VR UX: 100 PAGES OF VR UX, DESIGN, SOUND, STORYTELLING, MOVEMENT & CONTROLS

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WHAT'S DIFFERENT IN VR AND UX?

Infants

"... your users are infants and it's up to you to give them enough guidance to feel comfortable in your new world."

Metaphors Become Literal

"Metaphors for VR will be more literal, scrolling = strolling, click = pick/point/grab..."

Perspective is Important

"Designers have to strike a healthy balance on what should/shouldn't mimic our 3D reality with technical+physical constraints in play."

Content Rules for the Experience Have Changed

"Users can control the display by simply moving their head...it's important that content responds to those movements in a pleasing & somewhat organized manner."

There are New Affordances

"...changes will be made to experiences based on what we learn from the science of each individual user..."

Web & Mobile Designers Have to Grow into Environment Designers

More Addressable Screen Space

Account for the Player Setup

"VR is more explicit about the players setup... you'll have to consider the players setup, which UX designers typically ignore."

More Sketching than Wiring

"...Sketching is probably the most efficient way to get from concept to prototype."

Design Ideas Happen OFF the Computer!

The "...promise of VR design is that you can run into a variety of "aha!" ideas as you navigate the real world..."

More Freedom Means More Cues

"...you'll have to use cues in the form of sound, lighting, coloring, movement, character motion, and more to procedure the sense of story control."

VR Objects are not Passive

"They are autonomous...they should respond to the changes in the world around them..."

Dream in Spheres & skyboxes

"Spend some time under-standing skyboxes and skylines as they are critical for the end product

The Tech is Fragmented. But it's Different This Time

"...you can ask yourself when initially dreaming up a VR idea is who am I trying to reach and why?"

Presence is EVERYTHING

"The ultimate sin of a VR designer would be to explicitly break a user's sense of presence in the world you've created."

So is Multitasking a thing?

"Not yet...We are fully immersing a user and assuming their other devices and goods are absent..."

UX STRATEGY IN VR

The VR UX Strategy Online

1. Write a Short Narrative
2. Form Persona and Motives
3. Research & Pick Your Tools
4. Choose an Interaction Model
5. Sketch & Storyboard
6. Apply Sound, Cues, Inputs & Add-Ons
7. Develop Your Test Plan
8. Prototype & Adjust the Strategy

BEST PRACTICES

Adjust for Player's Experience

"How did you develop the person's character to play the experience...adjust for the player's height..."

Comfort Settings

"We're not there yet, but...adjust the experience based on the user's comfort preferences."

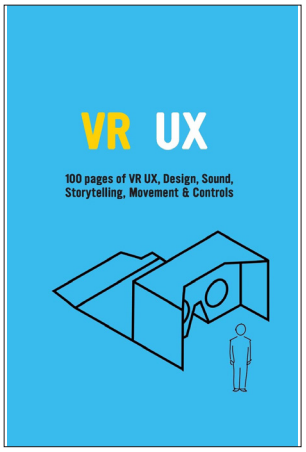
The Avatar

"In VR, the separation (between you and the character) is thinner so you may want to consider giving the player control over their avatar's features."

Build in an Intro Tutorial

- Controller inputs
- Movement
- Object interaction

Do's and Don't of My Virtual World



"Players will attempt to interact with your virtual world like they do with the physical... If theres something the user cant do that they would otherwise expect to be 'doable' then feel free to tell them ahead of time..."

Warn the User

"...it is important to warn users of any content that might be too intense."

Decide on 1st Person or 3rd Person

"...give the player a heads up on the perspective they will be assuming."

If you Learn Nothing from this book, at least take these core principles with you:

- Optimize for performance
- Prioritize Comfort
- Prioritize Ease of Learning
- Avoid Being too Literal
- Sound is Critical
- Don't Break Presence

Do Not Start Your Experience Until They Push the Start Button

Give "Familiar" Time

"When a user puts on the VR headset, they should not be rushed into coming an action."

Length of Time

"Notify the user of the duration of time the experience will take...you may want to give the user breaks..."

The Soft Lead In

"It's best practice to gradually unveil your virtual world."

Give Starter Cues

"Since there are 360 degrees of space...a user

will not know where to start unless there is an obvious cue."

MOVEMENT

Create a Movement Model

"It's important to see the player movements as an outline in VR because you can break down these important motion changes for improvement..."

Know the 6 Degrees of Freedom (6 DOF)

"The body has 6 different ways of moving in space...(+X, -X, +Y,-Y,+Z,-Z)..."

The Core VR Movement Rules:

- Forwards is better than Backwards
- Up/ Down is better than strafe Left/Right
- A fast camera cut is better than a gentle camera rotation

Place the Camera Right Above the Avatar's Neck

People get Sick When Movement is Done Wrong

"While it causes sickness most of the time, body confusion is another setback for the CR user when taking on an experience that gets movement wrong."

People get Confused When Movement is Done Wrong

Have Head-Tracking Enabled at All Times

"Head tracking enables objects to say in a fixed position regardless of how the user moves their head."

Let the User Drive

"The player should be the active driver for the camera motion."

Human Bodies Move More in Arcs than in Straight Lines

Don't Accelerate or Decelerate Often

If You Move, Make the Speed Constant

"Sudden speed changes can cause sickness...you can give the user control over speed change."

