

Congress of Cardiology over the Internet

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**On behalf of FVCC Group [1]
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ABSTRACT

An international congress of cardiology over the Internet was organized by the Argentine Federation of Cardiology (FAC) using Web, e-mail, mailing lists, and written chat. From October, 1999 to March, 2000, 7574 participants from 95 countries were registered. Scientific sessions comprised a total of 1688 multimedia archives, among which 176 lectures, 411 (of the 521 received) accepted brief communications and 20 newsletters. This material is available on www.fac.org.ar/cvirtual. 8 moderated forums remained operational for the Forum on Continuing Education on Cardiology by the FAC and were the interactive nucleus of the 2nd Virtual Congress of Cardiology (www.fac.org.ar/scvc, 11703 participants from 107 countries). With few precedents in other medical specialties, the results suggest that the Internet is a valuable tool for giving access to advances in medical science and for sharing opinions and experience, and this kind of academic and scientific virtual meetings can be a significant model for medical events.

KEYWORDS

Medical Informatics Applications; Health Informatics; Internet; Computer Communication Networks; Virtual Congresses; Cardiology; Continuous Medical Education; CME; Information Systems.

Introduction

Use by scientific communities of basic Internet resources may constitute a means of developing scientific and academic activities. The possibility of extending them over time make many other options available, depending on the requirements and availability of the interested parties, and avoids the restrictions associated with attending a multitude of simultaneous meetings which arise when attending congresses [2].

Design objectives

The object was to hold an international cardiology congress over the Internet, where the participants could access the latest discoveries on cardiology from anywhere in the world, interact with each other and with speakers and authors. Also, once the congress had concluded, the participants would be able to continue to communicate and update their knowledge permanently via a continuous medical education (CME) forum.

System description

Prior infrastructure: The Federación Argentina de Cardiología [*Argentine Federation of Cardiology*] has had an Teleinformatics (IT) Centre, known as CETIFAC, since 1994, with offices in the Engineering-Bioengineering School of the *Universidad Nacional de Entre Ríos* – UNER, in Paraná, Entre Ríos, Argentina. It currently has its own server with its own domain, fac.org.ar configured as a Web server [3], e-mail, mailing lists (Majordomo), SQL, FTP, FTPMail and Chat facilities (IRC). It published a free-access magazine [4] since 1997, edited in full text mode in HTML and PDF format since 1998. The Centre holds clinical forums [5], personally-attended courses with follow-on home study over the Internet in the use of IT tools [6-7]. The Centre hosts the Federate Societies and Committee data processing

which includes digital editing and CD publication of databases on open-themed issues from national congresses.

Project and call-to-meeting: In 1998, using the experience compiled by CETIFAC and the information obtained from the World Congress for Biomedical Sciences – INABIS [8], the Virtual Ibero-American Congress of Pathological Anatomy [9] and the Ibero-American Neurology Congress [10], we started up a project for a Cardiology congress to be held entirely over the Internet.

The call-to-meeting was sent out via e-mail to the future members of the Organising and Scientific Committees. Six working mailing lists were created, and “virtual” meetings were held via Chat rooms, with personal meetings between members located in Argentina.

The Organising and Scientific Committees had members from 23 countries (Argentina, Australia, Bolivia, Brazil, Canada, Colombia, Cuba, Scotland, Spain, France, Greece, Guatemala, Israel, Italy, Japan, Mexico, New Zealand, Peru, the Dominican Republic, Switzerland, Uruguay, USA and Venezuela [11]). Only 75% of the executive committee, known as the "FVCC Group" [1] have personally met at the time of the congress start. Of the multiple working meetings held, with the exchange of more than 5,000 e-mails, it was decided to organise a congress:

- which would last for six months, with progressive and periodic (weekly) publication of content;
- which would hold conferences, symposia, open-themed issues, courses, forums, interactivity between speakers, authors of open-themed issues and participants, self-assessments (with points for re-certification in Argentina);
- where the open-themed issues would have a peer review committee;

