Virtual Reality as a Design Tool: A Case Study

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David Hamel

- Studied architecture and 3d animation
- Over 12 years of visualization experience
- Manage 3D Vis group
- Building VR experiences for 2 years
- Single dad to 3 beautiful girls
- Get a firm grasp of the strengths and weaknesses of using virtual reality as a design tool in an architectural setting.

- Discover several workflows that have been tested and proven successful.

- Case studies sharing visuals of our VR builds showcasing real world projects that have benefited from virtual reality.

- Forge your own path into virtual reality, confident that this innovative technology will benefit your firm and your clients.
Discover several workflows that have been tested and proven successful.
Static VR: Panoramas / 360

- Spherical renders
- Phones and tablets
Static VR: Panoramas / 360

- Stereoscopic renders
- Google Cardboard and Gear VR
Static VR: Panoramas / 360

- Workflow

- 360
- v-ray
Static VR: Panoramas / 360

- **Strength**
  - Super mobile
  - Easy to create

- **Weakness**
  - Not immersive
  - Cannot move through space
  - Cannot interact with the space and the objects in it.
Immersive VR : HTC Vive

- Stereoscopic 3d standard
- Room scale
  - Walkable experience
- Controllers
- Customizable
- Interact with scene
Immersive VR: HTC Vive

- VR Lounge
Immersion VR: HTC Vive

- **Multiple workflows**
  - **Scenario 1: Unity**
    - Allows the visualization team to customize the VR experience.
  - **Scenario 2: IrisVR Prospect, Autodesk Revit Live**
    - Plug-n-play interface allows the architectural teams to export their own builds quickly.
  - **Scenario 3: Autodesk Stingray/Max Interactive**
    - Plugs into our visualization workflow offering a streamlined option for photo-realistic VR.
Immersive VR: HTC Vive

- Scenario 1: Unity
Immersive VR : HTC Vive

- Scenario 1: Unity
Immersive VR: HTC Vive

- Scenario 1: Unity
- Autodesk Revit
Scenario 1: Unity
- Autodesk Revit

**Immersive VR : HTC Vive**
Immersive VR : HTC Vive

- Scenario 1: Unity
- Rhino
Immersive VR : HTC Vive

- Scenario 1: Unity
- Sketchup
Immersive VR: HTC Vive

- Building VR in Unity
Immersive VR: HTC Vive

- Building VR in Unity
- Lighting
Immersion VR: HTC Vive
- Building VR in Unity
- Lighting
- Materials and Shaders
Immersive VR : HTC Vive

- Building VR in Unity
  - Lighting
  - Materials and Shaders
  - Movement : Teleportation vs. First person shooter
Immersive VR : HTC Vive

- Building VR in Unity
- Lighting
- Materials and Shaders
- Movement : Teleportation vs. First person shooter
- Entourage optimization
Immersive VR: HTC Vive

- Building VR in Autodesk Revit Live
- Plug n play
Immersive VR: HTC Vive

- Building VR in Iris VR Prospect
- Plug n play
Immersive VR: HTC Vive

- Building VR in Iris VR Prospect
- Plug n play
Immersive VR: HTC Vive

- Building VR in Autodesk Stingray/Max Interactive
- Integrated into our visualization pipeline
- Photorealistic experiences
Immersive VR : HTC Vive

- Building VR in Autodesk Stingray/ Max Interactive
**Immersive VR : HTC Vive**

- **Strengths**
  - Fully immersive experience
  - Ability to interact with the environment
  - Customizable and able to experience design options
  - Room scale promotes real world movement
  - Greater understanding of scale
**Immersive VR : HTC Vive**

- **Weaknesses**
  - Portability is limited or at least more cumbersome
  - Need to learn more involved workflows if want to provide customizable experiences
  - Cost of equipment is much greater especially if interested in providing mobile immersive VR.
Case studies sharing visuals of our VR builds
showcasing real world projects that have benefited from
virtual reality.
Case studies

- Teleportation
Case studies

- NO fishing
Case studies

- Keep it simple
Case studies

- Rendering level
Case studies: Northeastern University
Case studies: Northeastern University

- Architectural team designing in VR
Case studies: Northeastern University

- Customization
- Respawn
Case studies: Northeastern University

- Customization
- Respawn
- On/Off
Case studies : Northeastern University

- Customization
  - Respawn
  - On/Off
  - Sun Interaction
Case studies: College Building

- First to use AR
- First to use Cardboard
Case studies: College Building

- Multiple design iterations
- Prove and disprove designs
- MEP visual impact
- Client experience issues
Case studies: College Building
Case studies : Office Building
Case studies: Office Building

- Customization
- Boundaries
Case studies: Office Building

- Customization
- Boundaries
- Toggle Object
- Node Teleport
Case studies: Office Building

- Customization
- Boundaries
- Toggle Object
- Node Teleport
Case studies: Hospital

- Full Site VR
  - 2500 patient beds
  - 50 Operating rooms
  - 5,600,000 sq. ft.
  - 30 acres
  - 11,586,148 triangles
    (2,519,378 polygons)
Case studies: Hospital

- Full Site VR
Case studies: Hospital

- Full Site VR
Case studies: Hospital

- Digital mockup
Case studies: Hospital

- Digital mockup
Case studies: Additional customization

- Object interaction
Case studies: Additional customization

- Object interaction
- Live annotation
Case studies: Multi-user VR

- IrisVR Prospect
Forge your own path into virtual reality, confident that this innovative technology will benefit your firm and your clients.

David Hamel
Senior 3d Visualization Designer
Choose your path to VR

- What are you hoping to achieve?
  - Design tool
  - Presentation tool
  - Fundraising tool
  - Communication tool
Choose your path to VR

- What software/hardware combination fits your needs?
- **Static**: phone, tablet, GearVR, Oculus Go
- **Immersive**: HTC Vive / Oculus Rift
- Unity / Unreal / Autodesk Stingray/ Max Interactive
- IrisVR / Revizto / Enscape3D / Lumion / Twinmotion, etc
Welcome changes

- The design conversation
Welcome changes

- The design conversation: Classic design studio pinup
Welcome changes

- The design conversation: Virtual reality design studio pinup
Be over prepared
Volunteering

Christopher’s Haven: “A home for kids when cancer hits home”
Thank you