PD-B Needs Identification:

The client approached the team to create a dynamic VR environment that will teach organic chemistry to first year organic chemistry students. During the first meeting the client talked about the needs of this VR environment and the different scenarios that our group could take on the project. The team had the opportunity to empathise with the client and ask questions about each scenario. Our group chose the scenario that shows the connection between molecular and macroscopic (scenario 4).

To organize the data obtained in the first client meeting, our team identified the needs of the client in the following chart and used a ranking system to determine the priority of the needs. Numerical ranking of the priority of user; 5 as most critical priority to 1 as the most undesirable.

	Need	Rank
Environment Characteristics	Show a reaction on the microscopic and macroscopic levels	5
	Show how changes on one level affect the other level, and vice versa	5
	Show how molecules are dynamic (in constant movement and bonds moving)	5
	The VR lets the user be surrounded by molecules moving and colliding	4
	The environment has audio	2
	Movement of molecules is random	5
	Must show the magnitude of how many molecules there are	4
	Show successful/unsuccessful collisions	5
	State the learning outcome	5
	Test the user whether they achieved the learning outcome or not	5
	Solvent is shown in the reaction	4
Uses of the VR	Help organic chemistry students	5
	Provide a tutorial on how to use the environment	5
	Be simple enough for the general public to comprehend	3
Additional Features	Have a Pedagogical agent	2
	Show the relationship between 2D and 3D diagrams	2
Chemistry Material	Use organic molecules in demonstrations	4
	Content is scientifically accurate	5
	Molecules follow the colour scheme conventions	5

	Molecules are shown using one of the typical representations	5

Problem Statement: Students in organic chemistry have trouble visualizing the dynamic nature of molecules. A VR environment will help demonstrate the connection between molecular and macroscopic views of molecular chemistry.

Design Benchmarking

		ODYSSEY (WAVEFUN)	Molview
Description		A VR app produced by an education company which shows molecules and reactions	A website where the user can draw a molecule and see it displayed in 3d

Features		- VR
		- Shows reactions and motion
		- Lots of options
		  - Gas sim
		  - Reactions
			- Open source
			- User draws molecules
			- Respects colour standards
			- Can go from name to drawing or vice versa

Drawbacks		- Really expensive	- No VR - Few representations
Price	5	$7500	Free (GNU GPL)
Representations	3	4?	2
Shows collisions	5	Y	N
Shows dynamic molecules	5	Y	N
Connection between micro and macro	5	N	N
Easy to use	4	?	Y
Audio	2	N	N
Relationship between 2d & 3d	2	?	Y
Organic molecules	4	Y	Y
Total		42	35

In conclusion, our team ranked the client's needs to prioritize the needs of the environment characteristics requested by the client. After carefully analysing other similar software , we've found that neither of the programs considered fulfill the needs of the client. That being said, Odyssey came the closest to the client needs and would even be sufficient if not for the price.