- which would use resources available to most countries in the world: the Web, e-mail and chat facilities (leaving for future occasions activities requiring high-speed connections, such as audio and video-conferencing, which were inaccessible to four-fifths of the world population at the end of the millennium);
- which would advance the methodology: i.e. mailing lists, chat-rooms;
- which would optimise existing human and instrumental resources to be generated by CETIFAC, so that they would be cheap to create and free for all those registered;
- which would be on the Web permanently for consultation purposes;
- the content of which could be edited and distributed on CD;
- which would generate and leave human and technical resources to be used later in a continual education forum on Cardiology and future Internet congresses

Human resources: In 1998, CETIFAC had, apart from the *ad honorem* participation of its members for its usual activities, two staff members to work a total of 40 hours a week on the additional tasks associated with the congress until February 1999. Between February and June, a third person increased the working hours to 60 a week; between July and August, the working week was 80 hours and was later increased to 120 hours (using 6 people) between October 1999 and March 2000. All the members of the executive body worked *ad honorem*.

Technical resources: A compatible IBM Pentium I, 166-Mhz PC with 198 Mb RAM and a 6-Gb hard disk was used as a server, hosted on an ISP with 64 Kbps (theoretical) wide-band speed. It is configured to act as a Web server with e-mail, mailing lists (Majordomo), SQL, FTP, FTPMail and Chat facilities. It is managed remotely via Telnet from a further three IBM compatible Pentium II PC's.

Receipt of material: Non-moderated work lists were generated to accept material from conference-givers, speakers and open-theme authors. Several messages were found to have computer viruses. By installing up-to-date antivirus programs on the destination computers, these infectious agents were intercepted and deleted. The senders were notified of the infection and told what steps had to be taken before re-submitting the material.

Conference and speaker material: Given the fact that this was a new idea, and to help the invited conference-givers and speakers to take part, they were given total freedom in respect of format and modes of sending material. Table 1 shows how the material was sent and the formats used.

Table I: How the material for conferences
and speakers was sent

Mode of receipt	Format
e-mail	<ul style="list-style-type: none"> • <u>text:</u> .doc, .rtf, .txt, .ppt, .htm • <u>images:</u> .jpg, .gif, .cdr, .bmp, .tiff, .avi
conventional mail	<ul style="list-style-type: none"> • diskettes and CD with similar files to the ones listed above • printed matter • slides

Open Themes: Because this was the first Internet congress which would publish Open-Themed articles on Cardiology via a system of peer review, it was agreed to accept as many original works as had been presented to the FVCC in the two previous years. It was agreed that the material was to be sent in digital format, via e-mail: text as .doc or .rtf and images as .gif or .jpg files. The deadline for receiving abstracts was 30 June 1999. Six awards for Open Themes were set up, with free registration for the authors.

521 abstracts on open-themed issues were sent via e-mail, and these were sent on to the juries. They returned their verdicts in the same way. 411 abstracts passed (78%) [12] and the authors were offered the chance to present the papers in their entirety.

Editing, publication and errata monitoring: The material was edited using a simple page template, to provide speedy access even with slow connection speeds. Dynamic images were turned into animated .gif files so that the participants would not need to install additional plug-ins. The pages were published on the Web, to which there was no public access. To detect errata, the address for each publication was notified via e-mail to the conference-givers, speakers and Open Theme authors, and the necessary amendments were made.

Languages: It was agreed that the Virtual Congress would be held in three official languages: Spanish, Portuguese and English. Given the lack of financial resources, the conferences, lectures and open themes were not translated, but it was decided to translate the mailing list messages.

Interactive content: Implementation of bilingual moderated mailing lists

The free software Majordomo [13], accessible for projects with few financial resources, was used to generate the mailing lists. The lists were configured as being moderated, which means that messages sent to a moderated list are first read by a moderator who only includes messages related to the forum's objectives on the list.

It was agreed that the messages which arrived in English would be distributed in English and Spanish, and the ones received in Spanish would be sent on in Spanish and English, and those arriving in Portuguese would be sent on in Portuguese and English (Fig. 1).

