

# What I've Learned About Information Management

...

(from Google and other places)  
Mark Tomczak, Software Engineer

# About Myself

Software Engineer for 10 years

4 years at a game development company (Sim Ops Studios, creators of Wild Pockets game development framework)

6 years at Google

Small collection of side- and hobby-projects ([github.com/fixermark](https://github.com/fixermark) , <http://fixermark.com>)



# Disclaimer

Views and opinions expressed are mine and not necessarily my employer's.

Information is  
most useful  
when

Public (as possible)  
Searchable  
Auditable  
Collaborative

---

# Public (as possible)

Minimizes "bus factor" of  
information

Decreases likelihood of  
misunderstandings

Decreases likelihood of  
duplicated effort

Easier to keep everyone  
\_\_\_ on the same page

# Searchable

"If it can't be searched, how can it be found when needed?"

Only so much we can hold  
in our heads

Needs change over time

Creators of information  
don't always know who  
will consume  
information

---

# Types of Search

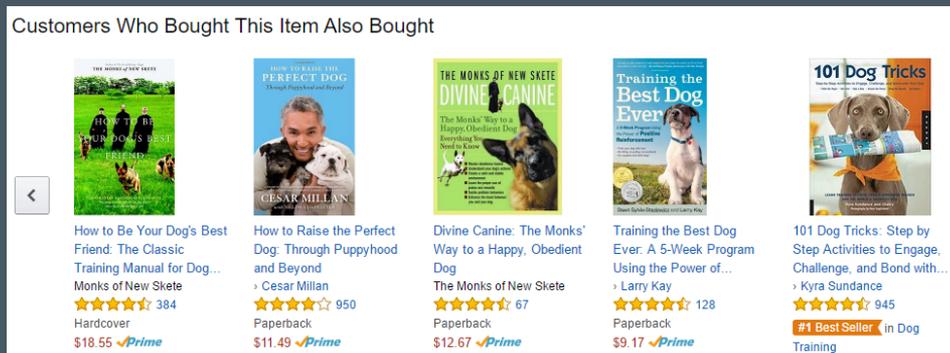
Keyword

Curated

Human ("welcome to my list!")

Automatic ("Others like you found this useful")

Customers Who Bought This Item Also Bought



The screenshot shows five book covers with their respective titles, authors, ratings, and prices. A left arrow is visible on the far left.

Book Title	Author	Rating	Price	Prime
How to Be Your Dog's Best Friend: The Classic Training Manual for Dog Owners	Monks of New Skete	★★★★☆ 384	\$18.55	✓
How to Raise the Perfect Dog: Through Puppyhood and Beyond	Cesar Millan	★★★★☆ 950	\$11.49	✓
Divine Canine: The Monks' Way to a Happy, Obedient Dog	The Monks of New Skete	★★★★☆ 67	\$12.67	✓
Training the Best Dog Ever: A 5-Week Program Using the Power of...	Larry Kay	★★★★☆ 128	\$9.17	✓
101 Dog Tricks: Step by Step Activities to Engage, Challenge, and Bond with...	Kyra Sundance	★★★★☆ 945	#1 Best Seller in Dog Training	

# If you can name it, you can find it

Useful resources should have an associated URL

Web pages

Docs

Dashboards and control panels

# If you can name it, you can find it

## Sharing knowledge made easier by URLs

Dashboards and tools can be embedded directly into document via links

Aggregate links into "Here is what you need to know to do this task"

*... and then changes to the linked  
linking document*

### Standard Procedure for Software Update

(last updated: 2016-05-15)

1. Confirm change is in testing version [[test version link](#)]
2. Verify tests are green [[current test status](#)]
3. Notify team we're starting the update [[group mailing list](#)]
4. Start the update [[update control panel](#)]
5. Manually monitor for issues [[key metrics dashboard](#)]
6. Confirm rollout is 100% complete [[rollout status panel](#)]
7. Finalize the update [[update control panel](#)]

# Auditable

Products have history

History is context  
("Why?")

