Share, Collaborate, Create Virtual Conferences

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Abstract

The Virtual Conference Generator (VCG) tool is part of a knowledge portal being developed by the Centro de Análisis de Imágenes Biomédicas Computarizadas (CAIBCO) at the Medical Faculty, Universidad Central de Venezuela**.** Targeted at the health sector, it is a content management tool focused on generating quality content while automating some operational tasks. It was developed to facilitate the interactive creation, management and publication of virtual conferences. VCG was an integral tool toward organizing a virtual conference held in July 2003 in the health sector, the "IV Congreso Virtual de Micología: Hongos Patógenos en América Latina" http://congresomicologia.ucv.ve Computer science students developed VCG using JSP technology, testing it on three different platforms, applying eXtreme Programming as an aspect of the evaluation process in an academic context.

Keywords: software engineering, virtual communities, collaboration tools

Introduction

Considering the worldwide economic and political panorama, some countries and institutions can not afford to or will not incur the expense of sending delegates to real conferences. VCG is an alternative, reducing the physical and temporal distances between members of a particular area of knowledge and enriching and promoting new virtual communities by creating the opportunity for expert discussions and interactions. It also offers advantages such as reduced operational costs and increased frequency of content updates, therefore improving the quality and amount of available content. The most valuable asset of a knowledge portal is this content, and as it must be frequently updated, management tools allow for a focus on content generation. As well, the automation of content management processes increases the productivity of non-technical contributors; these contributors should be able to use and submit content in a flexible way, without technical bottlenecks (Arboleda, 2002). This is very important for time-sensitive environments and customer-driven portals.

One of the goals of the medical school at our university is the diffusion of medical expertise and the use of technology to create an easily accessible knowledge base for members of the health care community. The expert knowledge we are particularly interested in is tropical disease.

The availability of information and communication technology and CAIBCO´S expertise in the diffusion of

biomedical knowledge has promoted the ongoing development of *Axis*, a knowledge portal specialized in and for the iberoamerican (Latin America and Iberian) biomedical community, which is also open to health care students and professionals worldwide. The services offered include web sites on medical specialties, documentation and publication of tropical and emergent pathologies, access to digital publications (particularly the biomedical electronic publication VITAE http://caibco.ucv.ve/vitae/), interactive tools such as a virtual conference tool, epidemiological information, links to scientific and medical societies, research organizations, hospitals, medical services and sites of interest. Initially, VCG was considered a low-priority service to be provided by *Axis*. However, the priority of the tool changed from low to high when a researcher from another organization was looking for an existing, user-friendly tool she could use to set up a virtual conference. Our main challenge was the development of a tool to satisfy the needs of a community of different levels of researchers and to be used for networked-based tools such as e-mail and web-based applications. The development was aimed at the publication of ongoing research and clinical cases as the bases for discussion between researchers, mirroring the basic model of conferences.

VCG imitates the processes involved in “live” conferences and reproduces diverse scenarios for the set up and publishing of virtual conferences. The format and workflow was chosen to approximate that of "live" conferences, where papers are presented and debates follow. With VCG these debates need not be limited by the typical time constraints of “live” conferences. When a virtual conference is over, all contributions remain on the web as permanent resources. The focus of this work is the presentation of our tool and its subsequent application to an actual virtual conference organized for the benefit of a specific research community.

Virtual Organizations - Virtual Conferences

Diverse authors have presented definitions of a virtual organization (VO), analyzing its nature, causes and impact on society. A structural definition of VO can be found in Whittaker, MacKinnon, & White (2001): “All current research appears to agree that the virtual organization is technologically centered, involves electronic telecommunications links to exchange information or knowledge and removes many of the limitations inherent in hierarchical organizations”. In this sense a virtual conference is a virtual organization. On the other hand, Igbaria identifies information technology and its application as an enabler for societies to develop virtual services, relationships and communities: “The new technology holds many possibilities for virtual societies. It enables individuals, groups, communities, organizations and societies, among others, to exchange information, conduct business, participate in newsgroup discussions and publish information electronically. The new technology enables innovative ways of communicating and doing business. It is an important element of creating the virtual society” (Igbaria, 1999). Virtual conferences are therefore an integral aspect of a virtual society. But there are different kinds of virtual organizations; using the typology of virtual organizations that classifies them into permanent virtual organizations, virtual teams, virtual projects, and temporary virtual organizations (Palmer & Speier, 1997), a virtual conference is defined here as such: the range of involvement is across organizations, with a typically larger membership having as its mission multiple functions responding to a (market) opportunity. This form of organization is temporary and uses a shared infrastructure.