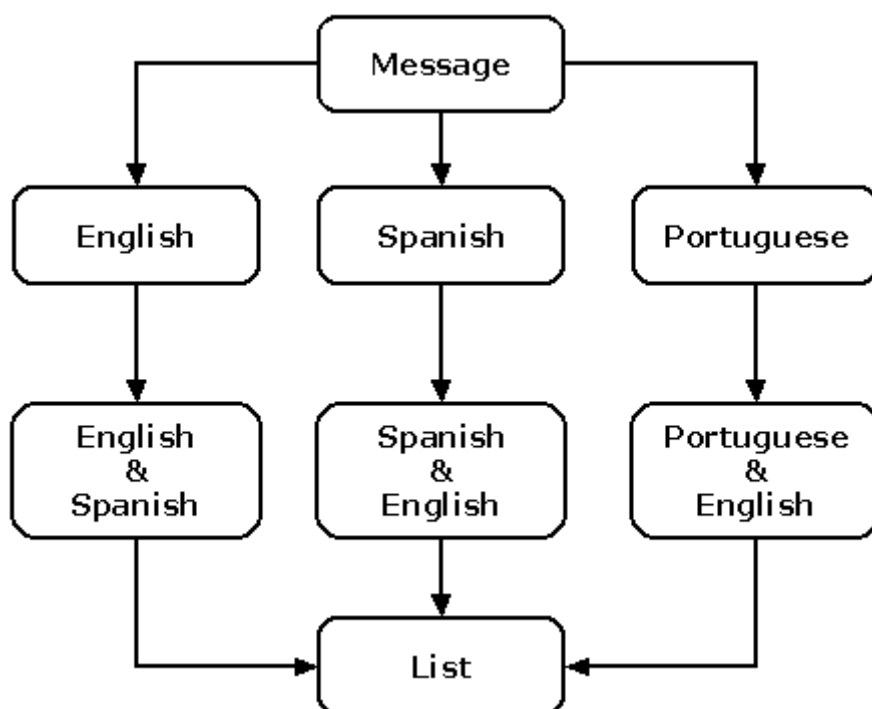


Fig. 1: translation of messages

A brand-new circuit, as shown in fig. 2 was developed for this purpose:

- a) a question, contribution or comment generated by the public and sent by e-mail to one of the mailing lists;
- b) only the Moderator of the respective list received the message. If, in his/her opinion, it was acceptable, the message was “cleaned up” (because the original text contains several commands), and re-sent by mail to the translators, and, if necessary, to the author or expert;
- c) the translators translated the message, put the code of the respective list in the title and sent it back to the list;

d) the message was distributed to all the subscribers.

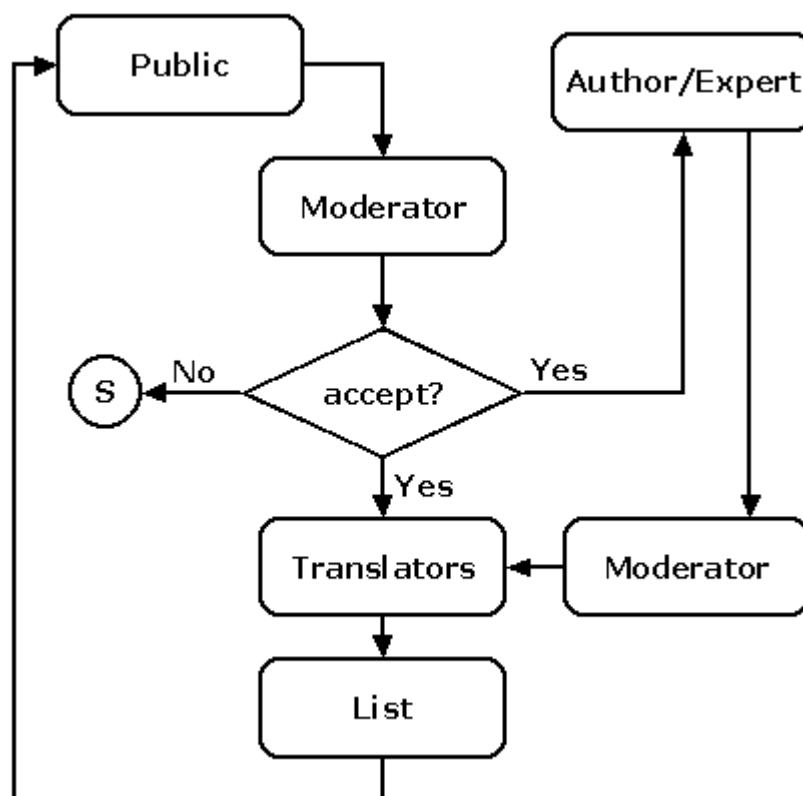


Fig. 2: Moderated and translated mailing list circuit (see text). S: sender.