"Who" sometimes matters

The more automatic, the  
better

---

# Example: Source Control

Every change records history

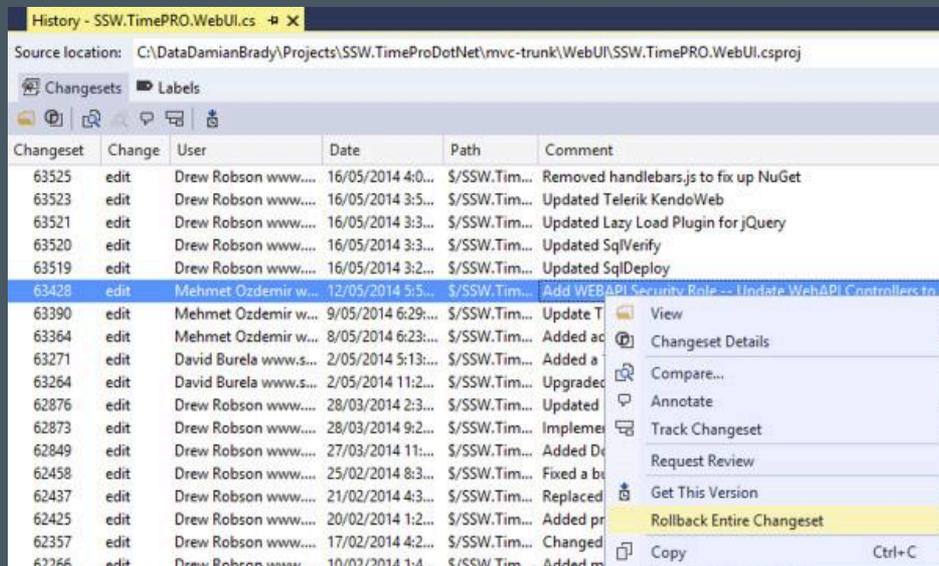
History is searchable (keyword and author)

Can record parallel histories (branches)

Need not be centralized (mercurial, git)

*Storage is cheap*

Good for documents as well as



History - SSW.TimePRO.WebUI.cs # X

Source location: C:\DataDamianBrady\Projects\SSW.TimeProDotNet\mvc-trunk\WebUI\SSW.TimePRO.WebUI.csproj

Changesets Labels

Changeset	Change	User	Date	Path	Comment
63525	edit	Drew Robson www....	16/05/2014 4:0...	\$/SSW.Tim...	Removed handlebars.js to fix up NuGet
63523	edit	Drew Robson www....	16/05/2014 3:5...	\$/SSW.Tim...	Updated Telerik KendoWeb
63521	edit	Drew Robson www....	16/05/2014 3:3...	\$/SSW.Tim...	Updated Lazy Load Plugin for jQuery
63520	edit	Drew Robson www....	16/05/2014 3:3...	\$/SSW.Tim...	Updated SqlVerify
63519	edit	Drew Robson www....	16/05/2014 3:2...	\$/SSW.Tim...	Updated SqlDeploy
63428	edit	Mehmet Ozdemir w...	12/05/2014 5:5...	\$/SSW.Tim...	Add WEB API Security Role -- Update WebAPI Controllers to
63390	edit	Mehmet Ozdemir w...	9/05/2014 6:29...	\$/SSW.Tim...	Update T
63364	edit	Mehmet Ozdemir w...	8/05/2014 6:23...	\$/SSW.Tim...	Added ac
63271	edit	David Burela www.s...	2/05/2014 5:13...	\$/SSW.Tim...	Added a
63264	edit	David Burela www.s...	2/05/2014 11:2...	\$/SSW.Tim...	Upgraded
62876	edit	Drew Robson www....	28/03/2014 2:3...	\$/SSW.Tim...	Updated
62873	edit	Drew Robson www....	28/03/2014 9:2...	\$/SSW.Tim...	Impleme
62849	edit	Drew Robson www....	27/03/2014 11:...	\$/SSW.Tim...	Added D
62458	edit	Drew Robson www....	25/02/2014 8:3...	\$/SSW.Tim...	Fixed a b
62437	edit	Drew Robson www....	21/02/2014 4:3...	\$/SSW.Tim...	Replaced
62425	edit	Drew Robson www....	20/02/2014 1:2...	\$/SSW.Tim...	Added pr
62357	edit	Drew Robson www....	17/02/2014 4:2...	\$/SSW.Tim...	Changed
62266	edit	Drew Robson www....	10/02/2014 1:4...	\$/SSW.Tim...	Added m

View  
Changeset Details  
Compare...  
Annotate  
Track Changeset  
Request Review  
Get This Version  
Rollback Entire Changeset  
Copy Ctrl+C

