

UMIN - Current Status and Future Perspectives

Takahiro Kiuchi^a, Tetsuya Igarashi^b

^a UMIN Center, the University of Tokyo Hospital, Tokyo, Japan

^b Department of Medical Informatics, Tsukuba University Hospital, Tsukuba, Japan

Abstract

UMIN, fully funded by the Japanese government, is the largest and most versatile public academic information center for biomedical sciences in the world, and is considered as indispensable information infrastructure for the Japanese medical community. As of April 1st 2004, all Japanese national universities, including UMIN, will be incorporated as independent administrative entities. After the incorporation, each national university will have authority to determine its own budget, organization, etc. by itself, and will also be able to carry out profit-making business related to its activities under certain constraints. Thus we suspect that UMIN will inevitably be faced with a strong demand to undertake profit-making business at an early stage. Even in this case, we believe that UMIN should continue to provide its information services to the Japanese medical community free of charge as it has done, utilizing earnings from its profit-making business that services commercial companies, because the success of UMIN has depended on the cooperation and sympathy of the community in the past, and will continue to do so.

Keywords :

Internet, academic information; research support system.

Introduction

University hospital Medical Information Network (UMIN) was established in 1989 as a common network-based computer center for forty-two Japanese national university hospitals, fully funded by the Ministry of Education, Culture, Science, Sports, and Technology (MEXT) [1][2]. Though its services were available only to medical professionals in the national university hospitals via its private circuits at the time of its foundation, they have been made open to all Japanese medical professionals via the Internet since 1994. Today UMIN has evolved into the largest and most versatile public academic information center for biomedical sciences in the world, and is considered as indispensable information infrastructure for the Japanese medical community [3][4][5][6].

As of April 1st 2004, the Japanese government will turn all its national universities, including UMIN, into independent administrative entities, called national university corporations [7][8]. After the incorporation, most legal and administrative constraints on the national universities will be relaxed, and each national university will have authority to determine its own bud-

get, organization, etc. by itself, and will also be able to carry out profit-making business related to its research and education activities under certain constraints. In this paper, we present the current status of UMIN, and discuss its future perspectives after the incorporation of the national universities.

Current Status

Organizations

The supreme body for UMIN is the Steering Committee, which is made up of representatives from the national university hospitals. UMIN Center, the head office with the server facility for UMIN, is located in the University of Tokyo Hospital, and from the administrative and legal point of view is one of the departments belonging to it. But the center is under the control of the Steering Committee, and functions as a common network-based computer center for the Japanese medical community. It is provided with a continual annual budget of about 240 million yen (about 2 million dollars) from MEXT, and is managed by a staff of eight people, namely one faculty member, one secretary, one clerk, and five operators. Under the Steering Committee, there are also seven subcommittees concerning specific fields: the Hospital Management, Drug Information, Nursing Information, Laboratory Information, Network Technology, Dental Information, and Clinical Trial Subcommittees. The domain expert members of each subcommittee discuss the related UMIN information services with a view to proposing new or better services.

Services

Currently UMIN provides a wide variety of information services covering research, education, clinical practice, hospital management, etc. [9][10][11][12]. It should be noted that some of them, such as academic society database, researcher- and student-recruitment information database, research grant database, faculty personal information database, etc. are dependent on the charge-free information made available by many non-profit organizations such as research institutes, academic societies, research funding organizations, etc. As it is impossible to explain all of its information services in this paper, we briefly introduce the three most outstanding and popular services, OASIS, ELBIS, and INDICE [12].

OASIS is a member-only homepage hosting service with a web-based member list management system, member mailing list ser-

vice, and some application software services, such as a document retrieval system and a bulletin board system, for academic societies, research groups, etc. If a user organization of OASIS alters its member list using its member list management system, member lists for member-only homepage and mailing list are also altered accordingly. The merit for organizations of using OASIS, compared with developing their own individual member-only homepage services, is the reduction of development and operational cost. It is convenient for each individual researcher that only one UMIN ID is required, which enables access to all the member-only homepages of academic societies, etc. of which the user is a member.

