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ABSTRACT

The MIS discipline in an American sense is not formed in Japan. It is meaningless to propose a Japanese information systems curriculum based on the MIS discipline. Under lifetime employment, Japanese companies have molded their own unique culture. The information systems adopted by a company must be attuned to its cultural line. The university education for people who will work at information systems in companies must be the "raw" education which will enable them to develop the skills appropriate to their company after training within the company; that is, "corporate cooking." The authors propose a model curriculum especially designed to fit with these Japanese conditions.

1. INTRODUCTION

Today's Japan requires a new curriculum for information systems education. Academically, it is computer science, mathematical science and other scientific and technological fields of learning that support information systems education. It would appear natural that teaching such fields should be the basis of any curriculum for information systems education. However, our research group has not merely aimed to design a purely academic curriculum. The information systems education demanded of Japanese universities is that which will enable graduates "practically" to contribute to the Japanese society through their activities connected with information systems. Computer use trends in Japan are showing a steady down-size shift from mainframe computers to work stations and personal computers. Talented people with a firm grasp of practical information systems that have embraced such a generational change are essential.

Our model curriculum (Ura 1992), which this paper is reporting, is in fact rooted deeply in the roles of Japanese universities and companies, the places of employment for graduates, and their expectations of each other. Since our research group was a mixture of representatives from Japan's academic and corporate circles, design of the curriculum ultimately gave strong consideration to what universities expect from companies and vice versa.

At about the same time as our effort to put forward the curriculum, the Japanese Ministry of International Trade and Industry (MIIB 1992) and the Data Processing Association (CEDPE 1990) each put forward their own model curricula. Compared to ours, these two do not give as much weight to the ability needed by information systems experts in Japan today to deal with human and social issues. They largely focus on scientific and technological knowledge about information systems.
2. OUTLINE OF THE PROPOSED CURRICULUM

2.1 Composition of the Research Group

With financial assistance from the scientific research budget of the Ministry of Education in Japan, our research group worked for two years from spring 1990 to spring 1992. The output was a model educational curriculum at undergraduate and graduate course levels aimed at training Japanese information systems students. The group, headed by Shoji Ura (professor at Keio University), consisted of nineteen members from academic and business circles. While designing the curriculum, the group also received invaluable assistance, views and suggestions from a large number of people from universities and private enterprises.

2.2 Need for New Information Systems Education in Japan

As information technology reaches further into Japanese society, more people who can plan, develop and operate information systems are needed. They must possess the knowledge and skills which will enable them to see into not just scientific and technological issues in related fields, but also the human and social issues facing us. They are expected to have the ability effectively to use information technology to contribute to resolving these various issues.

The present Japanese education system, in which departments are split into the various branches of learning, is not properly geared toward fostering such people. That is, training for information systems students requires a new integrated education system of studies connected with the various fields of society that use and are influenced by information systems.

Recognizing such a situation, our group sought to systematize studies related to information systems and, on this basis, we drew up our educational curriculum for training information systems students.

2.3 Structure of Information Systems Studies

We began by examining the model curriculum prepared by Buckingham et al. (1987). Immediately we realized that in designing a uniquely Japanese curriculum we had to systematize studies connected with the various fields of society that use and are influenced by information systems. Thus we developed the structure of information systems studies shown in Figure 1. It has three essential points: information systems themselves, their human and social aspects, and practical knowledge and techniques related to planning, development, operation and assessment of information systems. The idea at the heart of this is an equal emphasis on information systems themselves and the people and societies which use them.

This idea is maintained in the "core domain" studies, which deal with problems peculiar to information systems, and the "reference domain," which is based on existing studies. In the core domain, students deal with the information systems concept and their social environment. Based on these examinations, students cover the planning, development and operation of information systems. In the same way as the core domain, the reference domain takes up and integrates the scientific and technological studies related to information systems and the studies related to people and societies that use these systems. These include "mathematical principles and logic," "management science," "information processing technology," "people and information equipment," "human communication," "human culture and information," "human organizations," "business structure" and "social structure."