Interactive content: Chat-rooms

Chat-room sessions tend to be chaotic and it is hard to follow the thread of the conversation, because several of those present in a room might be writing ("speaking") at the same time. In an attempt to improve the practicality of the method, a Forum was created by using a mailing list [14] where information on the technical and methodological aspects was published, the interested parties were invited to take part in training sessions on netiquette prior to the scheduled sessions, and help files were published on Web pages [15]. It was agreed that one moderator would act during each session to direct the debate. The participants "requested permission to speak", waited for the moderator's authorisation and placement of an indicator

(*) at the end of their intervention. The chat logs are saved, edited and distributed on the chat-FVCC list and published on the Web.

FTPMail: For subscribers in countries without free access to the Web, an FTPMail system was configured so that they could request web pages [16] and all kinds of digital files by e-mail and receive them in the same way.

The cost of preparing and developing the FVCC was covered through the sale of advertising space.

Results

The FVCC was held over the Internet between October 1999 and March 2000 [17-18-19-20-21-22-23]. There were 7574 participants from 95 countries [24] in the scientific sessions (Fig. 3 and Table II) under the auspices of 15 universities, 58 scientific societies and 16 foundations [25].

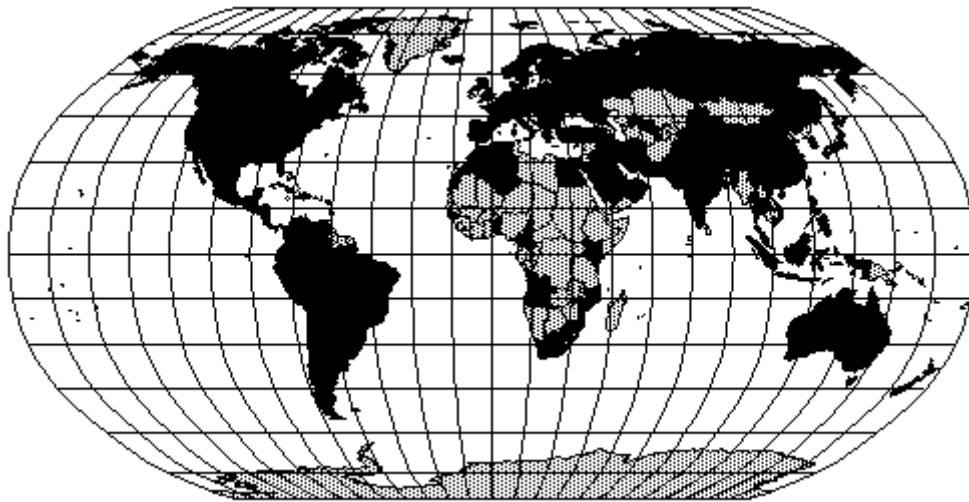


Fig. 3: FVCC Subscribers. Bold typeface: countries of origin (95) of the 7574 subscribers

[24].

Tabla II: Countries with more than 100 FVCC subscribers [24]

Argentina	2508
Brazil	828
Mexico	638
Spain	625
Peru	382
Uruguay	365
Colombia	302
Cuba	278
USA	262
Venezuela	207
Chile	122
Ecuador	110

Regardless of the format of the material received (Table I), all 187 conferences and lectures developed by leading experts in the world of cardiology were edited and published on the Web in the original language (Spanish, English and/or Portuguese) [26], as well as the forums (see below), the 146 Open Themes received in their entirety and the 265 for which abstracts were sent [27]. Two symposia were held, one organised by the Council of Rheumatic Fever of the World Heart Federation (WHF) [28] and the Department of Noncommunicable Diseases Prevention of the World Health Organization (WHO) and another organised by the Inter-American Heart Foundation (IAHF) [29], one course (arrhythmias) and two clinical rounds (interventional cardiology and echocardiography).

The content was distributed so as to make weekly “deliveries” over the 6 months that the congress lasted. The activities for each week, and the code for accessing them via FTPMail [15] were sent out to a mailing list known as INFO-FVCC, to which all the participants subscribed.

