Telematics experiences in a Faculty of Medicine

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Summary

The international cooperation through European research projects is an important chance for a Faculty of Medicine to experiment advanced technology. Telematics in Italy is still too far from normal clinical practice and it is not part of the curriculum, even though it is clear that it will become predominant for Medicine in the future. In order to anticipate this moment, it is necessary to show physicians and students the advantages and opportunities that communication technology offer to medical sciences.

The young "Campus Bio-Medico" University of Rome participates, mainly through the Medical Informatics Laboratory, at some telematics research projects, funded by public and private institutions.

Introduction

Research and development European projects, both private and public, are for any University an important chance to experiment advanced technology. Moreover, the relations among all academical and industrial partners give added value to the teaching, widening interests. In a Faculty of Medicine the burden of the University Clinic needs to be balanced by stimulus out of routine work, in order to look ahead, for the benefit of medical staff and patients.

In the past, telematics applications have seen only a small number of enthusiastic physicians involved: they were willing to accept technical limitations just for opening new paths for achieving a better cooperation among colleagues all over the world. Technology has improved and Internet is now diffuse: this is the background on which we can build new and unforeseen services. European research heads to solutions, which have the capability of being a stable or commercial service, to raise the European Union level, compared to the traditional technological leaders: USA and Japan. All the Mediterranean countries, even those not joining the Union, can benefit from this scenario and get its results to achieve medicine's main goal: patient care and health.

A wide spectrum of research projects

The Medical Informatics Laboratory of "Campus Bio-Medico" University of Rome is meant mainly for teaching informatics theory and application to medical sciences. A relevant part of its activity is in R&D European projects.

Being only six years old, the University started from the very beginning with a computer infrastructure, cabled buildings and a wide use of office automation with minimum paper production. The personnel are therefore trained to understand the benefits of informatics. This means that it is easier to experiment with telematics applications.

The following brief description of running and past projects is just a panorama. The bibliography gives more details.

The first research project has been IAEVA[1], aimed at a prototype of a distributed database containing three-dimensional models of pathological organs. An Anglo-Greek-Italian cooperation has proved the feasibility of a database fed by many important medical centres, with 3D models connected to traditional images and clinical cases descriptions, searchable and viewable using a plain modern personal computer.

IAEVA-II[2], still running, is its natural evolution, with the participation of companies, multimedia editors, university clinics and researchers, in a large number of EU Countries. At the end of the project, any user will be able to subscribe to an archive of 3D models available in different formats, full of technical and clinical information. These models, both volumetric or segmented, will be "navigated" (rotating, sectioning, zooming) on a normal PC, through the Internet. The main use will be didactical or for medical continuous education, but we do not exclude a diagnostic use, if we improve the production process duration.

EURORAD[3] goes toward a combination of quantity and quality, with a very wide database of diagnostic images and teaching files, all validated by external physicians, through a rigorous procedure that makes every submission a real electronic scientific paper.

In MEDFRAME, Campus Bio-Medico is the experimental user of an object based patient folder. This is one of the seven projects running under the *umbrella* MEDIMEDIA[4], which has the ambitious purpose of setting up a link among heterogeneous systems to achieve a unique entry point for any physician or student willing to find over the Internet clinical cases in many formats. When more medical specialties gather, the terminology problem comes out. In MEDIMEDIA, Campus Bio-Medico has a leading role, to produce the best solution for the integration of different coding systems used by the seven projects.

HERMES, funded by the European Space Agency has a different action field: Internet via satellite, applied to telemedicine. A teleconsultation using an outbound channel over ISDN (that is 128 Kbps) and inbound via satellite (512 Kbps) using a common satellite TV DVB receiver, allows the fast transmission of huge files, like diagnostic images. Multicast is also possible, so that many medical centre can receive, at even higher speed, a few minutes before the teleconsultation, the full set of clinical data to be discussed.

Telematics applied to teaching

Telematics immediately recalls the distance learning concept. It not our task to go deep into this topic, but we would like to state that it is important to find solution for extending traditional teaching. There are some experiences, like Consorzio Nettuno[5], with satellite TV diffusion, and Politecnico di Milano[6] for teaching to out-of-town classrooms, which can be considered as starting points. More advanced projects like Mediateca-ELIS[7], using video over the Internet with a standard modem, lead us to the conclusion that a University can re-engineer[8] their contents at a reasonable cost[9].

Campus Bio-Medico started using ISDN videoconferencing for employees' education on safety rules[10] in a TAP 1996-98 project. Now we use Intranet and Internet streaming video to teach nursing sciences, thanks to a Leonardo project[11].

Recently the Medical Informatics Laboratory started working on new image transport Internet protocols[12], supported by Hewlett-Packard, to solve a problem of availability of microscopes while teaching histology.

Final remarks

The European framework fosters the practical outcome of applied research, but we should also remember that any project involves a development of relations among all participating countries, in a peaceful cooperation environment. Moreover, interdisciplinarity is achieved by joining many different institutions. These are, in any case, positive results, which we consider valuable especially for our students.

The start, next October, of the Biomedical Engineering Faculty in "Campus Bio-Medico" University will surely increase our commitment in these ICT projects.

Bibliography

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