DSS for SCHOOL Management

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Abstract

The concept of DSS has been applied to profit organizations however, the purpose of this paper is to show how the DSS helps the school administrators to increase the productivity of their operation. DSS may change the structure and atmosphere of the school, but can't always make success in its implementation. Therefore top management should know the problems and its major limitations. Recently the price of micro computer has become cheaper and its capabilities has improved a lot. We'd better notice that decentralized control system will take place in school in the future.

1. Introduction

Management has been defined in many ways by many scholars. However, Koonts and Weihrich define management as the process of designing and maintaining an environment in which individuals, working together in groups, accomplish efficiently selected aims. (1)As Herbert A Simon pointed out that management is synonymous with decision making, school authority should make adaptive decisions continually to remain in a dynamic equilibrium with its environment. Information flow is very important for the drcision making process. We need knowledge of the past, estimates of the future, and timely feed back concerning current activity. The task of school management is implementing this information-decision system to coordinate effort and maintain a dynamic equilibrium.

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Decision making in school is a process by which certain goals are achieved through the of resources (people, money, energy, materials, space, time, etc). These resources are inputs and accomplishment of the aims is considered to be out put of the process as shown Figure 1.

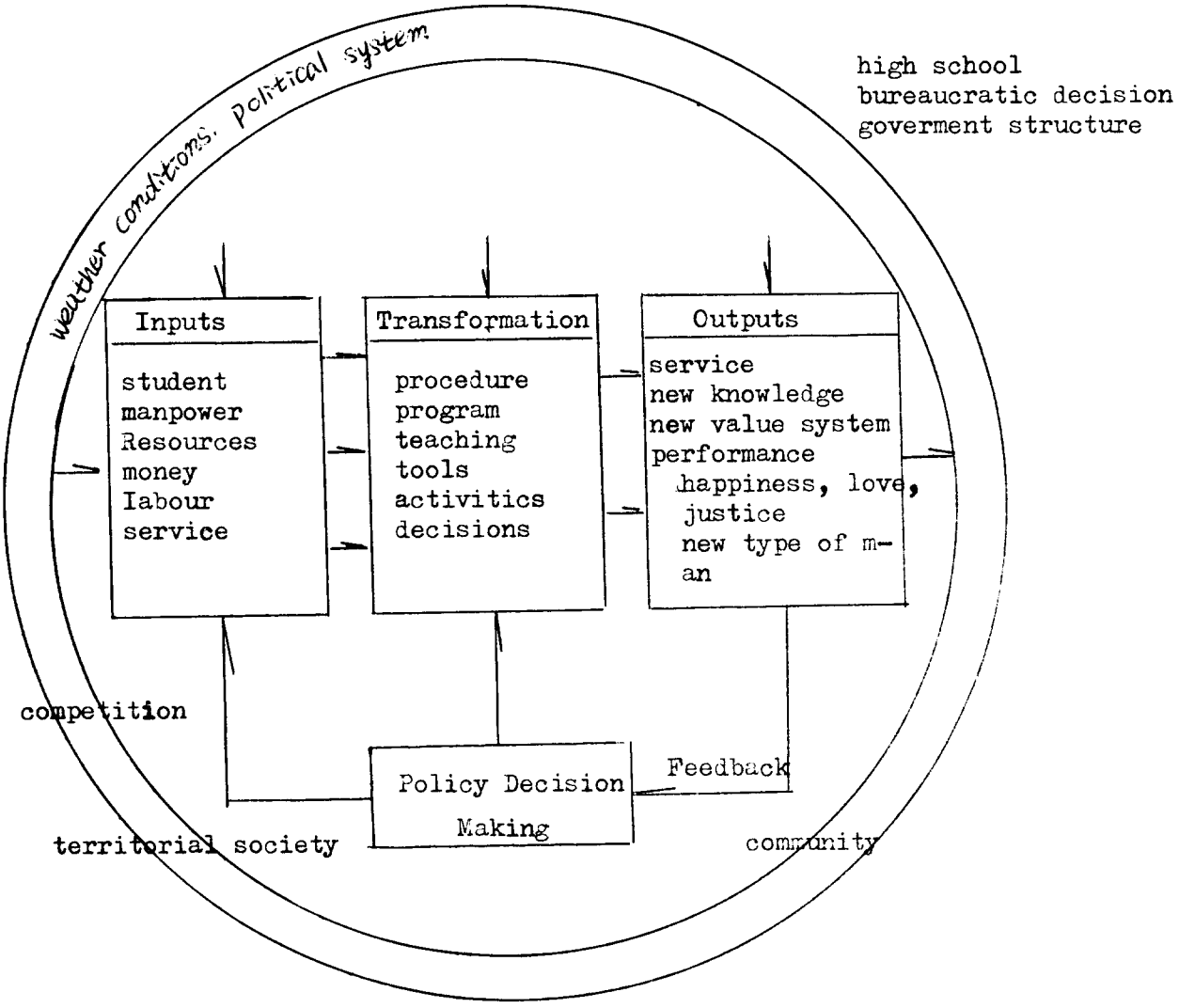


Figure 1. Input-Output Model of a University

The success of management depends on the execution of certain managerial functions like planning, organizing, directing, and controlling.