ELBIS is an Internet-based electronic library, which has a flexible and multifunctional online abstract and paper entry system for academic meetings. The collected abstracts, papers, and their bibliographic information are automatically compiled in an electronic library database and are retrievable via the Internet.

INDICE is a kind of Internet-based application service for clinical and epidemiological research [12]. The INDICE software packages, developed by UMIN, are customized and provided to clinical research groups. Almost all Internet-based clinical research projects in Japan have been carried out using UMIN INDICE.

Usage Statistics

The major usage statistics are summarized in the Table. Currently the majority of Japanese medical doctors (the total number of whom was 255,792 at the end of the year 2000) have UMIN user accounts [13]. The time series number of registered users and WWW views per month are shown in Figures 1 and 2. Both numbers have been rapidly increasing. The step-wise shape of the bar graph in Figure 1 reflects a series of batch registrations of all members of large academic societies.

Future Perspectives

Incorporation of the national universities in Japan

The national universities in Japan have been subordinate agencies of MEXT, and have not had corporate status independent of the government. Accordingly, they have not been able to determine even their own internal budget distribution and organization structure by themselves, although freedom of research and human affairs are assured within the prede-

Table 1: Major usage statistics (January 31st, 2004)

Item	Number
UMIN registered users	172,927
Total UMIN web page views per month	18,377,19
Mailing lists	1
Open homepages	3,132
OASIS member-only homepages	1,541
ELBIS user academic meetings (fiscal year 2003)	48
Abstracts collected by ELBIS	395
INDICE user research projects	405,681
Patients registered using INDICE	36
	42,598

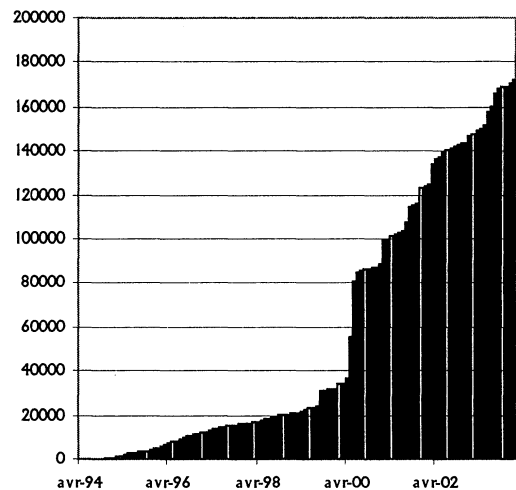


Figure 1 - The number of UMIN registered users

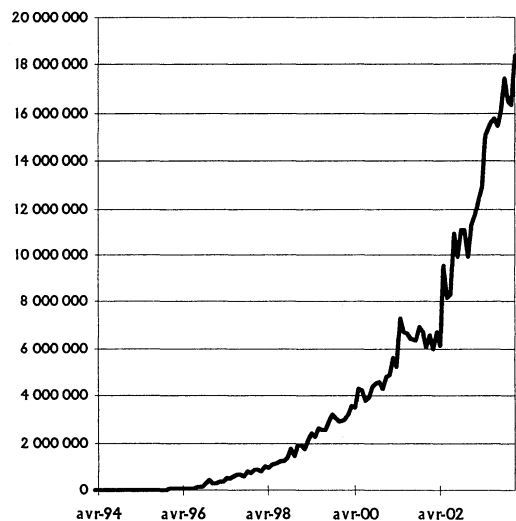


Figure 2 - The number of web page views per month

termined budget and organization. To make an alteration in their internal budget distribution or organization structure, first they have to receive approval from MEXT. Then MEXT has to obtain further approval from the Ministry of Finance, the Ministry of Public Management, Home Affairs, Posts and Telecommunications, and, finally, the Diet for the alteration. In order to establish a new department in a medical school or university hospital, these procedures are required even if the establishment is not accompanied by an increase in total budget or in the total number of regular staff. These procedures are very cumbersome and are considered obstacles to flexible and agile management and reform of the national universities.

