

INFORMATION EXCHANGE AND INTELLECTUAL CLIMATE:
ADOPTION OF AN ONLINE EVENTS CALENDAR AT A UNIVERSITY

by
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This study examines the history of the adoption of an online events calendar at the University of North Carolina at Chapel Hill and describes a questionnaire survey of over two hundred people who may post events on that calendar. The study was conducted in order to better understand the motivations of why an individual in an academic setting would choose to adopt or choose not to adopt a technological innovation, and to try and determine if any controllable factors (technology, training) contribute to those tendencies. The study found that most people posted their events on the calendar in order to publicize them and most believed that the events calendar application was easy to use. Those who tended not to post many events did so either because they were not convinced of the efficacy of this technology or because they experienced problems with the application.

Headings:

Colleges and universities

Events calendar

Groupware

Technology adoption

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Introduction

During the mid-1990s, the University of North Carolina at Chapel Hill (“UNC”) held a number of discussions and committee meetings regarding the (lack of) intellectual climate at the university (1). In 1997, the Chancellor’s Task Force on Intellectual Climate recommended that UNC “provide better information about events.” The reasoning behind this was rooted in the belief that more widespread publicity about campus events would increase interest about and attendance at those events. The Task Force worked under the premise that “social and cultural experiences beyond the classroom are an integral part of the intellectual life of students, faculty and staff alike” and additionally noted that:

“The University consists of different constituencies who know little or nothing about what others in their community are doing.... Students, faculty and staff all report that they are often unaware of events or uncertain about the purpose or themes of events they hear about.”

-Report of the Chancellor’s Task Force on Intellectual Climate
(UNC-Chapel Hill), August 1997 (2).

A number of suggestions were made to assist in providing better information about events:

- Create a new office (a “Central Clearinghouse”) that will receive information about all events at the University and distribute this information efficiently to students, faculty, and staff.
- Create a new administrative position to manage the new Central Clearinghouse for information on University events.

- Establish video kiosks in key student gathering spots on campus that would list forthcoming speakers, performances, exhibitions, concerts, and public meetings.
- Create a central office to distribute information about all intellectual awards and scholarships that are available to students.
- Create departmental and special interest e-mail groups and listservs.
- Include more information about the theme or purpose of events that are listed on calendars in campus publications.
- Create better communication among organizers of student and departmental activities (3).

Several years later, UNC would make inroads toward establishing an online events calendar through a massive coming together of hundreds of departments, institutes, and schools from all corners of the university. The process took nearly two and a half years from inception to “going live.” At this writing, the events calendar has been up and running for a year and a half, but many challenges still remain.

Initially the events calendar was intended to store information about occurrences that were academic or social activities, such as lectures, workshops, discussion groups, and readers. However, people and organizations who wanted to post information on the planned events calendar (“publishers”) began to show interest in publicizing other types of happenings such as deadlines, exhibits, and sales, shifting the definition of an event more towards anything that occurs.

As the perception of what constituted an event began to change, the more political issue of who would actually post events to the calendar became more prominent. While

departments and organizations were willing to publicize their own events, there was no one person or office that was willing or able to shoulder the responsibility for posting all UNC's events. Thus, decentralized entry of events was a primary requirement in the search for events calendar software. There would not be a central clearinghouse. By the summer of 2000 a software package had been chosen, based in large part on its ability to allow a large number of people to post events. After considerable testing and discussion among various interested parties (4), the calendar was linked off UNC's homepage in April 2001 and deemed by the Chancellor to be the official events calendar for UNC (see Appendix A.)

Although many units are enthusiastic about posting their events on the calendar, a number of units are not. There are a variety of reasons for this:

- *Perceived lack of interest.* Organizations are encouraged to post any and all of their events. Some believe, however, that their events are of little interest to the campus community and that they shouldn't bother publicizing outside of their unit.
- *Duplication of effort.* Many organizations maintain their own departmental calendars. They are reluctant to post events to two or more separate calendars or to update both paper-based and electronic calendars. This increases both time spent entering events and the risk that incorrect information might be entered.
- *Technology.* The events calendar application is not without its share of crashes. In addition, as with any software, there are bugs and glitches as well as limitations to what can be accomplished. Some event information

can be “copied and pasted” from text or HTML documents, but there is no “drag and drop” capability.

Interest in learning how to publish to the events calendar continues. However, being trained to post events does not guarantee follow-through, just as having an online events calendar doesn’t assure that the university community or the general public will use it. Although approximately 320 people have been trained to publish events, nearly a quarter of those do not do so. This study will examine in detail the publishers’ adoption of the UNC events calendar.

Literature Review

There is a wealth of literature on the use of calendaring systems in organizational settings. However, most, if not all of these articles refer to personal calendars that are shared online within organizations and are used to check agendas and schedule meetings, while the UNC events calendar is meant as a publicity tool as well as an information storehouse.

Grudin and Palen (1995) pose some research questions for personal calendaring systems that are adapted here to be applicable to the UNC events calendar:

- How widespread is the publishing, viewing, and searching of events?
- Who publishes? Who views?
- Is the application functionality/interface a factor in posting or viewing?
- Has the collective benefit of use been made apparent?
- Is adoption the result of top-down encouragement or mandate?
- How does adoption proceed over time?

They also note that buy-in from upper management is often a key factor in the adoption of shared informational systems (groupware.) These systems can succeed without advocacy from the top down; however, for this to happen, employees must be intrinsically motivated to use the system.

Munkvold and Anson (2001) suggest some features that contribute to successful groupware implementation: a focus on learning and training throughout the implementation, a high level champion from within the organization, and a design and implementation team selected from real users. Grudin (1994) warns to introduce groupware carefully, “leaving little to chance.” (p. 102)

Walls (1993) reports that “members of university communities are accustomed to getting and digesting large amounts of information in print, on paper, in their campus mailboxes; we still perceive this as the most effective way of getting information across.” (p.412) Nearly a decade later, paper memos have been replaced somewhat by electronic mail and Web pages, but universities still send a good deal of information in paper form. Walls also suggests that the premise “if you build it, they will come” does not generally apply to computer systems, meaning that people don’t generally begin using a system just because it’s been created. Walls was writing about the replacement of a college computing center print newsletter with an electronic version. This is the most analogous situation to the creation of the UNC events calendar found in the literature.

Constant, Kiesler, and Sproull (1994) note that increasing the sharing of information can result in many improvements to the organization (increased innovation, flexibility, understanding of goals, etc.) but also make the point that “organizations cannot realistically supervise and sanction universalistic norms and general information sharing policies. Employees must internalize them as attitudes.” (p. 401) This is especially true in a large university setting such as UNC.

Constant et al. also suggest that if employees believe that they are expected to share information, they will do so. Their study found that employees are more likely to share information when the information is perceived to belong to that organization rather than to an individual.

Bardram (1997) notes that it is common for people to devise work-arounds or even to take on extra work by maintaining both a paper- and a computer-based system. In addition, he suggests that it is important that new systems be designed around employees’

work practices, or at least not contradict those practices. This will facilitate rather than discourage use.

In a landmark study, Davis (1989) suggests that there are two primary factors in why people accept or reject information technology: perceived usefulness and perceived ease of use. He defines ‘perceived usefulness’ as “the degree to which a person believes that using a particular system would enhance his or her job performance” and ‘perceived ease of use’ as “the degree to which a person believes that using a particular system would be free of effort.” (p. 320) Of these two, perceived usefulness is the more important factor in user adoption, as people were found to be more likely to use a useful system despite difficulties with the system than to adopt a system that doesn’t perform any useful functions. Of course, difficulty of use can also discourage adoption of a useful system.

Hendrickson and Collins (1996) offer a reminder that failing to take into account user attitudes and intentions can have an adverse impact on understanding the complex relationship between perceived ease of use, perceived usefulness, and system usage.

Adams, Nelson, and Todd (1992) add to this by noting the importance of “implementation-specific characteristics such as training, support, user involvement, user expectations, or design characteristics.” (p. 229) They also suggest that while users may initially hold themselves responsible for failure to understand a system, they may eventually attribute their difficulties in learning to the system itself.

Galletta, Ahuja, Hartman, Teo, and Peace (1995) found that negative word of mouth comments were extremely influential on user attitudes about a new piece of technology. Positive comments had little effect. Additionally, the most influential comments come from co-workers, not supervisors, managers, technical support, or the media. Galletta et

al. also warn “in the case of optional software, users who have been exposed to negative communications can choose to adopt unsupported packages or fail to adopt any software.” (p. 77)

According to Kettinger (2002), there are three stages of IT innovation from the organizational viewpoint: “Initiation involves an idea or proposal for a new IT. Adoption of an innovation reflects an organizational mandate for change. Implementation aims to fully integrate the technology within organizational behaviors and processes.” (p. 81) Initiation generally occurs when a manager discovers a way of satisfying a need within an organization. Adoption is influenced by a number of factors, including ease of use, cost, and compatibility (how easy it will be to integrate into the organization.) Implementation is a long-term process and is greatly influenced by the availability of technical expertise.