To carry out these functions, managers are engaged in a continous process of making decision. However school management operates in changing environment.

Factors such as technology, information computers, school size, structual complexity, competition, political stability and government intervention affect the decision making.

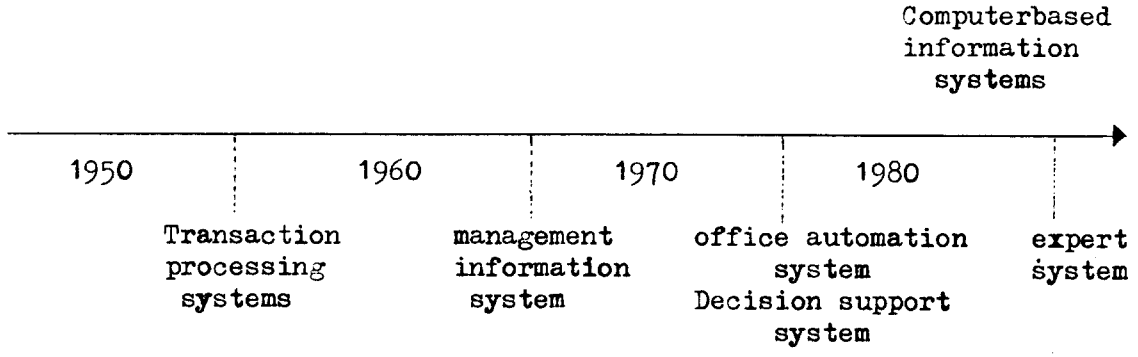
As J. Naisbitt pointed out in his book, we live in the 3rd wave, (information age) here technological advancement becomes a major determinant of our life-style. We can not achieve the success of management or productivity without concurrent advancement in management systems.

The purpose of this paper is to study how the computer information system helps the school administrator to increase the productivity of their operation.

2. What is DSS and why do we use it?

Computers have been used as aids to support managerial decision making for over last two decades. The computerized tools can be grouped into five categories as below.

The evolution of computer-based information system(CBIS) may be drawn as below.



A DSS was defined by many scholars such as Alter, Moor and Chang, Bonczek, Holsapple, Whinston and Keen.

However, a classical definition of DSS by Keen and Scott Morton is as follows :(2) DSS couple the intellectical resources of individuals with the capabilities of the computer to improve the quality of decisions. It is a computer-based support system for management decision makers who deal with semi-structured problems.

A still more specific use of DSS describes it in terms of a number of characteristics or attributes. For instance Sprage and Carlson[3] identify four such characteristics.

1. They tend to be aimed at the less well-structured, underspecified problems that upper level managers typically face.
2. They attempt to combine the use of models or analytic techniques with traditional data access and retrieval functions.
3. They specifically focus on features that make them easy to use by noncomputer people in an interactive mode.
4. They emphasize flexibility and adaptibility to accommodate changes in the environment and decision-making approach of the user.

Similary, King[4] has identified the typical DSS to be an integrated system that is made up of various subsystems :

1. Decision models
2. Interactive computer hardware and software
3. A data base
4. A data management system
5. Graphical and other sophisticated displays
6. A user friendly modeling language

Why do we use a DSS? We can identify several major characteristics and benifits of DSS, some are based on Alter's observations.[5]

1. Abilitity to support the solution of complex problems.
2. Fast response to unexpected situations that result in changed input.
3. Ability to try several different stratigies under different configurations, quickly and objectively.
4. New insights and learning.
5. Facilitated communication.
6. Improved management control and performance.
7. Cost savings.
8. Objective decisions.
9. Improving managerial effectiveness.
10. Support for individuals and/or groups.

Hogue and Watson[6] conducted a survey and identified six main reason why major corporations started large-scale DSS as below.

Factors	cited by (percent)
Accurate information is needed	67
DSS is viewed as an organizational winter	44
New information is needed	33
Management mandated the DSS	22
Timely information is provided	17
Cost reduction is achieved	6

3. Application and Future Role of DSS for University

Sang M. Lee and Edward R. Clayton[7] applied goal programming model for academic resource allocation.

Allen G. Greenwood and Laurence J. Moore[8] described the design, construction and implementation of a comprehensive computer based decision support system that serves as an on-line interactive decision-making environment for tuition and fee analysis at a major state university, Virginia Polytechnic Institute and State University. The DSS provides the administration with a rational and traceable, yet flexible, means to analyze and establish tuition charges.

