

Empowering the universities – one small step through electronic access to the literature

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The UGC-INFONET programme has been set up to bring the benefits of information and communications technology to Indian universities. Through the programme, more than 150 universities spread all over the country now have broad band access to the Internet. The universities have also been provided electronic access to more than 4000 international journals, and several important databases, covering all subjects. This has been made possible by adapting a centrally administered consortium approach with innovative features.

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OVER the last few decades, university libraries have faced dwindling resources and rising costs, and even the best libraries now can boast only of a limited subscription list and hardly any purchases of books. In the smaller universities, access to research journals is almost non-existent. The community has therefore been deprived of research journals, reviews and access to databases, which are critical for research and developmental work and in teaching. This situation is unacceptable, but it simply cannot be mitigated in any conventional manner. About three years ago, the University Grants Commission (UGC) decided to address the issue using modern information and communications technology (ICT), and initiated a programme broadly known as the UGC-INFONET¹. As a part of this programme, more than a hundred universities now have full electronic access to more than 4000 research journals and database, in all fields of learning, including the humanities, social sciences, physical and biological sciences and mathematics. A long felt need has therefore been fulfilled in a short time, and that too at a modest cost. It is instructive to examine the enabling mechanisms of the programme, and to see whether it can be extended to colleges and schools, to networks of research institutions, and even to other countries in the developing world.

The INFONET programme was motivated by rapid expansion in the number of full-text journals which can be accessed over the internet. Most publishers of research and review journals now provide such access to current issues and to archives, but the facility is generally made available as a supplement to conventional print subscriptions, typically at a reasonable incremental cost. Electronic access takes the user much further than the printed variety, since query and search mechanisms are provided, and access to back issues, sometimes going back to the first issue of a journal, which may have started publication a century or two

ago, becomes possible. Moreover, journals can be accessed from any networked computer on a campus, and text can be downloaded and stored by users, which is convenient. While providing electronic access, publishers have been encouraging a consortium approach, through which a group of organizations can have full electronic access to a publisher's complete collection, if between them the institutions have print subscriptions to a significant number of the journals. Such arrangements have also been considered for the universities, but there were two major difficulties which came in the way. First, even until a couple of years ago, most universities had practically no access to the internet, and therefore were not in a position to use journals electronically. Second, the subscription base which the universities had was so poor that they were not in a good position to negotiate, even collectively, supplementary electronic access arrangements with publishers. The matter languished there until the INFONET came on-line in 2003.

With the inception of the INFONET, the UGC set up an expert committee to decide on the best means to bring broadband connectivity to the universities. It was found by the committee that a centralized project directly funded by the UGC, with a single internet service provider, and just one organization administering the programme, would be the most efficient route. ERNET, which is the pioneering organization for providing connectivity to educational and research institutions in the country, was chosen as the internet service provider. INFLIBNET, Ahmedabad, which is an inter-university centre of the UGC, was chosen to administer the programme. An expert committee was appointed by the UGC to provide coordination, to monitor execution, and most important of all, to arrive at strategies for upgradation and growth. Through this connectivity programme, in just two years, more than 150 universities have been provided broadband connectivity which, depending on the need of the university, can range from 512 kbps to 2 Mbps raw bandwidth (Figure 1). Where a terrestrial link is not possible, broadband satellite links have been provided. As the usage in a university builds up, and campus-wide net-

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works are put in place by the university, the bandwidth is upgraded to account for the increased load. Excellent mechanisms for monitoring usage levels and patterns are available.

