The past few years the Tebodin BV logistics department in The Hague has conducted an increasing number of simulation studies. As the number of concluded studies mounted so did the realisation that every simulation study is conducted, following a more or less standard pattern. Experienced programmers intuitively follow this pattern based on prior experiences they have had in the field of simulation. When an experienced programmer stops working he takes with him all the experience he has acquired through the years. An accompanying problem that often occurs is the fact that most simulation studies are conducted by only one person. As a result the conceptual model and the working of the computer model are only clear to the persons who were directly involved in the project. This lack of clarity stands in the way of possible reuse of the model as a whole or of parts of the model.

In the light of these developments Tebodin BV wanted to develop a methodology in which knowledge control and transferability are the key issues. Knowledge control comprises of ‘the build up and filing of knowledge gained in past simulation projects’. The definition of transferability is ‘conducting a simulation study in such a structured way that the study becomes clear and understandable for persons who are not directly involved with the project’. The first advantage of knowledge control and transferability is the ability to promote the reuse of parts of existing models. The second advantage is that because of the transferability the project can be conducted with a team instead of one person.

To set up this methodology the following steps were taken. First an extensive survey on the existing literature was done. Next interviews with experienced programmers were conducted to fill up the gaps left after the literature survey. The final step was to test the new methodology by conducting a simulation case study.

The developed methodology is derived from existing methodologies as described in the literature. These methodologies basically all follow the same pattern. They all have well defined consecutive steps, which have to be followed to come to the final result. What the existing methodologies lack is so called ‘milestones’ which conclude the steps. In the new methodology the milestones can be either documents or models. These milestones are important to ensure the project progresses as was agreed beforehand. The second reason for implementing milestone documents is to prevent the client from changing the contents of the assignment as the project goes along. The new methodology will consist of the following five phases:

- Phase I: define problem and goal;
- Phase II: draft the Software Design Specification (SDS);
- Phase III: construct and validate the model;
- Phase IV: analyse, report and present the results;
- Phase V: evaluate and file the project.

Each phase has a milestone document. The milestone documents are:

- Phase I: ‘problem definition and goal definition’ and ‘conceptual model’;
- Phase II: Software Design Specification;
- Phase III: Computer model and model description;
- Phase IV: Results;
- Phase V: total project file.

This methodology is designed for simulation projects where the programming of the computer model is done by a different person than the author of the conceptual model. The SDS document serves as a feedback document for the author of the conceptual model. With the SDS the author can check whether the programmer is programming the computer model as described in the conceptual model. The author should be able to understand the SDS without extensive knowledge of the programming language the programmer intends to use.

The milestone documents assure knowledge control and transferability by registering all steps and decisions in the simulation project. Furthermore all separate components of the simulation project are thoroughly described. It is mandatory that the milestone documents be created during the project. Postponing the creation of these documents mostly results in not making the documents at all. It is these documents, with their standard structure and layout, which contribute the most to the intended knowledge control and transferability.

In respect to the methodology the conclusions are divided into three parts:

- Conclusions with respect to the functioning of the methodology;
- Conclusions with respect to the transferability;
- Conclusions with respect to the knowledge control.

Applying this new methodology has advantages for the client as well as the company who executes the study. For the client the added value lies in:

- Project time is cut because the clear problem- and goal definition result in fewer delays. Most delays are a direct result of poor arrangements in the goal definition phase.
The advantages for the person who conducts the study are:

- Delays in progress because of interim changes in the project are minimised;
- The project quality is controlled by the clear-cut structure of the methodology;
- More than one person can work simultaneously on the same project;
- Parts of a model can be altered without changing the whole model;
- Parts of a model can be reused;
- Problems are spotted in an early stadium and can be solved before the programming phase;
- The programming can be outsourced.

In respect to transferability the following can be concluded:

- Documenting and structuring the different phases promotes the transferability;
- The different milestone documents ensure the possibility of more than one person working simultaneously on the same project;
- With the new methodology communication, between the different parties involved in the project, remains essential;
- Using the same layout and structure in the different milestone documents increases the transparency of the project to the people directly and indirectly involved.

With regard to knowledge control the following can be concluded:

- Precise documenting and filing of the processes and milestone documents per phase promotes the ability to execute knowledge control;
- All processes are described separately which greatly increases the possibility to understand and reuse them.