More applicable to this study, Rogers (1995) outlines five steps in the innovation decision process from the individual viewpoint: knowledge, persuasion, decision, implementation, and confirmation. Learning about an innovation and how it functions is described as knowledge. This leads to persuasion, where an individual develops a particular attitude about the innovation. In the decision stage, the individual takes part in activities that eventually convince him or her to accept or reject the innovation – it is actually put to use in the implementation stage. The individual then seeks confirmation of the decision to adopt or reject.

In summary, while there is little empirical data concerning the adoption of a shared events calendar system, both Davis and Rogers have identified theoretical constructs that suggest a framework for the current study.

Background and History

Discussion over email about UNC purchasing an events calendar application goes back at least as far as October 1998. After the Report on Intellectual Climate came out, Elizabeth Evans, the manager of the Instruction Technology Development Group, was asked to have the programmers in her group develop a calendar application that would be used for instructional purposes. She began to research whether this idea could be expanded to an application that could include events of public interest at UNC. She also started identifying people who had the technical knowledge to offer advice on the feasibility of such a product and what kind of technology would be necessary to support it. Finally, she began gathering the names of people and organizations on campus that sponsor events. Although there were many technically-oriented people involved, there were already a number of potential publishers interested, including representatives from the Student Union, the General Alumni Association, the Black Cultural Center, Playmakers, and the School of Public Health, as well as UNC News Services, the organization that publicizes campus events at the university level and off-campus.

A small group of people met on November 9, 1998, and created an extensive summary of needs (Appendix B.) This was primarily a wish list of features for a calendar application broken down into publisher, user, and system needs. It was always the intent to have a main campus calendar as well as a variety of unit calendars.

One of the most important items on the list was the need to approve an event. Although many people in a unit could enter events, one or more designated people within that unit would have the responsibility to approve events, making them visible on the calendar, or reject them. A central unit, likely News Services, was to approve any event

posted on the campus-wide calendar. Other publisher needs included required fields and standardization of input when entering events, categorization of events, connections to room reservation systems, and ability to enter and display course schedules.

There were a variety of needs listed for users ranging from the basic (searching, filtering, receiving electronic mail notification of new events) to the more complex (drag and drop events to a personal calendar, customized printing of personalized calendar views). It was also intended for the calendar application to run on Unix and comply with open standards, as well as integrate with campus Web tools (which were unidentified at that point.)

A revised list of needs (Appendix C) was created on February 3, 1999, that was very similar to the original list. The main difference was the addition of a section on process and policy needs that were non-application specific. The question of whether or not to sell ads on the calendar came up early on and was sent to the university lawyers to provide an answer. It was noted that there were 379 student organizations, meaning that whatever application was chosen, it had to be able to handle a very large number of posting units. In addition, the need for a marketing plan was discussed as well as the need to “do what we can” to keep the event information up to date.

From this point, it took another two years to identify and prepare an application for production. The reasons for this are varied but can be attributed to three main factors: wide interest in the project, lack of person-hours, and technical challenges.

Wide interest in the prospect of developing a campus-wide events calendar had both positive and negative aspects. It was good because this guaranteed a wide base of support for the project and a plethora of original thoughts and ideas. However, with a large

number of people interested in having a calendar application as soon as possible, pressure to make a quick choice was high. Many units set a high priority on having particular features that, if absent, guaranteed (so they said) that they would not use the calendar. Additionally, the growing list of interested parties meant that many more people from whom to get opinions and suggestions.

Lack of person-hours was a problem from the beginning. Ms. Evans, a manager in ATN, was responsible for the project, and although she had staff that could handle technical issues, she had to coordinate all activity and push through any progress. Nor was she exclusively focused on the calendar – she had a number of higher-priority projects making demands on her time. (Appendix D contains a plan of action sent via electronic mail by Ms. Evans during October, 1999.) During these two years, people from all across campus would assist with application testing, but the calendar project would have benefited dramatically from having one person's time entirely devoted to it.

The initial technical challenges were numerous, beginning with the primary issue of whether it would be better to buy a commercial application or create one within the university. It was agreed that if a commercial application could be found to meet everyone's primary needs, that would be the better choice. Ms. Evans was a strong proponent of buying an application instead of building one. Even if initially expensive, buying an application can often save money over time and vendor support is definitely a value-added item. The one major advantage to building an application in this case was that it could be tailored to UNC's specifications.

The other technical concern that became a major issue had to do with authentication. Each person that published events on the calendar would need to have a login name and

password. There was already a project underway at UNC directed toward allowing people to have only one login/password for every application or service they used. The single login, known as the Onyen (5) – the Only Name You’ll Ever Need – is associated with one password and lets the user log in over secure connections to protect the anonymity of that password. The secure network protocol that allows this is Kerberos. It was agreed that any purchased application absolutely had to use Kerberos so that passwords for user accounts wouldn’t have to be stored in a database. As the choices for a vendor application narrowed down to one, it became apparent that despite repeated assurances from the vendor, not only did their application not use Kerberos, the vendor wouldn’t be able to incorporate it anytime soon.

By March of 2000, some progress had been made. Here’s a summary of what had already taken place and a discussion of Kerberos, from electronic mail sent by Ms. Evans:

“Last spring (1999), I created a list of folks on campus I’d heard published calendars of one sort or another. We scheduled several meetings to discuss what those calendar publishers would want in a campus-wide events calendar. Not everyone came to any of the meetings, of course, but I sent out summaries after each meeting so everyone had a chance to comment.

After developing the "specifications" (specs for short), we started trying to find out if any commercial products existed which would meet our needs. [Name], a student (since graduated) did a lot of the work of finding products and deciding which ones were worth further review. We ended up looking at two possibilities: Campus MainEvent (CME) from a company called Groveware and a locally written application being used at Frank Porter Graham Child Development Center (on campus). The locally written one would have required a fair amount of additional work to do what we needed. Folks came to the Groveware demo and seemed pleased. It didn’t do everything we wanted, but it did enough to meet our major needs.

Except that our campus is trying to move towards one user name/password for any service or application people want to use. The system we use for that is called kerberos. CME didn’t use kerberos, but

they sounded interested in working with us to give us what we needed. Last November, we decided to go with that product if we could get it to work with kerberos. During the discussions with the company, two of us in separate conversations understood their rep to say that they had incorporated kerberos, but when we got the product installed, kerberos wasn't included. Nor could we figure out a way to add kerberos. That stalled things for a while. Then last week, they told us their new product was out (Calendar 2000) and that it includes kerberos. So, we're moving ahead with installing that product (done), figuring out what "gotchas" there are with it (a couple so far), and beginning to use a subset of the publishers to pilot test it. The College of Arts and Sciences will begin testing the new software next week."

One of the primary ongoing discussions was how people would actually find events on the calendar of interest to them. Would they browse or would they search? There was a good bit of discussion about whether users would prefer to have calendars devoted to particular subject areas (i.e. an Arts calendar, a Sciences calendar, etc.) or whether it would be better to mimic the structure of the university and have school- and unit-based calendars. Because each calendar would have at least one administrator responsible for all of its content, the decision was made to go with the second option. It was not believed that the calendar administrators would be able to realistically manage events from a variety of departments on campus, and identifying administrators would be more difficult as well. This option would also allow units either to have a calendar of their own or to create a filtered view of just their events on a larger calendar.

The chosen calendar application allowed for three different kinds of groups – departments, topical groups, and interest groups. Departments on the calendar were to be the posting units. The topical groups would be subject areas that could be assigned to an event to help categorize it. Interest groups would be types of events, such as workshops and lectures. Essentially all the selections in each group would be used as keywords that

people could search on. In August 2000, the working group came up with lists of potential topical and interest groups. The plan was to come up with a set list of groups that would be used on every calendar. Although this would somewhat limit each unit's ability to customize, it was thought that this way would be better for the users, who would see familiar groups on every calendar.

- Topics:
 - Medieval Studies
 - Films
 - Athletic and Recreation
 - Tours
 - Libraries
 - Health and Wellness (Alcohol, sex, etc.)
 - Public Service/Community Outreach
 - Cultural
 - Language
 - Arts (art, music, drama, etc)
 - Humanities
 - Diversity
 - International and Global Interests
 - Fundraising
 - Activism
 - Environmental
 - Sciences (physics, biology, chemistry, etc)
 - Social Sciences
 - Literary
 - Technology
- Interest Groups (formats):
 - Exhibits
 - Performances/Films
 - Conferences
 - Tours
 - Volunteer Opportunities
 - Lectures/Speakers/Presentations
 - Workshops/Seminars/Panels/Discussion Groups/Forums/Classes
 - Sales/Promotions/Awareness Events
 - Festivals/Fairs
 - Meetings
 - Special Events (e.g. homecoming, receptions, etc)
 - Sporting Events

One of the items on the original wish list of features was for users to be able to receive electronic mail about events of interest to them. The calendar application provided a way to associate mailing lists (and electronic mail addresses) with departments, topical groups, and/or interest groups. Discussion began on how to conceptualize those mailing lists. Would they be specially created for the calendar or would they be existing lists? It didn't take long to decide to create new lists because not many lists existed that matched up with calendar groups. The more challenging issue was how to let users know that they could subscribe to these mailing lists to be informed about upcoming events. In August, a technically oriented group came up with three options, excerpted here from electronic mail sent by Ms. Evans. Eventually the second option was chosen.