16 themed forums were implemented [30] via bilingual moderated mailing lists. 1163 messages were received, of which 142 were rejected (12.2%) because they were not in line with the forum's objectives, and 1021 were distributed (87.7%) (Fig. 3). The brand-new mailing list circuit (Fig. 1) worked uninterruptedly during the six months of the FVCC, with an average of 24 hours between the time the 1021 translated messages were sent and the time they were distributed [31]. These messages were also edited and published on Web pages

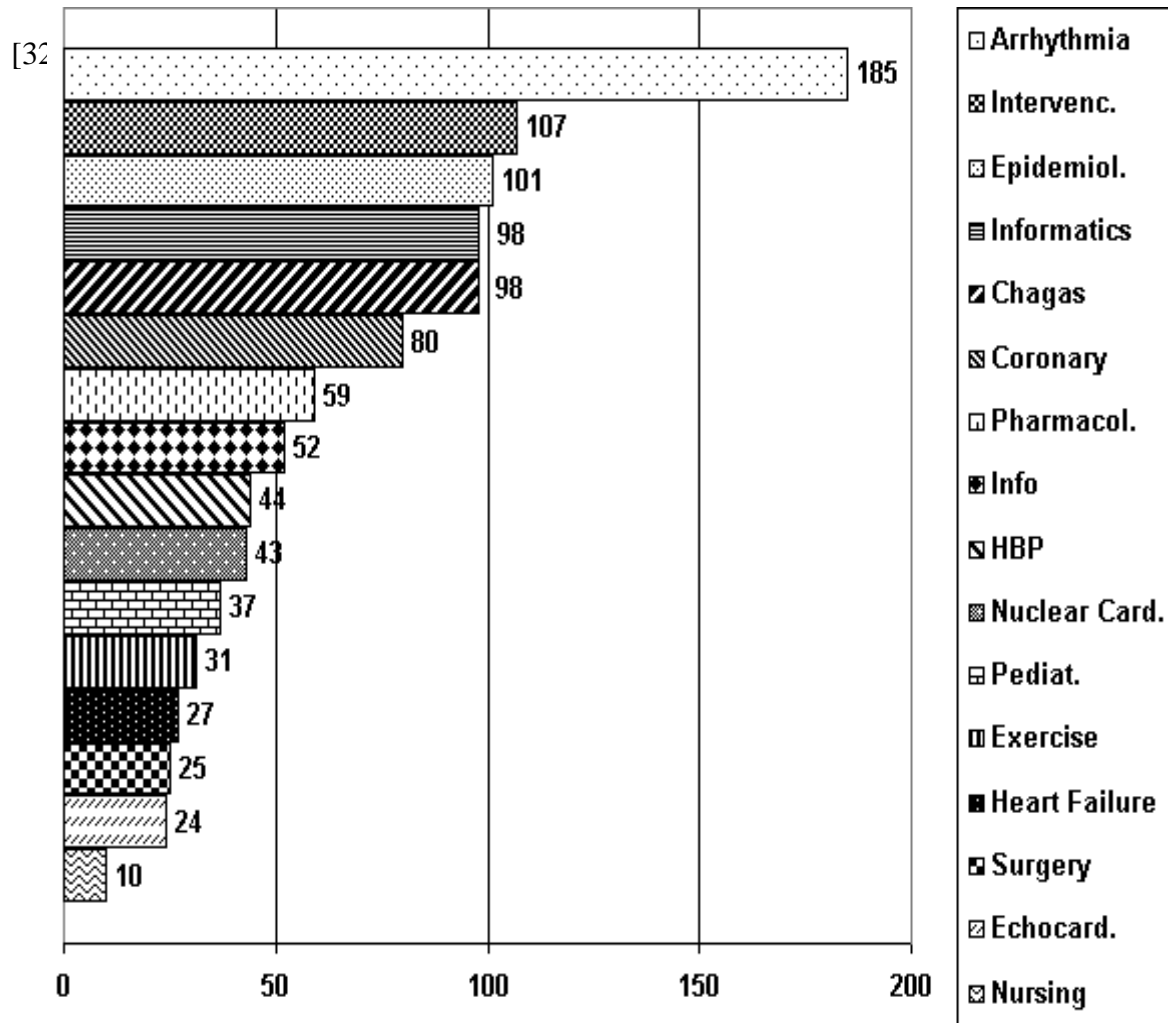


Fig. 3: Distribution of the messages (1021) from the 16 themed forums. [31 - 32]