2.4 The Model Curriculum

Table 1 shows the model curriculum based on the structure of information systems studies. Learning items of the core domain are in the center column. To the right are the learning items of the science and technology reference studies domain related to the information systems themselves. To the left are the learning items of the reference studies domain related to people and societies that use these information systems. Case studies and project research have been included in the curriculum as a means of integrating and putting into practice the core domain and reference domains. All items classified "basic" and some items classified "advanced" are for the undergraduate level. Most items classified "advanced" are for the graduate (master's degree) level.

The core domain deals with knowledge, ideas and technology peculiar to information systems themselves. These can be divided into two aspects. The first aspect directly concerns the construction and management of information systems; namely, their planning, design, development and operation. The second is of matters regarding the basic concept of information systems, their social environment, and the intertwining of the information system and the environment.

The two reference domains are peripheral academic domains. They are necessary when dealing with information systems or grasping the field in which the information system is constructed. While the domains already possess their own academic bases, here they must be re-examined and taught from the viewpoint of information systems without adhering solely to the original bases.
Information systems studies aim to systematise practical knowledge and techniques related to planning, development, operation and assessment of information systems by defining the conceptual framework of information systems and conducting detailed examination of their social aspects.

**Figure 1. Structure of Information Systems Studies**

- **Social structure**
  Deals with basic social and economic activities from the aspect of information and information systems.

- **Business structure**
  Deals with corporate structures and their various activities from the aspect of information systems.

- **Human organisations**
  Deals with the structure and function of organisations formed by people from the aspect of decision-making and passage of information.

- **Information systems concept**
  Deals with the characteristics, design and the various technical concepts of information systems, looking upon human and organisational activities as processes which extend from the creation of information to its application.

- **Social environment of information systems**
  Deals with the relationship between information systems and the surrounding people, organisations and society from various viewpoints.

- **Human communication**
  Deals with the characteristics of human information behaviour and information processing activities, and communication skills in information transfer.

- **People and information equipment**
  Deals with the relationship between the cognitive science aspects of human information processing and information equipment.

- **Mathematical principles and logic**
  Deals with the mathematical principles, logic, probability and statistics necessary for various activities ranging from the creation of information to its use.

- **Operation of information systems**
  Deals with methods of applying and evaluating information systems and with organisations that carry out these functions, from the viewpoint of the effective use of information resources.

- **Human culture and information**
  Deals with the relationship between the cultural foundations on which organisations and society depend and information activities from various viewpoints.

- **Information processing technology**
  Deals with the function and composition of computer systems and with the various computing techniques required in information systems.

- **Development of information systems**
  Deals with organisations, methods and techniques connected with the development of information systems.

- **Management science**
  Deals with the construction of models to grasp and resolve the various problems faced in the operation of an organisation.
3.2 The MIS Discipline is Not Formed in Japan

When computers started to spread throughout Japanese society, the number of companies using them for company management soared. However, MIS education, which aimed at teaching the effective use of information systems within company management, was not included in university education. Of course, universities became active in computer science, which is a study of the computer itself, and in areas of learning necessary for it, such as mathematical science. Operations research, management science and other fields that use the computer as a tool for academic research also became very popular. Nevertheless, the academic field of MIS discipline did not take root in Japanese universities, nor was it established as a professional specialty.

In the last ten years, management information programs have been set up at about twenty universities in Japan. With this, the importance of management information systems has been socially acknowledged. The programs have been aimed at training the staff needed to operate management information systems. However, program content has not been based on what is known as the MIS discipline in the United States. It is not exaggerating to say that the programs merely added existing computer training to functional management training.

3.3 The Lifetime Employment Principle

It is possible to list various reasons that the MIS discipline is not formed as a field of learning or a specialist professional domain in Japan. The explanation we have given in this paper is grounded in the role expectation relationship between universities, which provide the training, and companies, which provide employment to graduates.

