European Facility Management Conference

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Knowledge · Innovation · Inspiration

Co-creation of Campus by Using Virtual Reality

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Goal and Research Question

- Primary Question: “How can virtual reality be used as a tool for overcoming thresholds in FM”

- The sub questions answered are:

i. What is the unique value of virtual reality?

ii. How to overcome Experiential and communication challenges in Co-creation?

iii. How to overcome technical challenges?

Agenda

- Theory
- Methodology
- Results of two demonstration projects
- Conclusions
- Recommendations

Theory: Complex Agile Universities

- University campuses are complex entities consisting of simultaneous processes of design, construction and maintenance.
- Agile user-centric co-creation of spaces
- Increasing volumes and complexities of Information and data
- Utilising data within FM effectively

The unique value of Virtual Reality

- Immersive environments
- Understanding of scale and presence
- Experience 3D environments in 3D
- Visualise and interact with complex systems
- Works alongside tradition platforms
- Implemented through game engines allows customisation

Challenges

Experiential and Communication

- Communicating designs / ideas using traditional means
- Gaps in communication lead to misunderstandings
- Visualising changes as you make them

Technical

- Traditional CAD/BIM systems not created with FM in mind
- Very steep learning curve
- Limits of size and detail of 3D models
- Black box solutions only

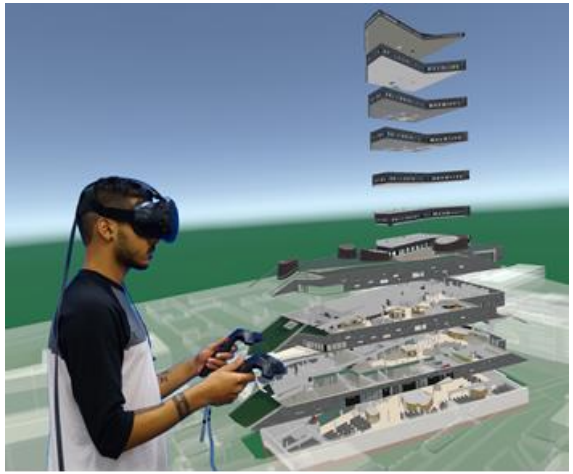
Methodology - Case Study Kampusareena

- The Kampusareena in Tampere University of Technology (TUT), Finland.
- Two demonstration projects
- User data gathered through interviews and observation

Demonstration Project 1

- Goal – Interacting with complex location-relevant data
- Results

	Description of the method used	Description of user experience
Phase 1	Teleportation	Disorientating, Unintuitive.
Phase 2	Flight	Leads to motion sickness, difficult to control accurately
Phase 3	Grab and Pull (swimming method)	Highly intuitive, Fast navigation with scaled down model, Accurate, Comfortable.



Demonstration Project 2

- Goal – Co-creation of working environment
- Results

	Description of the method used	Description of user experience
Phase 1	Menu to swap out sets of furniture	Fast learning curve, Good understanding of environment
Phase 2	Grab furniture	Easy to communicate and test different ideas
Phase 3	Data collection	Collect data such as Votes/ preferences Save environment for future users/discussion

Conclusion

- VR is a powerful tool in understanding complex environments
- In addition to technical solutions, further research is needed within VR User experience
- VR is an effective medium for co-creation and communication

Recommendations

- The elements of virtual reality can be an essential part of digitalisation strategy of campus and its Facilities Management.
- VR can be used as a powerful tool in co-creation and story-telling
- Real-time applications can be used to make location-relevant data accessible

Future Research

- Including further Information into models
- New technologies for interacting with digital environment (LeapMotion)
- Different platforms (eg, mobile, AR)
- Scalable solutions for FM