In parallel with the connectivity committee, the UGC set up another expert committee to consider the best ways for providing electronic access to the literature. It was soon realized that this was a rather difficult task, because of the many fields of learning to be covered, the many publishers involved, and the apparently astronomical cost of the project. Electronic access models offered by publishers were mostly linked to existing levels of print-subscriptions, and were therefore not relevant to most universities because of their low print-subscription levels. Publishers were ready to offer fully electronic models, but here the total costs were huge, because the same amount would have to be paid for a university regardless of the number and level of users. Solutions to such problems arose themselves through intensive discussions, which the committee had with publishers linked to professional societies. It turned out that the business model for a large group of electronic subscribers could be quite different from a print-based electronic model. Publishers serve such electronic subscribers through a data server with mechanisms for user authentication and monitoring of usage. Once the hardware and software are installed and running, the incremental costs for bringing in additional subscribers are small. These arrangements are particularly advantageous when subscription on behalf of a large consortium is made by a single organization, which also acts as a conduit between the publisher and individual universities for the resolution of any problem which may arise. In such a centralized arrangement which covers a large geographic area, publishers save all the costs and effort which would have gone into marketing to individual universities, and servicing subscriptions. There are, of course, no costs towards printing

and postage. All these factors mean that even subscriptions offered at highly discounted rates to large consortia would bring high margins to the publisher. The crucial point here is that the reduced prices offered by the model would enable publishers to bring to their fold new customers who individually would never have afforded the publications, while reduced operating expenses due the new technology would keep the arrangement profitable. And as for the universities, they would obtain access to the literature to a depth and breadth which would be the envy of even many wealthy research institutions.

Subscriptions were first put in place to various society publications on behalf of about 50 universities, which had by then obtained some level of internet connectivity. This early success soon got the attention of large commercial publishers who had hundreds of journals in all fields in their stables, and here too mutually beneficial arrangements became possible. When subscriptions were made for 50 universities with such publishers, they offered free access to a number of other universities on a trial basis. This enabled additional universities to be brought into the ambit of the programme, even while they were experimenting with their newly provided connectivity, without having to commit funds on their behalf until they were fully ready to access the literature. As the ICT infrastructure in a university was built up, it was transferred from the trial category to the subscription category, while others entered the trial group. The agreed tariff structure with society as well as commercial publishers is such that as the number of universities under subscription increases, there is reduction in the cost per university. Such agreements have enabled the facility to be offered to an increasing number of universities, while only gradually ramping up the total cost of the project.

The INFONET E-subscriptions programme now covers nearly all major international publishers. Over a 100 universities now have access to over 4000 journals in all fields, and to archives which often stretch to the first volume of a journal. An important fact here is that over half of all titles are from the humanities and social sciences, which are areas traditionally thought to be neglected in consortium arrangements. Another special feature is the geographic footprint, which covers universities in every corner of the country. As a consequence, students and teachers in a university located in the Northeast, or in Jammu and Kashmir, have the same access to the literature as their peers located in one of the metros. It would be difficult to overestimate the practical and psychological importance of this arrangement.

Besides journals, the e-subscriptions programme has also provided access to important chemical and biological databases, and to collections such as JSTOR and Muse, which aggregate large numbers of excellent, mainly humanities and social science journals from many different publishers. These resources are ordinarily so expensive that they would have forever remained outside the reach of most universities. Now the resources can be accessed from individual offices on more than 100 campuses. It has been gratifying that the usage of this wealth has been significant and growing. For example, a collection of 30 or so journals



Figure 1. Location of universities covered by INFONET. The number is increasing steadily.

offered by the American Chemical Society was accessed more than 250,000 times in a 12-month period ending in February 2005, and since then there has been a growth of about 20%. There is a wide dispersion in the number of accesses made by different universities; these range from over 20,000 for the most prolific users, to an average of a few thousands, to just a couple of hundreds for the least enthusiastic campuses. In the case of Project Muse, the number of hits varied from a high of about 19,000 to a low of about 150, and averaged at about 2000. It is important to bear in mind, while perusing such statistics, that an increasing number of universities are coming into the fold, that only a limited number of universities have campus-wide networks, and that it takes time for any user community, not previously exposed to electronic access, to learn to make optimal use of the resources provided. What is important is that there is steady growth in the access, and that usage comes not only from the large established universities, but from smaller, less privileged campuses in distant places as well.

