# Virtual reality in tourism: project plan

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Smart Solutions Semester Immersive Media and Storytelling

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# Foreword

This project plan is written within the context of the project 'Virtual Tourism and Virtual Presence', a project which is a part of 'Immersive technologies and storytelling', a smart solutions semester learning community and a minor for creative media and game technologies. This project plan is written to give us, the student team, our tutor, Ms. Nicolette Bolte, and our client, Mr. Fred Galstaun, an impression of what the coming months will look like. Additionally, and perhaps most importantly, this project plan serves as a tool to remove discrepancies between the expectations of our client and our ideas.

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## Introduction

In this project plan there will be discussed different aspects. Some of them are about how we are going to work as a team. So in the plan is described who is going to take which role during the project. For this project we are working with the Sensiks, so in the project plan is told what the problem is of our client. There is also a schedule with all the deliverables with the correct date so that it is clear for every member of the team. The questions that are needed for the research are also described in this plan so we all know how we are going to do the research.

# 1. Introduction of client, tutor & students

The client that we are going to work for is Fred Galstaun. He is the founder of Sensiks, which is a company that has created a multi-sensory pod with applications in healthcare, travel, leisure and entertainment. The pod allows users to feel, hear and smell experiences, taking virtual experiences to a new level.

Our tutor during this project is Nicolette Bolté, lecturer marketing and tourism & leisure at Saxion University of Applied Sciences. She will give us advice on research strategies, and help us with cooperation and planning of the group work. We will have weekly meetings with her to discuss our progress, so she can steer us in the right directions where needed.

Our project group consists of seven people from different studies who all want to cooperate and bring in their knowledge and expertise in order to bring this project to fruition. We all participated in an online personalities test called the 16 personalities test. We did this so that we could better understand each other's strengths and weaknesses.

**Martins Avots** is a Game Design and has the personality Commander ENTJ-A which has the following strengths being efficient, energetic, self-confident, strong-willed, strategic thinkers, charismatic and Inspiring. But there are also weaknesses like being stubborn, dominant, intolerant, impatient, arrogant, poor handling of emotions, cold and being ruthless.

**Andrei Burdeti** does a study about Art & Technology and has a personality test of INFP-A / INFP-T which has the following strengths : idealistic, seaking value and harmony, open minded, flexible, creative, passionate. There are also weaknesses associated like being too idealistic, selfish ( fulfilling self prophecy), impractical, dislike dealing with data, difficult to get to know (Private).

**Fabian Krämer** is a Game Engineer with the personality of a Logistician ISTJ-A which has the following strengths being honest, direct, strong-willed, dutiful, very responsible, calm, practical, create and enforce order and being a jacks-of-all-trades. But there are also weaknesses like being stubborn, insensitive, always by the book, judgmental and often they unreasonably blame themselves.

**Vincent Witten** is a Software Engineer with the personality of a Logician INTP-A which has the following strengths being great analysts and abstract thinkers, imaginative and original, open-minded, enthusiastic, objective, honest and being straightforward. But there are also weaknesses like being very private and withdrawn, Insensitive, Absent-minded, Condescending, Loathe Rules and Guidelines and they Second-Guess Themselves.

**Thije Ten Have** does a study in Tourism Management and has the personality of an Entertainer ESP-A/ESFP-T which has the following strengths being bold, original, aesthetics, showmanship, practical, observant and has excellent people skills. But there are also weaknesses like being Sensitive, Conflict-Averse, Easily Bored, Poor Long-Term Planners and being Unfocused.

**Vera Borren** does a study in Tourism Management with the personality Consul ESFJ-A/T which has the following strengths being having strong practical skills, strong sense of duty, very loyal, sensitive and warm and are good at connecting with others. But there are also weaknesses like being worried about their social status, inflexible, reluctant to innovate or improvise, vulnerable to criticism, often too needy and being too selfless

**Chiel Hento** does a study in Tourism Management with the personality of a Logician INTP-A which has the following strengths being great analysts and abstract thinkers, imaginative and original, open-minded, enthusiastic, objective, honest and being straightforward. But there are also weaknesses like being very private and withdrawn, insensitive, absent-minded, condescending, loathe rules and guidelines and they second-guess themselves.

