Sparrow Web: Group-Writable Information on Structured Web Pages

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ABSTRACT
Sparrow Web is a server-based software tool that supports the creation and customization of group-writable Web pages. Templates in each page define the data schema and layout of that page’s group-editable data items. Using different templates, page authors produce Web pages that support many tasks, including task lists, co-authored documents, bibliographies, home pages, faculty directories, and project lists. While lacking the rich UI of dedicated information-sharing applications, it is successful at supporting a variety of groups and tasks because it integrates information-sharing into Web pages, leveraging the affordances of the Web for supporting group work.

Keywords
Group-writable Web pages, item templates, shared documents, discussion servers, computer supported cooperative work, web-based collaboration, groupware

INTRODUCTION
Many systems support group work by allowing members to view and modify shared information from their workstations. These systems include online bulletin boards (e.g. ezboard.com), task lists [2], shared documents [1], co-authored reports [4], and discussion servers [7]. Such shared information provides group context that is needed to start tasks, coordinate group activities, aid asynchronous brainstorming, and provide a record of group activities. Any collaborative project may require sharing several kinds of information. So, a team may install several software tools, each managing a different information type. This approach has some problems: (1) Each tool requires installation and training; deploying several can require lots of work. (2) Many groupware tools work only if adopted by a critical mass of users [5], but any individual user will be reluctant to go first. (3) Often a tool will run in its own window. As more tools are used, users must manage scarce screen space and copy content between applications.

We have built an alternative: a single tool that supports groups in sharing many information types and that is easy to customize to new types. Sparrow Web, a new version of Sparrow [3], is a server-based software tool (a Java servlet) that supports the creation and customization of group-writable Web pages. Templates in each page define the data schema and layout for group-editable items on that page. We abbreviate Sparrow Web as SpW.

SpW addresses the three issues above: Its Web pages are based on customizable templates, so that any number of information-sharing applications can be deployed once its server-side software is installed. The UIs of the resulting applications have a similar feel, so users require little training to use new applications. Some of its applications are useful for small groups or even individual users, so adoption of the technology need not wait for a critical mass of users. Finally, because these applications are available in a Web browser, they don’t require additional windows.

These applications inherit the affordances of regular Web pages as follows: An application page can be linked from other Web pages and can link to other pages. Data can be laid out using HTML formatting, including pictures, tables, lists, fonts, and colors. Applications can be added anywhere on existing Web pages, so any Web content can be used as context for the application; users switch to the application by scrolling to the correct part of the page. Multiple applications can be placed on the same page. Existing Web pages that have items in a list or table can be automatically converted to SpW pages, where each item becomes group-writable. Application information can be indexed and searched using an off-the-shelf enterprise search engine. Application information can be backed up just by saving files, with no need to maintain a database. Finally, modern Web servers can deliver the application pages to thousands of users per day.

To ensure broad availability, SpW requires neither Java nor JavaScript support by browsers. Interaction with its pages uses HTML forms. Of course, building information sharing tools out of Web pages and HTML forms has disadvantages when compared to standalone applications: The UI cannot make use of direct manipulation interaction. Each change to a page requires a round-trip communication between the browser and the server, which can result in delays over slow networks.
links. Text must be edited using the simple text editors available in browsers.

Nonetheless, our research indicates that the benefits of a single customizable groupware system, with the affordances of a set of Web pages, can outweigh the benefits of a set of full-featured standalone groupware applications [8]. Defining a variety of different templates, users produce Web pages that support many group tasks, including shared task lists, co-authored documents, catalogs, bibliographies, home pages, faculty directories, and project lists.

THE SPARROW WEB USER INTERFACE
SpW allows group members to modify and add items to a Web page. We call such users contributors. Someone who creates and manages pages is a page author. Page authors can make more fundamental changes to the page, including changing the schema and layout of data items, and changing the overall layout of the page. These changes can be made even while a page remains editable by contributors.

User Interface Projects

- Click a black triangle to edit an item.
- Ensure all services handle multi-file I/O [jplang 11/9/00]
- ✓ Build a UI showing multi-file results [cbur 12/19/00]
- Ensure all services handle large files [jplang 11/9/00]

Figure 1. A simple task list.

A SpW page often consists of lists of formatted items, such as the User Interface Projects task list shown in Figure 1. Each editable item has a small image button associated with it, such as the black triangles in this example. Clicking the button causes the associated item to be temporarily replaced in the user’s browser with a dialog box that allows the user to edit the contents of the item. When the edit is complete, clicking the OK button causes the list to be re-displayed with new content for the modified item.

The plus button (+) appears below the list of items in this example. Clicking this button causes a dialog box to appear to allow the user to enter content for a new item.

The Control Panel button, shown at the bottom of Figure 1, is replaced with a dialog box when clicked. This dialog exposes some of the advanced functionality of SpW. A button appears for each template in the page, allowing the user to edit the template definition for its items. The user can also edit the content of all items, edit overall layout, or make a copy of the page.

RELATED WORK
SpW is not a complete groupware application, but an information-sharing component that can be used as part of group work. It brings the advantages of Web pages to group tasks like task lists, organizational memory, team home pages, event announcements, bibliographies, and shared reports. In addition to the systems cited in the Introduction, SpW is related to tools for building Web-based applications, such as Zope [6]. It differs from these in that new applications can generally be built without programming, by modifying templates. It is also related to shared Web page tools like Wiki [7], but differs in that the data layout and schema is specified by the page author, so contributors ignore issues of layout and focus on content. It also differs in that contributors edit a single item at a time, so they are not distracted by the content of other items nor at risk of modifying other items unintentionally.

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REFERENCES