Wesleyan University compected with other universities for the very best students, coupled with the budgetary strains. The university rethink its policies and procedures regarding financial aid.

A five-year budget forecast predicted a potential financial crisis if this policy were to have continued. As a result, a detailed financial aid modle was developed using a DSS to assess alternation strategies that could prevent the crisis. The DSS was constructed in 1979 to solve the problem. A DSS generator specifically for use in universities, called EFPM, was used.[9]

Resource planning in university management by goal programming by Roger G. Schroeder also provides a new look at university resource-management problem.

Alber H. Rubenstein, in a paper titled "Integration of Operations Research into the Firm" discusses the relationship of operations research to staff groups to operating groups in the universities, and predicts a pattern emerging.[10]

Simulation was beginning to gain momentum and was carried out at several levels and in several types. Richard Judy and Jack Levine[11] at the University of Toronto used their "Campus" simular to simulate university operations as a function of time, combining the structure, level of activity, staffing, space, materials and money.

Turban identified 9 success factors of implementation which are frequently interrelated : external environment, organizational support, user involvement and training, process and structure, change management, human factors, data factors, technical factors and project related.

If we pay special attention to the following three key issues, we can increase the probability of successful implementation of an MIS.[12]

1. Gaining management and user commitment to the project.
2. Gaining user commitment to any changes necessitated by the new system.
3. Assuring that the project is well defined and plans are clearly specified.

Rockart[13] did a research about the changing role of the information systems executive in nine companies. He revealed several critical success factors : Top management education and communication, retaining trained, high quality personnel, reliable, high quality information system service, support from Top Management, decentralization of MIS Function and effective, efficient systems.

The above success implementation factors gives us good teaching when we apply DSS to school.

The microcomputer revolution and the advant of personal computers may be the most important factors in increasing the acceptance of DSS. Whereas a decade ago computers were viewed by the majority of people as a machine to be not accessible and possibly even feared, today computers have become so familiar that even elementary schools teach computer programming.

For example, IBM personal computer or compatible becomes very cheap and its performance is very good. Computer industry develops software to provide data for micro-based decision support applications.

As Davis, Olson, Allen and Nolan[14,15,16] said that there will be more pressures for decentralized control system due to availability of low-cost technoligy, backlog of development work, user control over operations and organizational behaviour, decentralized control system will take place in university in the future as in Figure 2.

We should know that there are major limitations to DSS in the distant future. Dreyfuses[17] identified 19 statements of shortcomings of computer in their book titled "Mind over Machine."

However, it is worth bearing in mind Keen's[18] implication that DSS is a base for learning, not for solutions, and encourages looking at more alternatives, experimenting, and probing, although the benifits of DSS can be hard to quantify, but not necessarily to recognize.