## 2. Working agreements

General agreements
- At the beginning of the day we have a 'daily stand up' during which everyone briefly explains what they are going to work on for the day as well as what they worked on the previous day.
- Working days generally start at 9.30 unless discussed otherwise.
- Personal communication is done via WhatsApp.
- Don't call in sick 10 minutes before we start.
- Every Monday we recap our progress to make a small presentation for the weekly on Tuesday.
- Trello is used for planning and the division of tasks. Everybody moves their own tasks in Trello.
- If you set a deadline that is connected to other group members, be sure to finish it. If you can't, make sure to communicate this with the other group members.

Agreements for programmers
- Everytime you make a change, submit it on GitHub, so everyone who is contributing to it can see what changes you make.
- Trello is used for planning and the division of tasks. Everybody moves their own tasks in Trello.

# 3. Problem analysis

In The Netherlands 2,5 million inhabitants are disabled. These people need a special treatment in their tourism related activities. The usual product tourism companies sell as their core business is mostly not good enough for this disabled target group. As the ANVR is the Dutch leading travel association one of their tasks is to make sure that all the people who want to travel get the opportunity to do this. The ANVR is trying to offer as much help for the customers as they can to make their travel experience as good and pleasant as possible. The problem for the ANVR is that at the moment they cannot provide this target group with a replacement in a virtual way. A virtual experience replacement can give the customer an experience of being at a destination to her wishes without physically travelling there. In this way the problem of the target group of not being physically able to travel to a destination will be solved by a virtual experience offered by the tourism industry under supervision of the ANVR. During this project we are going to think of a way how the ANVR can give disabled customers a good VR experience that contributes and/or replaces the customer journey.

There are a lot of different disabilities, for our project our specific target group will be travellers with an physical disability. This is choosen because travellers with an mental disbality can get fears, claustrophobia or other complications. The travellers with an physical disability have other needs and wishes dan an regular traveller. At this moment the tourism industry tries to make it easier for this target group, but is already there? In the next research phase we will find out how we can responding to this needs and wishes.

# 4. Research objectives

The current topic of research is how to implement VR into the customer experience of traveling agencies. Either by showcasing the final destination or making a VR customer journey. The research objectives therefore are:

- Research different technologies that can enable a deep feeling of presence in VR. Hereby you can look at storytelling, additional hardware, graphics and scenario setup.
- Research how high quality VR experience can contribute to travel agencies.
- Research and develop an interesting and compelling 1-2 minute travel scenario that disabled people can experience in VR, as a substitution to a regular holiday.
- Research on 360 videos and photos. How realistic can they be viewed in VR?
- Research on creating an interface for VR traveling agencies.
- Research on when is the best moment for the customer to have the VR experience during the traveling experience. Before, during or after the trip?
- Research on what locations would benefit the most from VR experiences.
- Research on target groups and what people expect from a VR traveling experience
- Research on the different needs and wishes of the target group
- Research on what is already offered for our target group in the tourism industry
- Research on how VR can be implemented for the target group

In order to get the most out of our project we need to do a lot of research. So to make sure we stay on track for our research we are dividing it into several objectives. These objectives are mainly divided between what we need to research for the prototype and the advice rapport.

## Prototype

In order to work with the prototype we need to research the following topics.
- What hardware do we need for the VR headset?
- What hardware do we need for the 360 camera?
- Which internet connections are needed between the two endpoints?
- What are the requirements for the  streaming connected to our prototype?

The prototype that will be created is an virtual reality environment leaded by an local guide at the destination. The traveller can choose which destination he wants to travel to and what he wants to see and learn about that destination. When the traveller will join the excursion or tour the guide will wear an headset that will be live streamed through youtube. The traveller who will join the excursion or tour at home will see everything through virtual reality.

## Advice report

For the advice report we need to include the same topics as with the prototype but with more focus on the economical side as well as some other topics that are as follows.

