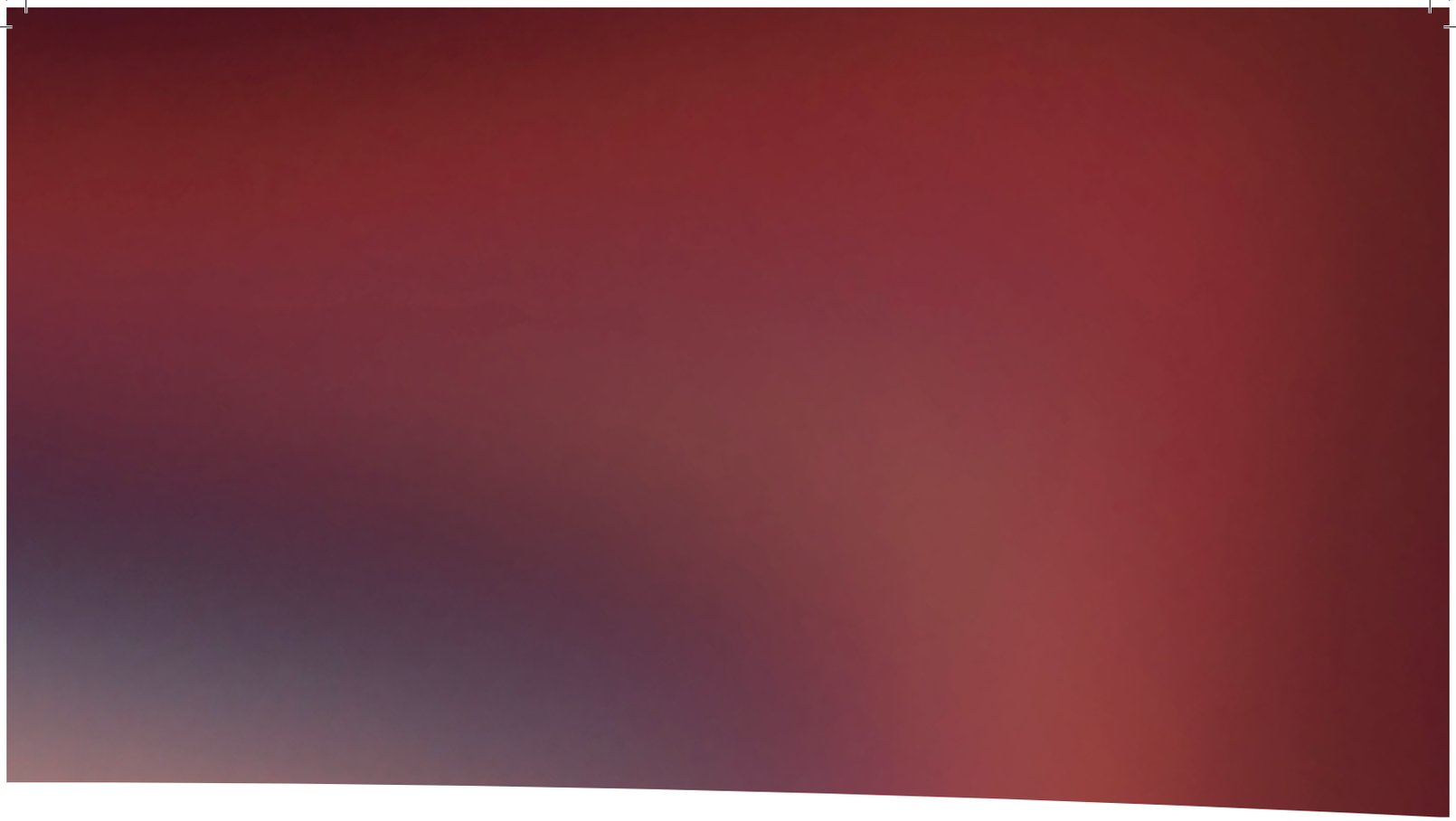
VR ORIENTATION

XR MEDIA

11 August 2017

BGRS



Rob,

Thank you for meeting us at NYU’s future media lab. We appreciate your time and consideration of services. The XR solution we have suggested was designed with Unilever in mind, but will work for any client interested in experiencing a destination without hassle.