1. Document for calendar managers what HTML to embed in an event subscription so that users, when viewing that event, can select the link and be taken to a new browser window with the Lyris subscription page open for the list associated with that event. (Concern: How many lists might be associated with an event since lists can be associated with multiple departments, topics, and interest groups. Perhaps the calendar manager could embed links to all applicable lists?)
2. Embed a "subscribe/unsubscribe" link on an HTML wrapper page. The link will go to a page where the list of lists (and their descriptions) associated with the calendar (and extracted from the backend database) will be displayed. The user can then peruse the list of lists and descriptions to select list(s) to which he wants to subscribe or unsubscribe. The program will package the necessary electronic mail messages to Lyris for the [un]subscription. (Concern: Calendar managers could have lists which are not Lyris-based.) (Concern: The list of lists could be very long and, since it would have to be ordered by either list name or list description, finding a list of interest could be difficult.)
3. Embed (if possible) a link to a subscribe/unsubscribe option (as described in 2 above) in the customization of the calendar. (Concern: This would only work if 2 could be made to work.)

By September 2000, UNC Design Services had been asked by University Relations to create the Web pages that would serve as entry points into the events calendar. This would allow the university to add a “UNC look and feel” to the calendar. The College of Arts and Sciences was ready to put the events calendar into production on October 1. UNC had completed the necessary paperwork to buy the application and the vendor was ready to ship it. However, once the application was installed, it had to be configured correctly and undergo testing. Not surprisingly, there were bugs in the software that delayed the planned rollout to Arts and Sciences. It wasn’t until mid-November that the calendar was deemed ready for production use.

Part of UNC’s contract for the application included two days of vendor training on campus. This could not be scheduled until mid-December. A real effort was made to recruit people from all over campus to be trained. An information electronic mail message was sent to everyone who had worked with News Services to publicize events as well as to all campus Webmasters on record. Ms. Evans also used the university organizational chart to identify other organizations that might sponsor events. Interest in publishing events on the calendar was still very high – as of December 1, there were 56 people signed up for the vendor training. A mailing list was created to keep potential publishers informed about calendar news.

After the training, it took another three months to put the calendar into production. A student was hired to thoroughly test and document the application and begin training people on an individual basis to publish events. There were some outstanding technical problems to deal with and last minute discussions about calendar interface. Most of this time was spent customizing the calendar, dealing with policy-based issues, and

promoting the calendar to units that had not yet begun using it. The list of topical and interest groups was also reworked. While the topical groups were simply condensed, the existing list of interest groups was repurposed as potential types of events and a smaller listing of target populations was created to serve as interest groups.

- Topics:
 - Arts (art, music, drama, etc)
 - Athletics and Recreation
 - Diversity
 - Environmental
 - Fundraising
 - Health and Wellness (Alcohol, sex, etc.)
 - International and Global Interests
 - Language
 - Libraries
 - Personal and Professional Development
 - Public Interest
 - Sciences (physics, biology, chemistry, etc)
 - Social Sciences
 - Technology
- Interest Groups:
 - Alumni
 - Carolina Parents
 - Faculty
 - Public
 - Staff
 - Students

The calendar officially went live on April 5, 2001. Since then, a link to the events calendar has been displayed on UNC's homepage. There have been some comments that the link is not prominent enough to attract attention; however, the thousands of hits per week on the calendar belie that idea. The application software has been upgraded twice (with a third upgrade approaching) and still does not allow Kerberos authentication. Despite the occasional inconvenience of a publisher forgetting his or her password, this has not created any major problems yet.

The Research Problem

The purpose of this research is to investigate the process of implementing an online events calendar at a large university and to examine what motivates people to post to it or hinders them from posting to it. Understanding these motivations will assist in increasing awareness and use of the events calendar, which will help improve access to event information at UNC. Part of the difficulty in assessing why people use the calendar is that publicizing events is rarely tied to job performance. Publishing events on the calendar is for most people a means of publicity and communication. If publishers do not believe that the UNC community (and the general public) will go to the events calendar as a source of information, they are much less likely to publish to the calendar.

This paper will also explore the theoretical rationale behind factors in adopting this new technology by examining the events calendar's compatibility with and relative advantage to current computer systems and its complexity relative to the users' level of technical understanding. Rate of adoption of this new technology in a large distributed setting is also of interest because while adoption of the events calendar is *encouraged* at UNC, many published studies examine situations where adoption of a specific technology was *required*. Studying the historical and current usage of the events calendar will inform this body of knowledge about discretionary adoption of technology.

Given what is known about the history of the events calendar, the main question of interest is, why do people adopt or reject publishing events on Carolina Calendar?

Several smaller questions that can impact the individual at Rogers's decision stage are:

- Do the publishers believe that posting their events serves a purpose and is useful to their unit?

- Has training and locally-maintained documentation had an impact on how and if the publishers post to the events calendar?
- Are the publishers experiencing incompatibility between the events calendar application and their Web browser or operating system?

Methods

Event publishers are diverse and come from numerous departments and organizations at UNC. In November of 2002, 230 publishers were invited to complete a Web-based survey that focused on their reasons for posting and not posting to the events calendar. Some Web metrics were also performed in order to determine peak and total usage of the events calendar. The methods are described in detail below.

Population

The publishers are a widely varied group of people and include office assistants, system administrators, communication specialists, and assistant deans. This is to be expected because events are sponsored at all levels of departments and organizations. Most of the professional schools funnel all event publicity through one or two people. Those schools and colleges that do have departments tend to have one or more publishers in each department. Publishers are both male and female and range in age from undergraduates to the nearly retired.

Survey

Conducting a Web-based survey was deemed to be the most appropriate method to uncover people's motivations in choosing to post to the UNC events calendar. The strengths of conducting this survey are:

- Receipt of quantifiable data.
- Opportunity for free-text responses in surveys.

- Easily targeted population (approximately 240 people currently have access to post events.)
- Ease of distribution (all publishers are required to be on a particular mailing list.)
- Ease of receiving results (accessible as soon as a survey is completed.)

The weaknesses of conducting this survey are:

- Possibility of bias by researcher (involved in training the publishers) and publishers (may fear repercussions if their remarks get back to management or not want to be fully honest to the person who trained them.)
- One main group of interest (those who publish to the calendar infrequently or not at all) may not respond to a survey focusing on a piece of technology they rarely use.

The survey focused on publishers. Initial information about the survey was sent to the events_calendar mailing list at UNC. This list is private, which means that new subscribers have to be added by a list administrator. Carolina Calendar technical support staff are also list administrators. Most of the list subscribers publish (or intended to publish) events; however, some belong to the list for other purposes.

While the survey took place, there were 252 people subscribed to the list. Seventeen were subscribed for technical or informational purposes only. People in this group include the campus Webmaster, Web Services, Carolina Calendar technical support and their supervisors, and others who were involved in the original testing of the calendar application. Five others were subscribed because they had previously used the Resource

Manager (a second module related to the calendar, but unrelated to publishing events) but did not have access to publish events. Because these two subgroups were not “publishers” they were excluded from the study, leaving 230 in the study population.

The survey was available on the Internet for two weeks. It was written in HTML and encoded with PHP in order to automatically write the data to a MySQL database. This database resided on a server with strong security and was accessed through secure shell logins. The survey was tested with Internet Explorer and Netscape to ensure that the most commonly used browsers on campus would be compatible with it. It was expected that the vast majority of the publishers would complete the survey during work hours, thus load time was not a factor; however, the survey took less than two seconds to load using the campus network.

Publishers were contacted via an initial mail message to the mailing list on November 7, 2002. The follow-up mail message was sent one week later only to those who had not yet filled out the survey. A final message was sent on November 21 thanking the publishers for their participation and noting that the link would be taken down at noon that day. Survey questions focused on exploring what reasons the publishers had for opting to post or not to post to the events calendar, what kinds of events they posted, and what technical problems they’d encountered. (See Appendix E for the mail messages and survey text.)

Web Metrics

The events calendar is hosted on a system that features an advanced logging program. Web logs were used to determine peak usage times for the events calendar, as well as

data on what calendars are viewed and/or accessed most frequently. There is also data on top browsers used for the events calendar, what domain people are coming from, and how many pages they view within the calendar application. While these logs will provide interesting additional data, they cannot speak to the motivations of the publishers. They can, however, illustrate how often the events calendar is accessed.

There is no way to confirm how often or how frequently a publisher logs into the calendar. While the username of the publisher who posted an event is embedded within the URL of that event, there is unfortunately no way to automate the harvesting of this data. Therefore, it was not included in this study.

Results

Survey

The population for the survey included 230 publishers. Two follow-up messages were returned due to a bad mail address. Four auto-responses were received stating that the addressee had moved to another department or left UNC. Overall, there were 77 responses to the survey (a response rate of 33%.) Of these, there were 72 usable responses and 5 non-usable responses to the survey. 47 people completed the survey in the week after the initial message. 25 completed the survey after the follow-up message was sent. Of the non-usable responses, three noted that another publisher had completed the survey on behalf of the unit and two indicated that the publisher would not fill out the survey because they did not intend to publish to the calendar anymore.

Males comprise 22% of the population and of the respondents. About two-fifths of the respondents answered that they posted their first event on Carolina Calendar over a year ago, while 10% said that they had never published an event. Another 10% are recent adopters, publishing their first event within the last month. (See Appendix E for the survey questions and response percentages.)