The organization of this seemingly complex edifice is rather simple. An expert committee, through wide and continuing consultations, selects publications for the consortium. The committee then negotiates a mutually acceptable agreement with the publisher, and makes a recommendation to the UGC. Once the approval is received, the subscription is placed by INFLIBNET, which supervises and coordinates the whole scheme. The UGC provides funds to INFLIBNET for the purpose, so that the facility is cost-free for the universities. INFLIBNET also provides training to library staff and users in the universities, so that the facility can be most effectively used.

There are some universities which are not yet drawing the full benefit of the e-subscriptions programme, even though they have been provided access since its inception. The programme has been most successful on those campuses where the highest levels of the administration and faculty have appreciated its potential, and have taken urgent steps to make access widely available. The worst performing have invariably been those places where the administration, for whatever reason, has failed to provide support and to appoint in charge of the programme, those individuals who have the ability to quickly create at least an interim infrastructure and who are themselves users and stakeholders in the programme. It is important for students and faculty to be able to have access from their own departments. It has been found that where this is available, the usage is significantly higher. Some enterprising universities which do not have campus-wide networks, have as an interim measure developed cyber spots in their libraries and at other convenient locations², which users can access. Given the change that availability of literature makes, it is very important for all universities to make such arrangements while moving towards a comprehensive network, and even afterwards, since collective usage, as in a library, has its own charms and advantages. The UGC is in fact providing funds, under a separate scheme, to a number of universities for this purpose. It has now become necessary to have an accreditation process to assess the quality of

the ICT infrastructure developed by various universities, so that funds can be provided where they would be the most effective, and where the potential for growth is high.

So where do we go from here? It will be a relatively simple matter to bring into the fold all the entitled universities, and increase the scope of the literature provided. These can eventually include newspapers, magazines and other such publications, provided a good and affordable subscription model can be developed with the cooperation of publishers. But a more challenging task will be to provide electronic access to the over ten thousand colleges in India affiliated to the universities. A majority of these colleges are devoted to undergraduate education, but a substantial number of them have post-graduate and research programmes. Moreover, while research may not be the priority area for colleges, attracting good faculty to them requires that access to professional literature is provided to colleges as well. The difficulties here will be that most colleges do not have connectivity with adequate bandwidth, and the number of active researchers in any one subject in a college is usually so small that the kind of subscription models which have been adapted for the universities will be impractical and too expensive. The issue of bandwidth can be addressed using commercial broadband connectivity which is becoming available at reasonable cost, and the use of educational satellite channels. While users of research literature are thinly spread over thousands of colleges, the total number is still substantial, and therefore models which treat a large number of colleges together as a single entity need to be considered. Here it should be possible to pay a basic subscription to the publishers to keep the arrangement going, and then to pay an additional charge on the basis of total usage by the system of specific resources provided by publishers. The INFONET has adapted such usage volume-based pricing models for the universities to obtain access to rather expensive databases, and they have worked quite well. Faculty and students from colleges will of course stand to benefit immensely from the general literature, newspapers and periodicals, and special efforts will have to be taken to make these available.

The INFONET is in many ways a symbol of the resurgence of the university system, and it is necessary to nurture and develop it. The programme has been executed in record time, and has produced tangible benefits at a cost which is a small fraction of that of moving along the traditional route. Success has been in no small measure due to the total commitment and involvement of people in the UGC, the readiness of INFLIBNET and ERNET to take on the responsibility, and the ability of the committee to break new ground, encouraged by the forward-looking attitude of the publishing fraternity.

1. Information about this programme can be obtained from http://www.in_ibnet.ac.in/, <http://www.ugcinfonet.ernet.in/> and <http://www.ugc.ac.in/>.
2. Calicut University has computers set up in a location with a number of other student facilities, and has actually called the access centre a *cyber spot*; other universities, like Delhi and Annamalai, use more conventional library locations.

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