Overview

Objective

Design and build a virtual pre-move experience for assignees:

- Provide a convenient and fun alternative to intercontinental travel
- Inform, educate and inspire assignees and their families
- Save on the burdens of visas, vaccines, transportation, *et cetera*
- Earn a measurable return on investment

Solution

Develop a global mobility service VR platform, built on three years of research and development in navigating virtual destination:

Create a fully immersive, «gamified» experience where users can virtually dive into their potential new home. They will engage in a «day in the life» through an a-la-carte offering of places, people and amenities.

Define goals | Design | Produce | Develop | Test | Integrate | Activate | ROI

Strategy

- Understand the pre-move orientation well enough to recreate it virtually

- Produce a software pilot «VR» of host city

- Install VR hardware at key locations for assignees *(Bloomaway)*

- Measure employee satisfaction

- Conduct financial analysis

- Strategize expansion

Return on Investment

Direct savings :	On flights, meals, hotels, vaccines, visas, *et cetera*
Client services :	Assignees will be more prepared, less stressed, and impressed by the futuristic technologies leveraged by BGRS for their benefit.
Data libraries :	XR allows for very personal data collection which we can utilize to optimize client services. Increasingly popular within XR is using biometrical data and measures.
Content:	Own and repurpose VR media (photogrammetry, 3D models, UX/UI) (upgradable). As well as 4K video and 360° stereoscopic content.
Intellectual property:	Produce the technology (code and algorithms) to easily navigate a virtual visit to a destination. Building on three years of current work we'll develop a global mobility services VR platform.

Why develop customized XR Media Content and Software ?

Virtual and Augmented Reality (VR/AR) are two exponential technologies categorized as "Extended Reality" (XR), which create 3D media using spatial computations in real time. They will increasingly become a part of our everyday. By wearing a "head mounted display" (HMD), one will engage simulated environments, digital models, and other dynamic information for entertainment, education, productivity, and much more.

Twenty-five percent of the US population will have adopted AR/VR in their homes in the next five years. (Smart phones reached 25% in 2011)

XR Media can be the ultimate communication tool, or the reason your business falls behind. XR is the next frontier of human connectivity.

Impact on your industry – be a leader

Think of XR content development similar to building a website and digitizing in the 1990s. By building now you can innovate, understand the complexities, and devise real strategy to drive long-term revenue.

What BGRS has to gain by investing :

- PR and notoriety in industry
- Digital assets (3D models, digital environments)
- Intellectual property of interface and design
- Data libraries to optimize customer services

What BGRS may lose by not by investing :

- Credibility, the appearance of being a laggard
- Money when paying competitors of content and IP
- Out on data, insights and analyses
-Clients

Pilot VR – Production Overview

Client :	**BGRS - Unilever**
Objective :	Create a global mobility platform to improve services and scale revenue
System framework :	Game Engine: Unity
Story :	Assignee visits host city in a pre-move orientation
Location :	Rotterdam
Timing :	TBD - (10 days on-site)
Deliverables :	Photogrammetry, 3D audio, and 3D models to build four levels, housing, downtown, school, shopping
Features :	Room Scale, 3D asset library, data collection, proprietary UX/UI
Disciplines :	Photogrammetry, Game Engineering, 3D Audio, UI/UX, Design, Scripting, Sketching, Photography, 3D Modeling, Volumetric Capture, Motion Design, Systems Integration, Networking, Programming, Testing.
Programming :	WebVR, Python, SQL, C++, C#, Javascript.

	Investment	**Timing**	**Deliverable**
Retainer	$40,000	12 Weeks	Full Spec
Pilot	Mid six figures	~8 months	Functional city
Complete platform	Seven figures	~ 3 / 5 years	84 cities

Strategy

Background

«When planning for a 3-5 years move to a new host location, an assignee is offered a Pre Move visit which is facilitated by Destination Service Provider's (DSP), Brookfield Global Mobility Services. Assignee is normally guided/driven around by DSP local field consultant to understand housing options, schooling, local facilities (i.e. sports), public transport, city highlights, parks, etc. They may go into houses or schools, shopping centers, parks, drive by tourist attractions, restaurants, etc. The intention is to give the assignee a feel for what life would be like in the host location. Each visit is tailored a bit to the assignee's needs (i.e. singles vs. families) however the visits have an overall similar feel.»

Lynne

Objective

Design and build a virtual pre-move experience for assignees:

- Provide a convenient and fun alternative to world travel
- Inform, educate and inspire assignee
- Save on the burdens of visas, vaccines, transportation, *et cetera*
- Earn a measurable return on investment, own IP, strengthen digital assets.

