A Sense of Self in a Virtual World: Comparative Interface Evaluation of Two Virtual Worlds

Jonathan Young

Professor Nahl
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Table of Contents

INTRODUCTION .......................................................................................................................... 3

PART 1: SELF ASSESSMENT ........................................................................................................ 3
  Methods .................................................................................................................................. 3
  Results and Discussion ........................................................................................................... 4

PART 2: HEURISTIC EVALUATION .......................................................................................... 5
  Methods .................................................................................................................................. 5
  Results and Discussion ........................................................................................................... 6

CONCLUSION ............................................................................................................................. 7

APPENDIX ................................................................................................................................... 7
  Sample Interface Assessment Journal ..................................................................................... 7

REFERENCES ............................................................................................................................ 12
INTRODUCTION

One key feature of a usable interface is the alignment of how the user expects the interface to work with how it actually does work. Donald Norman calls this the matching between the user model and the system image.\(^1\) When these are not well matched, errors can occur due to the user assuming incorrectly about the interface.

In a virtual world, this alignment is even more crucial. This is because immersion is of key importance in virtual worlds, and if the avatar does not respond in the way the user expects, this immersive experience can be damaged.\(^2\)

This self study and evaluation looks at two virtual worlds, Second Life and Blue Mars, with a focus on system models for basic avatar use, such as movement and viewing. A self assessment was completed while working in these two VWs and heuristic evaluation was conducted as a follow-up.

PART 1: SELF ASSESSMENT

Methods

The researcher attempted to complete standard interface tasks in both virtual worlds, and self rated himself on several ten point standardized scales. Open ended responses were also provided immediately following each rating scale.

Open ended responses were coded for the presence of terms and phrases indicating consideration of a system, frame, or model underlying the use of the interface. Ratings from system comments were compared to those not mentioning system using basic descriptive statistics.
Results and Discussion

The results of the comparison are shown in Figure 1. While there was little difference between ratings on Optimism or Importance of tasks when the researcher made a system model related comment, there was a large difference in frustration and irritation. Because the researcher and self-assessor is studying conceptual models in the context of interaction design, the most likely conclusion from this is that the interface elements that demonstrate misalignment between user and system models cause a high level of frustration and irritation. On inspection, a high frequency of comments about poor alignment between system and user models occurred in evaluating the Blue Mars interface, which led to Part 2 of this study, to test the hypothesis that the two virtual worlds differ in usability based on differences in the alignment of their system models with user models.

Figure 1: Self Assessment Rating Scores of System Image Comments Compared to Control Ratings were scored on 4 categories: Optimism, Importance, Frustration, Irritation. Scale was 10 point. Ratings were divided into two groups: those scores with associated comments that were positive for system model related words, and those that were negative.
PART 2: HEURISTIC EVALUATION

Methods

Both virtual worlds were compared on four heuristic criteria, three of which were judged to be related to matching system and user models, and one which was unrelated. These criteria are taken from Nielsen’s Usability Heuristics. All were rated on a 10 point scale to allow for direct comparison to the self assessment rating scales. These criteria are listed below:

Visibility of system status

The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

Match between system and the real world

The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.

Recognition rather than recall

Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

Help and documentation

Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to
search, focused on the user's task, list concrete steps to be carried out, and not be too large.

Results and Discussion

Table 1 shows the heuristic evaluations of both interfaces. Across all the system/user model matching heuristics, Blue Mars scored lower than Second Life.

<table>
<thead>
<tr>
<th>Heuristic</th>
<th>Second Life Rating</th>
<th>Blue Mars Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visibility</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>status shown (flight, stand); cursor change on camera controls; sounds on each button press</td>
<td>No feedback on where avatar is located</td>
</tr>
<tr>
<td>Match</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Buttons click when pressed; movement and camera relative to avatar</td>
<td>Avatar moves independently from camera; point click to move</td>
</tr>
<tr>
<td>Recognition</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Text menu buttons always visible; hover text on icons</td>
<td>Icon based buttons</td>
</tr>
<tr>
<td>Documentation</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>In client help; hyperlinked help; help missing some methods (such as page up to fly)</td>
<td>Extensive web based documentation; some suggested methods do not work in world</td>
</tr>
</tbody>
</table>
CONCLUSION

A major advantage and feature of virtual worlds is the sense of immersion in the 3D environment, the sense of ‘being there.’ This is used for visual information seeking and exploration that is only possible in virtual worlds. However, this capability is dependent not only on graphical representations, but critically on an intuitive interface that allows the user to suspend disbelief and identify with the avatar. An intuitive interface is one that does what you expect it to do, and that is embodied by a perfect match between the system image and the user model.

