

# Suffr: Democratic Control of Computing Infrastructure

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## ABSTRACT

Suffr uses Wiki to facilitate corporate governance. Suffr allows a group's members to administer a computer system and its information resources collectively.

## Categories and Subject Descriptors

H.5.3 [Information Interfaces and Presentation]: Group and Organization Interfaces – *Web-based interaction; Computer-supported cooperative work.*

## General Terms

Management, Security, Human Factors.

## Keywords

Wiki, Groups, Boards, Committees, System Administration.

## 1. INTRODUCTION

Groups of people work together on shared projects. They might use a Wiki to collect and organize their notes, minutes, plans, and publications. They might also use other centralized facilities such as database servers, shared file systems, and networks.

To coordinate their efforts, groups often establish formal governance structures—memberships, boards, committees, and offices. Suffr helps them extend formal governance to the computer system(s) that host their work.

Groups appoint executives and/or officers to implement their decisions; they in turn have a central role in managing the group's information and computers. In particular, systems administrators, individuals or in small teams, use unfettered access to perform technical tasks.

Great trust is placed in the people fulfilling these roles, and this trust is occasionally abused with devastating results. They are single points of weakness, or choke points in accountability.

Suffr aligns computer security privileges to the governance structure of an organization. It ensures the widest possible control remains with the widest possible constituency.

The name Suffr is derived from “Suffrage”, a term describing the right to vote.

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## 2. Suffr

Using Suffr, group members author, review, and approve system administration 'recipes'. Recipes are Wiki topics that have administration-specific Wiki directives and documentation interleaved. Recipes may deal with start-up tasks, configuration, security and logging, or application matters.

To write these recipes, Suffr offers a series of Wiki directives such as:

```
(:command arguments:)  
- invokes an executable.  
(:rcfile filename:)...(:rcfile:)  
- emits or updates a configuration file.  
(:pagesignature:)  
- offers a page signature link to authenticated users.  
(:depends-on recipename:)  
- prevents action until another recipe is processed.  
(:log:)  
- stores the error output of a directive.
```

The Suffr programming must run under a privileged process, through *setuid*[1] or another privilege escalation mechanism.

Suffr requires users to sign off on recipes that they approve of, via authentication and clicking the “pagesignature” UI link. When approved by a majority of users, Suffr follows the recipe's directives. It installs updated system configuration files, and extracts and runs commands or scripts to perform administration tasks.

Fundamental changes to the system do not occur until a majority of the user base approves them. System control closely tracks the group's policy development that governs information technology.

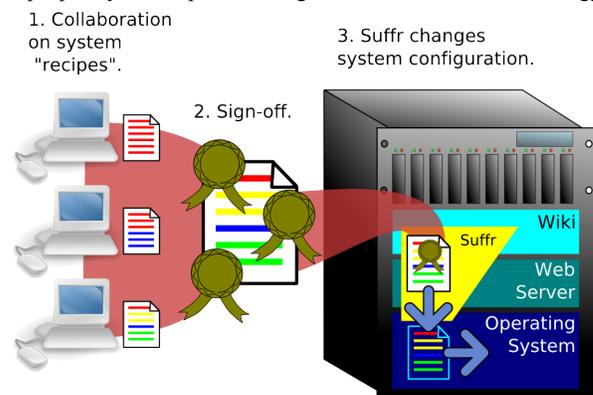


Figure 1: Suffr workflow

As currently implemented, Suffr is a plug-in for PmWiki[2]. It is licensed under the GPL. More information is available at [3].

### 3. DESIGN & ISSUES

Suffr was conceived in response to issues in group collaboration.

- Is a Wiki truly “open” when system administrators and executives have the ability to alter topics at the text file or database level *and* bypass any audit trail?
- Are contributors disheartened or dissuaded from contributing when they hear tales or see evidence of suppression of their work by moderators, administrators, or executives?
- Do ethical moderators or administrators have the effective power to impede executives seeking to misuse electronic resources? Likewise, do executives retain the privileges necessary to rein in administrators in crisis situations?

#### 3.1 Suffr and System Administration

Even users with administrative privileges within an application (e.g. moderators within a forum hosted on a web hosting provider's server) have little real power if others have administrative privileges in the underlying computer system.

It becomes evident that true control is available to those who administer the computer system itself. They may be officers acting within a duty to the group, or contractors only partially beholden to the organization.

Groups that wish to maintain control of their computers must ensure that “root”, the ultimate administrator privilege, is available to them through a convenient collaboration environment. Suffr leverages the Wiki that group members are already using to perform systems administration.

Traditional interactive systems administration and utility scripting are language-driven activities. The fundamental parsing and composition skills needed for (traditional) Wiki authoring and command composition/shell scripting are much the same.

A Wiki with Suffr can collect and control system administration directives at the system level, from within the Wiki. No one delegate or contractor needs unrestrained control at the system level.

Suffr can perform limited delegation by actually managing the operating system's user database. Limited accounts for traditional administrators allow quick response without giving up full control.

#### 3.2 Suffr and IT Governance

Once the group has secured administration privileges to itself, it can directly implement its corporate IT policy.

Suffr can ensure correct and complete logging of all officers' work, by actually enabling and tailoring logging processes.

Suffr even allows for its own management. Removing a user's profile from the Suffr Wiki, perhaps by disabling or deleting the profile file, is itself a Suffr activity.

#### 3.3 Suffr and Corporate Governance

Suffr enables the group to perform activities previously relegated to officers or delegates, who acted on trust and who occasionally betrayed trust.

The time-consuming formality of rules of order, normally managed by a chair or president, are replaced by Wiki-specific methods: pressing issues can be brought to light and prioritized by syndication or other forms of automatic notification.

Suffr facilitates financial or commercial transactions by actually performing online API calls. Groups can write Suffr recipes to enact transactions using online service providers' APIs. When enough signatures are collected, Suffr performs the transactions autonomously. There remains little need for “signing authority” and the risks or inconvenience it implies.

#### 3.4 Issues

Suffr raises some issues:

- Despite new technologies and conventions (Plug 'n' Play hardware configuration and networking, executables with simple command structures and complete-word options), system administration is still challenging. Is maintaining collective control worth the extra complexity and learning curve for member users?
- To be seamless, Suffr control must be established early in the boot process, before any production web server or Wiki has been initialized. How early in the boot process can Suffr control be made available? Hardware design changes would ultimately be necessary to plug any final holes: elimination of keyboard/display functionality, for example.

### 4. DEMONSTRATION

Three volunteers use Suffr to perform typical systems administration tasks.

- Members reconfigure a web server to adjust logging information.
- They install new software.
- They grant selected administrative access to a named administrator.
- Finally, they shut down the computer system.

The demonstration shows the read-edit-write-approve cycle of Suffr administration, the Wiki markup used to author administration tasks and information, and the similarities and differences between terminal access and web-based Suffr administration.

The audience sees a working proof-of-concept implementation, and retains familiarity with a Wiki-based solution to a commonplace technical governance problem.

### 5. References

- [1] <http://en.wikipedia.org/wiki/Setuid>.
- [2] Michaud, Patrick. <http://www.pmwiki.org>.
- [3] <http://www.suffr.info>.