- Research on target groups and what people expect from a VR traveling experience.
- What are the main problems and needs of disabled people with regards to travelling?
- Research into the costs of a virtual reality 360 streaming experience

# 5. Pre-conditions & deliverables

## Pre-conditions
Because our group consists of students from different academies, the group work will be unlike any other we have done so far. Thus it is important that we meet a set of pre-conditions in order to let the project and the group work in run smoothly. The most important ones are the following:

- We meet at least 4 days per week in the Saxion XR lab in Enschede.
- We have access to a powerful PC to run tests and eventually create the virtual reality experience, to be rented from the Saxion XR lab. We will also use this PC to test codes.
- We need access to one Virtual Reality Headset, the Oculus Rift S, in order to test our virtual reality experience. This headset is to be rented from the Saxion XR lab.
- We act according to GDPR (General Data Protection Act)

## Deliverables
Please note, all the deliverables are to be delivered at the end of the stated week.

| Week | Deliverable | Description |
|------|-------------|-------------|
| **3.2** | Draft of project plan | With the input of our client, we write a first draft of the Smart Solutions Project Plan and deliver this to your tutor for feedback. |
| **3.2** | Project agreement | Signed by the client and all group members (the signature of Saxion is pre-filled). We submit the project agreement as 1 scanned PDF-file. |
| **3.3** | Project plan final version | Version of the project plan including the implemented feedback from the client and the tutor. We then send this final version to the client for his reference. |
| **3.7** | First individual portfolio | A purposefully chosen selection of supporting documents which you can use to demonstrate your work, development and results within Smart Solutions. The portfolio enables us to demonstrate our development and the standard we have achieved in the following areas:<br><br>● Research abilities<br>● Professional skills<br>● Development of a professional product<br><br>Deadline**: 5 April, 23:59 hrs** (individual submission)<br><br>We only submit this portfolio in the SSS |

| | | course on blackboard. Only submit a portfolio as a .pdf file! **Format portfolio** |
|---|---|---|
| **3.10** | Midterm presentation | As a group we are preparing and presenting a formal midterm presentation to the relevant stakeholders. For this presentation we need to invite the first assessor. The presentation should include but is not limited to:<br><br>● Status update of the project plan,<br>● The group work done thus far<br>● The next steps |
| **4.3** | Second individual portfolio | Identical to the first portfolio<br><br>Deadline**: 24 May, 23:59 hrs** (individual submission)<br><br>We only submit this portfolio to the tutor Only submit portfolio as a .pdf file! **Format portfolio** |
| **4.7** | Smart solutions festival | Date and time to be announced |
| **4.8** | Final individual portfolio | Identical to first two portfolios<br><br>Deadline**: 28 June 2020, 23:59 hrs** (Individual submission)<br><br>We have to submit our final portfolio **three times.** Once to the tutor, once to the client and one to Matthijs (?)<br><br>Only submit portfolio as a .pdf file! **Format portfolio** |
| **4.8** | Group work | Since the group work is the basis for the individual portfolios and because it is desirable to keep these documents as well, an extra submit point has been created on Blackboard. One member of our group should hand in the group work! The documents are not part of the assessment, but can be used by the examiners to get an overview of the project. |

In addition to these deliverables, we as a group deliver a couple of powerpoint slides which showcases our progress every Monday. Every Tuesday we compose an agenda for the tutor meetings.