# Collaborative

Everyone who works on a resource should be able to work on the *same* resource

Solving this problem minimizes geography

---

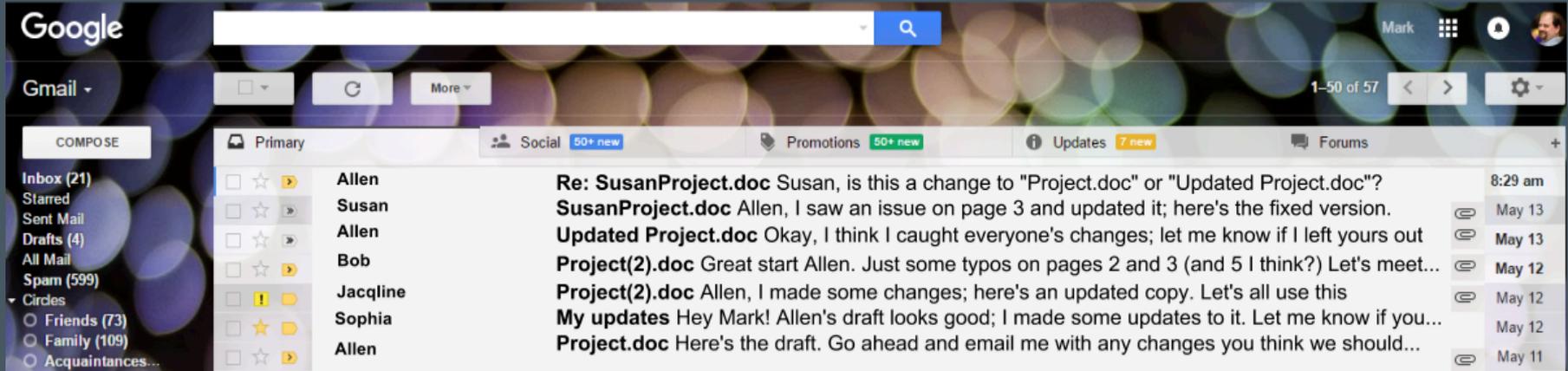
# Collaboration is not copies

Computers are *very* good at making copies; sharing takes more work

Synchronization

History

Real-time communication



# Collaboration is shared state

Version control

Google docs and  
spreadsheets

Hangouts



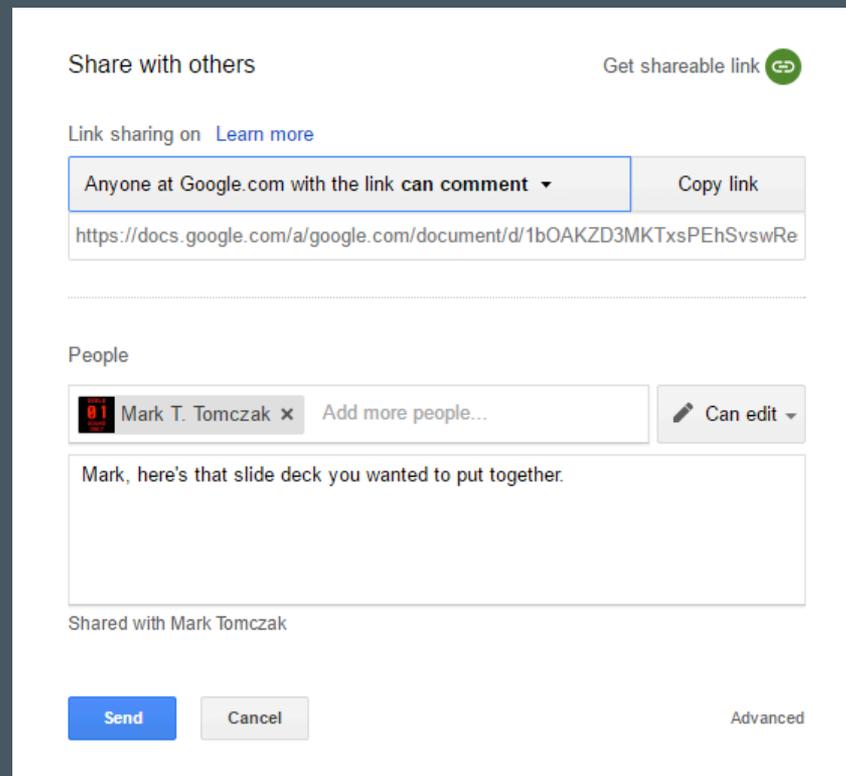
# Examples

# Example: Google Drive Document Sharing

Public

Access control by  
document owner

Docs can be shared to  
small group, publicly, or  
domain-wide



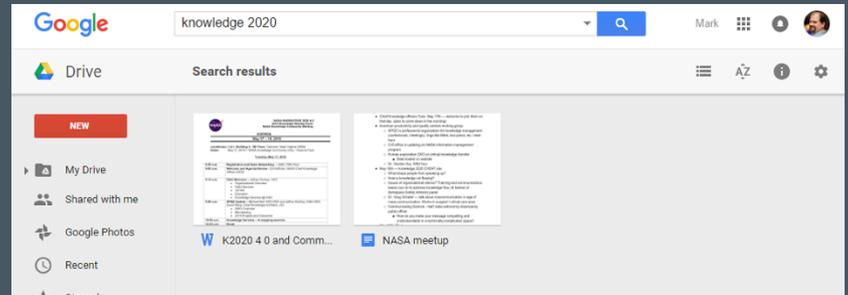
The screenshot shows the 'Share with others' dialog box in Google Drive. At the top right, there is a 'Get shareable link' button with a green link icon. Below this, the text 'Link sharing on' is followed by a blue link 'Learn more'. A dropdown menu is open, showing the sharing permission 'Anyone at Google.com with the link can comment' with a downward arrow. To the right of the dropdown is a 'Copy link' button. Below the dropdown, the shareable link 'https://docs.google.com/a/google.com/document/d/1bOAKZD3MKTxsPEhSvswRe' is displayed. A horizontal dotted line separates the link section from the 'People' section. In the 'People' section, there is a search bar containing 'Mark T. Tomczak' with a red 'x' icon and a plus icon, followed by the text 'Add more people...'