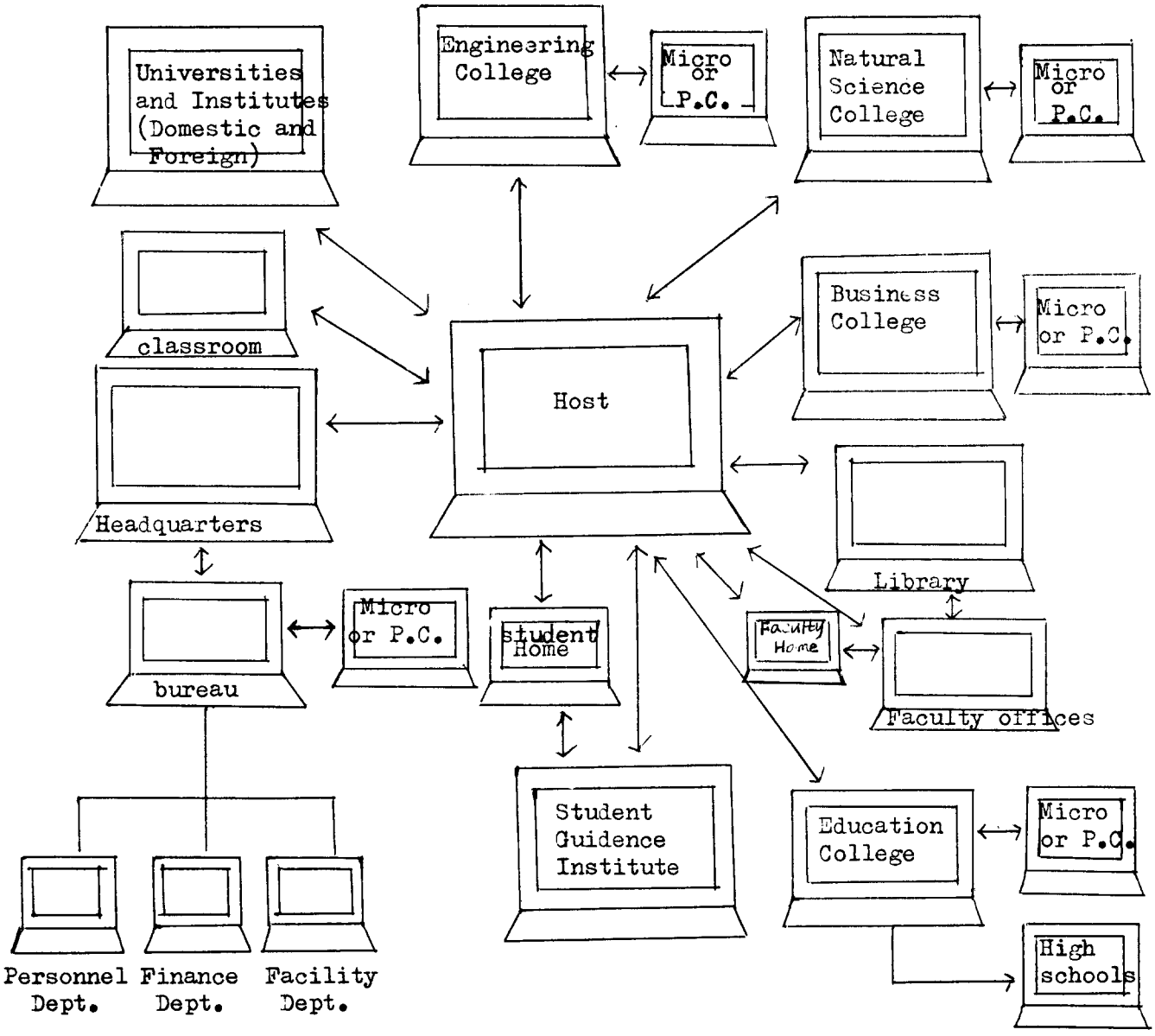


Figure 2. Integrated Information Flow Diagram of University in the Future.

MINI CASE

Being located at the most beautiful and largest island in Korea, X university started as a community college around 40 years ago and has become a national university since 1981. Before the school had Vax computer several years ago, the students in the dept. of business education could not use computer in their studies, although they studied 20 credit hours computer subjects according to their curriculum. Now the students are very glad to use the computer in their learning. However, the dept. students found it very hard to know how to operate the vax computer. Fortunately, a millionaire donated PCs to the school several years ago. The PC room was always crowded with students. It is hard even for professors to use the PC in the room.

Few qualified computer scientist work for the maincomputer center. The center began to deal with basic transation data such as reporting grade, student names, pay roll and simple class schedule.

Ex prexy did not know about computer and was not interested in investing money in the computer center. The university elected the first prexy by democratic election in its general faculty meeting. The new prexy was much interested in the center and said in his inaugural address that he will strenghten the role of the computer center, promising that he will install BITNETT system in the university to assist professor to study and teach. BITNET system is a kind of computer network which enables us to communicate with domestic or foreign schools or institutions with the terminal. It's very good news to the facutias. Because can communicate with world famous scholars in the U.S. even in his office very quickly with their computer terminal.

Because the university is a local school, the faculties and students are lack of information. Finding a job is very hard and competitive in Korea. Because of labour disputes and inflation in Korea, compainies do not like to invest. So job opportunities

is relatively scarce.. Some universities' computer center in Seoul have a great store of information about companies. Students can utilize the data to find a good job. The computer based information system is very helpful to the student.

E women's university library, Korea developed its own software, E LIS, and Y university bought a software from abroad. Some other universities are eager to computerize their library systems. School authorities realizes that library is the center of school and students or faculties can utilize the library efficiently and effectively.

A very nice and modern building has been built as a main library recently in the school. The library may make use of the computer center for its effective administration.

To become a good university, the university has to recruit good pupils in the community. So the university needs data about the high schools especially in the local community.

Each colleges may want to have their own computing system in the future. But there is budget limitation at this time. The price of micro computer or PC has been very reasonable and their performance has improved a lot due to technology development. Especially high-tech industries spend enormous amount of money to develop new technology.

Korean govn't also encourages companies to invest a lot of money in developing new technology, giving several incentives in R & D expenditures. The Korea telecommunication authority(KTA) plans to provide 10 million PCs nationwide. And KTA also plans to provide 28,000 educational PCs to elementary schools in Korea this year and 3,220,000 educational PCs till 1996 according to newspaper. Considering the Korean govn't policy, every home will have a computer in the year of 2000.

In the future the school authority will be encountered with sophisticated administrative problems. Because society is changing so fast. In other words, the environment in which managerial decisions must be made continues to be ever chanfing and ever more complex.

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