Three-fourths of the publishers agreed that posting their events helps to publicize them. This was the most popular reason for publishing. Almost half agreed that it was important to have all of UNC's event information in one location. About a third responded that they posted events because they were told to do so while 10% noted that their supervisor gave them given the publishing duty when the former publisher in their department changed jobs or duties. Write-in answers included:

- “I post events when I am requested to do so by the person responsible for coordinating the event.”
- “I am a unit director and feel obligated to post to the campus calendar.”
- “It's important for scheduling purposes, too. Lets others know about major events so that they don't schedule their events at the same time.”
- “It's a learning institution and if we don't publicize what we have to offer - what's the point??? We're here to serve the college and our community.”

Chi-square analysis suggests a relationship between publishers who said that the calendar helped publicize their event and who said they always posted their events on the calendar. ($X^2 = 4.34$ with 1df, $p < 0.05$.) No statistically significant relationship was found between publishers who claimed to always post their events and publishers who agreed to any of the other reasons on this survey question.

There were a wider variety of reasons why the publishers don't post events to the calendar. Nearly 60% said not every event they sponsored was appropriate for the calendar. Additionally, 15% said that they would have to do double entry to post on the calendar because they maintain a separate Web- or text-based calendar. Two publishers wrote in additional responses that the calendar application was too slow, and two others described it as “cumbersome.” Three mentioned that they received event information from other people in their department and did not always get it in time. Two cited invitation-only events, and one went on to say that putting these events on the calendar would increase the number of attendees beyond the department's capacity, i.e. the calendar would generate too much publicity. Write-in answers included:

- “Some of our events have such a narrow target audience that it is just as effective to advertise via the listservs and mailing lists that our center maintains or posts to.”
- “The Calendar subject/heading doesn't accurately represent our organization.”
- “I posted events when the calendar first went online. It was incredibly cumbersome. Subsequently, I delegated this responsibility to one of my staff.”

Chi-square analysis suggests a relationship between publishers who said that not every event they sponsored was appropriate for the calendar and who did not always post their events on the calendar ($X^2 = 9.73$ with 1df, $p < 0.05$; see Table 1). No statistically significant relationship was found between publishers who claimed to always post their events and publishers who agreed to any of the other reasons on this survey question.

		Do you always post your events to Carolina Calendar?		
		Not checked	Checked	Total
Not every event that we sponsor is appropriate for the calendar.	Not checked	16	15	31
	Checked	35	6	41
	Total	51	21	72

Table 1: Relationship between posting behavior and perceptions of posting appropriateness.

A majority of the publishers had posted events promoting a speaker from both within and without UNC. Nearly 20% said they had posted an exhibit of some kind. Write-in answers included workshops, symposiums, conferences, and receptions.

The most commonly cited problem was being prompted to log in and having that action fail. Write-in answers included comments about the slowness of the application, error messages when trying to submit events, and length of time before the calendar times out on a publisher. Three mentioned that publishing events didn't provide many benefits to their department.

Nearly 70% described the events calendar as very easy or relatively easy to use, while 14% said it was not very easy to use. Chi-square analysis did not suggest a relationship between how people described the calendar's ease of use and whether or not they said they always posted their events on the calendar. Close to 90% were aware of the Frequently Asked Questions About Carolina Calendar document (FAQ) available online; however, only 31% of respondents said they always or sometimes consulted it. Most of the publishers (68%) were trained by Academic Technology and Networks, a department that provides technical support for the events calendar. One in five said a co-worker trained them. Chi-square analysis did not suggest a relationship between those that described the calendar as easy and those that were trained by Carolina Calendar technical support.

Three-fifths of respondents said they used the Internet Explorer Web browser when posting to the calendar; the rest indicated Netscape usage. Nearly all publishers use the Windows operating system – 56% use Windows NT or 2000. Three publishers use the Macintosh OS and one noted Solaris usage. Chi-square analysis did not suggest a

relationship between those that described the calendar as easy and those that use either a particular browser or a particular operating system.

Web Metrics

During the current semester (Fall 2002), there have been over 1000 visitors to the Carolina Calendar Web site per hour between 9:00am and midnight. Usage peaks between 11:00am and noon and between 3:00pm and 5:00pm. Since April of 2001, the Web site has averaged 768,547 hits and 23,100 visitors per month.

Discussion

When it was found that 42% of respondents said they published their first event over a year ago, it seemed that this was a high number and that this pool of publishers was more likely to respond to the survey because they'd had more contact with the calendar and with the researcher as a trainer. However, analysis of the mailing list shows that 71% of publishers were trained over a year ago. There could be several reasons for this wide discrepancy. It may be that some publishers trained over a year ago lost interest in the events calendar and never made the effort to unsubscribe to the mailing list. It may also be that those trained more recently are more "fired up" about the events calendar and full of opinions.

Responses to the survey question pertaining to reasons for publishing events on the calendar suggest that while most publishers recognize that this will generate publicity, not all of them do. One noted that most of their events are for the majors in their department (students) and said, "we don't feel they look at this calendar." Most of those who did not agree that the calendar helped publicize their event said that they posted because the head of their department told them to do so. Write-in answers tended to reinforce a belief in publicity. The relationship found between those who said that the calendar helped publicize their event and those who said they always posted their events on the calendar suggests a future emphasis for training: point out ways in which the events calendar provides publicity, other than just the act of having event information on the Web.

Nearly three-fifths of respondents said that not every event they sponsored was appropriate for the events calendar. This suggests that perhaps the purpose of the calendar

needs to be rethought. It was initially conceived as an academic tool, then a means to publicize events open to the public. During training, publishers are encouraged to put anything at all that their department sponsors on their calendar. Many of them apparently do not do this and still see the calendar as a listing of occurrences open to the public. Some publishers sponsor events so specialized that they either believe the public would not be interested or they don't want the public to attend. This conflicts with the original conception of the events calendar as "one-stop shopping" for everything going on at UNC. If publishers already believe that events on the calendar are really only meant for the general public, then perhaps the calendar should reflect this perception.

The issue of double entry is not as prominent as initially expected; however it is still a problem. Some publishers are willing to post events in several places in order to invite more publicity, while others do not believe that this will generate more publicity or simply do not want the extra work. Because the event entry form on the calendar is set up with a number of fields, existing event information cannot, in most cases, be simply copied and pasted into the events calendar. Until there is an easy way to share events from existing text to the events calendar and from the calendar onto a Web page, it is likely that the double entry issue will persist.

Analysis of types of events posted shows that, as expected, most respondents are publicizing speakers. Only a few indicated that they published departmental meetings or staff training sessions. This may support the idea that most publishers see the events calendar as a tool for publicizing events to the public, not within their department. However, it may also indicate that fewer publishers sponsor those types of events.

Further research into this area could compare types of events sponsored with types of events actually published to the events calendar.

Close to 20% of respondents said they published student organization meetings. This is a little higher than anticipated, although still low when compared with the number of student-oriented events. One reason for this might have to do with calendar structure. Two people have the responsibility for posting all events submitted by official student organizations. Although this could total many events, they are all attributed to one respondent. However, many departments have student-run professional society chapters or other academically oriented groups. The relatively few number of respondents who post these types of events supports an earlier comment that students are not believed to look at the calendar. If events directed at them are not published, this would contraindicate them actually going to the calendar.

About one-third of respondents said they had experienced a problem where they were prompted with a login box, tried to log in, and had that action fail. This could have happened in two ways. Publishers occasionally forget their passwords and will receive an error message if they try to log in with an incorrect password. Usually, however, they write to technical support in this case and are reminded of their correct password. It is more likely that the majority of affirmative respondents to this question experienced time-out difficulties.

As is the case with many applications with a login feature, the events calendar will automatically time out as a security measure. It is believed that this occurs after approximately fifteen minutes, although it has never been determined for certain. After a publisher logs in *and* does not move to a different page in the application after this

amount of time, the calendar will present him or her with a login box to affirm their identity. Unfortunately, due to an ongoing “bug” in the application software, the publisher is never able to log in and has to close their browser and begin again. Several survey respondents mentioned their frustration in being in the middle of entering event information and losing it all. It does not customarily take more than a few minutes to enter event information; however, if a publisher receives a phone call or is asked to work on something else, the time-out is more likely to occur. The only foreseeable solution to this issue is to ask the application vendor to repair the “bug” in a new software version and then have technical support upgrade the application software.

There were also a number of comments about application slowness. This is an unfortunate cycle – the more events posted on a calendar, the longer it will take to fully load. Publishers who use the most active calendars are also the ones who have to experience the longest wait as the application moves from page to page. Because of the problem mentioned earlier with timing out, publishers do not have the option of gradually moving from page to page while completing other tasks in the meantime. This is a performance issue that, again, the vendor will have to address.

Despite these problems, nearly 70% of respondents said that the events calendar was easy to use. This could be one reason why usage of the FAQ seemed low – the publishers rarely need to go to it because they do not have any questions about how to use the calendar. All publishers have the option to be trained by technical support, because all requests to create a new login must come through them. It was expected that those who were trained by technical support would find the calendar easier to use than those who weren't. This was not the case. Those who opted to be trained by another person in their

department also did not cite having a particular problem with a higher frequency than those trained by technical support.