Nine chat room training sessions were held during the FVCC, seven with scientific content (six with questions for special guests, one debate between two guests) [33]. To facilitate the

participation of the special guests, a member of the FVCC took care of the technical aspects and typed in their replies and opinions. Three of the sessions were broadcast in real-time from auditoriums with multiple participants. Throughout all the sessions, with guests assisted by members of the FVCC and trained participants, netiquette was observed, thus avoiding chaos and fulfilling teaching and scientific objectives [33].

A self-assessment system was implemented (REFACIN - REcertification of FAC via the INternet [34] with questions from the conferences, and credits for re-certification from the Argentine Federation of Cardiology , the replies for which came in via snail-mail until 30 November 2000.

20 editions of the FVCC Newsletters were published in their Spanish and English versions.[35] The bi-directional online link between the cardiovascular area of the 6th Internet World Congress for Biomedical Sciences [36] and the entire FVCC was established. A free-access Public Area was enabled [37], in Spanish, with medical, cultural and entertainment information for professionals and the general public.

All material from the FVCC is still available on the Web 24 hours a day [17], and by e-mail through FTPMail [15]. The full contents of the FVCC were edited and distributed on a CD free of charge.

Use of the human and technical resources generated in FVCC

Continual Cardiology Education Forum: The human resources and technical infrastructure developed have helped to develop the so-called “Foro de Educación Continua en Cardiología

– FECC” [*Continual Cardiology Education Forum*], the official languages of which are Spanish and Portuguese [38-39].

Within this context, an international symposium (Virtual Symposium on Chagas Disease) [40-41] has been underway since April 2000, with conferences, forums, chat rooms, and the publication of 20 editions of the Newsletter, help files on IT matters, etc. 19 themed mailing lists have been enabled in which 3361 messages have been exchanged in 12 months [42]. Over the same period, 2949 e-mails were exchanged on co-ordination tasks through the internal working lists. Everything is done at no extra cost over and above basic CETIFAC charges. Four symposia have been scheduled for 2002: Paediatric Cardiology, Exercise Cardiology, Cardiovascular Pharmacology and Chagas Disease.

First Virtual Symposium on Chagas Disease: Using CETIFAC’s permanent human and technical infrastructure, also at no additional cost, a Virtual Symposium on Chagas Disease [40-41] took place between November and December 2000. This event, held in Spanish and Portuguese, brought together 723 participants from 25 countries and gave this “Cinderella” disease (so-called because the population it targets is of no interest to pharmaceutical companies) the necessary dedication to help combat its effects not only on the inhabitants of Latin America but also - according to information received in the Forum - other countries like Spain and the USA.

Second Virtual Congress on Cardiology – SVCC: Using a similar schematic as the FVCC, although with a much shorter duration, the SVCC was held between 1 September and 30 November 2001 [43], bringing together 11,703 participants from 107 countries. The results of this symposium are currently being analysed (July, 2003).

Observations and conclusions

Very few congresses of this kind have been held in other medical specialities (the ones mentioned above [8 – 9 - 10] were of a shorter duration, and lessor complexity and content and with fewer participants). The FVCC included original new developments, such as the circuit for translating the moderated mailing lists and the methodology of chat sessions, and was developed using the human and technical resources available in the “Federación Argentina de Cardiología – FAC” [*Argentine Federation of Cardiology*] and generated additional resources which have allowed and still allow continual medical education (CME) activities.

The results obtained suggest that the use of basic Internet resources by scientific societies may be a useful method for future development of interactive scientific and academic activities. Its extension over time may provide access to multiple activities without the restrictions, which are common in meetings with various simultaneous sessions.

The aim of such activities is not to replace but to complement personally-attended meetings. Because of the changes to habits and customs caused by the tragic events of 11 September 2001 and its consequences, and those resulting from the evolution of technology might be quite significant. It is difficult to predict the conditions that access to the Internet or the systems which succeed it might have in the future. It is possible that the nature and periodicity of personally-attended meetings may change and the number and frequency of Internet activities increase.

Conflict of Interest

None declared.

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