THE EMPIRICAL STUDY ABOUT COMPUTER UTILIZATION* (IN THE KOREAN FIRMS)

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I. Introduction

1. The Objective and the Necessity of the Study.

This study is the research report about the utilization and the influence of the computer in Korea. Since the first computer was introduced to Korea 15 years ago, the skill as well as the scope of its utilization has been developed. Korean government declared 1983 as "the year for the information industry." The numbers of computers in Korea are increasing at 38% rate per year. At the end of Dec. in 1982, Korea has 766 computers, more than 70 percentage of which are used in business firms. Korea government estimates that there will be ten thousand computers in Korea until the end of this decade. This trend implys that Korea will shortly experience the same thing as developed countries have done; the considerable change caused by the use of computers, and its impact on the way of life. This study, considering above aspects, has been directed toward explaining following issues. First, the background and the characteristics of computer utilization in Korea. Second, computer application fields, the status of the computer departments, and the change of that status. Last, the change in management after introduction of the computer system.

The objective of this study, in conclusion, is to study above problems. In other words, this study is directed towards providing the basis for making macro strategy by analyzing the environments of computer utilization, organizational change, and their relationships.

2. Research Methodology and Time.

i) The scope and the object of the survey.

This study surveyed 300 business firms which are selected randomly from "Directory of Korean firms". these samples are categorized according to industry, region, and computer application field of those firms. To perform a survey 61 questions are made from seven categories

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including the current situation of computer installation, organizational status of the computer department, and some issues related with organizational management.

ii) Survey method

In this study, a literature survey as well as a field survey was used. Articles and books including directories, brochures, and abstracts, were used first to get information and to know the situation of each firm. Questionaires based on the literature survey and interviewing were performed to supplement the basic data.

iii) Survey time and procedure

This study was being done for a year from May in 1982 to September in 1983, and proceeded through six steps.

II. Analysises, Results of the Study

1. Subjects of the Study

This empirical study deals with following issues; First, the present situation and the background of the computer applications in the Korean business firms.

1) the present situation of applications in each industry.
2) the type of installed computer
3) the operating system used
4) the timing of the computer installation
5) the field in which on-line systems are used
6) the objective of computer installation
7) applications in the first stage
8) evaluation of the computer system

Second, The organization of the computer department

1) the status of the computer department
2) reporting system
3) organizational change of the computer department

Third, the relationship between the computer usage and job-displacement as well as the impact of the computer on jobs. In fact, the implantation of the first computer impacts on old jobs. This study explains both qualitative and quantitative impacts of the computer on each work class.

Fourth, the impact of the computer on the authority related with management.

1) the authority of the line
2) the relationship of the authority between line and staff

3) the structure of the authority.
4) the change of the numbers of the sub systems.

Fifth, the impact of the computer on the decision process.

1) the change of the decision making group
2) the quantification of the decision making
3) the group which influences the decision making
4) the group which is influenced by the decision making

In addition, the change during the following decision processing steps a) setting the goal b) identifying the problems which should be solved to accomplish the goal c) gathering and analyzing the information d) enumerating the alteratives e) selecting the alternatives f) evaluating the alternatives g) final decision.

Sixth. how does the computer change the span of control? How does the computer impact on the control of individual employee? Through which process does "the control by man" change to "the control by the computer"?

Finally, The change of human relations and communication within the whole organization that results from the introduction of the computer.

This study is the first empirical study in Korea about above issues, therefore it can be the basis for the further research in this field.

2. Results of the Study

This sutdy, which is supported by Ministry of Education, discovers the following facts.

First. the effect and the impact of the computer show differences at the different stages of the development of the computer applications. In the first stage when the computer is newly introduced in an organization, it is applied to the simple computational jobs with the result that it impacts on the small part of the organization. In stage 2, its applications are extended to overall management with the result that the impact of the computer reaches the extent of the whole organizational level. In this stage, the computer department becomes the autonomous unit. In addition, there happens qualitative and quantitative of old jobs in the lower class managers as well as the work field managers. Like this, there occurs the initial change in management field to the extent of the whole company level, however, as yet there is no dramatical impact on the managers above the middle management class. Stage 3 is a period in which the computer is applied to the routine decision making process. As the computer begins to do the routine decision making on behalf of the work field managers and the middle class managers, the important organizational change happens; The numbers of the work field managers and the middle class managers decrease and specialty is required to the managers. In this stage, the authority change in decision making happens. In stage 4, the final stage, applications are extended to overall management including top management's decision making and corporative planning. Though developed countries seem to face new stage beyond fourth stage, Korea is still in the first or second premature stage.

