To Main Proceedings Document

Business Modeling Process

Shoji Hidaka

NTT DATA Corporation
Shinkasumigaseki Bldg. 18th Foor
3-3-2 Kasumigaseki, Chiyoda-ku
Tokyo 100-0013, Japan
Telephone: +81-3-3506-4631, Facsimile: +81-3-3506-4638
E-mail: hidakas@noanet.nttdata.co.jp

Abstract

This paper discusses the key issues in modeling process. In teaching business simulation, the most frequently asked question is, “How can I get to develop such models?” It is easier to explain the structure of existing models and managers can easily learn how to use simulation software. Modeling is integration of several techniques; techniques for collecting necessary information, techniques for summarizing them, techniques for mapping them into diagrams, and computer simulation technology. In this paper, I discuss the key points in modeling process through my experience in teaching business modeling not in classroom but in real business fields. I also introduce the effectiveness of the KJ Method, a useful technique in collecting and summarizing information, which is frequently used in Japanese organizations. This paper is based on the case study in NTT Data, applying the SD modeling to software quality management. This case study has two main implications for effective modeling. First, it suggests that understanding whole process of modeling is the most important to develope a good modeler. Second, some techniques for TQM are also useful for SD modeling.

1. Business Modeling Process

Frequently Asked Question

When I teach SD modeling to managers in my company, the most frequently asked question is, “How can I get to develop such models?” This means that managers can understand the SD modeling but they cannot become a good ‘modeler’ even after the SD course.

In the course, as the time is limited, I usually show several sample models and explain the structure and formula. I also explain how to develop simulation models with special software, such as i-think or Powersim.

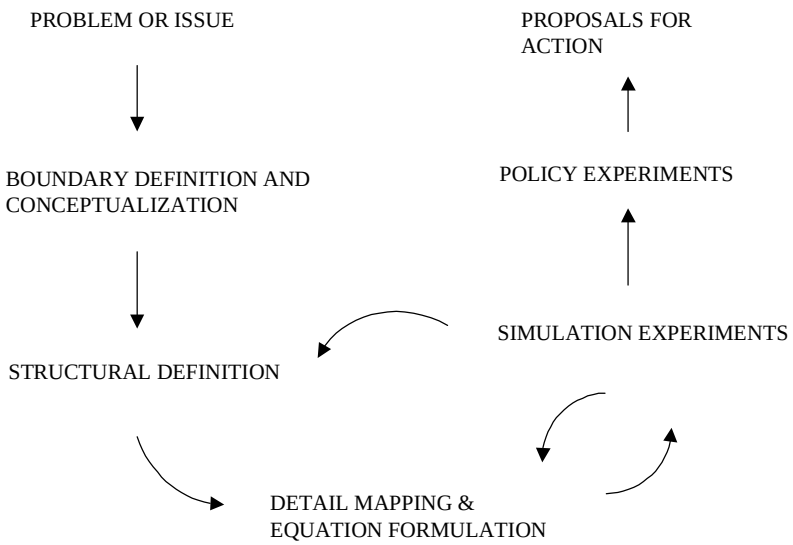
Managers can understand the structure of the models and get easily boring in the third model. They quickly learn how to use simulation software because those software have Windows-based simple user interface. In addition, most the mangers have systems engineering background. (NTT Data is the largest systems integrator in Japan.)

However, they often complain that they cannot develop their own simulation models by themselves. This may be the similar situation when students in painting class saw beautiful pictures and learned how to use painting tools but they cannot draw such beautiful pictures.

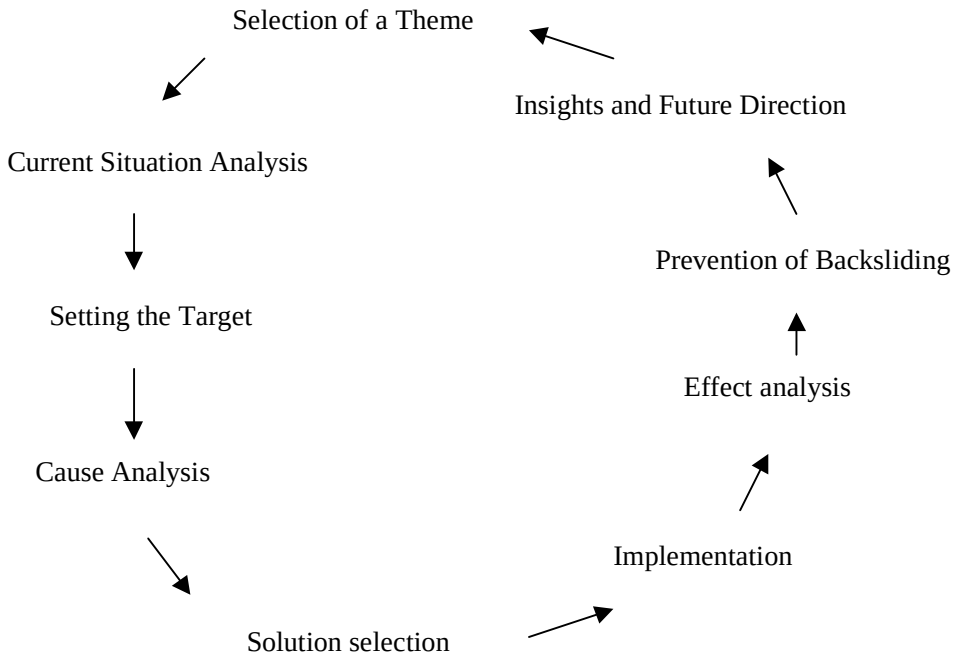
I think that developing simulation models with software is only a part of the modeling processes and is not the most important one. Managers need to learn total process of modeling. From this point of view, I would like to analyze the modeling process in detail first.