Some Definitions

A conference is a meeting organized for the discussion or exchange of views between members of an area of knowledge using different forms of contribution, such as papers, invited speakers, and panels. Various stakeholders can be identified: contributors, participants, members of different committees, invited speakers, visitors and sponsors. A contributor is an author of one or more contributions and a contribution may have more than one author. Participants do not make formal

contributions, but ask questions or make comments about the contributions. A conference generally has committees with members; an invited speaker is somebody that gives a talk about a relevant topic; and a visitor is anybody who browses through announced conferences. Content of a contribution can come from a variety of sources, and in a "real" conference participants and contributors have to register and pay a fee.

The VCG Tool

Extreme programming (XP) (Beck, 2000; Donovan, 2001) is one of the most agile methodologies (Cáceres & Esperanza, 2002) and it has generated a lot of interest in the academic media by defining new ways to educate and train students, particularly undergraduates, in the production of quality software. It is focused on the values of communication, feedback, simplicity and courage, and is defined through 12 practices: the planning game (Jeffries et al., 2002), small releases, simple design, refactoring, use of metaphor, pair-programming, collective ownership, test-first development, continuous integration, on-site customer, coding standards, and a 40-hour week. VCG's implementation, consisting of 78 user stories, was delivered in six releases within the time frame of one academic semester. (It has to be noted that the semester was atypical as a three-month strike paralyzed many activities in our country. The students that were developing the tool using XP could not apply some of the practices, such as an on-site customer. When the strike was lifted, we had four months to produce a working application). Two weeks before the delivery date, we still did not know which server was to be used; on the development side there were three different platforms (win32/Oracle9i, win32/mySQL, Solaris/Oracle9i) and on the deployment side VCG was hosted on two ISPs (Solaris/mySQL, win32/mySQL). That was the driving force behind the development strategy; the development had to be sufficiently flexible to be adapted, within a few hours, to a different platform. Using JSP technology (Ostróvskaya, 2002; Servlets and JSP Pages Best Practices, 2003) on a three-tier architecture it was tested for the platforms shown in Table 1, changing only a configuration file; in this way the tool was adapted. The size of the current VCG version is 37.943 LOC distributed as follows: 32.387 JSP, 3.783 Java and 1.773 Java Script LOC.

Table 1: Platforms tested with VCG tool

Operating System	Application Server	Data Base Management System
Solaris	Jakarta Tomcat	MySQL
Solaris	JServ	Oracle9i
Windows XP	JServ	Oracle9i
Windows 2000 Server	Resin	MySQL

Users of the tool are classified as visiting, registered, coordinator or evaluator. A visiting user has a limited set of available facilities. To gain access to details of the contributions he has to register at no charge. Once registered, the visiting user can browse through past conferences published with VCG, view planned or ongoing conferences, post comments and questions to the contributing authors. All contributions are generated as PDF (Portable Document Format) files. A conference has a coordinator responsible for the interaction of evaluators and speakers; an internal messaging tool facilitates this interaction automating messaging, e-mail notification and contribution acceptance. An evaluator has the responsibility of reviewing one or more contributions and sending the reviews to the coordinator. A workflow diagram for these activities is shown in Figure 1.