Execution

Produce a Global Mobility Platform pilot experience to scale to all 84 Unilever cities and be repurposed for other clients and similar programs. Develop with expansion in mind to save 50% a year repurposing assets, algorithms and code.

1. Design full specification and concept art
2. Build virtual environments and assets
3. Collaboratively decide on user interface and design
4. Draft beta experience to test
5. Finalize program
6. Deploy pilot
7. Monitor feedback
8. Strategize expansion

Production

Introduction

To build the optimal virtual experience we must understand the physical world experience. A good production is based on ambitions, budget, timeline and strategy.

Each week's aim will be clearly defined in a weekly report. BGRS is to review and sign off on services. We will include a deliverable to review in a tele-conference.

The User Story

Unilever will offer the assignees the opportunity to explore their new host country through a fully immersive experience tailor to their lifestyles and personal needs. This experience engine will be designed to influence the assignee to have a realistic and positive opinion of their host city. Once inside the VR headset, our users will find themselves in a beautiful and enchanting Unilever lobby. They will be warmly greeted and welcomed by a virtual host (1) . After a short conversation (where we log preferences) we will "Dreamscape" (2) to a 360°-video of their airport, then to a still photogrammetry (3) of their host city airport and then to a room-scale photo-real 3D model (4) of one of the city's top attractions. It will be a gorgeous day! (It's always sunny in VR) and it takes only a few seconds to travel from the airport, to downtown and then into their new house's living room.

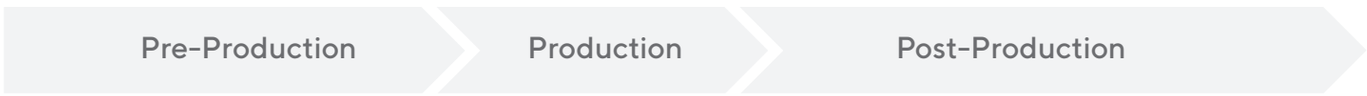
Now that they've received a glimpse of their new home and been debriefed, it is time to make their first decision. Our user will help narrate the storyline as they live out their "day-in-the-life" through prompts by the virtual guide. "There is so much to do! How shall we begin? Would like to go upstairs, freshen up and explore the house, or head downtown for a smoothie (5) where you will meet, depending on the user (6), your new friends?"

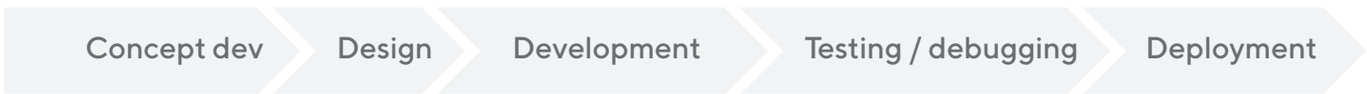
In the parameters of the screen will be their GPS coordinates on the map providing them with insights and information they would be interested to know, such as metro home, Line A, 32 minutes, $2.20 and choose (7) to board the metro with the tap of a finger.

The user can access their map at anytime to chose their next POI. Or, from their "home-base" the user can discover new locations' offerings by exploring the environment. Imagine you are in a simulation of a house, and see a bookshelf that has books clearly out of place and slightly glowing (8). When you pick up the glowing book your guide voices "Oh yes, we have an amazing school system here, ranked for this and famous for that. Why don't we go check out the school! All you have to do is raise your hand to the sky, as if the teacher is calling on you and you've the answer! (9) and they Dreamscape to the class room! The class room can be a still model, a live 360 stream of an actual classroom, or inhabited be an avatar teacher that can answer their real questions in real time.

Walk away with a physical object they were first introduced to in the VR experience.

