

INTER INSTITUTIONAL USE OF EDUCATIONAL RESOURCES

Joint Use of Management Simulation Games

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ABSTRACT

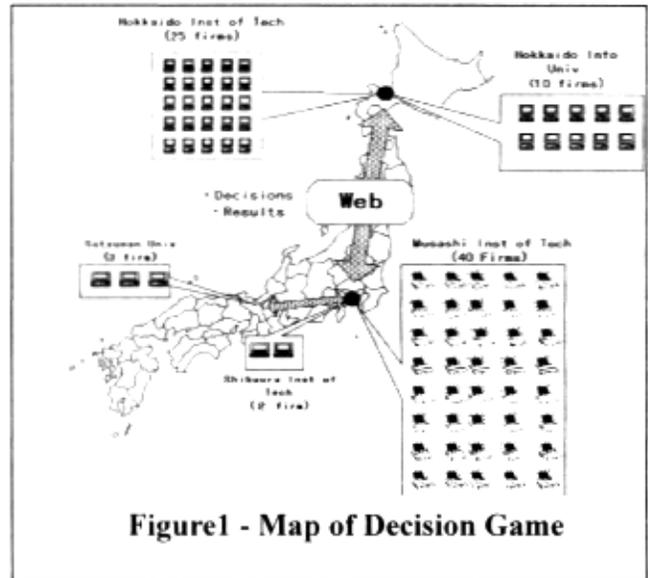
This paper describes the joint use of two management simulations among several universities in Japan. The one used is a decision game(DG) which is a WEB based game, and the other one is a management game(MG) which is a network based real-time game. Results and problems found in two games are presented.

INTRODUCTION

Hokkaido Institute of Technology started taking part in a decision game developed by Musashi Institute of Technology in 1994, and in 1997 participation was expanded to five schools with the addition of Shibaura Institute of Technology, Hokkaido Information University, and Setsunan University. A management game developed by Hokkaido Institute of Technology and played on the internet in seminar classes has completed testing, and from April, 1998 it has been used by 3rd year seminar classes at Musashi Institute of Technology.

MUTUAL USE OF EDUCATIONAL RESOURCES

Musashi Institute of Technology has been developing and using a decision game (DG) since the 1970s, and Hokkaido Institute of Technology developed and used a management game (MG) in the 90s. Both employ computers to achieve specialized educational goals. Both DG and MG were limited to intra campus use and require networks. In 1993 both games were the subject of presentations at the Japan Universities Association for Computer Education conference and discussions to enable their mutual use via networks took place. In 1994, the DO was used



simultaneously at the two campuses as a first trial. At this point the network was not fully developed and telephone lines were used for data exchanges as well as data was verified via fax. In 1995, Hokkaido Institute of Technology was connected to the internet and testing took place via the network. In 1996, Shibaura Institute of Technology and Hokkaido Information University joined, and in 1997, Setsunan University became the 5th school to take part. An Internet compatible version of the MG was developed and testing verified that it could be used safely.

DETAILS OF THE DECISION GAME  
Development and use of the decision game

The development of the decision game was initiated in the 1970s at the Murahara laboratory of Musashi Institute of Technology with the goal of enabling a systematic understanding of industrial engineering subjects.

## Developments in Business Simulation & Exp

The DG was used in weekly 90 minute lessons by third year students in Cost Engineering seminar classes, and its history may be divided into three stages:

- 1970s: Batch processing with data on computer cards.
- 1980s: Use on LAN computers with TSS of minicomputers.
- 1990s: Real time processing open format using the Internet

In the 1990s it was finally possible to use the DG with other universities, with the only limitation on the participation that the various data must be transmitted by a specified time (presently Friday, 4:00 PM). The students at the participating universities then retrieve the decision data of each period from the web page of Musashi Institute of Technology. The DG referee at Musashi Institute of Technology calculates production and sales volumes from the decision data and posts the results on the web page. Each company then confirms sales volumes with the web page and prepares financial statements from the figures and sends these to Musashi Institute of Technology. Finally the DG referee posts five kinds of ranking data on the web page, including market share and rate of return on assets. The DG is executed weekly in this manner in eight cycles from September to December, and details of the execution can be confirmed on: [cost.ie.musashitech.ac.jp/~d~index.html](http://cost.ie.musashitech.ac.jp/~d~index.html)