Modeling Process

Below is the standard SD modeling process which I learned at the London Business School as an MBA student.



When I saw this chart for the first time, I thought that this is similar to the 'QC story', which is used for the process in Japanese TQM activities. The second chart shows the standard 'QC story' in Japan.



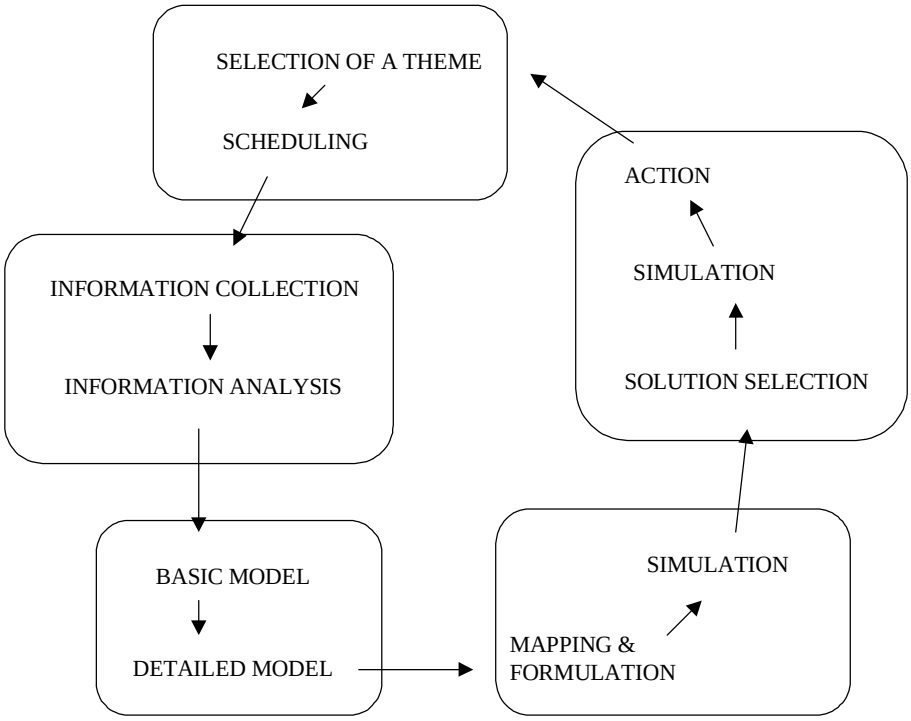
The main differences between the two chart are:

1) ‘QC story’ itself is the feedback loop process. (often called ‘PDCA’ cycle)
2) ‘QC story’ emphasizes more on the early stages of the process. (Selection of the theme, Current situation analysis)

This ‘QC story’ provides good suggestions to understand the modeling process in detail. Before using simulation software, there are several steps to do in modeling.

In addition, when we develop models with causal loop diagrams, we usually start from the very simple model to the detailed one. Further, we sometimes develop parts first and combine them later.

Below is the modeling process model, I use recently in my classes. Based on the standard model which I learned at the LBS, I add some elements from the QC story and my own experiences.



2. Example

A proper example often helps to understand concepts effectively. In this section, I would like to show the processes which I used in developing the Quality Control Model last

year.

1) Selection of the theme and planning

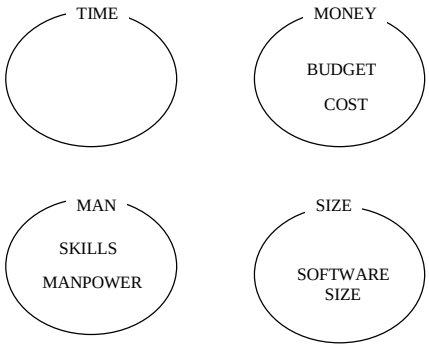
Firstly, we develop a team for the TQM activities and discussed the theme of the year. We usually use the ‘brain-storming’ technique for creative thinking with a team. We chose the quality improvement of a computer system as that year’s theme.

2) Collection of the information

The data about the system’s quality was extracted from the database and analyzed by using statistical techniques. We also interviewed some experts to understand the causes of the poor quality of the system. Interviews are necessary because there are lots of fuzzy or non-linear relationships which cannot be easily explained by Statistics.