Production Pipeline





- Game Designers
- Subject Matter Experts
- Instructional Designers

- Artists
- Programmers
- Tech Directors

- Prof. Testers
- Beta Testers
- Educational Testing

- Phys Install
- Training
- Maintenance

System Architecture

Hardware 2-5 computers with graphics cards, (GeForce 1080 X Titan – maybe) Windows binary is the executable on Windows, produced in Unity. Assets will be made custom in Blender or purchased from libraries

Technology Requirements (Software and Hardware)

General Software :

- Windows 10
- Console Softwares (Steam, Oculus)

Graphics :

- Blender
- Adobe CC Suite

Web VR :

- React VR (Open Source)
- Web VR capable browsers

General Hardware:

- MSI, Alienware laptops
- Custom PCs

Framework :

- Unity 3D Professional

Capture:

- Matador
- Leap Motion

Project challenges

- Linking digital platforms with XR
- Gathering assets and geometries on-site shoot (lighting/crowds)
- Colliding objects
- Data storage and transfer

Investment and Return

Investment

Pilot Program

Single city (Rotterdam) - $600k, 8 months (2 cities – $1mm, one year)

After 3-6 months of full implementation we will measure client satisfaction to decide if the program is worth building out in full, and with what additional features, cities or platform integrations.

Global Mobility VR Platform

After a successful pilot, continue to build on the software by implementing 10 additional cities at one tenth of the software development cost. By investing $1.5mm/year BGRS'ङ client, could save six figures in year five and seven figures in year six of implementing a virtual solution to their global relocation services.

Return on Investment

Monetary : Direct savings on flights, meals, hotels, vaccines, visas, et cetera

Software : Own software and IP that can be licensed.

Client Services : Assignees are more prepared, less stressed, impressed by technologies being leveraged on their behalf.

Data libraries : XR allows for very personal data collection which we can utilize to optimize client services, scaling from traditional measures to biometrical and beyond.

Content: VR content (photogrammetry, 3D models, UX/UI) + Video (2D 4K + 360 stereoscopic)

Year	Investment	Cities	Dev Costs	Dev cost per city
1	$ 600,000	1	$ 500,000	$ 500,000
2	$ 1,500,000	10	$ 550,000	$ 55,500
3	$ 1,500,000	25	$ 275,000	$ 11,000
4	$ 1,500,000	35	$ 275,000	$ 7,800

Summary Unilever VR

Pilot Orientation VR 2017 Summary

Virtual Reality will democratize experiences the way the internet democratized information.

BGRS's pre-move orientation pilot will be designed to replace some of the hassles inherent to intercontinental travel. By virtualizing the experience, we will save directly on travel expenses, loss work time and stress. Further we will increase brand equity by leveraging immersive technologies and Intellectual Property.

The pilot orientation will have three levels for assignees to interior design their homes, explore the downtown and visit schools, ultimately proving as a model to simplify and expedite the pre-visit process. Assignees and families will experience their new host city in the convenience of an afternoon, walking, flying and teleporting through a simulated environment, custom designed to optimize BGRS services.

The 8-month pilot build can scale to all of Unilever's 84 host cities, breaking even in the fourth year, with a net savings of seven figures in year six. The software will be adaptable to navigate destination visits for other clients, and be fully integrated into current digital platforms.

Investment and Timeline:

	Investment	Timing	Deliverable
Retainer	$40,000	12 Weeks	Full Spec
Pilot	Mid six figures	~8 months	Functional city
Complete platform	Seven figures	~ 3-5 years	84 cities

Next Steps

Retainer agreement → Install VR rigs at offices → Collaborate on creative

Appendix

Overview of XR Media Industry

Virtual and Augmented Reality (VR/AR) are exponential technologies that "extend reality". They will increasingly become a part of everyday life. By wearing a"head mounted display" (HMD), one observes digital 3D media for entertainment, education, productivity, and much more.

More than 50% of the market (Customer Segments of Technology Adoption), which is expected to be a 150 billion dollar industry by 2020. Twenty-five percent of the US population will have adopted AR/VR by 2022.

Clarifying XR Jargon in User Story

1) Virtual Guide :

This virtual guide can be de modeled after a specified human (Unilever's head of HR?) an animated character (friendly mascot) or even a real person remotely rendered and composited live and in real time. If we chose an NPC (Non-player character – i.e. a computer avatar, we can program smart algorithms that allow the NPC to continuously learn and increasingly improve their offerings and conversational ability. Answers to the initialization questions will influence the way in which the experience unfolds.

2) «Dreamscaping» :

An artistic transition of a player without breaking immersion or cognitive flow. It is to VR what editing is to film, a spatial slight of hand. This tactic of dreamscaping from a "360-video" environment to "photogrammetry" and then into a "photo-real 3D model" will have a psychological effective of demonstrating clear improvement in environment from one scene to the next, starting with real images of a familiar location.

3) Photogrammetry :

This process involves using images from a conventional digital camera to create three-dimensional scenes, exploiting the differences in geometrics.