It was interesting to note that while several publishers described in free text problems that they were having using the events calendar on Macintosh computers, of the three that said so, two still said it was very easy or relatively easy to use. There were no comments indicating any incompatibility with the Windows operating system. A comment was made noting an incompatibility with Netscape that is already known. The vendor is currently working on this particular issue.

The sheer number of visitors to the events calendar Web site would suggest that it is a strong method of publicity. What is unknown, however, is whether visitors are successful in finding events. Some will be looking for specific information about an event they've heard about. Some will be looking for events that fall into their areas of interest. Further studies in this area could clarify this issue. This would be useful not only to the UNC campus but also to provide data about how persistent people are in searching for something specific on the Web.

The peaks in calendar visitation occur between 11:00am and noon and again between 3:00 and 5:00pm. This correlates somewhat with results from the Ready for Reference pilot project at the University of Illinois at Urbana-Champaign (6). They found that initiation of live, online reference sessions peaked between 2:00 and 3:00pm and between 5:00 and 6:00pm. However, they did not find a before-lunch peak. This suggests several possibilities. People may be looking for something to do on their lunch hour. They may also simply be browsing the calendar because they are reluctant to begin a new work-related task before they go on lunch break. Although publishers may also favor these time

periods to post events, since posting is a contained task, it is not likely that the relatively small number of publishers contributes much to the large amount of Web traffic.

Conclusions

UNC adopted an online events calendar over a year ago. While it is in use by a number of different departments and organizations, use is not widespread enough to fully represent the depth and breadth of events taking place at UNC. This research aimed to investigate the publishers' motivations for posting to the events calendar and expose any problems they may have had in doing so.

Overall, publishers seem to believe that posting their events on the calendar is useful for publicity purposes. The tendency to publish events is not directly related to how they were trained, nor is it connected with the viewing of documentation. Although publishers occasionally experience technical problems with posting to the events calendar, these problems do not seem to keep them from continuing to publish events.

Limitations and Directions for Future Research

This study examined a single software application that has been in use at a single university for a year and a half. Additional studies might compare adoption of this and other recently implemented applications at the same university or in other educational settings. The survey itself was relatively brief. The number of questions could be increased to better cover a range of issues and questions about the events calendar application. One of the main limitations was the inability to examine how often publishers were logging in and/or posting events. The addition of this logging feature to the application would be very useful.

The greatest problem encountered in this study was eliciting responses from the sub-population of greatest interest – those who have been trained to post but do not. Their

opinions may be underrepresented in this research. It is difficult to encourage people to recapture interest (by responding to a survey) in something in which they have abandoned. But these opinions need to be heard.

Implications

Because in the current situation, people must choose to adopt the events calendar – it is not required of any department or unit – it is most important that the adoption process be made as easy and as problem-free as possible. Training and documentation can help, but there are some technical problems with the events calendar application (loading time and interface) that dissuade a few people from publishing to it. However, this study shows that more people do not publish their events for other reasons, such as disinterest in publicizing their events to a wide range of people or disbelief that the events calendar is an effective tool for publicizing their events.

These reasons for not publishing demonstrate that it might be prudent to reconsider the purpose of the UNC events calendar and how it is promoted to the university community and the public. Future planning sessions should focus on encouraging broader adoption of the events calendar by increasing awareness of its existence. It is hoped that this research will provide sufficient direction in both pursuing that specific goal and in the more general area of technology adoption.

Notes

1. See <http://www.unc.edu/chan/intclim/chapI.htm> for a detailed description of “intellectual climate.”
- 2, 3. See <http://www.unc.edu/chan/intclim/chapIII.htm> for the complete text pertaining to the Task Force’s recommendations on event publicity and complete recommendations for better event publicity.
4. Interested parties were identified in a variety of ways: contacting organizations that were known to sponsor events, browsing UNC’s Web site for event information, and examining the campus organizational chart for likely event sponsors were the main methods used. A number of departments contacted Ms. Evans directly because they had heard about the calendar project from other people. Once the events calendar went live, a link was set up that would let anyone inquire about the calendar and there was occasional publicity in campus publications that included contact information for Carolina Calendar.
5. The Onyen is the Only Name You’ll Ever Need. See https://onyen.unc.edu/cgi-bin/unc_id/services for more information about it.
6. Information about the Ready for Reference pilot project can be found at <http://www.lis.uiuc.edu/~b-sloan/r4r.final.htm>.

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Appendix A: Letter of Support from the Chancellor (April 4, 2001)

April 4, 2001

MEMORANDUM

TO: Vice Chancellors
Cabinet
Deans

FROM: James Moeser

RE: Carolina Calendar

I am pleased to tell you that tomorrow we will launch the Carolina Calendar, the University's official campuswide public events calendar. You can visit the new calendar at <http://www.unc.edu/calendar>, or you can access it off the main university home page.

This calendar is another tangible result of the Chancellor's Report on Intellectual Climate published in 1997. That report urged the creation of a universitywide calendar to illustrate to those within our campus community and far beyond that Carolina is a vital intellectual community. We owe special thanks to Student Body President Brad Matthews for encouraging us to make the calendar a reality and to Vice Chancellor for Information Technology Marian Moore who chaired a committee that planned the new calendar.

The technology employed to create the calendar enables us to have individual calendars for each school, even down to the departmental level. But more importantly, it will feature a master calendar of events with broad interest to the public.

Although the calendar is a work in progress, we need you to begin using it and entering events on it now. A number of people in schools and units across campus have been trained to use the calendar and to enter data, and I ask that you encourage your calendar designee to begin posting events immediately. (If you are not sure who in your school or unit has been trained, please contact Libby Evans at 962-6344 or by email at evans@unc.edu.) Our goal is to have a calendar chock-full of events when we publicly launch the calendar this fall.

I also call your attention to a link on the calendar that enables campus users to provide feedback that will help us continually to make improvements to the calendar.

I thank you and your staffs in advance for making this calendar successful.

Appendix B: Original summary of needs (November 9, 1998)

Campus-Wide Event Calendar Brainstorming Session
Monday November 9, 1998
102 Abernethy

Attendees:

[name], Center for Instructional Technology, Academic Technology and Networks (ATN)
[name], Carolina Union
[name], Instructional Technology Development, ATN
[name], Administrative Information Services
[name], UNC News Services
[name], Instructional Technology Development, ATN
[name], ATN
[name], Academic Affairs Editor, UNC News Services
[name], School of Public Health
[name], ATN

Purpose:

The purpose of the meeting was to brainstorm about what functions a campus-wide events calendar should provide.

General Process:

Evans proposed a general process which seemed agreeable to the group. Today's meeting would be used to brainstorm about what we need in a campus-wide events calendar. After the meeting, the list developed today would be sent out to the same group, as well as to anyone else who might be interested. When the list is as complete as possible, a set of commercial calendar applications which might meet the needs will be identified. Each person in the group (and anyone else who is willing) will be asked to review one or more commercial applications against our list of needs. Evans will provide a standardized checklist reviewers can use. After we determine the extent to which each commercial application meets the needs, we'll discuss whether any of them come close enough to our needs to justify a campus purchase. If not, we'll discuss how to obtain resources to develop our own calendar application.

Follow-Up:

[Name] will send Evans a copy of the document the UNC-CH communicators' group has developed which includes names of other people interested in calendaring applications. (Note: This has been done, and Evans has sent electronic mail to the people listed in the document to let them know to expect notes from our meeting.)

Categories of Features:

Each feature/need has been designated to one or more categories including user needs, publisher needs, system needs, and miscellaneous. The items under each category are listed below.

Publisher Needs:

"Publisher" is any individual or group on campus who is responsible for maintaining a calendar. For example, the Carolina Population Center (seminar series), the Provost's office (academic calendar), the Friday Center (continuing education activities), an instructor (class schedule), a campus club (activities schedule) might each be a publisher. See items below for more information on necessary access and maintenance permissions for publishers.

1) Permissions

- a) Administrative: We need an approval path for each calendar event.
 - i) Publisher will enter event information.
 - ii) Approving unit will receive automatic notification by electronic mail that an event has been submitted for approval and will be responsible for approving the event or for contacting the publisher if disapproved.
 - iii) Campus-wide calendar events will be approved by a central unit, probably UNC News Services (represented at the meeting).
 - iv) Publishers in individual units (departments, research, student groups) will be able to define an internal approval process for themselves. Any event that is entered on the main campus calendar, however must be approved by the central approval unit.
 - v) The approval process may include editing to ensure adequate, clear information.
- b) View Access
 - i) Publishers should be able to specify if there are restrictions on who can view events to prevent frustration from users who find events they cannot attend. Question: How will we determine what users can attend what events? Maintaining a database of users would be a lot of work. We might be able to specify that anyone viewing the calendar from a unc.edu domain can view certain events and users coming from other domains can view certain events (which may be the same or different). Can anyone else add to this?
- c) Add/Change Access
 - i) We need to be able to maintain a list of publishers along with what calendars they are permitted to change (by adding, editing, or removing entries).

- 2) Required Fields. The application needs to be able to require that certain fields are entered before the entry is accepted. The list of required fields may vary by even type. For example, a basketball game might not require the same fields as a concert. What fields will be required will be determined by consensus later. For now, we noted that phone number and name of contact are among those which will be required.