In Japan, university graduates generally join companies under the lifetime employment principle. The basic idea is that university graduates stay with the company they joined immediately after graduation for a long period, if possible until they reach the retirement age. The company, in turn, employs the new graduates on this premise, providing them with practical education and training. After graduation, only a small number of people move from company to company in the quest for a job in which they can earn more money effectively using the specialist knowledge and skills acquired at university.

Therefore, what is expected of university education is wide-ranging basic knowledge necessary for a person to become a full-fledged member of society and a competent member of a company. Receiving an education that is too specialized can in fact hinder company in-house training for the new graduate after employment. Becoming a competent member of the company is what companies are looking for the most in their new employees. Whether or not they are experts in a specialist professional domain is of only secondary concern.

Companies require their employees to have the ability to give full consideration to the requisites of corporate culture, such as unique management methods, when applying information systems to the company’s business operations. Such an ability is, of course, different from the special ability gained through the MIS discipline in the United States. The reason for this is that, while knowledge about information systems is important, the ability to understand how work at the user departments is actually done and also to understand users’ work-place practices and culture is just as, if not more, important. Moreover, in Japan, people responsible for MIS in companies do not look upon their work as their professional specialty compared with American MIS people. Nor do the Japanese people form MIS social groups in which members are bound together by a common professional interest.

In the next section, we shall discuss how lifetime employment, which is a distinctive Japanese employment practice, characterizes the professional consciousness and professional specialty of workers.

4. Professional Consciousness of Japanese University Graduates

4.1 A Sense of Belonging to One’s Company

In Japan the basic unit of social belonging is the company, not the professional specialization. This is easy to understand if we draw comparisons with American society. American people are very conscious of what their specialization is, and therefore choose to work at companies where they can use their specialist skills to their best advantage. In many cases, such specialists form associations or societies. Their sense of belonging to these organizations is greater than to their companies.

There are various reasons that Japanese people feel a stronger sense of belonging to their company. Some can be traced back to the cultural uniqueness of the Japanese people. However, what we shall do here is search for factors in the Japanese labor market and the personnel systems within Japanese companies. Company recruitment programs focus on the recruitment of university graduates every April (in Japan, an academic year ends in March). Of course, companies also hire people with work experi-
ence during the year, but this is mainly aimed at obtaining personnel to fill a particular and urgent need. The number hired through this avenue is minuscule compared to the number hired during the April recruitment period. Under such a system, companies do not, and cannot, judge new graduates' suitability for employment on the basis of specialist skills; rather, they look carefully at whether the graduates have the potential to grow with the company and whether they are able to work in harmony within the company structure.

Because employment conditions in Japan are based mostly on the principle of lifetime employment, recruitment means that the new employees are, in effect, made members of the company. When recruiting, companies do not have the view that they are looking for people with special skills to fill particular vacancies. We could say, in a very strict sense, they do not take into account any professional specialization that applicants may have.

4.2 Specialist Occupational Education: Not Demanded

From the standpoint of the universities, which produce the graduates for the April recruitment drive, giving students specialist occupational knowledge does not serve to fulfill their employment goals. Naturally, special knowledge in specific domains is academically important and can, at the same time, have occupational value. However in many cases, the source of students' enthusiasm toward learning lies in a desire to be selected by the preferred company in the concentrated recruitment period rather than in a desire to study in their special field of learning. Thus there is little need for universities to structure their departments to accommodate specialist occupational education. In most cases, they are structured in line with a purely academic specialty.

Under company recruitment policies based on the concentrated recruitment of graduates, the period from when graduates join the company organization to when they leave is extremely long, generally about 38 years if, say, a person joins the company at 22 and retires at 60. This, of course, does not apply to all company employees, but there is no doubt that it does apply to the majority. Almost all recruitment campaigns are conducted by companies with the intention of having the new employees become long-term members of the company and not for the purpose of filling specific vacancies. Rotation of personnel within the company is therefore an essential means of education and training, identifying capabilities and achieving optimum personnel placement.