This exploratory study finds that there are substantial differences between two major virtual worlds in this match, this intuitiveness. This correlates with usability and frustration levels. The main conclusion of this study is that virtual worlds should place an intuitive interface, one which matches with the model of how the user expects their avatar to work, at the highest priority for system design.

APPENDIX

Sample Interface Assessment Journal

STEPS in the EXERCISE for VW 1:
1. Choose a VW and obtain an account.
2. Enter the first chosen VW.
3. Explore the immediate surrounds and describe the process of moving, navigating, teleporting (if available), etc.

4. Using the camera try to view and then modify your avatar, describe the process of changing appearance and whether you succeeded.
5. Describe the process of changing clothing, hair, or some other apparel.

6. Locate and use the photography affordance to take a photo of your avatar (if available).
7. Describe whether there are people around where you land, whether anyone speaks (chats) to you, and your interaction in general.

8. Try to make or create something and move it or place it.
9. Describe the process of building, making, creating, moving and if you are able to do it.
10. Take photos of your creation and put into the report

Interface Assessment Journal Structured Self Report Form [IAJSSR]
Take as much space as needed to answer the prompts in this form. Answer all of the prompts.
Comment descriptively on your User Experience in terms of Affect (feelings, emotions, values, preferences, expectations), Cognition (confusion, understanding, problem solving, strategy, knowledge acquisition), and Sensorimotor (noticings, performance, actions, procedures, routines, accomplishments).
Fill out this IAJSSR Form at five (5) points during the tasks:
A. Before you begin the tasks
B. After working through tasks 1-3 [choosing and setting up account, entering and moving in VW 1]
C. After working through tasks 4-5 [camera, modify avatar, change app]
D. After working through tasks 6-7 [taking photos, communicating with other avatars]
E. After completing tasks 8-10 [making and placing objects, photographing]

A. Before you begin the tasks How likely is it that you will become good at this particular task?
Doubtful 1 2 3 4 5 6 7 8 9 10 Almost Certain
Type your number here: 9
Briefly explain your rating:
As a long time gamer, I am quite used to and enjoy the process of learning new systems. There are only so many ways you can implement a VW, and it should be easy to find out the way each one works.

How likely is it that the skills you are learning in this task will be useful in your career?
Doubtful 1 2 3 4 5 6 7 8 9 10 Almost Certain
Type your number here: 9
Briefly explain your rating:
I think the skill of learning new systems and figuring out how things work is applicable to many tasks.

To what extent are you feeling frustrated before doing this particular task?
Not Frustrated 1 2 3 4 5 6 7 8 9 10 Extremely Frustrated
Type your number here: 2
Briefly explain your rating:
I’m only a little frustrated by the sheer number of these places that exist. I think there will need
to be some consolidation in the future.

To what extent are you feeling irritated before doing this particular task?
Not Irritated 1 2 3 4 5 6 7 8 9 10 Extremely Irritated
Type your number here: 2
Briefly explain your rating:
Same reason as above.

--------------------------------------------------------------------------------------------------------------------

1. Choose a VW and obtain an account. Name of VW: Blue Mars
2. Enter the first chosen VW.
3. Explore the immediate surrounds and describe the process of moving, navigating, teleporting (if available), etc.

The face selection process is intriguing. Having a sort of genetic procedure to move along facial types is intuitive, but the inability to go back and choose again was frustrating. Movement with the left click is fine, but how do I move the camera with me? Camera button does nothing when clicked. Talk about lack of feedback. Mouse wheel does nothing. Inconsistencies in interfaces, sometimes have close button, some have the little minimize -. According to help file, can use wasd to move? nope. really really frustrating.

B. After working through tasks 1-3 [choosing and setting up account, entering and moving in VW 1]

How likely is it that you will become good at this particular task?
Doubtful 1 2 3 4 5 6 7 8 9 10 Almost Certain
Type your number here: 4
Briefly explain your rating:
I guess I’d have to become good eventually, but I can’t see putting the time in.

How likely is it that the skills you are learning in this task will be useful in your career?
Doubtful 1 2 3 4 5 6 7 8 9 10 Almost Certain
Type your number here: Briefly explain your rating: 2
Would be useful to know how to walk, but won’t ever learn because it is too unintuitive.

To what extent are you feeling frustrated doing this particular task?
Not Frustrated 1 2 3 4 5 6 7 8 9 10 Extremely Frustrated
Type your number here: Briefly explain your rating: 10
It’s not hard to design a system to move a guy around. Having me hold BOTH mouse buttons is not the way to go, even if it DID work, which it doesn’t.