### Results from 1997.

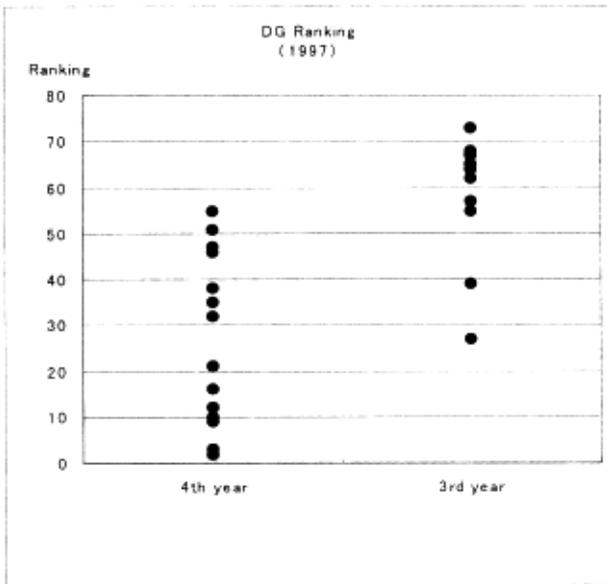
In 1997 a total of 83 teams took part, 40 from Musashi Institute of Technology, 4 from Setsunan University, 26 from Hokkaido Institute of Technology, 10 from Hokkaido Information University, 2 from Shibaura Institute of Technology, and one team from the general public (details in Fig. 2).

The problems encountered in 1997 may be divided into problems with the system in general and operational problems.

- 1) General system problems



Figure 2 – WEB pages of DG



**Figure 3 - Ranking of 4th and 3rd year students**

- a) The participating universities have different schedules making it difficult to implement the game in a timely fashion.
- b) Despite different curricula it is still necessary to implement the aims of DO in detail.
- c) Differences in computer literacy.
- 2) Operational problems
  - a) Effort required to verify the data for transmission.

b) Time taken up with responding to queries and inquiries from participants.

Musashi Institute of Technology has to input the DG manually into an enormous worksheet. Further, with the increasing use of spreadsheets there are very large differences in operational results depending on how well students are able to use spreadsheet software. In 1997 five of the top ten teams were Hokkaido Institute of Technology 4th (final) year teams. Of the Hokkaido Institute of Technology teams the 4th year teams outscored the 3rd year teams (Fig. 3). One reason would be that the 4th year students are provided with own computers and concentrate on studying company management using spreadsheets. Many of the inquiries and questions from other participants overlap and for this year (1998) we are planning to update the ‘DG handbook.’

**MANAGEMENT GAME (MG) ON THE INTERNET**

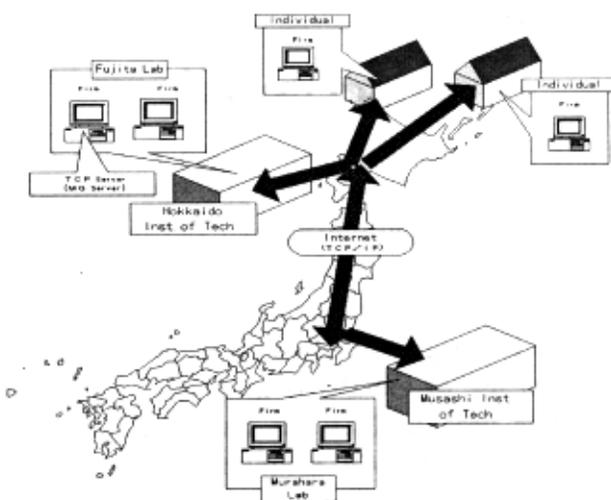
**Development and use of the internet MG**

The Fujita laboratory (Hokkaido Institute of Technology) has used the MG on the LAN. This system which is termed the ‘internet MG’ has been made TCPLIP accessible and requires Windows networked computers (PC). The game was developed with Visual Basic (5.0), and the MG using board (board MG) functions are nearly completely realized (Fig. 5).