| Week | Action | Description |
|---|---|---|

| 3.8 | Finishing initial desk research | Complete the set of research questions that we have divided for the initial desk research phase. |
|---|---|---|
| 3.8 | Start first sprint | First sprint, from 3.8 onwards there will be a sprint every week. See research methods (P. 14) for an elaboration on sprints. |
| 3.9 | Interview Gerda van 't Land | Interview with Gerda van 't Land. A tourism professional who owns a travel agency focused on travelling with a wheelchair. She can help us with identifying the main problems and needs of the target group. |
| 3.9 | Send out Questionnaire / start second sprint | Send out the questionnaire aimed at our target group, people who are unable to travel due to a disability. |
| 3.10 | Finishing initial prototype for the midterm presentation. | - |
| 4.1 | Midterm presentation / start third sprint | Formal meeting with the tutor, client and first assessor. In which we present the following:<br><br>● A status update of the project plan,<br>● The group work done thus far<br>● The next steps |
| 4.2 | Start second research phase | Process results from the questionnaire and expert interviews as well as the feedback gathered from the midterm presentation into research questions for the second research phase. |
| 4.3 | Start fourth sprint | Planning, Implementation |
| 4.4 | Second half fourth sprint | Review Retrospect |
| 4.5 | Fifth sprint | Planning, Implementation |
| 4.6 | Second half fifth sprint | Review Retrospect |
| 4.7 | Last sprint | Reviewing all available information Implementing the best solutions found in the last sprints |
| 4.8 | Completed product | Completed group project. Show product to client and tutor. If there still is feedback then we implement it in week 4.9. |

# 6. Risk management

Not following our main plan and getting off track. We can manage it by sticking to one idea and not going multiple directions without a defined ending.
Running out of time for the final delivery. We can manage it by making a weekly plan of everything that should be completed/ Using Scrum.
Failing to apply our idea in the travelling sector. It could sound like a very nice experience but we can fail implementing it properly. Managed by focusing on our target goal.

During the project there can be several pitfalls where you want to protect yourself from. Therefore we have this risk management to catalogue all risks and have backup plans for them. We will list all risks and explain where and when they can happen together with possible solutions.

## Missing the deadlines

This one is very obvious but nevertheless very dangerous. By not having the work done that needed to be done in time we will miss or deadline. This can have a small impact or a large impact depending on the amount of work that still needs to be done and on what the deadline is for. In order to prevent this from happening we will have the project divided into multiple smaller tasks so that it is easier to manage. If we were unable to prevent this from happening we have the following options:
A.   stop with the project or specific part of the project.
B.   Put up a new more realistic deadline.
C.   Scale the project or specific part of the project down.

## Getting of track

During our enthusiasm we can get off track from the main goal. This will result in a different or unfinished project. And depending on how enthusiastic we get it can have a small impact or a large one. So by dividing the project into small and specific tasks before hand we can keep track on the main goal. However if we do not manage these tasks and still get off track we have a couple of options depending on the amount of time still left:
A.   Trying to get the project back on track towards the main goal as much as possible in the given time frame.
B.   Trying to make the current state of the project as coherent as possible.

## Not applying to the travel sector

It's all nice and good if we finish our project as we intended on time but if it doesn't apply to the travel sector it won't do much for us. This will not have a big impact on the project itself but rather on the use of the product after it is finished. To make sure it applies to the travel sector we really need to make sure we keep focused on our targeted group which is people who want to book a vacation. If we fail to live up to this at the end of the project there will be nothing we can do about it. But if we detect it on time we can still reevaluate the situation and adapt.

## Underestimating the scope

People like to dream big, sometimes too big. The same can be said about when people make a project they like to do too much. This will have a big effect on the end result because parts will not be done and other parts will only be half finished. In order to prevent this we will use the scrum method of dividing tasks into small pieces and assign each piece points based on how long it would take to finish this way

we can roughly see if there will be enough time and plan accordingly. In case we do get out of scope we have the following options:

A. Cut parts of the project.
B. lessen the quality of the overall product.

## Teammates breaking the agreements

It would be very unfortunate if this happens but it is always a possibility to keep in mind. The impact this can have on the project ranges from minimal to maximal and really can't be predetermined. To make sure everybody has an enjoyable time we made our work agreements(rules) as specific and clear as possible. Also we will make everything discussable so that if someone has an issue with something or someone we can have an open discussion. If in the end nothing works we will take things to our tutor and ask her to intervene.