- 3) Categorization of Events. Each event will be grouped into one or more categories such as concert, seminar, workshop, etc. A list of categories will be determined by consensus later for the main campus calendar, but departments and other units may choose to have additional categories for their use.
- 4) Standardization of Input. Pull-down menus for as many fields as possible should be supported. For example, location, date, time, publisher, fee/free are all examples of fields which can be standardized through pull-down menus. In some cases (eg. location), an option for "other" will be included so the publisher can enter a value which isn't on the menus.
- 5) Automatic Archive/Removal of Past Events. Maintenance of the calendar is a major issue for all publishers. The application should allow a publisher to indicate whether an event should be archived or deleted automatically after the event date is over. Archived events might be useful for annual reports.
- 6) Custom Configuration. A publisher should be able to configure the application for the easiest data entry. For example, some publishers may want "archive" to be the default for past events while others may want "delete" to be the default. Some may want a default location to appear for their events. Some may want a URL to always be included for any of their events. The data entry screen should be customizable by each publisher.
- 7) Open Meetings Indicator. Each event can be specified as an "open meeting" and the campus Web page which currently lists all open meetings (required by law) can link to a view of the calendar which displays those meetings. Each unit would be responsible for entering its own open meetings which would then be passed through the campus approval process.
- 8) URLs. The application should allow one or more URLs to be associated with each event for more information.
- 9) Alternative Display Formats. Publishers should be able to format their calendar data for uses other than Web-based display. For example, the academic calendar needs to be printed in a format suitable for the telephone directory. The Gazette needs to have entries in a format that suits its print needs. Some publishers may need to produce electronic copies to distribute to the media or other on- or off-campus users.
- 10) Public Events. Each publisher should be able to specify if an event is "open to the public." Those events can then be used in our outreach efforts with the communities around us.
- 11) Course Information. Instructors (faculty and TAs) should be able to enter class schedules into the calendar. This way class calendar can link (at the instructor's

choice) to relevant event on campus, and academic calendar dates can be easily accessible when the instructor is defining the class calendar.

- 12) Connection to Carolina Union (and other?) Reservation Systems, Part I. There was some interest in having events which are in the Union's reservation system but not in the campus calendar accessible by request. So, a user might ask for a listing of all events in the reservation system and see more than what he or she would see in the calendar. Note: At some point, there will need to be consensus about what publishers are eligible to use the calendar. I'd like to see student groups like clubs have access to enter their events.
- 13) Connection to Carolina Union (and other?) Reservation Systems, Part II. A publisher should be able to request a room reservation for an event. That reservation request is then passed automatically to the proper authority for approval, amendment, or denial.
- 14) Event Registration. Note: This was added by Evans after the meeting. Ideally, the calendar application should permit a publisher to accept registrations for an event via the calendar interface. (If this is agreed upon, we'll need to decide what registration functions will satisfy the need.)

User Needs:

- 1) Forward event via electronic mail. Users should be able to forward an event entry to an individual or group via electronic mail.
- 2) Search. Users should be able to search the calendar by category, location, publisher, date of event, or any other field. Users should be able to use pull down menus to search. The pull down menus will have the same standardized set of values used by the publishers to enter events on the calendar. Users might also be able to search by typing in the first few characters of a word or phrase to see a list of all events matching those characters.
- 3) User Views: Selection. Users should be able to ask to see a subset of the calendar based on event category like seminar, concert, etc.
- 4) User Views: Display. Users should be able to select from several options so that the output is suitable for online display, print, or downloading to another calendar program.
- 5) Automatic Notification of New Event. Users should be able to ask that they be notified when an event matching certain criteria is scheduled. The users would then be notified by electronic mail when an event matching those criteria is scheduled.

- 6) **Reminder of an Event.** A user should be able to ask that she be reminded of an event on the calendar. The system will then send an electronic mail message to remind the user of the event at some specified time interval.
- 7) **Location Maps.** The location of each event in the standard pull-down menu should have a map showing the location associated with it automatically. Locations which are not in the standard pull-down menu can have a map link created by the publisher.
- 8) **Parking Information.** There should be links in the calendar to information about parking.
- 9) **Links Between Calendars.** When a user is viewing an event sponsored by a specific unit, he or she should be able to select a link which will take the user to a view of that unit's specific calendar. For example, if a user selects an event sponsored by the music department, he should be able to select an option which will change the calendar display to the music department's calendar. An option from the specific unit's calendar would return the user to the campus-wide event listing.
- 10) **Customized Printing.** Currently, Student Stores sells a printed calendar called Week-by-Week. It would be helpful if the calendar application would allow a user to customize a print format which is printed on campus and charged to the user as a replacement for the generic Week-by-Week.
- 11) **Sharing Dates with Personal Calendars.** A user should be able to share one or more dates from the campus calendar with her personal calendar through drag and drop, by exporting a group of events, or by clicking the right mouse button and following a menu.
- 12) **Cancellation Notifications.** If a user has asked to be notified or reminded of an event, he should be sent an electronic mail notice if that event is canceled or changed.
- 13) **Default View.** The default view of the calendar for users is "today." The user can easily change from looking at the current day's events to a week's events to a month's events, etc.

System Needs:

- 1) **Standards Compliant.** The calendar application should use non-proprietary data formats which comply with open format standards for calendars.
- 2) **Backend Database.** The calendar should use a database as a backend for the data. The database should be accessible via a standard database query language (SQL) so that the calendar data can be used for customized applications as necessary. For example, we probably want to put "Today's Events" in a prominent location on the UNC-CH

home page. We probably want to put the current week's assignments at the top of a class syllabus.

- 3) HTTP 1.1 Compliant. We want to comply with open standards whenever possible.
- 4) Runs on Unix Platform. For scalability, the application should be available on a Unix platform.
- 5) Search Engine. We need to be sure there is a search engine which can search the calendar and retrieve relevant events.
- 6) Integration with Campus Web Tools. The campus is in the process of identifying tools to make Web site management easier. The calendar application should be appropriately integrated with those tools.

People on the Campus Calendar List:

ATN Center for Instructional Technology (unit mailing list)
 ATN Instructional Technology Development Group (unit mailing list)
 [name], Friday Center for Continuing Education
 [name], Center for Instructional Technology, ATN
 [name], Student Union
 [name], General Alumni Association
 [name], Office of Institutional Effectiveness
 Elizabeth A. Evans, Instructional Technology Development, ATN
 [name], Administrative Information Services
 [name], ATN
 [name], Black Cultural Center
 [name], SunSite, School of Information and Library Science,
 School of Journalism and Mass Communication
 [name], Student Union
 [name], ATN Development and Evaluation
 [name], UNC News Services
 [name], Instructional Technology Development, ATN
 [name], ATN
 [name], Playmakers
 [name], School of Public Health
 [name], University Gazette
 [name], Student Union
 [name], School of Public Health
 [name], Academic Affairs Editor, UNC News Services
 [name], ATN Training
 [name], Student Body Vice President
 [name], ATN Development and Evaluation
 [name], Office of the Provost

Appendix C: Revised List of Needs – February 3, 1999

Campus-Wide Event Calendar List of Functional Needs

Purpose:

The purpose of this group is to define the functions a campus-wide events calendar should provide and to anticipate some of the procedural and policy requirements of a central calendar.

General Process:

The group has spent two meetings brainstorming about what we need in a campus-wide events calendar. Those needs are briefly described below. The next step will be to find a calendar application that meets as many of the needs as possible. During a meeting on Monday December 7, Evans noted that the campus has committed to providing database support using Oracle. In addition to the database management software, Oracle sells licenses to a calendar application which uses an Oracle database. Evans believes there are many reasons for looking closely at the Oracle product before identifying other commercial applications. The group agreed that once Evans has combined notes from the November and December meetings and has sent them by electronic mail to the group, they will review the notes for accuracy and completeness by early January. Evans will then schedule the Oracle representatives to demonstrate their calendar application to this group. If the Oracle software adequately meets the group's needs, we'll move ahead with that application. If not, we'll follow the original plan to identify and evaluate a number of commercial applications.

Categories of Features:

Each feature/need has been designated to one or more categories including user needs, publisher needs, system needs, and process/policy needs. The items under each category are listed below.

Publisher Needs:

"Publisher" is any individual or group on campus who is responsible for maintaining a calendar. For example, the Carolina Population Center (seminar series), the Provost's office (academic calendar), the Friday Center (continuing education activities), an instructor (class schedule), a campus club (activities schedule) might each be a publisher. See items below for more information on necessary access and maintenance permissions for publishers.

1) Permissions

- a) Administrative: We may need an approval path for each calendar event.