Encourage Neck Movements

"You'll want to encourage neck movements when testing."

Teleportation is Cool but Sickening When Not Done Right

Don't Rotate the User's View When Teleporting as this can be Uncomfortable

God View

Don't Zoom in or Out Quickly

No Sudden Changes in Direction, Please

Less Backwards and Side-to-Side

Move in Constant Lines More than Turning

Snap Turns

Speed is a Virtue

Build Stationary Environments for Stationary Moments

Lagging Content Will Feel Awful & Unrealistic

Tech Targets to Avoid Lagging Content:

- Frames per second (FPS)
- Display Refresh Rates
- Sample Rate

Haptic Feedback & Distance

Tiresome Motions

Objects in Motion

Avoid Dizzy Bat

"Dizzy Bat is when the body rotates on one axis at a time the head is tilted. This condition will most likely cause sickness."

Don't Intentionally Design for Spins and Other Sickening Crap

Children ages 2-12 are More Likely to Experience Sickness. Something to Consider if Designing for Children

Position Tracking Allows for More User Exploration

Slopes & Steps Should be used at Angles that Don't Upset One's Stomach

Accessibility & VR:

Outside of being a health accompaniment, accessibility for all body types needs to be considered.

Here are some of the "modes" to think about for accessibility:

- Physical/ Motor Skills
- Hearing Loss
- Sight
- Photosensitive epilepsy

SOUND

Sound is 50% of the VR Experience

Sound Should Come from Headphones

Use Binaural Sound Cues & Recordings

Spatialize the Audio for Other Virtual Characters

Real-life Sounds are More Impactful than Designed ones

Don't Break Sound Expectations

Adjust Sounds with Movement

Avoid Invisible or Unidentifiable Sounds

CONTENT

Field of View (FOV)

Create a Content Map

Don't Condense too Much Content in One Place

Avoid Presenting Two Different Images to Each Eye

Don't Rush Content

Leave Room for the Holy Spirit

The Z Axis

Apply Persistent UI Content to Objects in the 3D Space Rather than Floating

Active Objects Should be Reactive Before the User Takes Action

Load Screens & Warnings

Display a reticle or Leading Line for Fine Targeting Tasks

3D is Better than 2D for Complex Data Sets

Display Options of Choice

Curve Written Content & Menus

Keep the Horizon Line Steady

Altitude Matters

Independent Visual Backgrounds Can Reduce Discomfort

Don't Rumble or Head Bob

Objects that Avatars are Holding in First Person View Shouldn't be Big and Visible When not In Use

Avoid Flicker

Beware of Strong & Repetitive Object Motion

Fade to Black & Never White

Use Pattern Recognition

Use Contrast

Hands Dysmorphia

More About Menus

- Progressive Linear or Orbital
- Idle Call & Point
- The Box

Eye the Target

Design Beautifully but Know performance is Queen

Object Weight May be Annoying

Blocks > than Blades

If you are designing a VR experience with a game engine, be aware that large block objects look better than skinny objects right now."

The Floor

James Gibson in *The Ecological Approach to Visual Perception* breaks down the primary terrain features to think about when designing a virtual world:

- Ground
- Path
- Obstacle
- Barrier
- Water Margin
- Step
- Slope

CONTROL INPUTS

Standards are Forming

Users Can't See the Input Device

Your Tutorial Should Explain Controls

Be Aware of Occlusion

Press any Key to Recenter

Keep Controls Simple

Fuse

Fuse is an input that allows a user to look-to-select-- if they stare at something with a reticle guide for a certain period of time, they imply a selection.

Use The Primary Buttons for Important Actions

Don't Teach a New Sign Language

Avoid Tiresome Gestures

Haptic Feedback Controls

VR Hot Keys & Gestures

Teleportation Control Inputs

- Point to Loft
- Point & Pull
- Point to Room & Pull
- Grab to Face
- Draw an Imperfect Circle
- The Ride
- God Mode Pick & Move

Objects that are Up for Grabs

More on Picking Up Objects

Pressing an input to pick up the object and holding that input or locking it to maintain possession of the item is perhaps the most natural/ intuitive action in VR controller use today. There are two primary selection placements for controls:

- Direct-Link: Selecting the object at the remote head
- Loose Link: Selecting the object with a leading line... so it's not stuck directly on the remote head

Set Snap Points for Easier Object Delivery

The Backpack Trunk

Naked Hand Inputs

Audio Commands

Gaze Inputs

What the Hell is Bimanual Ambiguity?

You have two hands as a user. One paints as you move throughout the space and the other holds the pallet... you can change the interaction of the user's input devices when a menu, or equivalent that requires their attention, is prompted and in use.

STORYTELLING

It's a story, You Get it. But it is Immersive, so Relinquish Some Control

The Audience has Agency

Passive vs. Active

Linear vs. Non-Linear Stories

For much more information, check out my obsessively-updated bookmarks:

https://pinboard.in/u:basemaly/t:vr
https://pinboard.in/u:basemaly/t:programming

Sign up for my upcoming Fall `19 courses:

PIC-321-01 VR & the Battle for Truth

HMS-331C- Critical Game Design (grad)