In simple terms, to employees the company is a place where they spend many hours of their lives and has all the characteristics of a communal group. If the same members work together over many hours, an extremely unique organizational culture will be nurtured in each company. Work methods within a company are a reflection of its corporate culture. As long as the work methods are followed, the culture of the company will continue.

The important point here is that many large Japanese companies with policies of regular concentrated recruitment and lifetime employment have their own unique corporate culture. Employees therefore try to adhere to work methods that do not stray significantly from the corporate culture within their company. The greater the number of "local" people who know their company's culture well, the more efficient and less wasteful their company's business operations become. If there are a large number of "cosmopolitans" who place priority on professional specialization, the overall performance of the company will drop, at least in Japan, because the general harmony, and in turn the general effectiveness, of the company will be lower, even though the "cosmopolitans" may be able to achieve good results in their narrow fields of specialization.

5. BRIEF SURVEY

As a brief examination of the actual employment situation in the information systems division, we interviewed the information systems department managers from four companies — Toshiba (manufacturing), Isetan (distribution, department stores), Japan Airlines (air transport) and Sanwa Bank (finance) — in February 1993. These four companies can be treated as a representative of their respective industries. The interviews revealed that all four companies had similar trends.

Overall, almost all employees with university degrees working in the information systems departments were recruited during the regular concentrated recruitment period. When recruited, their job assignments were not specified by the company. The first assignment was noticed only after the fresh-person training program of several months. Some were posted to the information systems department and continued to work there at the time of the survey. Others were posted to other departments and experienced job rotations before they came to the department. There were very few employees who had been hired mid-career.

While most of the employees recruited during the concentrated recruitment period graduated from the departments connected with science and technology, their special fields
were not limited to information systems. What we should note here is the 10% to 20% of employees graduated from the arts and literature departments. In fact, employees working in the information systems departments come from a broad academic background. The interviewed managers unanimously said that employees in the departments do not have a strong sense of MIS profession or the self-awareness of professional specialization based on the MIS discipline.

What we should also note is that, when looking at the job rotation trend within the information systems departments of the four companies, we can see that there are more than a few cases where employees are rotated to other departments, not just within the information systems department. In Toshiba, 30% of workers in the information systems department had been rotated through other departments, while in Isetan this figure was 40%. In contrast, the percentage was small in Japan Airlines and Sanwa Bank.

6. CONCLUSION: JAPANESE NATURE OF OUR MODEL CURRICULUM

The MIS discipline in the American sense is not formed in Japan. It is meaningless to propose an information systems curriculum which seeks to develop professional specialists through specialized education based on the MIS discipline. Under lifetime employment and the regular concentrated recruitment of graduates, each company has molded its own unique culture, so the information systems adopted by a company must be attuned to its cultural line. The education that people who work in information systems receive during their time at university must be the raw education that will enable them to develop the skills appropriate to their company after training within the company, that is, corporate cooking.

The curriculum that satisfies this requirement must give students precise scientific and technological knowledge about information systems and, at the same time, must place equal importance on developing the students' capability to understand the people and society that use information systems. This is not the kind of education that will enable students to display professional specialization immediately after graduation. Rather, it is raw education that will enable graduates to develop into information systems experts at their company after training within the company.

The importance of this education is obvious when we consider that there is a growing trend for more user-based information systems in Japan and that the end users will become the main actors. Students will become the needed information systems experts only after they have obtained the scientific and technical knowledge of information systems and also the ability to deal with the various special human and social problems faced by the end users. They can develop this knowledge and ability not only through their university education but also after they have received training within their company following their employment. The model curriculum proposed by our research group can satisfy requirements such as these in Japan.

7. REFERENCES