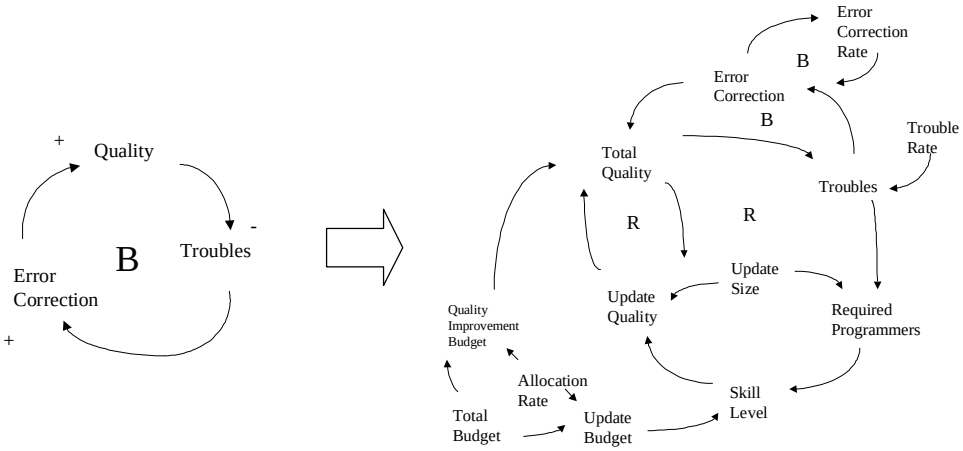
3) Analysis of the information

In the next step, we wrote down what we collected into small pieces of paper and summarized them by the ‘KJ Method’.



4) Modeling

We developed the causal loop diagram of the quality process. We started from a very simple model to a detailed model. This process was done by the team again, which allowed us to share the concepts of the model. Modeling in the business fields requires consensus of a team to develop effective solutions.



5) Development of the simulation model

We developed the simulation model with some simulation software, i-think and Powersim, ran the simulation, and checked the results.

6) Reflection and Feedback

We discussed the solution to improve the quality of the system and changed the simulation model and checked the simulation results again.

3. Techniques in Modeling

In order to develop the modeling skills, students need to learn all techniques use in the whole process of modeling. In this section, I would like extract some of those techniques from the previous example. Some of them tend to be overlooked in teaching SD modeling.

1) Techniques for collecting information

Database Manipulation
Interview technique
Brain-storming

2) Techniques for analyzing information

‘KJ Method’
‘Hexagon’

3) Techniques for developing models

Causal Loop Diagram
Stock and Flow Diagram

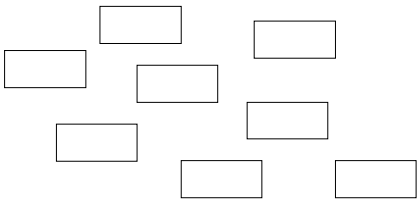
4) Techniques for developing simulation models

Simulation Software

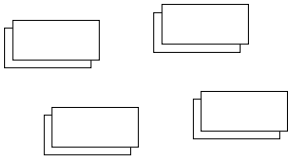
*KJ Method

KJ Method is a technique for summarizing information. It was developed by Jiro Kawakita in 1970s. Most of Japanese managers can use this technique today. The chart in the previous section was also made with this technique. The main processes of the KJ Method are as follows.

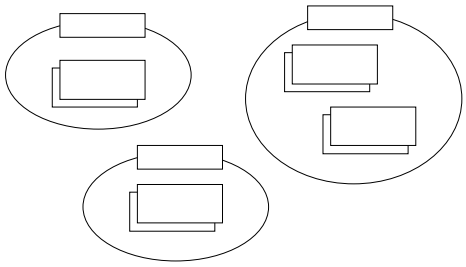
1) Write down the information onto cards. (We often use Post-It™)



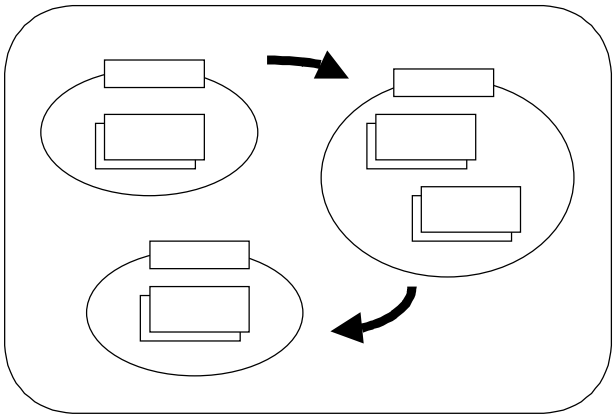
2) Collect similar cards to some groups.



3) Name each group.



4) Make a story



4. Conclusion

In the SD modeling courses, we tend to explain only diagrams and simulation tools, which cannot develop good modelers. We need to emphasize more on the early stages of the whole modeling process, such as collection and analysis of information. I started a new SD modeling course this year in my corporation. In this course, I am trying to explain the whole process of modeling and techniques used in each step. I found that Japanese traditional techniques used in TQM activities, such as KJ Method, are often useful in SD modeling.

Further studies

As the next step of my study about the modeling process, I would like to introduce some techniques used in the software development into SD modeling, such as Structured Analysis, DOA(Data Oriented Approach), Object-Oriented Approach.

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