## Research Questions & Methods

### Research Questions

We are conducting a mixed research, both qualitative, asking questions such as "Why is x product better used than y? How should it be implemented?" but also a quantitative one asking "Where should those technologies be deployed?" and "When is the right time to do so?" This research will be applied for:

- Current trends and technologies in VR.
- Best apps and content in VR.
- Target group: Disabled people
- Storytelling

Methodology:
- Surveys: Involves collecting information, usually from fairly large groups of people, by means of questionnaires but other techniques such as interviews or telephoning may also be used.
- Questionnaires: Multiple choice questions, attitude scales, closed questions and open-ended questions.
- Case studies: About the capabilities of the VR spectrum and the people who are most likely to use it.
- Secondary Data Analysis / Archival Study: Of already available research done on VR and tourism.

The research is being done on the internet, news articles, videos on the subject and books about tourism and virtual reality. All notable findings are written down and listed.

The management question that we will aim to answer is:

**How can VR be implemented in the tourism branche for travellers with an physical disability?**

In order to effectively answer this management question, a set of main research questions have been set up, which are in turn answered by a set of sub-questions. The research questions are:

1.  What are different technologies that can enable a deep feeling of presence in VR?

    1.1 How can additional hardware enable a deep feeling of presence in VR?
    1.2 Can having a social experience in VR enable a deep feeling of presence?
    1.3 Is it possible to create interactions in our virtual reality experience?
    1.4 How to make a high end 360 live streaming experience when we are not limited to budget (advise part)
    1.5 What are our minimum requirements in terms of fps and resolution in order to create a smooth experience
    1.6 What is the minimum set of tools that we need in order to be able to live stream this resolution + fps? (
    1.7 What are the minimum requirements for the set of tools that you need in order to make this happen?
    1.8 What are the streaming services that meet our requirements?

2.  Research how high quality VR experience can contribute to the travel branch.

    2.1 What are best practices of virtual reality in tourism?

2.2 What are the possible applications of virtual reality in tourism?
2.3 In which phase of the customer journey virtual reality can be implemented?
2.4 Which senses are activated during the use of virtual reality?

3. Research on how a VR experience can contribute to the customer journey of disabled people.

   3.1 Which different types of disabled people do exist in the tourism perspective?
   3.2 Which problems do disabled people experience during their tourism related experiences?
   3.3 What are the main components of a holiday for disabled people?
   3.4 What kind of experiences does the tourism industry nowadays offer disabled people?
   3.5 In which stages of the customer journey VR can contribute the best?
   3.6 Is it possible for disabled people to experience VR in different stages in the customer journey?
   3.7 Which type of disabled people could benefit from our product?

## Research Methods

The two processes that we are going to use are the advice process and the fabrication process. During the next 18 weeks there will be seven sprints, so we can improve the project by steps. For new ideas there will be different brainstorm sessions during the sprints.
For the process there are different steps and those steps need actions that have to be done during the step. The steps that are involved are definition, diagnoses, solution, realisation and test.

**Definition**

The step definition has six aspects that are useful for the research during the project. Those aspects are: needs, stakeholder map, goal, use case, requirements and restraints. For those aspects there are four actions there need to be done to define and research successfully. The actions that need to be done are: Focus group and web analytics. There are two more actions that can be used in the phase of definition, those are file analysis and literature search. These actions also can be used in other steps.

While there will be working on the step definition there will be a lot of research of different aspects. The aspects that need to be researched by the tourism students are what is virtual reality? And is it already implemented in the tourism industry? But also which senses will be active when you are using virtual reality? Those aspects are more for which phase virtual reality can be used in the tourism industry. The students who are going to realize the virtual reality experience will do research how they can build environments for the tourism industry.

**Diagnoses**

The step diagnosis has two aspects that are necessary for the project, those are problem diagnoses and problem perception. The actions that need to be done are expert consult and search for practices. Next to those actions there are the actions file anlysis and literature search. The last two actions also be called for the step definition but also can be used during the diagnoses. The action that is used during the step solution is product benchmark, but this action also can be used in this phase of the project. In this phase of the project there will be more deeper research for the project so we all know where we are talking about. Next to that we can research new subjects that are be mentioned during the meeting with the client.

**Solution**

The step solution has four aspects where it will be on for a successful solution. Those aspects are: plan, intervention, idea and detailed design. The actions that need to be done during this phase is the product benchmark. During this phase there will be research on how other industries, companies and organisations are using virtual reality, and in particular the tourism industry.

