# ABSTRACT

## Development of a New Cross Impact Method Considered Influences of Time on Interdepentent R&D events.

Keun Tae Jo,  Cheol Shin Kwon

Department of Industrial Engineering, Sung Kyun Kwan University

The objective of this research is to develop a model which estimates 「time influence」 , the influence on the completion time of R&D events as the interdependency between the events are considered.

However, most of the existing technological forecasting models, which estimates the R&D events completion time, are simple models that do not support the analysis of cross impacts between the events.

the Gordon Model developed to solve this problem was also to forecast the final completion probability by way of determining randomly the occurrence order of events regardless of time interval between completion time of them.

Therefore, research question in this paper is to differently apply the degree of cross impact according to time interval between the completion time of interdependent events.

To attain the stated research objective, a simulation method with 3

steps was developed and applied as follows;

First of all, we determined the initial completeion times by way of estimating the distribution functions of the initial completion times of the individual R&D events which is based on the three point estimation by experts and then of taking the inverse transformation of the distribution functions, and finally determined the conditional completion times by using the 「bisection method」 .

Here, the parameters which can indicate the degree of cross impact according to the correlation of R&D events was designed in terms of technological seeds and social needs.

Major contributions of this research can be summarized as follows:

The time influence estimation model, which reflects the variable nature of the magnitude of cross-impacts that are dependent on the completion time of the R&D events, improved the precision level of the forecasting results.

Especially, it is significant that the forecasting method presented in this paper differs from existing one and provides a closer control on the forecasting process. And It is also easy to use since we employed computer simulation as part of the forecasting process design.