To what extent are you feeling irritated doing this particular task?
Not Irritated 1 2 3 4 5 6 7 8 9 10 Extremely Irritated
Type your number here: 10
Briefly explain your rating:
Just a very poor model. I can’t even begin to imagine the conceptual model for how to intuitive move your guy and camera around.

Using the camera try to view and then modify your avatar, describe the process of
changing appearance and whether you succeeded.

5. Describe the process of changing clothing, hair, or some other apparel.
   Clicking on the clothes tab actually works! Graphical UI isn't bad. It was certainly confusing to see 'closest to body, furthest from body' that took some thinking to figure out what the system meant. I think the graphical UI could get cumbersome with more clothes, and I see no search function.

C. While working through tasks 4-5 [camera, modify avatar, change appearance]
   How likely is it that you will become good at this particular task?
   Doubtful 1 2 3 4 5 6 7 8 9 10 Almost Certain
   Type your number here: 
   Briefly explain your rating:
   This seems to me to be a low skill ceiling model. It caters to the lowest denominator, and I can't imagine it scaling with user needs and skills. I'm already as good as I can get, I think, and that's not much.

   How likely is it that the skills you are learning in this task will be useful in your career?
   Doubtful 1 2 3 4 5 6 7 8 9 10 Almost Certain
   Type your number here: 
   Briefly explain your rating:
   Figuring out the layering model was a nice challenge and thought provoking.

   To what extent are you feeling frustrated doing this particular task?
   Not Frustrated 1 2 3 4 5 6 7 8 9 10 Extremely Frustrated
   Type your number here: 
   Briefly explain your rating:
   The simple task is indeed simple using this interface. I'm just frustrated imagining a more frustrating task using it.

   To what extent are you feeling irritated doing this particular task?
   Not Irritated 1 2 3 4 5 6 7 8 9 10 Extremely Irritated
   Type your number here: 
   Briefly explain your rating:
   My irritation is growing due to the nonstop lag on Blue Mars.

6. Locate and use the photography affordance to take a photo of your avatar (if available).

7. Describe whether there are people around where you land, whether anyone speaks (chats) to you, and your interaction in general.
   There seems to be a bot spewing out announcements, but no other people. I typed Hello in the chat, and got no response. The little bubble over the head is a nice touch.

D. After working through tasks 6-7 [taking photos, communicating with other avatars]
   How likely is it that you will become good at this particular task?
   Doubtful 1 2 3 4 5 6 7 8 9 10 Almost Certain
   Type your number here:
   Briefly explain your rating:
   Given that I could find no in world photo app, and the camera button does nothing, I used print screen. Not much to get good with there, I already know how to crop.
How likely is it that the skills you are learning in this task will be useful in your career?  
Doubtful  1  2  3  4  5  6  7  8  9  10  Almost Certain
Type your number here:  10
Using print screen is an essential skill for all tasks.

Briefly explain your rating: To what extent are you feeling frustrated doing this particular task?  
Not Frustrated  1  2  3  4  5  6  7  8  9  10  Extremely Frustrated
Type your number here:  10
Briefly explain your rating: I've pretty much gone off the chart on frustration with blue mars. It just has no means to do anything really.

To what extent are you feeling irritated doing this particular task?  
Not Irritated  1  2  3  4  5  6  7  8  9  10  Extremely Irritated
Type your number here:  10
Briefly explain your rating: Lag continues...

Try to make or create something and move it or place it.

9. Describe the process of building, making, creating, moving and if you are able to do it.
10. Take photos of your creation and put into the report

I can find no interface option to making things, nor is it mentioned in the Help. My guess is that it is impossible without other tools.

E. After completing tasks 8-10 [making and placing objects, photographing]

How likely is it that you will become good at this particular task?  
Doubtful  1  2  3  4  5  6  7  8  9  10  Almost Certain
Type your number here:
Briefly explain your rating: 1
Without any guidance, I cannot even begin.

How likely is it that the skills you are learning in this task will be useful in your career?  
Doubtful  1  2  3  4  5  6  7  8  9  10  Almost Certain
Type your number here:
Briefly explain your rating: 7
I could do more searches about how Blue Mars supports end user content, that would be sueful.

To what extent are you feeling frustrated doing this particular task?  
Not Frustrated  1  2  3  4  5  6  7  8  9  10  Extremely Frustrated
Type your number here:  11
Briefly explain your rating: No options, no way to do much

To what extent are you feeling irritated doing this particular task?  
Not Irritated  1  2  3  4  5  6  7  8  9  10  Extremely Irritated
Type your number here:  11
Briefly explain your rating:
Lag makes doing anything impossible anyway.

REFERENCES