**Realisation**

The step realisation has two aspects that are important during this step. The aspects are: demonstrator and prototype. For this step there are four actions necessary, those actions are: wild goose, brainstorm, provotyping, sketching, scamper and morphological chart. During this phase there will be discorvered how virtual reality can be implemented in the tourism industry and how it will work technology wise. An action that is very important in this phase is brainstorming to come up with an idea that our client may can use in the future.

**Test**

For the last step there are also four aspects that are important for the final touch of the project. The four aspects are: pilot, performance test, requirements check, evaluation. During the last phase of the project the virtual reality experience will be tested by stakeholders from the tourism industry and our client. The opinion of those stakeholders are important so we can improve the experience so the industry could be interested in implementing the virtual experiences. The actions that are connected to this phase are: usability test, peer review, think aloud and Kelly grid. What mentioned before during this step is that it is important to test it but also to check if everything is done for the project.

**Reflection cards**

Next to the steps that need to be done during the research of the project there are the reflection cards. The cards that we have chosen as a group are: feedback, interaction, justification, efficiency, accuracy, uncertainty, openness, creativity, knowledge input and ambitions.

 The reflection cards feedback, interaction, justification, efficiency, accuracy and uncertainty are necessary during the whole research of the project. The last four reflection cards openness, creativity, knowledge input and ambitions are important during the step of realisation

# 7. Team roles & responsibilities

- Martins Avots - Game Design - Design
In this project Martins will take on the role of Designer. He will do research, testing and practical implementation of the visual aspects in the product. More specifically Martins will specialise in 3D asset creation and implementation.

- Andrei Burdeti - Art & Technology - Design
In this project Andrei will take on the role of Designer. He will do research, testing and practical implementation of the visual aspects in the product. Andrei will specialise in 2D art like ui design and editing of 360 images.

- Fabian Krämer - Game Engineering - Engineer
Fabian will have the role of Game Engineer for this project. He will be responsible for the technical aspects of the project, especially those related to game technology(e.g. in engine development). He will also do research for the technological side of the project how the technology can be implemented.

- Vincent Witten - Software Engineering - Engineer
In this project Vincent will have the role of Engineer. He will have the responsibility of working directly in the product codebase keeping it well structured and organised.  He will also do research for the technological side of the project how the technology can be implemented.

- Thije ten Have - Tourism Management - Research, Planning Master
Thije will have the role of Researcher in this project. He will research how and what kind of VR product can be implemented in the customer journey. He also will research the target group and what the needs and wishes are. During the project his role will also be to take care of the planning so that the project will proceed as planned. He will make use of Trello during this process.

- Vera Borren - Tourism Management - Research, Minute Master
Vera will have the role of Researcher and Minute master in this project. She will research how and what kind of VR product can be implemented in the customer journey. For the research part she will also find out what the needs and wishes of our target group are. Additionally she will be responsible of taking the minutes of meetings with the client and tutor

- Chiel Hento - Tourism Management - Research, Team Leader
Chiel will take on the role of Team Leader in this project, his responsibilities will be communicating with the client and relaying that information further to the team so that both parties are well informed on current affairs. Additionally, he will be responsible for dealing with impediments and resolving potential conflicts. During the project Chiel will do research of the tourism aspects and the target group with their needs and wishes

# 8. Conditions & Limitations

There are certain limitations to this project
1. Time limit
The project is limited to the 18 weeks of the Smart Solutions Semester during which the students are expected to work 4 days a week.
2. Hardware
VR mostly relies on specific hardware to run on like VR headsets. This hardware has its own limitations which have to be respected. Furthermore different pieces of hardware have different capabilities and limitations, increasing the complexity. One set of tools is not able to meet our needs in the price range
3. Expectations, budget and logistics of the end user.
The final limitation is that of the end user. The product must be useful to the client while being financially feasible and logistically possible.
4. Internet speed in a lot of places is not fast enough, we could create a map of places that are possible