4) Room-scale photo-real 3D model :

The use of a clear space to allow movement for someone using a VR application. Being able to physically move within the space helps to replicate real-world movement for the user.

5) What we provide:

Provide a few beverage/snack options that can be provided in their current location. After the experience, you can offer them a real smoothie to carry this dream-like experience they just had into the cognitive reality.

6) New Friends :

This can be new colleagues, the chef of a local restaurant, a young single neighbor, all depending on the user. In fact, they can have all three possible encounters in front of them and chose demonstratively, instead of explicatively.

7) Choose Transport :

We can map out the full route in which one travels (IE we can replicate the entire bike ride Lynne takes in Rotterdam from work to home). The user will be offered the option to cycle, walk (teleport), taxi or fly place in which public transportation is not available.

8) Glow :

These glowing items are "live" as in they are portals to bring you to a point of interest.

9) Triggers :

Triggers initiate computer behavior. A trigger can be a voice, an eye-gaze, a controller button, or a physical gesture.

Return on investment

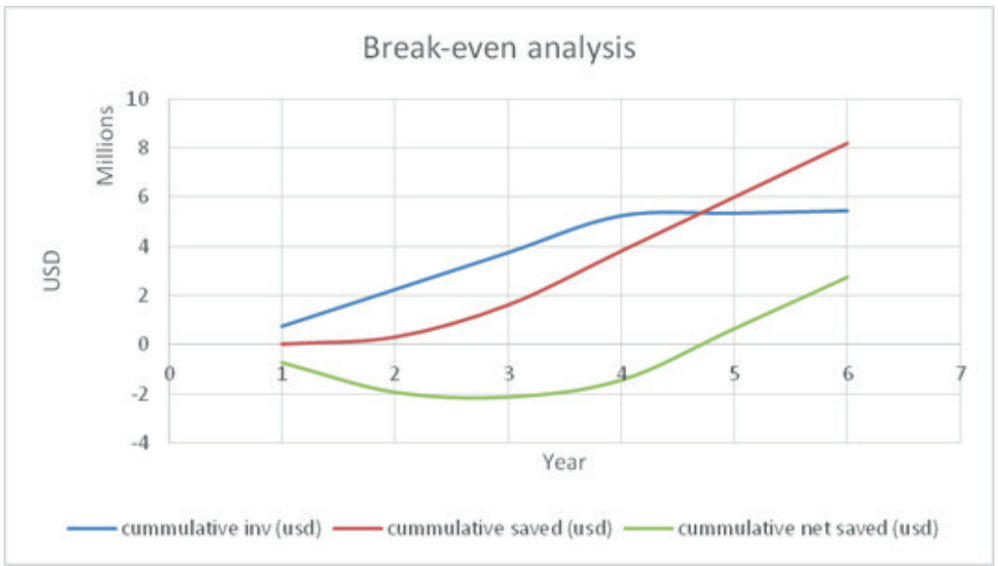
Assumptions

Unilever relocation yearly budget	*(usd/yr)*	**2,000,000**
Budget per person relocated	*(usd)*	**10,000**
People relocated yearly	*(ppl)*	**200**
Avg Unilever salary	*(usd/yr)*	**50,000**
Avg relocation time	*(wk)*	**1**
Money lost relocating	*(usd/yr)*	**192,307**
Total cities Unilever is present at	*(cities)*	**84**
Relocations per city per year	*(ppl/(city*yr))*	**2.4**

Break-even analysis

Unilever could save six figures in year five and seven figures in year six of implementing a virtual solution to their global relocation services.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Yearly investment (usd)	750,000	1,500,000	1,500,000	1,500,000	200,000	200,000
Cumulative number of cities	1	11	50	84	84	84
Yearly employees VR relocated (ppl)	2.4	26.2	119	200	200	200
Yearly money saved (usd/yr)	26,098	287,087	1,304,945	2,192,307	2,192,307	2,192,307
Cumulative inv (usd)	750,000	2,250,000	3,750,000	5,250,000	5,450,000	5,650,000
Cumulative saved (usd)	26,098	313,186	1,618,131	3,810,339	6,002,747	8,195,054
Cummulative net saved (usd)	**-723,901**	**-1,936,813**	**-2,131,868**	**-1,439,560**	**552,747**	**2,545,054**


Break-even analysis
USD
Millions
10
8
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7
Year
cummulative inv (usd)
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