As already mentioned, since the first computer introduced in Korea, the installed capacity is increasing and there are 766 computers at the end of 1982. 76.26% of the computers in Korea are used in the second industry, especially 11.25% in the chemical industry and 16.25% in the bank and tne insurance companies. The most popular items are those of I.B.M. In terns of system structure, 67.7% of the computers are used as batch system while 32.2% as on-line system. The survey shows that on-line system had not been used for two years after the computer was installed. That fact implys that there is some problem in the environment and the timing of computer utilization.

Second, the objective of computer applications in Korea, are to improve management information system (30%), or to reduce cost (16.25%), or to speed up the job performance, while in foreign countries, the objective of computer applications is automation. In foreign countries, the computer is usually applied first to job improvement, while in Korea it is applied to personnel management, sales management, and material requirement management. It is doubtful whether it is effective to apply the computer to such specific fields. It is also wonder that 38.75% of the respondents answered that they never evaluated the effect of the computer, nor do they thought its need. In the U.S. only 3.4% replied like that. Even though the computer is the useful instrument, it could be waste unless the users' attitude changes.

Third, Korean companies don't care about the status of the organizational unit. However, in general, the status of the computer department in most Korean companies is "center" while in foreign countries the status is "section" or "department". According to the result of interviewing, the status of the computer department is determined by rule of thumb, or by refering to other company without consideration of the objective and the characteristics of its own company. The trouble is that some companies determine the status which is never fit to its job characteristics, management style, and size. Unless there is considerate study in the status of the computer department, it is of no use utilizing the computer because of the loose relationship among each functional area.

Fourth, the implantation of the computer save the work of the low class managers. In the higher management level, job displacement is less; job displacement in the low class management is 85%, 63.75% in work field management, 56.25% in middle class management, 22.50% in top management. In terms of work quality, there is the strongest change in the low class management. 76.25% of the low class managers think that their tasks become simple, compared with 66.25% of the work field managers, 61.25% of the middle class managers, 38.75% of top managers. In conclusion, the delegation of authority and job cordination are not realized, so there should be any solution for that.

Fifth, the numbers of employees in each class are decreasing dramatically with the introduction of the computer. From the fact that 50% of the low class managers, 16.25% of the work field managers, 11.25% of the middle class managers face job displacement, while no top managers do that, we can know that job displacement occurs more often in the lower class management. Anyway, it can be said that the computer contributes to saving resources.

Sixth, still decision making is done by the higher class managers, contrary to the tendency that the lower class managers do decision making more often than before with the delegation of authority.

However, fortunately the quantitative approach which is indispensable to the scientific management is getting popular. Another remarkable fact is that the middle class managers grow to influence the decision making.

Seventh, with the introduction of the computer, decentralization of the authority is generally developed and individual control becomes more strict. In addition, we must consider the change from "control by man" to "control by the computer". Therefore, we must be prepared to manage that change, even though the change is not so strong yet.

Moreover, unfortunately the interviewed never think about above would be problem.

Finally, human relations is the key factor to make management effective. The introduction of the computer positively change both the vertical and the horizontal human relations and improve the communication among each class within the organization. In conclusion, although the computer brings much positive effect, it can be also known from the study that the computer causes other negative effect.

III. Suggestion and Remaining Task.

As already mentioned the objective of this study is to provide the effective strategy in order to make an environment for the effective computer utilization in Korea. For the effective and deep rooted utilization of the computer in Korea, following tasks should be performed by government and the business firms.

1. Tasks for Government;

First, government should provide the firm basis for the computer utilization by making a law which can develop the information management organizations. In addition, government should lead the movement for enlarging the computer-oriented mind. Second, for the optimal applications, appropriate criteria must be provided to each different application fields. Last, government should educate experts who can plan and evaluate the public information, data communication, on-line system, and centralized system. It should also establish an organization for effective utilization of the facilities and better applications.

2. Tasks for the Business Firms;

First, the business firms should make an effort for setting the structured organization by analyzing the staff organization considerately.

Second, each firm ought to recognize its internal environment of applications, and try to provide a reasonable basis for applications. In addition, it must research and develop the global control system. Third, each firm should prepare to meet the fast development of high technology, establish an organization which continues to study the related function of organizational management, and develop its own new model system.

Finally, each firm must preinvest for each stage of the growth which it will enter.

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