- i) Publisher will enter event information.
 - ii) Approving unit will receive automatic notification by electronic mail that an event has been submitted for approval and will be responsible for approving the event or for contacting the publisher if disapproved.
 - iii) Campus-wide calendar events will be approved by a central unit, probably UNC News Services (represented at the meeting).
 - iv) Publishers in individual units (departments, research centers, student groups) will be able to define an internal approval process for themselves.
 - v) The approval process will almost certainly be solely for the purpose of editing to ensure adequate, clear information.
 - vi) [name], ATN, believes that pts groups can be used to set up the proper group permissions. Pts groups are described briefly at <http://www.mit.edu:8001/afs/sipb.mit.edu/project/doc/afs/html/subsection7.3.html>. In addition to creating permissions for users, pts might be used to create permissions for rooms so that the calendar might be able to be used for room reservations in the future. (That isn't our emphasis right now.)
 - b) View Access
 - i) Publishers should be able to specify if an event is open to the general public or only to a specific group. If an event is not open to the general public, anyone who has been authenticated through the central login process can see it, but others cannot.
 - c) Add/Change Access
 - i) We need to be able to maintain a list of publishers along with what calendars they are permitted to change (by adding, editing, or removing entries).
 - ii) Someone associated with each publisher will need to be responsible for maintaining a list of login names (user IDs) which can create and edit calendar entries. For example, [name] of the Student Union will manage the list for all student organizations.
- 2) Required Fields. The application needs to be able to require that certain fields are entered before the entry is accepted. The list of required fields may vary by event type. For example, a basketball game might not require the same fields as a concert. What fields will be required will be determined by consensus later. For now, we recognize that phone number and name of a contact person are among those fields which will be required.
 - 3) Categorization of Events. Each event will be grouped into one or more categories such as concert, seminar, workshop, etc. A list of categories will be determined by consensus later for the main campus calendar, but departments and other units may choose to have additional categories for their use.
 - 4) Standardization of Input. Pull-down menus for as many fields as possible should be supported. For example, location, date, time, publisher, fee/free are all examples of fields which can be standardized through pull-down menus. In some cases (eg. location), an option for "other" will be included so the publisher can enter a value which isn't on the menus.

- 5) Automatic Archive/Removal of Past Events. Maintenance of the calendar is a major issue for all publishers. The application should allow a publisher to indicate whether an event should be archived or deleted automatically after the event date is over. Archived events might be useful for annual reports.
- 6) Custom Configuration. A publisher should be able to configure the application for the easiest data entry. For example, some publishers may want "archive" to be the default for past events while others may want "delete" to be the default. Some may want a default location to appear for their events. Some may want a URL to always be included for any of their events. The data entry screen should be customizable by each publisher.
- 7) Open Meetings Indicator. Each event can be specified as an "open meeting" and the campus Web page which currently lists all open meetings (required by law) can link to a view of the calendar which displays those meetings. Each unit will be responsible for entering its own open meetings.
- 8) URLs. The application should allow one or more URLs to be associated with each event for more information. One URL might be associated with the event itself (for more information) and another URL might be associated with the publisher of the event. Ideally, a publisher could store its URL and have that URL automatically associated with each event it publishes.
- 9) Alternative Display Formats. Publishers should be able to format their calendar data for uses other than Web-based display. For example, the academic calendar needs to be printed in a format suitable for the telephone directory. The Gazette needs to have entries in a format that suits its print needs. Some publishers may need to produce electronic copies to distribute to the media or other on- or off-campus users.
- 10) Public Events. Each publisher should be able to specify if an event is "open to the public." Those events can then be used in our outreach efforts with the communities around us.
- 11) Parking and Transit Information. We need to be able to prompt for information about parking lots on campus which be affected by the event, parking options for participants without parking permits, and any special transit arrangements which have been made (special bus routes, for example). Cost of parking and/or transit options should be included.
- 12) Course Information. Instructors (faculty and TAs) should be able to enter class schedules into the calendar. This way a class calendar can link (at the instructor's choice) to relevant events on campus, and academic calendar dates can be easily accessible when the instructor is defining the class calendar.

- 13) Connection to Carolina Union (and other?) Reservation Systems, Part I. There was some interest in having events which are in the Union's reservation system but not in the campus calendar accessible by request. So, a user might ask for a listing of all events in the reservation system and see more than what he or she would see in the calendar.
- 14) Connection to Carolina Union (and other?) Reservation Systems, Part II. A publisher should be able to request a room reservation for an event. That reservation request is then passed automatically to the proper authority for approval, amendment, or denial.
- 15) Automatic Reminders to Enter Events. We would like to be able to send out automatic reminders for publishers to enter events for the next semester.
- 16) Any group on campus can be a publisher. This includes student groups, staff groups, committees, and other campus units. We are waiting for information from [name] about laws or University policies which may impact this item.
- 17) Selling Tickets. Eventually, some publishers may want to be able to link tickets sales to events listed on the calendar. This is unlikely to be directly tied to the calendar application.
- 18) Event Registration. Ideally, the calendar application should permit a publisher to indicate if registration for an event is required and, if so, the application should be able to accept registrations for the event via the calendar interface.

User Needs:

- 1) Forward event via electronic mail. Users should be able to forward an event entry to one or more electronic mail addresses.
- 2) Search. Users should be able to search the calendar by category, location, publisher, date of event, or any other field. Users should be able to use pull down menus to search. The pull down menus will have the same standardized set of values used by the publishers to enter events on the calendar. Users might also be able to search by typing in the first few characters of a word or phrase to see a list of all events matching those characters.
- 3) Keywords. We would like to be able to assign keywords to events which can be used for searching.
- 4) User Views: Selection. Users should be able to ask to see a subset of the calendar based on event category like seminar, concert, etc. Users should also be able to ask to see a subset of the calendar based on publisher like Playmakers or Department of Music. Users might also want to see all new events related to a keyword or sponsored

- by a publisher. A new event would be one that was added since the user last viewed the calendar.
- 5) User Views: Display. Users should be able to select from several options so that the output is suitable for online display, print, or downloading to another calendar program.
 - 6) Automatic Notification of New Event. Users should be able to ask that they be notified when an event matching certain criteria is scheduled. The users would then be notified by electronic mail when an event matching those criteria is scheduled. This function should be handled by the user's client, not the calendar application.
 - 7) Reminder of an Event. A user should be able to ask that she be reminded of an event on the calendar. The system will then send an electronic mail message to remind the user of the event at some specified time interval. This function should be handled by the user's client, not the calendar application.
 - 8) Location Maps. The location of each event in the standard pull-down menu should have a map showing the location associated with it automatically. Locations which are not in the standard pull-down menu can have a map link created by the publisher.
 - 9) Parking Information. There should be links in the calendar to information about parking.
 - 10) Links Between Calendars. When a user is viewing an event sponsored by a specific unit, he or she should be able to select a link which will take the user to a view of that unit's specific calendar. For example, if a user selects an event sponsored by the music department, he should be able to select an option which will change the calendar display to the music department's calendar. An option from the specific unit's calendar would return the user to the campus- wide event listing.
 - 11) Customized Printing. We need as much flexibility as possible when printing calendars. Users need to be able to print in formats that suit them. Publishers need to be able to print in formats that suit their needs.
 - 12) Large-Scale Events. We need to be able to handle large- scale, multi-day events like the literary festival and the jazz festival.
 - 13) Sharing Dates with Personal Calendars. A user should be able to share one or more dates from the campus calendar with her personal calendar through drag and drop, by exporting a group of events, or by clicking the right mouse button and following a menu.
 - 14) Cancellation Notifications. If a user has asked to be notified or reminded of an event, he should be sent an electronic mail notice if that event is canceled or changed. This function should be performed by the user's client, not by the calendar application.

- 15) Default View. The default view of the calendar for users is "today." The user can easily change from looking at the current day's events to a week's events to a month's events, etc.

System Needs:

- 1) Standards Compliant. The calendar application should use non-proprietary data formats which comply with open format standards for calendars.
- 2) Backend Database. The calendar should use a database as a backend for the data. The database should be accessible via a standard database query language (SQL) so that the calendar data can be used for customized applications as necessary. For example, we probably want to put "Today's Events" in a prominent location on the UNC-CH home page. We probably want to put the current week's assignments at the top of a class syllabus.
- 3) HTTP 1.1 Compliant. We want to comply with open standards whenever possible.
- 4) Runs on Unix Platform. For scalability, the application should be available on a Unix platform.
- 5) Search Engine. We need to be sure there is a search engine which can search the calendar and retrieve relevant events.
- 6) Integration with Campus Web Tools. The campus is in the process of identifying tools to make Web site management easier. The calendar application should be appropriately integrated with those tools.

Process and Policy Needs (Unrelated to Calendar Software)

- 1) There are 379 student organizations on campus. (Reported by [name] of the Student Union.)
- 2) I sent mail to [name] on Friday January 29 asking our questions about selling ads and/or listing sponsors on University Web sites.
- 3) The question remains about what calendars will need to continue being printed in what formats.
- 4) We'll need a marketing plan for the calendar. It won't do us any good to have it available if people (both publishers and users) don't know about it.

- 5) We need to do what we can to ensure that information in the calendar is kept up-to-date.
- 6) We should provide links to other calendars in our geographic area. This can be done outside the functionality of the calendar software, though.
- 7) Long-range information is important for semester-long planning. This will help in collaborative efforts like including events in syllabi, etc.
- 8) We will need to be clear about deadlines for events for University publicity purposes. This should be part of our marketing and PR effort.

Appendix D: Plan of Action – October 17, 1999

From electronic mail sent by Elizabeth Evans:

At the Groveware demo, we decided to ask the rep to demonstrate the next generation of their calendar product to us. He had said, I thought, that the release date was November 4, and we preferred not to install the current product only to want the new product almost immediately. The new product is called Calendar2000. According to Hrair, it will incorporate kerberos for authentication and will also include several other features we consider important.