After the incorporation of the national universities scheduled for April 1st 2004, each national university will have authority to determine its own budget and organization by itself. The budget of each national university will be covered by student tuition, grant for operating costs from the government, various research grants, etc. The grant for operating costs will be an open-ended government grant for the national university corporations, and will be essentially replacement for the national budget for the national universities, whose way of usage is predetermined as budget items. The Minister of MEXT will specify mid-term goals for each national university corporation, evaluate it according to achievement of the goals, and increase or decrease its grant for operating costs, based on the evaluation [8]. Each national university also can undertake profit-making business and establish subsidiary corporations related to its own research and education activities under certain constraints.

As for the demerit of the incorporation, the national universities are concerned about the reduction of government budget distribution to them. Up to now, when the government budget, whose way of usage is predetermined as budget items, is allocated to each national university, it has not usually been reduced or deleted. However, after the incorporation, the government can easily decrease the grant for operating costs for any national university, based on its evaluation. Currently the Japanese government budget deficit in relation to GDP is higher than in any other industrialized country [14]. The national universities suspect that the government will reduce net allocation of its budget to them.

UMIN after the incorporation

UMIN is now fully supported by government funds. It has provided almost all information services free of charge and has not earned money by inserting advertising. Since it is by far the most popular Internet site for medical professionals in Japan, many people suspect it has great potential for profitable business. After the incorporation, many schools, departments, institutes, etc. in the University of Tokyo will scramble for its limited budget. In such circumstances, a potentially profitable section like UMIN will inevitably be faced with a strong demand to undertake profit-making business at an early stage. Thus the emerging problem is to examine the best options concerning operating body, timing, and business models to realize profit-making business for UMIN. These issues have been under continuous discussion up to now, and will be further discussed in the future. For the final decision-making, the UMIN Steering Committee has to consult with the University of Tokyo, and the two organizations have to reach an agreement. Our current ideas are as follows:

- Operating body for profit-making business
- We think that UMIN should establish another operating body for profit-making business rather than undertake profit-making business by itself. In this case, UMIN itself would be slimmed down and devoted only to information services that are closely related to university hospital activities. The operating body for profit-making business should not be a commercial company, but should be a non-profit corporation that provides public

information services to medical professionals, utilizing earnings from its profit-making business, while the slimmed-down current UMIN would still be one department of the University of Tokyo Hospital, evaluated and funded by MEXT. Details of how to share the current information services between the two divided bodies will be determined in the future.

- Timing for starting profit-making business
- In the mid-term goals of the University of Tokyo, some goals for UMIN activities are designated to be included. Thus, up to the initial evaluation to be made six years from the incorporation, we suppose that the necessary budget for current UMIN activities will be assured by the University of Tokyo for the most part. This means that we have to build a framework for undertaking profit-making business within six years after the incorporation.
- Business models for profit-making
- We do not plan to collect service charges from individual researchers, research institutions, academic societies, or other non-profit academic bodies, but to earn money from profit-making enterprises related to medicine, such as pharmaceutical companies, medical equipment companies, etc. Currently we assume the following business models:
 - Utilization of the huge number of user accounts
 - More than 170,000 medical researchers, mainly composed of medical doctors, have UMIN user accounts. These user accounts are used for various kinds of UMIN information services. UMIN can make these user accounts available to commercial companies and get paid for their usage. The commercial companies can set up their member-only homepages and provide their customer-only information services for free or for a charge. Using individual users' IDs, it is possible for each company to analyze utilization statistics and to offer custom-made homepages for each individual user. The UMIN user accounts can be also used for data entry for product marketing, clinical research, etc. If commercial companies use UMIN user accounts, they can access some individual information about UMIN registered users, such as names, affiliations, etc. Therefore, each individual user should have opportunity to express their agreement or otherwise to using such a member-only homepage by notifying his or her necessary personal information to the providing commercial company. This business model will be also beneficial to UMIN users because each individual user can use information services of multiple commercial companies, using only one UMIN ID.
 - Database and software selling
 - UMIN can sell licenses to use some databases and software to profit-making companies, while we

intend to continue to provide all of them to non-profit research institutes free of charge.

- Web advertising for commercial companies
- UMIN can earn fees for web advertising insertion for pharmaceutical and medical equipment companies, etc. Commercial advertisements are sometimes uncomfortable for individual users, and may hurt UMIN's image. Thus UMIN should limit the amount of advertising and also carefully select advertising commercial companies.

