Visualization of 3D data and Annotation generation

3D visualizations are an important part within 3D system. The ability to visualize content like annotations within 3D scenes is often mandatory when the use-case exceeds typical demo scenarios. Annotations are a way to share spatial information in 3D space and to enrich existing scene with more (useful) information. The work consists of three major Topics:

Visualization
First of all the visualization system should be lightweight and be implemented in WebGL based on the three.js framework alternatively Unity3d could be used as well. The important aspect is the visualization of point clouds and 3D models e.g. the reconstruction of a SLAM or Structure for Motion system.

Annotation
In this project, annotations should be used to enhance special parts/or areas of 3D scenes or models. Therefore we will have to find a format to generalize an annotation and the corresponding 3D pose. Parameters like pose (rotation, translation), 3D model, animation and affected area of vertices should be encoded into this new format. Additionally ways to store, load, play, transmit and receive would have to be implemented.

Evaluation of 3D picking techniques
The final step is to implement a system which can generate or place annotations within a 3D scene (visualization). Therefore it is important to use the right method for a certain task e.g. selecting an area (group of points) within a point-cloud, placing an annotation directly on a 3D point. This section serves as test-case for the previous ones and also evaluation for the right method in the right situation.

The result is a visualisation-and-annotaion system which can be added on top of e.g. SLAM-Systems in a plug-and-play manner.

Three.js http://threejs.org, Unity3d https://unity3d.com/
SLAM https://en.wikipedia.org/wiki/Simultaneous_localization_and_mapping
C++, WebGL, JS, C#