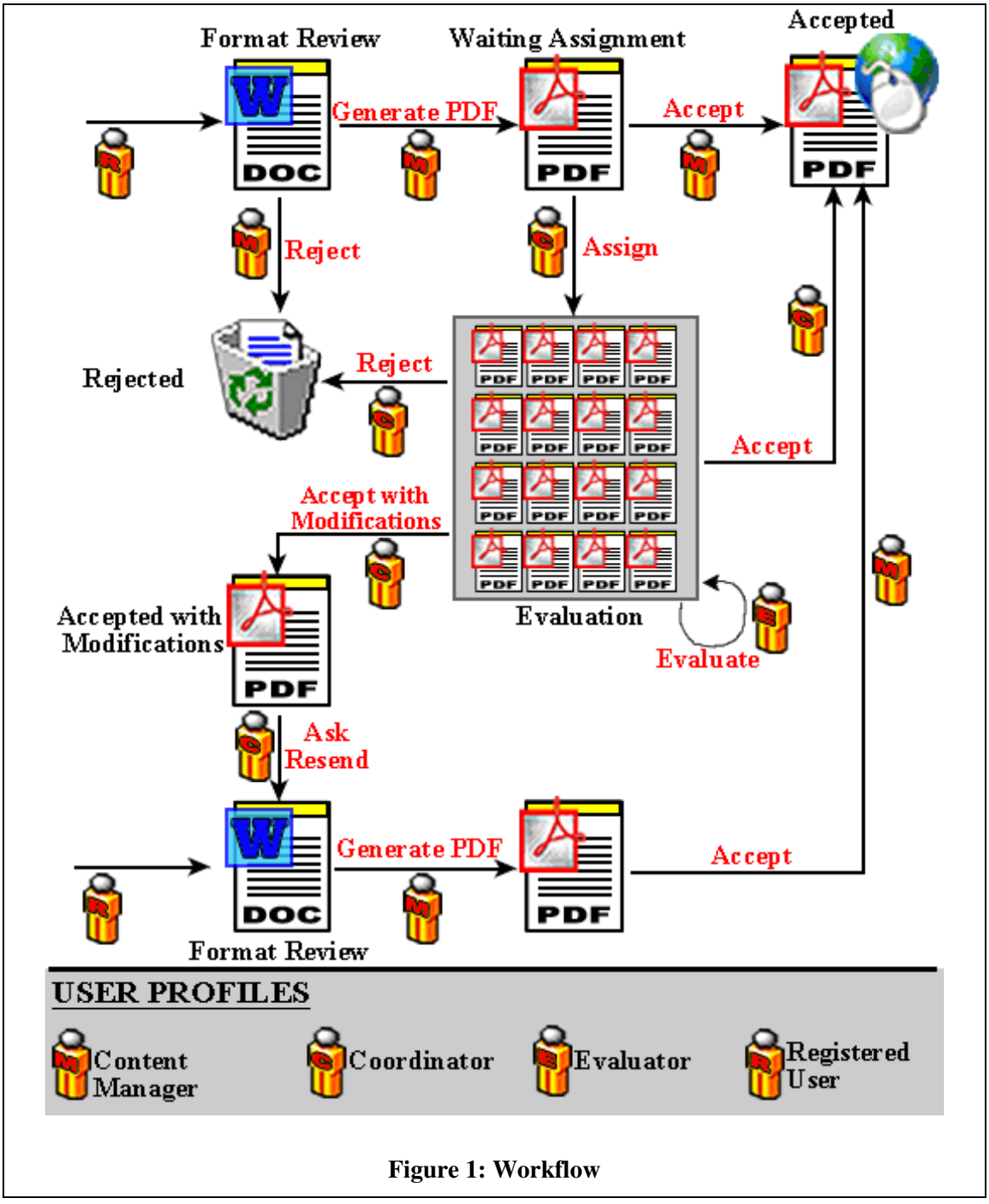

Figure 1: Workflow

A virtual conference needs VCG to be used as a virtual conference support system; it is not a black box that can be used independently. An example of a conference running on VCG (http://150.185.75.30:8080/cv/administracion) can be viewed at http://150.185.75.30:8080/cv. Each virtual conference generated with VCG has an interface that implements the Composite View Pattern (Core J2EE Patterns, 2003), with customizable colors and images. Any generated

conference has a presentation composed of images and style sheets, and can be changed by a content manager. The VCG interface for accessing facilities is shown in Figure 2.

Figure 2: VCG's main interface.

A conference from the time of its creation onwards passes through different states:

- Preconference: contributions are submitted for peer-to-peer evaluation during a specified period of time; once this period is over, the submitted papers are evaluated and the selection of contributions for a particular conference is completed.
- Conference: the conference is held between a start date and a finish date.
- Postconference: after the conference is held, all accepted contributions and talks are published. During the postconference period all users are considered visiting users.

Table 2 shows the facilities available for each kind of user within the different conference states. The available options for each user-role within a given conference state were used to customize the menu.