Discussion

Current Status

In Japan, national universities have been most influential, but have not been interested in commercialization of their research findings and related activities, while in the United States, many influential private universities are active in commercialization of their research findings and related activities. In such an atmosphere as prevails in Japan, UMIN has provided almost all its services free of charge, using constant generous government funding, and has not even considered profit-earning business. In Japan, whose modernization was initiated by the national government, a government-funded, non-profit organization like UMIN can earn the confidence and secure the cooperation of others much more easily than a profit-making company. Thus many individual users, academic societies, medical schools, etc. have cooperated with and supported UMIN activities. As a result, the number of users and web accesses are now enormous. Today UMIN seems to break even, or be potentially even profitable, while many commercial companies aiming at Internet-based information services for medical professionals have failed since the dot com booms in the mid-1990s. Ironically, those who seek profits from the start seem not to be able to actually obtain them in the end. We believe that UMIN is now indispensable information infrastructure for the Japanese medical community and that a similar public network organization would be beneficial for other countries [3]. Other factors important for the success of UMIN are as follows:

- Business strategy
- In the mid-1990s, there appeared many net venture enterprises intended to provide Internet-based information services for medical professionals. Their typical business strategy was to spend a lot of money to collect digital content for medical professionals at first, to solicit as many member users as possible at the earliest possible time, and then, using this content as a feature, finally to earn much more money [15]. UMIN did not adopt such a business strategy. Its strategy was not to spend its limited budget on medical content itself, but to invest it in developing information systems to collect and provide digital content, such as ELBIS, OASIS, INDICE, etc. This strategy has proven to be a success, and UMIN can collect a large amount of digital content for a modest amount of cost.
- Good timing for the establishment

- UMIN was already in being, and its staff experienced with network-based distant information services, when the Internet began to become popular at dizzying speed. If UMIN had been established after the popularization of the Internet, it could not have won the overwhelming success it has.
- Information center for a single discipline
- As researchers in different academic disciplines are usually much different in way of thinking and sense of values, they do not go together well in managing a common information center. Thus we believe that an information center for academic activities should be developed for a single academic discipline such as medicine, or a few closely related ones.

Future perspectives

The primary reason why UMIN should establish a new operating body for profit-making business is legal constraints that will be imposed on the activities of the University of Tokyo. As it receives its grant for operating costs from the government, some constraints on profit-making business will be imposed in order to assure fair competition against private enterprises, although their details are not yet clear. The second reason is the need for swift decision-making. As the University of Tokyo is a large and lumbering bureaucratic organization, it is not convenient for UMIN to carry on profit-making business under its control. Establishment of a new operating body for profit-making business would resolve these problems. However, it should be noted that its establishment would temporarily increase the total cost of UMIN operation and management. Thus we have to launch the profit-making business into a stable orbit in its early phase.

Japanese people believe that the incorporation of the national universities will encourage commercialization of potentially profitable research findings and related activities. However, we think that UMIN should remain a non-profit organization even if it proves profitable. UMIN has been strongly supported by the cooperation and sympathy of the medical community, and thus it would be difficult for it to maintain a good relationship with the community if it were to become a commercial company. In addition, we think that UMIN should not seek profits at the risk of its reliable and secure operations because UMIN is now important information infrastructure for the Japanese medical community. It should be noted, however, that the profit-making business operations begun on the occasion of the incorporation might be beneficial to UMIN and the medical community. The profit-making business might bring about a sufficient amount of fully discretionary money to UMIN, and it could contribute to enhancing the quality of UMIN activities for the medical community.

There are no other public network organizations in the world comparable in variety of services and utilization to UMIN. We believe that UMIN-like public information infrastructure would be beneficial in other countries, and that thus the future of UMIN would be of interest in the world medical community.

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Address for correspondence

Takahiro Kiuchi, M.D., Ph.D.
UMIN Center, the University of Tokyo Hospital
7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8655, Japan
Tel. +81-3-5800-6549, Fax. +81-3-5689-0726
Email kiuchi@umin.ac.jp