

Title	包絡分析法を利用した主観的判断の分析支援システムの研究
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# Analysis Support System based for subjective judgement based on Data Envelopment Analysis

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**Keywords:** decision support system, AHP, DEA.

In this thesis, we propose a decision support system which can explain the basis of subjective decision making. We always make decision making. Decision making is located at the upper stream in intellectual thinking activity. An area of decision making study is wide. We make the best use of decision making. but, there is a flood of information, an information-oriented society have various values. Thus, systematic decision makings are difficult. In the present situation, decision support is very important. And it is necessary to decision support. The last decision making based subjective desions. Subjective decisions based on experiences, values, knowledge, and so on. Thus, To understand thinking process, decision making process is very important.

Focusing on this aspect, we consider the application of decision support systems which connected subjective decisions with quantitative data. Our system adopts Analytic Hierarchy Process(AHP) which evaluates subjective judgements based on the decision maker's evaluation structure, and Data Envelopment Analysis(DEA) evaluates the relative efficiency of a set of decision making units(DMU's). The AHP is a comprehensive framework which is designed to cope with the intuitive, the rational, and the irrational when we make multiobjective, multicriterion and multiactor decisions with and without certainty for any number of alternatives. It is a method for deriving ratio scales used to integrate our procedure for representing the elements of any problem. It organizes the basic rationality by breaking down a problem into its smaller constituent parts and then calls for only simple pairwise comparison judgements to develop priorities in each hierarchy. The DEA evaluates DMU's. DMU's have common inputs and outputs. These outputs and inputs will usually be multiple in characrer and may also assume a variety of forms which admit of only ordinal measurements. The system can reduce the decision maker's mental load by quantitative data analysis, that is, DEA evaluate resonably without depending on subjectivity. The AHP evaluates weight, and DEA evaluates efficiency value. AHP's weight

and DEA's efficiency value understand ranking of ideas. Then, in this study, our system propose agree ranking. An index is norm of AHP's weight and DEA's efficiency value. There is decision making analysis approach of two. When AHP's weight is important, called topdown approach, and when DEA's efficiency value is important, called bottomup approach.

The experimental system is implemented in X11R5(X Window Release 5) environment on Sun Sparc Station 5. This system is composed of three modules. The first module is for graphical user interface. This module based Multi window interface. The second module evaluates top down approach. The third module evaluates bottom up approach. We used AHP-aid is a decision support system.

Finally, we evaluated this system through two following points. One is decision making used topdown approach, and decision making used bottomup approach. As a result, when this system was used, the subjective decision and quantitative data explain this approach mechanism.

In this thesis, we proposed a mechanism of the decision support system which used AHP and DEA. Thus, we consider the application of decision support systems which connected subjective decisions with quantitative data.

In future, we will verify the effectiveness of the system and improve the system.