Table 2: Navigation options in a virtual conference

	Conference State				
User	**Submission**	**Evaluation**	**Selection**	**On-going Conference**	**Post Conference**
Visiting	Welcome, Organizing Committee, Technical Committee, Sponsors, name of Invited Speakers.	Welcome, Organizing Commute, Technical Committee, Sponsors, name of Invited Speakers.	Welcome, Organizing Commute, Technical Committee, Sponsors, name of Invited Speakers	Welcome, Organizing Committee, Technical Committee, Sponsors, Invited Talks, Exit	Welcome, Organizing Commute, Technical Committee, Sponsors, Invited Talks, Exit, View contributions**, View participation, participants profile.
Registered	Welcome, Organizing Commute, Technical Committee, Sponsors, name of Invited Speakers, Submit Contribution, View participation, user profile, close session.	Welcome, Organizing Committee, Technical Committee, Sponsors, name of Invited Speakers, View participation, user profile, close session.	Welcome, Organizing, Committee Technical Committee, Sponsors, name of Invited Speakers, View participation, user profile, close session. Resubmit contribution.	Welcome, Organizing Committee, Technical Committee, Sponsors, Invited Talks, View participation, user profile, close session, View contributions, internal messaging	***No user session is available***
Evaluator	Welcome, Organizing, Committee Technical Committee, Sponsors, name of Invited Speakers, Submit Contribution, View participation, user profile, internal messaging, close session.	Welcome, Organizing Committee Technical Committee, Sponsors, name of Invited Speakers, View Participation, User Profile, close session, internal messaging, Evaluation.	Welcome, Organizing, Committee Technical Committee, Sponsors, name of Invited Speakers, Resubmit Contribution, View Participation, user profile, internal messaging, close session,	Welcome, Organizing Committee, Technical Committee, Sponsors, Invited Talks, View Participation, user profile, close session, View contributions, internal messaging	***No user session is available***
Coordinator	Welcome, Organizing, Committee, Technical Committee, Sponsors, name of Invited Speakers, Submit Contribution, View participation, user profile, internal messaging, close session.	Welcome, Organizing, Committee, Technical Committee, Sponsors, name of Invited Speakers, Submit Contribution, View participation, user profile, internal messaging, close session.	Welcome, Organizing, Committee, Technical Committee, Sponsors, name of Invited Speakers, Resubmit Contribution, View participation, user profile, internal messaging, close session.	Welcome, Organizing, Committee, Technical Committee, Sponsors, Invited Talks, View Contributions, View participation, user profile, close session, internal messaging.	***No user session is available***

** Comments or answers may not be added

Content Management Processes

- Validating a content manager: a content manager opens a session; user and password are validated. A content manager can change the privileges of users and send internal messages.
- Managing a virtual conference: a new conference can be created, an existing one can be eliminated or redefined (for example, a date extension for submissions). Redefinition

uses the same interface as creation. Manager profiles can be changed or the corresponding session can be closed.

- Creating a virtual conference allows for conference definition: Main theme and subtheme, welcome messages, invitation URL, selection of one or more languages (Spanish, English or Portuguese) and date definitions as shown in Figure 3a and 3b. Once the coordinator creates a conference, a specific presentation can be defined, such as the one shown in Figure 4. The navigation language can be set and reset anytime in the welcome section of a particular conference. A set of images can be used to customize the presentation of a conference and are classified as header, top left, top right and bottom images; if one or more are not used, only the welcome messages will be shown in the associated area. If the header image is omitted the title of the conference will be displayed. Details of the presentations and of the speakers are collected through the interface shown in Figure 5a and 5b.

The Technical and Organizing Committees for a given conference can also be defined or modified using a similar interface.

