Project Initialization Document

Optimize the transportation time for X company

Problem definition[1]

X company deals with transportation of containers between commercial units (factories, distribution centers, terminals, etc.). The company provides both sea and land transportation facilities by means of vessels (sea) or by trucks (land). In order to maximize the profit it is indispensable to optimize (reduce) the transportation time.

Currently X company encounters the problem that some of the dispatchers of transporters (vessels and trucks) are not taking the proper decision when they define the route for the transporters. Accordingly, this entails the lost of enormous amount of money caused simply by wrong decisions.

For this reason, X company initiated a pilot project that aims to create a decision support application that helps the dispatchers making the right decision concerning the definition of the route of the transporters.

TBA got an offer to provide this decision support application. Although TBA is giving you this job, it provides senior project managers to supervise your activity during the project life cycle.

Problem owner

X company

Expected delivery

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

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

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 discuss 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 (e.g. development in configuration of the route network, create the route graph, implement the searching algorithm, etc.). 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:

  The configuration should be done by use of XML files.

  The user should have the possibility to define a source node (commercial unit) and a destination node.

  The user should have the possibility to visualize the map on a 2D GUI.

  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 request from you 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)

- The route network is basically a graph, where the commercial units are the nodes and the routes are the edges.
- You need to define two types of graphs, one for land transportation and one for sea transportation. The two graphs can have common nodes, because a container first can be transported by truck, then by vessel and finally again by truck. For example, a TV which was made in China it is first transported by trucks to one of the terminals (e.g. Sjanghai), after that transported from Sjanghai to Rotterdam (by vessel), and finally from Rotterdam to Delft by truck.
- The graph must be configurable; please consider XML.
- The weight of the edges defines the distances between the commercial units.

- We assume that all vessels have the same speed. Similarly, all trucks have the same speed. The speed of the vessel and truck should be also configurable.
- In order to find the shortest route use different algorithms, such as Dijkstra, Bellman-Ford, etc. The user should choose between the different types of searching engines (algorithms)
- Provide a user interface with 2D visualization which shows the route network. The most optimal route will be shown with another color.
- The application must have a user friendly GUI.
- Keep in mind:
    - the code should be well structured
    - the code should be well documented
    - please use the *Design Patterns* where it is possible (e.g. strategy pattern when considering the different type of algorithms)
- 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

All deliveries will be evaluated by project managers from TBA BV.