Like the board MG, the internet MG involves four or five PCs in one group (industry) and compete in manufacture and sales. Here one of the PCs also acts as the server of the MG (Fig. 4). During operation from January to March 1998 the participants identified a number of problems with the internet MG:

- a) general public

These people (10) represent participants in ‘training to form companies’ sponsored by a Hokkaido bank. They aim to become company



**Figure 4 – Map of Management Game**

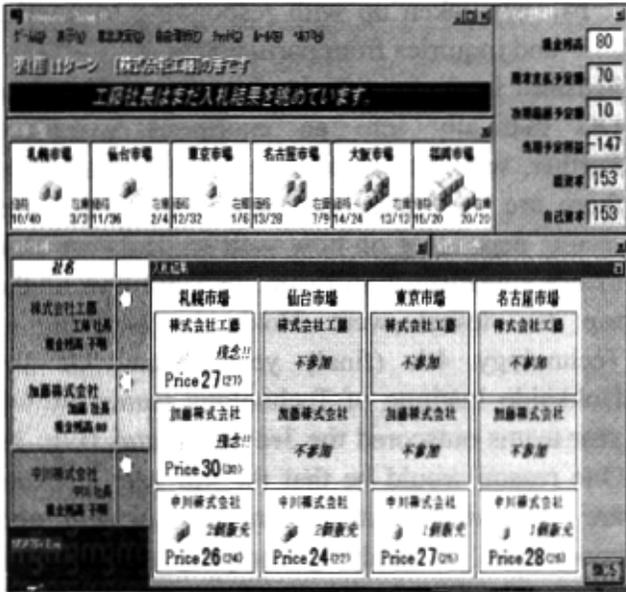


Figure 5— GUI of Management Game

managers, and the age spread is very wide, 20 to 80 years of age.

b) professional school students

Students (30) who have played the board MG for half a year and study public welfare and management. Most of these students are not proficient PC users.

c) university students

Musashi Institute of Technology and Hokkaido Institute of Technology students (10) playing the MG for the first time, and without experience with the board MG. These students had an MG server in their respective laboratories and formed a mixed group.

**Implementation and problems identified**

The groups detailed above formed the participants in the internet MG for two to five periods.

**1) problems with MG implementation**

This game is similar to the board MG and additionally has numerous functions that allow input of past results of the own company and details of decisions of other companies, and these additional functions gave rise to a few errors.

**2) problems in operating the MG**

Joining procedures at the start of the game and the steps necessary to move on to following periods did not go as smoothly as expected, and there is a need to make improvements to make the progress of the MG more smooth.

**3) problems with operating the PCs**

Among the participants, some were not well acquainted with the use of PCs, and it will be necessary to use larger fonts and make it easier to know where mouse clicks have occurred.

**Results at Musashi Institute of Technology**

The internet MG has been used with 2nd year students of the Industrial Engineering Department of Musashi Institute of Technology since April 1998. This has involved two 90 minute lessons with groups of 30 students. Due to the time limitations only two periods of the MG were possible, but one group responded to the game as shown in Table 1. It shows that the student response to the MG was positive, pointing to the benefits of MGs where students are enjoying the game. The DG is expected to provide motivation also in other classes for the participating 3rd year students (Cost Engineering seminar) (a survey of the participants at Hokkaido Institute of Technology, the general public, and professional school provided very similar results).

**CONCLUSIONS**

A DO for the management of large companies aimed at advanced students is planning to expand participation among universities and the general public this year. Another MG starting with just capital for the management of small companies is aimed at lower grade students (younger students). The joint use of the DG is in its fifth year, and from this year an MG has been used via the internet from Musashi Institute of Technology. The result has been a radically new educational environment involving the joint use of software

resources and joint implementation of the software at both universities.

People interested in taking part in the DG or the MG are invited to contact the e-mail addresses below:

DG: [murahara@ie.musashi-tech.or.jp](mailto:murahara@ie.musashi-tech.or.jp)

MG: [fujita@hit.ac.jp](mailto:fujita@hit.ac.jp)

Table 1 Reactions to the Management Game (MG) at Musashi Institute of Technology:

- wish to try it over longer periods good because real
- attracts interest as the best course experiences
- would like to learn to analyze the print outs
- such exercises where all can participate should be increased
- interesting and wants to try again
- like real Cost Engineering and so interesting interesting when compared with present experiments
- unfortunate that there was not enough time will help me to manage better
- the management game format is interesting nice to study pleasantly
- really quite interesting, hope for more courses like this

## **REFERENCES**

Available from authors.