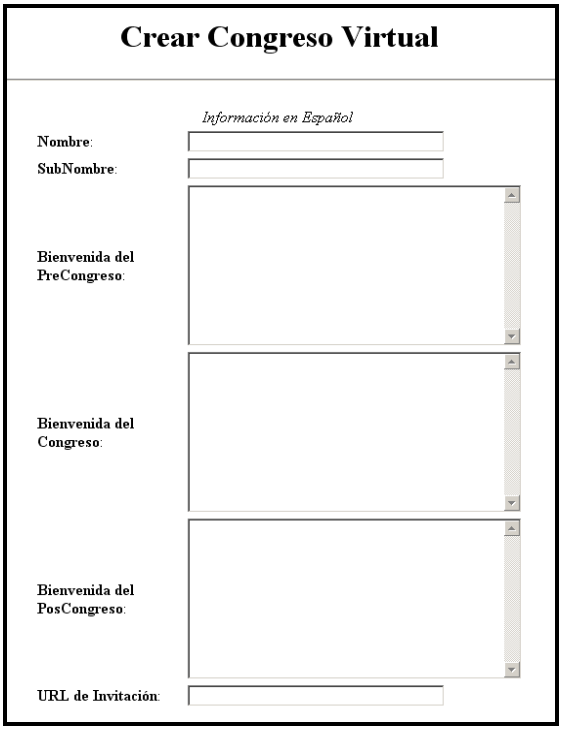

Figure 3a: Text invitations for a conference

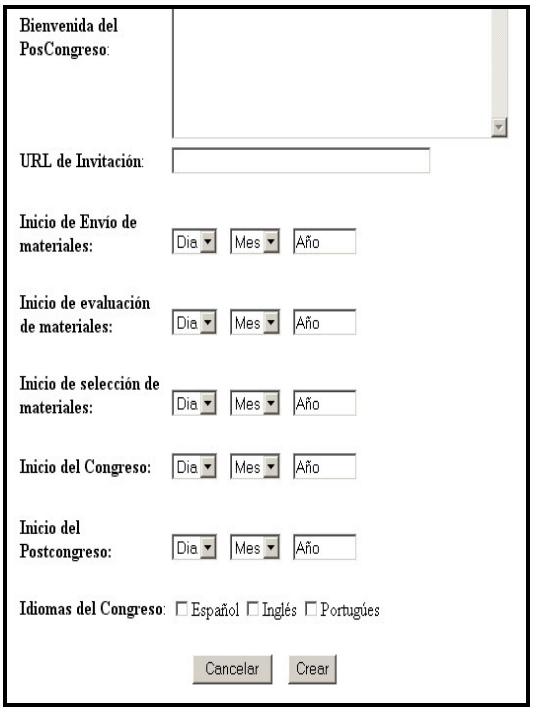

Figure 3b: Date definition

Figure 4: Presentation of a conference created with VCG tool

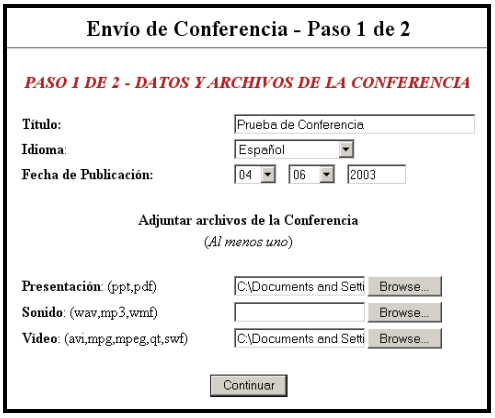

Figure 5a: Presentation data for a specific conference.

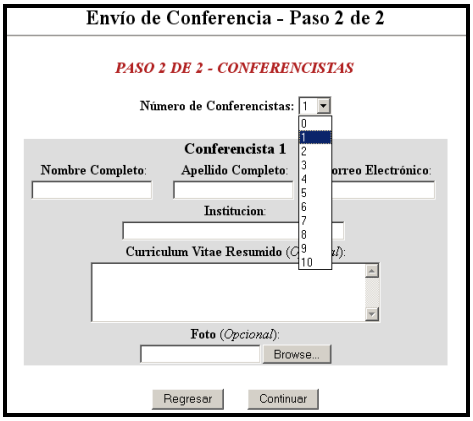

Figure 5b: Invited speakers description.

A conference can cover different presentation areas that are managed with create/read/update/ delete (c/r/u/d) operations. For the exemplified conference the coordinator defined two areas: technical papers and clinical cases (Figure 6). Each area has one or more specialties; in our case medical specialties were used, as shown in Figure 7. These specializations are also managed with c/r/u/d operations.

- Managing Contributions: the coordinator can view the specifics of all contributions, send a message to the corresponding author, download submitted contributions and their im-

