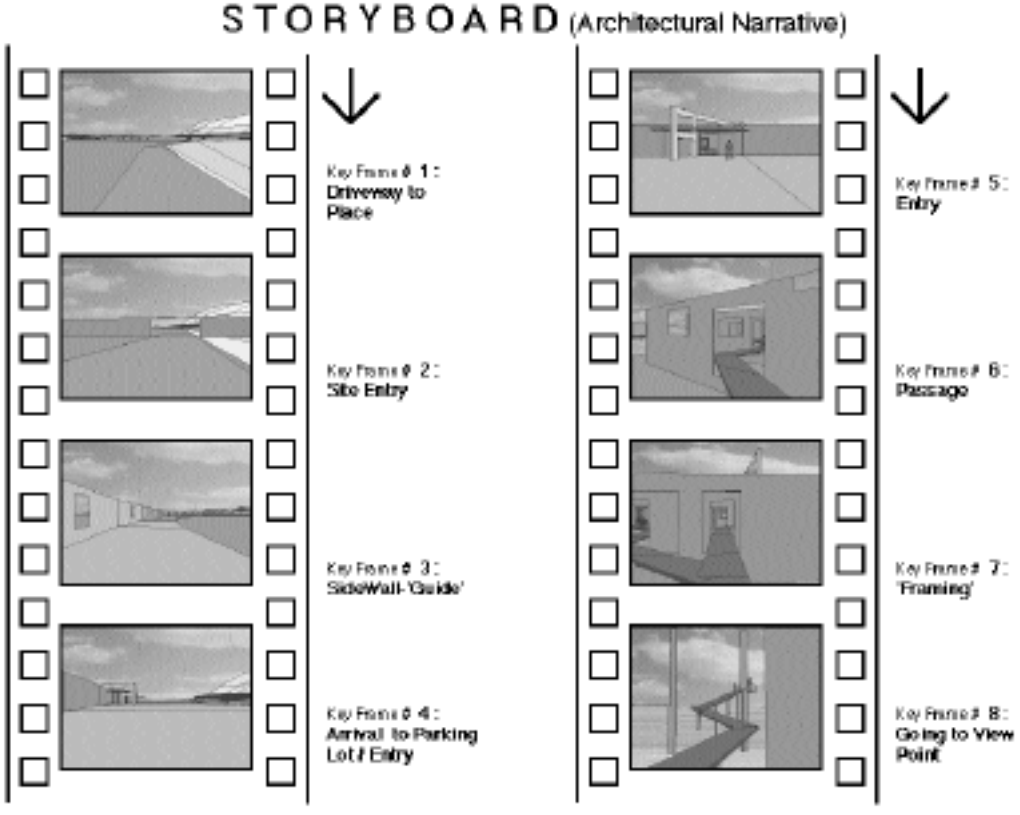
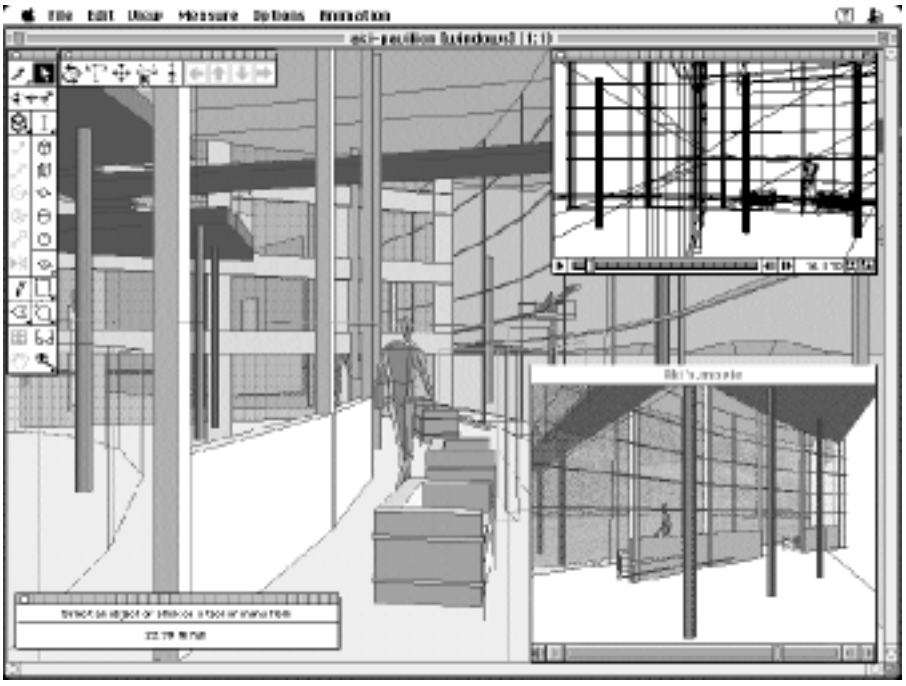
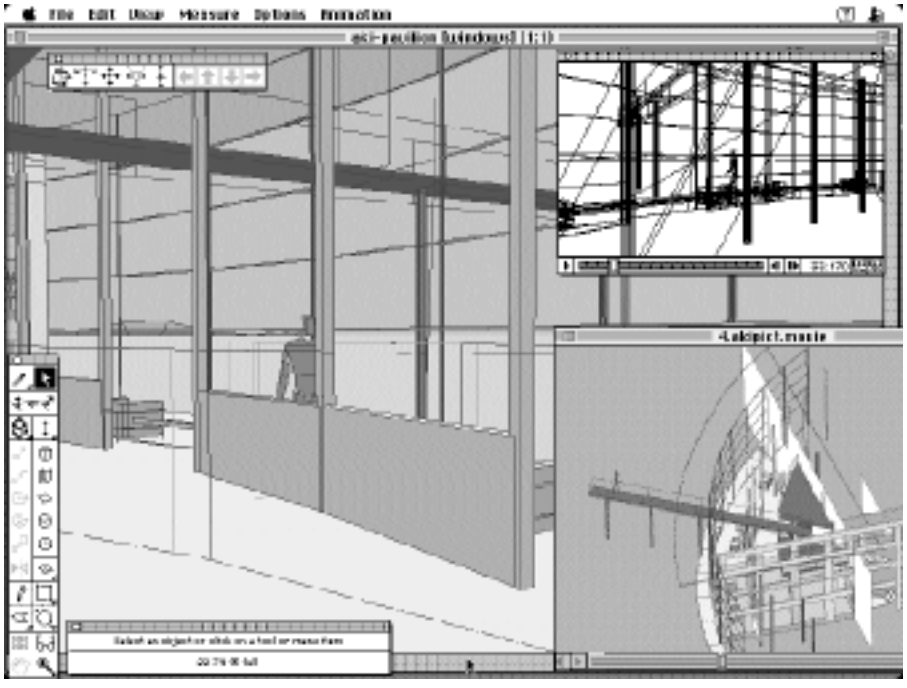


Figure 3
Example of Storyboard (after design was completed)





Figures 4a and 4b
Two examples of computer screens during the design process