



Create Dynamic 3D Models for Google Earth

Problem definition¹

X company operates a busy container terminal. To optimize the workflow, company staff uses a simulation model of the terminal and runs virtual experiments regularly. There are various ways to visualize such experiments (like 2D animation or 3D animation), but these require detailed layout modeling. The users would like to observe their terminal in a virtual environment (like Google Earth) where the layout is already provided (e.g. <http://maps.google.com/maps?ll=57.691072,11.855084&z=16&t=h> or <http://maps.google.com/maps?ll=56.154729,10.245888&spn=0.008808,0.021586&t=k&z=16>).

Create 3D models of buildings and vehicles that can be embedded in Google Earth and implement an application that updates vehicle locations in order to visualize their actions in a simulation model.

Problem owner

X company

Expected delivery

- project plan
- specification document
- design document
- source code
- test document
- final report

Detailed description

Project initialization (delivery: meeting minutes and project plan)

- Before starting the project organize a *kick-off meeting* (max 1 hour) and discuss the details of the project. All uncertainties concerning the problem should be

¹ This is a fictitious task which primary aim is to help students to carry out all processes of project life cycle.

discussed and at the end should be included in a document (called *meeting minutes*). You will send this document to the TBA project managers; they will review it and will answer to your questions (no more than 1-2 pages).

- During the meeting you should also provide a *project plan* by means of *effort (time)* you will spend for each task. The tasks will include: project management, specification, design, development, test, and report. Furthermore, all these tasks can be expanded in subtasks. After you finish this document please send it to TBA. (no more than 2-3 pages)

Specification (delivery: specification document)

- Write a specification (by means of requirement lists) with all tasks that needs to be done for this project. Typical requirements are:

3D models should be defined in a format recognized by GoogleEarth.

Container stacks should be modelled dynamically.

Locations of moving vehicle should be updated in every second.

etc.

This list will be evaluated by TBA project managers (no more than 2-3 pages).

Design (delivery: design document)

- In order to carry out the design you are encouraged to use *UML diagrams*. Although you can use most of the UML diagrams we primarily suggest the *use case diagram* (consider the requirements during specification), *sequence diagram* and *class diagram*. Write a document with all these diagrams and send it to TBA (no more than 5-6 pages)

Development (delivery: source code)

- 3D objects must be as detailed as possible.
- The updater application must be able to retrieve/accept vehicle locations from various sources: file, database, server, etc.
- Keep in mind:
 - o the code should be well structured
 - o the code should be well documented
 - o use *Design Patterns* where it is possible
- The application will be reviewed (code) and evaluated by TBA.

Testing (delivery: test document)

- In order to test your code please consider unit testing.
- Write a test document (use the specification document - requirement lists) that contains all the specific tasks that you need to test before deploying your product.

This list will be evaluated by TBA project managers (no more than 2-3 pages).

Final report

- Review initial project plan
- User manual (no more than 2-3 pages).

Miscellaneous

Feel free to request support from TBA staff in any development phase.

All deliveries will be evaluated by project managers from TBA.