

Collaborative 3D Model Viewing on the Web

First Review

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Overview

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- 3 Market analysis
- 4 Gantt Chart
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At a Glance

Why Collaborative 3D Model Viewing?

- Teaching and learning from 3D models more comprehensive than from 2D drawing
- Access to real objects costly or limited
- Collaborative viewing allows new, interactive learning methods



Our Approach

- Upload models (especially from 3D scanning) into a database
- View models in a browser on different devices
- Manipulate view on all devices at the same time



Technology Survey - Digitization of Physical Objects

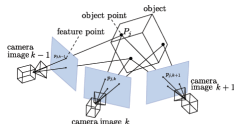
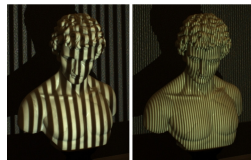
White Light Scanner

- Allows digitization of small objects
- Scanning process requires user interaction
- As accurate as a laser scanner



Structure From Motion

- Creates 3-D models from videos!
- Utilizes modern computer vision techniques
- No user interaction necessary
- Output is not nearly accurate as WLS



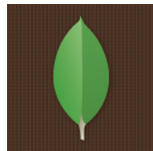
Technology Survey - Image and Model Data Storage

Database - To Embrace or Avoid?

- Model files are generally massive
- Indexing them is not trivial
- ACID (Atomicity, Consistency, Isolation, Durability)
- Authorization

Candidates

- MongoDB
- PostgreSQL
- MySQL



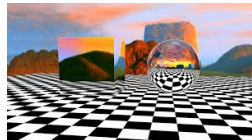
PostgreSQL



Technology Survey - 3D Data Presentation

Criteria

- Supports common 3-D data formats
- Allows user to apply affine transformations
- Exposes internal state to the browser
- Final product is not dependent on an add-on.



Candidates

- Three.js
- O3D
- X3Dom



Technology Survey - Cross-Browser Communication

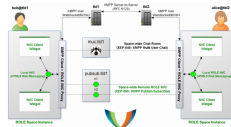
Role SDK

- Open source e-learning environment
- Personalized with widgets
- Any web-application is convertible to a widget with some preamble
- Provides multi-user interaction



Inter-Widget Communication System

- Defined as part of the preamble
- Communicates with other add-ons in the same space
- Publishes events to all active users in the same learning space



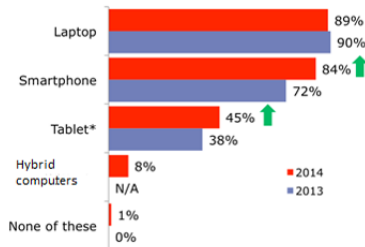
Market analysis

Industrial Diversity

- Medical industry, Architecture, Computer Graphics, TV, movies, video games.
- Educational sector.

Wide User base

- Everyone with a mobile device or desktop computer that supports the used technology.
- 75% of desktop computers and 50% of mobile devices are equipped with WebGL-enabled browsers.





Market analysis

Industry cost structure

- Scanning equipment is expensive, but will become more affordable.
- Standardized web technologies and SDKs.

Distribution Channels

- Medical Faculty at RWTH Aachen.
- Expand to more medical faculties in Germany and broaden the scope of application.

Key Success Factors

- Adjust to new technology/developments.
- Abilities in programming.
- Building reputation.



Gantt Chart

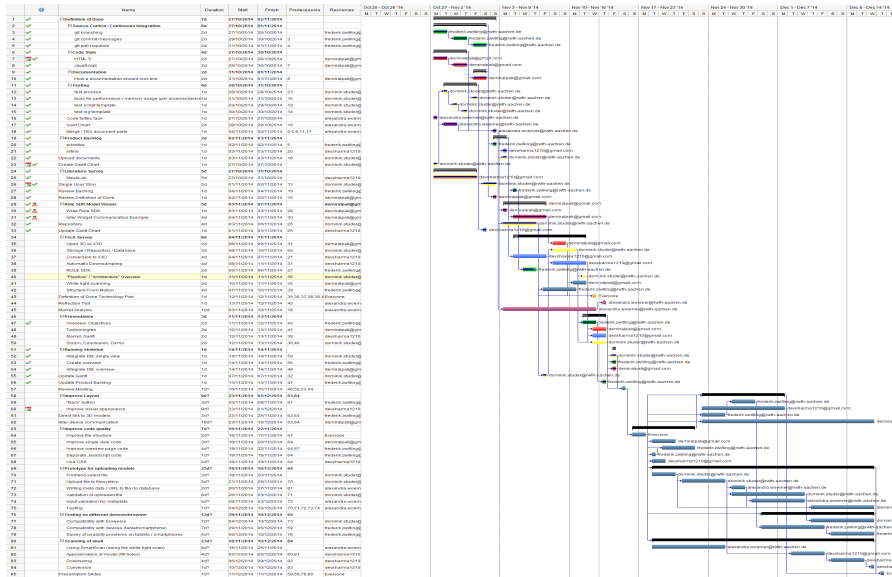
A Gantt chart is a bar chart that shows the tasks of a project, when each task must take place and how long each will take.

Conventions

- Try to keep it simple.
- Highlight milestones/reviews.
- Assign different colors to team members .
- Indicate the (temporal) dependency of one task from another with arrows.



Gantt Chart





Scrum

Scrum Meetings

- Sprint Planning: Define tasks
- Daily Scrum: Check progress
- Sprint Review: Customer currently not available

Customer contact

- 3 Customer meetings: Requirements and introduction
- Mail: Appointments, questions, literature



Reflection on team process

Communication

- Meetings, Facebook
- Mailing list: Sharing results of technology survey

Collaborative working

- Google Drive: Protocols of customer meetings, ..
- Git: Prototype, presentation slides

Team member

- Evaluation of skills and preferences
- Distribution of roles



Demo of current prototype





Conclusion and next steps

Conclusion

- Collaborative viewing of 3D models
- Access to limited objects, new learning methods
- The educational sector and many industries offer great potential and profitability for usage of 3D models.

Next Steps

- Talking with the customer
- Interface for uploading models
- Inter-device-communication
- Layout prototype