I've been in contact with Hrair, and unfortunately Calendar2000 isn't ready to be demonstrated. He suggested that we buy the current product, then upgrade to Calendar2000 when it's available.

After much pondering and talking to some folks, I think this is the way we should go *if* we can get kerberos authentication to work with the current product in our environment. So, here's the process that will happen beginning ASAP:

I'll arrange for us to obtain a copy of the current product on a trial basis. We'll have someone install it on a test machine, and see if kerberos authentication works. (For those who haven't been part of the kerberos conversations, this will allow access and permissions for the calendar to be controlled through ATN user names so nobody has to create calendar-specific logins. It does *not* mean you'll have to have a login name to *view* the calendar, of course.)

If kerberos authentication works, we'll buy the current product and install it on a production machine. We'll select a reasonable number of calendar publishers on campus to be part of a pilot phase. If you'd like to be part of that pilot, please let me know. Be prepared to commit to attending some group sessions where we can obtain feedback and try to deal with some policy issues. Being part of the pilot *will* require some time investment on your part, but will get you up and running early.

The pilot phase will let us test some of the areas we were uncertain about like reporting (for print calendar products).

After a short pilot period, we'll reconvene the entire calendar group so everyone can hear what the pilot users have to say. At that point, we'll decide whether the product meets our needs.

If the product *does* meet our needs, I'll submit a 'request for a new ATN service' proposal to the ATN group which deals with such outlining what resources (machine, people, etc) the service will require. I'm going to go ahead and start drafting that document.

Appendix E: Mail Messages to Publishers, Consent Form, and Survey

Recruitment Mail Messages

Initial Message (November 7, 2002) – sent to events_calendar mailing list:

As some of you know, I'm completing my Master's paper this semester. I will be focusing on the events calendar by investigating the implementation process and examining what motivates people to post to it or hinders them from posting to it.

I'd like to ask for your assistance in filling out a short survey. The results of this survey are only for my paper and are entirely separate from my job as technical consultant for the calendar. I am asking for your name at the end of the survey only to track who has responded and who hasn't. I will not pass on your responses to anyone else without your permission.

Here's the link to the survey: <http://ils.unc.edu/~nassk/survey/>

I really appreciate your assistance and will be happy to answer any questions you may have about this.

Sincerely,
Ryn Nasser

Follow-Up Message (November 13, 2002) – sent individually to non-respondents:

I sent email last week regarding research that I'm doing on the events calendar. I'm asking the publishers to express some opinions about the events calendar, specifically on what motivates people to post to it or hinders them from posting to it. Please note that if you are not currently using the calendar, I would still like to hear from you. Finding out why people *don't* use the calendar is one of the main reasons for this survey.

As of today, I have not received your responses. Your insights about the events calendar would be very valuable to me and I hope that you have a few minutes to complete the survey located at <http://ils.unc.edu/~nassk/survey/>.

Thank you very much for your help!

Sincerely,
Ryn Nasser

Consent Form

Project Title: Why Do People Use or Not Use Carolina Calendar?

The general purpose of this research is to investigate the process of implementing an online events calendar and to examine what motivates people to post to it or hinders them from posting to it.

Please complete the survey on the following page. It is expected that you will be able to complete this survey within a few minutes.

All data collected in this survey will be confidential. You will be asked for your name in order to track who has responded and who hasn't. Your name will not be associated with your answers anywhere in papers and/or publications resulting from this research. Only the principal investigator and the faculty advisor will have access to the data. You are free to refuse to participate or to withdraw from this research activity at any time without penalty and without jeopardy.

The Principal Investigator (Ryn Nasser, knasser@email.unc.edu) and/or Faculty Advisor (Barbara Wildemuth, wildem@ils.unc.edu) may be contacted if you have any further questions about the study. You may contact Barbara Davis Goldman, Chair of the UNC-CH Academic Affairs Institutional Review Board (aa-irb@unc.edu) at any time during this study if you have questions or concerns about your rights as a research participant.

Online Survey (including variables)

How Do You Use Carolina Calendar?

Please choose one answer to each question unless otherwise specified. If you encounter any difficulty filling out this survey, please send email to knasser@email.unc.edu.

1. When did you post your first event on Carolina Calendar? (Please choose the most accurate description.) (FIRST_EVENT)

- 9.7%** Within the last month.
- 23.6%** Within the last six months.
- 15.3%** Within the last year.
- 41.7%** At least a year ago.
- 9.7%** Never.

2. After you schedule an event, when do you usually post it to Carolina Calendar? (WHEN_POST)

- 47.2%** Right away.
- 37.5%** When I remember to.
- 15.3%** Never.

3. Do you always post your events to Carolina Calendar? (IF_POST)

- 29.2%** Yes.
- 70.8%** No.

4. What are your main reasons for posting to Carolina Calendar? Check all that apply.

- 73.6%** It helps publicize my events. (YES_REASONS_1)
- 36.1%** I was told to do so by the head of my department or organization. (YES_REASONS_2)
- 9.7%** The person who used to post events changed jobs or left and passed the duty on to me. (YES_REASONS_3)
- 47.2%** It is important to have all of the University's event information in one central location. (YES_REASONS_4)

If you have another reason, please enter it here: (YES_REASONS_MORE)
(**12.5%** responded)

5. If you post every one of your events to Carolina Calendar, please skip to question number 6. If not, what are your main reasons for not always posting to Carolina Calendar? Check all that apply.

56.9% Not every event that we sponsor is appropriate for the calendar.
(NO_REASONS_1)

15.3% I would have to do double-entry to post on the calendar because I maintain a separate Web-based or text calendar. (NO_REASONS_2)

8.3% I have trouble remembering how to post to the calendar. (NO_REASONS_3)

9.7% I understand how to post to the calendar, but I often have problems when trying to do so. (NO_REASONS_4)

15.3% I sometimes forget about posting to the calendar. (NO_REASONS_5)

5.6% Putting my unit's events on the calendar provides no benefit to my unit.
(NO_REASONS_6)

5.6% Putting my unit's events on the calendar provides no benefit to the University.
(NO_REASONS_7)

If you have another reason or reasons, please enter them here:

(NO_REASONS_MORE)

(34.7% responded)

6. Please indicate whether you personally have posted events on your unit calendar of the types indicated below. Check all that apply.

55.6% Speaker, reader, or lecturer from your unit. (TYPES1)

47.2% Speaker, reader, or lecturer from outside your unit but from UNC. (TYPES2)

61.1% Speaker, reader, or lecturer from outside UNC. (TYPES3)

16.7% Student organization meeting. (TYPES4)

5.6% Departmental meeting. (TYPES5)

9.7% Deadline of any kind. (TYPES6)

5.6% Staff training session. (TYPES7)

19.4% Exhibit. (TYPES8)

12.5% Film or artistic performance. (TYPES9)

If you have posted events of a type or types not indicated above, please enter the types of events here: (MORE_TYPES)

(19.4% responded)

7. Have you ever experienced any of the following problems when entering events?
Check all that apply.

33.3% I was prompted to enter my username and password again and when I did so, I got an error message and had to start over. (PROBLEMS1)

16.7% I added my event information but then couldn't find the event on the calendar. (PROBLEMS2)

9.7% When I tried to go to the calendar, it wouldn't come up. (PROBLEMS3)

20.8% I thought I posted an event to the Master calendar but it wasn't there. (PROBLEMS4)

If you have experienced other problems, please enter them here (be as specific as you can): (MORE_PROBS)
(**23.6%** responded)

8. Do you consider the calendar easy to use (for adding events)? (EASY)

22.2% Yes, very easy.

47.2% Yes, it's relatively easy.

16.7% Neither easy nor difficult.

13.9% No, not easy.

0.0% No, it's very difficult to use.

9. How often do you consult the Publishers' FAQ (online documentation) when you have a question or a problem? (FAQ)

8.3% Always.

22.2% Sometimes.

33.3% Rarely.

22.2% Never, but I knew it existed.

13.9% I didn't know there was a FAQ!

10. How were you trained to use the calendar? (TRAINED)

68.1% I was trained by Ryn Nasser and/or Libby Evans.

22.2% I was trained by someone from my department.

9.7% I was not trained by someone to use the calendar – I figured it out myself.

11. Which Internet browser do you most often use when posting events to the calendar?
(BROWSER)

60.6% Internet Explorer

39.4% Netscape

0.0% Other - please specify: (BROWSER_OTHER)

Please enter your version number, if you know it: (BROWSER_VERSION)
(**12.5%** responded)

12. What operating system are you generally using when posting to the calendar? (OS)

32.4% Windows 95/98/ME

56.3% Windows NT/2000

5.6% Windows XP

4.2% Macintosh

0.0% Linux

1.4% Other - please specify: (OS_OTHER)

If you have more specific information about your operating system version number, please enter it: (OS_VERSION)
(**1.4%** responded)

Please enter your name. This is required so that people who haven't completed the survey can be contacted.

*First Name: (FIRST_NAME)

*Last Name: (LAST_NAME)

Press Submit to send your answers or press Reset to clear the form and start over.