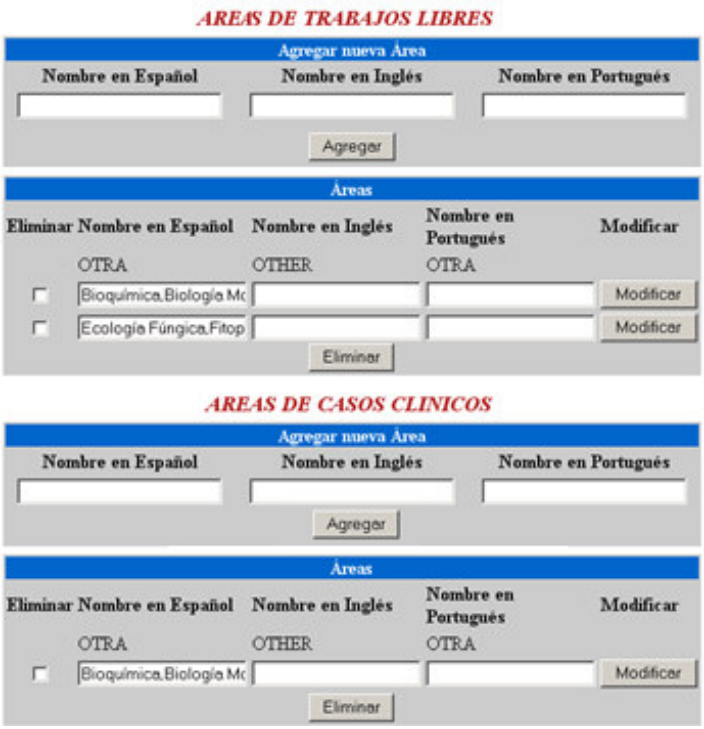

Figure 6: Area definition

ages and upload or download the PDF file of a contribution. A specific contribution is shown in Figure 8. Internal messaging can be used for sending and receiving messages to/from all participants**.**

Figure 7: Specialties definition

Figure 8: Received contributions for a selected area.

Conclusions

On the Development Side:

Although 80% of the functionalities were delivered as planned, some of the XP rules and practices could not be applied:

- Delivered releases created the need for changes in requirements, particularly in the presentation tier, even after user's acceptance tests were completed.
- Previously negotiated user stories were also changed, requiring over-time from Development, which is against one of the rules in XP.

These rapid and almost daily changes in requirements, particularly as the deadline was approaching, could partially be explained by the absence of monetary development costs; if the customers don't pay, their needs are more subject to change.

- User story cards were grouped together, taking care of dependencies.
- No CRC cards were prepared; each planned iteration code was developed directly.
- There was no rotation of pair-programmers since each pair was working on a project which was a final requirement for their CS degree; that is, it was academically impossible to rotate them. However, pair programming is like having a constant code review in process, and all student pairs participated in the team meetings.

- Since the pairs consisted of students with similar levels of experience, there was no need for any relearning, eliminating any loss of productivity. There are many benefits of paired programming, including knowledge dissemination, increased sense of community and an increase in quality.
- As for the speed of development with pair programming, the best pair programmers tend to be emotionally mature individuals who are excellent communicators, and so pair programming works well for them because they have the skills to take full advantage of it.
- On all projects involved students prefer XP to a prescribed process.
- Standards and guidelines were used; they are important as long as they are simple, relevant and readable.
- "Change management" was purportedly a negative mechanism. During development there were unrewarding situations; first of all, the number of persons on the client side outnumbered the development side: 10 (not including 16 members of the scientific committee and 26 evaluators) versus five. As well, the client did not take on the corresponding responsibilities as defined in XP. Development was asked to input the texts describing the conference: our students have poor writing skills and the texts they uploaded were a major obstacle for the organizing committee. The graphic designer did not have the design when expected, and when he finally showed up with his version it had to be changed as it had details that were inappropriate such as menus on the bottom of scrolling pages. After exceeding the 40 hours week in the last week before the start of the conference, we had a product which was accepted by the client.

On the Client Side:

Satisfaction with the first conference generated with VCG was overwhelming, with a total of 68 accepted contributions in two areas: one with five specialties and the other with three. Contributions from 12 iberoamerican countries (Argentina, Brazil, Colombia, Costa Rica, Cuba, Ecuador, Spain, Mexico, Panama, Peru, Uruguay, Venezuela) and Germany were received. A few hours before entering the postconference state, there were 600 registered users writing encouraging comments in the guest book, a feature incorporated at the last minute. However, VCG tool mimicking interactions that can be observed in a real conference has additional possibilities for enrichment such as posters, panels with a moderator, and live discussions. This first version of VCG has some limitations, particularly in the management of languages: a virtual conference can be started in at most three languages (Spanish, English and Portuguese); further the content manager must create manually the PDF files to be evaluated. Finally, it might be observed that clients don't care if a process is agile or light. They want to have access to ideas, to get what they need and to see something of value (promotional, in our case.) In software changing a requirement means that somebody learned something through evaluation and addressing changes does not mean accepting them without question.

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Biographies

Jorge Coll and **Rosanna J. Del Vecchio** earned their CS professional degree in 2003 at the Universidad Central de Venezuela specializing in J2EE, XML, and Web services support. Their professional software development experience is currently focused on Java technologies at the Centro Investigación de Operaciones y Modelos Matemáticos Aplicados (CIOMMA), Escuela de Computación, Universidad Central de Venezuela.

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