The comparison of animation, virtual reality, and scenario scripting in the design process

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Design media is a fundamental tool, which can incubate concrete concepts from ambiguous ideas.

Different media are used to communicate with designers or users with different conceptual levels during the design process. (Dave, 2000; Woo, et al., 1999)

Physical models help designers in managing forms and spaces more precisely and more freely. (Millon, 1994; Liu, 1996)
But computerized drafting, models, animations, and VR have gradually replaced conventional media, freehand sketches and physical models.

<table>
<thead>
<tr>
<th>Computerized Drafting</th>
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<tbody>
<tr>
<td>drafting</td>
<td>drafting</td>
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<tr>
<td>modelling</td>
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<tr>
<td>animations</td>
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<tr>
<td>virtual reality</td>
<td>virtual reality</td>
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The rapid emergence of computers in design process has ushered in efforts to the visual impact of computerized modelling and animations, particularly (Rahman, 1992).
Bai and Liu (1998) applied a new design media—virtual reality, to proposed an evaluation process to examine the visual impact of this new media in the design process.

A new computerized media, scenario scripting (Sasada, 2000; Jozen, 2000), markedly enhances computer animations and positively impacts design processes.
For the three latest media, i.e., computerized animation, virtual reality, and scenario scripting, the following question arises:

What role does visual impact play in different design stages of these media?

What are the similarities and variances of computing techniques, principles of interaction, and practical applications among three computerized media?
Objective

To investigate the similarities and variances among computing techniques and interacting principles of the three media.

Different computerized media in the design process are also adapted to explore related phenomena by using these three media in a real project—a renewal planning project of the old district of Hsinchu City.

Finally, similarity and variance among these computerized media will be discussed.
Gradually, computerized media intervene in various architectural design stages.

Diversity of computerized media will have some differences in digital technology and making processes.

We will analysis and compare three media—animation, virtual reality and scenario scripting, in terms of computer technology and making processes.
1. Construct a building or space in computerized world, and assign proper **textures** and **lightings** on all objects in the scene;

2. Set up a camera with a moving path for making a dynamic movie in 3D MAX;

3. Finally, an **animation** was combined by this dynamic movie and background **music** in Adobe Premiere 5.5.
1. As similar as animation, after building a complete space;

2. Using Nemo, which can import 3D MAX file and modify it, make a model-based virtual reality; (not image-based VR)

3. In this kind of VR, users and designers can move their viewpoints as their will to enjoy the computerized world.
Analysis of the Three Media

Scenario Scripting

1. As similar as animation, after building a complete space, and before making a dynamic movie;
2. We defined characters who live and activate in Hsinchu, and their properties (e.g. high-tech engineers) in the scene;
3. Scenario Scripting was combined by defined characters who follow the script, and animations made by 3DMAX.
## Summary

<table>
<thead>
<tr>
<th></th>
<th>3D Model</th>
<th>Texture</th>
<th>Lighting</th>
<th>Music</th>
<th>Characters</th>
<th>Scripting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Animation</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Virtual Reality</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Scenario Scripting</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</table>
In order to realize the capabilities of the three media mentioned above to be used in the design processes including architectural design and urban design.

We first took the same urban scene to be the test data: a linear block of the Chung-Cheng road in the Hsinchu city, Taiwan.

Please note that the three media were carefully dealt with so that the subjects of the experiment could be provided within the same experimental conditions.
Experiment Samples

Animation

3D Model
Dynamic Movie (in 3D MAX)
Music
Animation (in Premiere)
Animation without characters and scripts.
Experiment Samples

Scenario Scripting

- 3D Model
- Dynamic Movie (in 3D MAX)
- Music
- Scenario Scripting (in Premiere)

A girl dates with her boyfriend at HsinChu Government
Twenty subjects were included in this experiment. We invited ten designers and ten non-designers to be the two groups of subjects.

There are three main factors for analyzing results.

<table>
<thead>
<tr>
<th>Three Media</th>
<th>Four Characteristics</th>
<th>Six Design Stages</th>
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</thead>
<tbody>
<tr>
<td>Animation</td>
<td>Interactive with media</td>
<td>Realizing the environment</td>
</tr>
<tr>
<td>Virtual Reality</td>
<td>Spatial handling</td>
<td>Design presentation</td>
</tr>
<tr>
<td>Scenario Scripting</td>
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</table>
The effectiveness of the use of the three media in the following Six design stages:

- local environment analysis
- design concept developments,
- design alternatives,
- design evaluation,
- final design decision
- final review

(Rahman, 1992)
Each subject was asked to fill out a questionnaire based on what the subject saw the three kinds of media.

**Media vs. Design stages**

1. In terms of Local Environment Analysis --

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<th>Animation</th>
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<th>Scenario Scripting</th>
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<tbody>
<tr>
<td>1 2 3 4 5</td>
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</table>
Each subject was asked to fill out a **questionnaire** based on what the subject saw the three kinds of media.

**Media vs. Design stages**

**Media vs. Characteristics**

1. In terms of interactive with media --
Each subject was asked to fill out a questionnaire based on what the subject saw the three kinds of media.

Media vs. Design stages
Media vs. Characteristics
**Characteristics vs. Design stages**

1. In terms of Local Environment Analysis --

But we only analysis the part of designers because the aspects of non-designers are very divergent that can not conclude some remarks.
• **VR** could be mostly effective in all stages

• **scenario scripting** is not easy to realize in the beginning but the most understandable in the final review process.

• there are no significant difference of animation.
• **Design presentation** is more and more important from the beginning to the end of the design process;

• **Realizing the environment** is truly in the opposite way.

• **Spatial handling** and **interaction with the media** are both equally needed throughout all phases of design.
• **Animation** is similar to **scenario scripting** among the four characteristics;

• **animation** and **scenario scripting** are very good at “design presentation”;

• **VR** are good at “Interactive with media” and ”spatial handling”.

![Graph showing comparison of different characteristics for different media types]

- **Interactive with media**
- **Spatial handing**
- **Realizing the environment**
- **Design presentation**
VR

- be mostly effective in all stages,
- good at “Interactive with media” and ”spatial handling”,
- VR could be most useful tool in all design stages.

Animation

- very good at “design presentation” among the four characteristics
- similar as scenario scripting
- but is different from virtual reality.
Scenario scripting

- not easy to realize in the beginning of design process
- the most understandable in the final review process

Significance

- provide further insight into the fundamental characteristics of the three computerized media
- enable designers to adapt different media in the design stages.
Future studies should more closely examine how these three media impact the design process.

Try to find out how to deal an experiment for users to compare these three media.
The End
1. Construct a building or space in computerized-world, and assign proper materials and lighting on all object in the scene.

2. Set up a camera with a moving path for making a dynamic movie in 3D MAX.

3. Finally, an animation was combined by this dynamic movie and background music in Adobe Premiere 5.5.