. To the right of the search bar is a 'Can edit' button with a pencil icon and a downward arrow. Below the search bar is a text area containing the message 'Mark, here's that slide deck you wanted to put together.' At the bottom of the dialog, there is a 'Send' button, a 'Cancel' button, and the text 'Shared with Mark Tomczak'. In the bottom right corner, there is an 'Advanced' link.

# Example: Google Drive Document Sharing

Searchable

Can search all docs you have access to (or all docs in your organization)

Searchability can be configured by doc owner

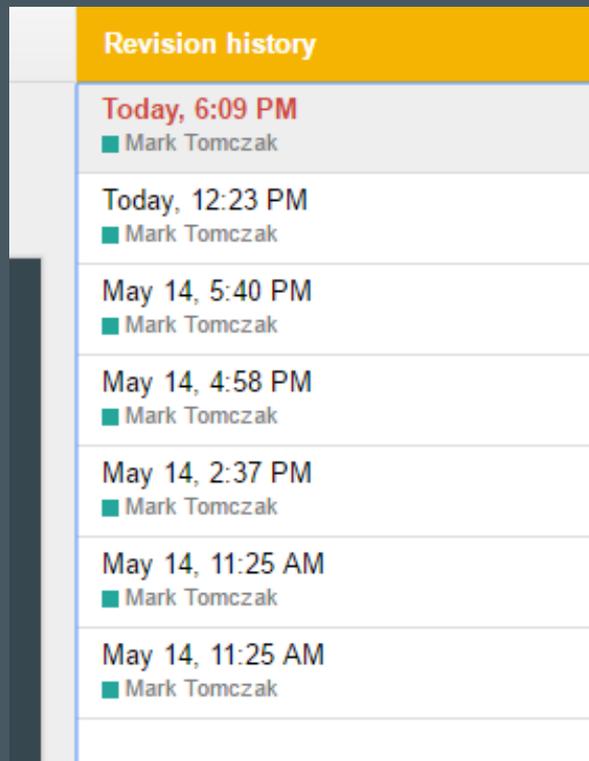


# Example: Google Drive Document Sharing

Auditable

Docs have a history of edits

Spreadsheets can be set to  
notify you if they are  
changed

A screenshot of the 'Revision history' panel in Google Drive. The panel has a yellow header with the text 'Revision history'. Below the header, there is a list of revisions. Each revision entry consists of a timestamp and a user name, preceded by a small teal square icon. The revisions are listed in chronological order from top to bottom.

Revision history	
Today, 6:09 PM	Mark Tomczak
Today, 12:23 PM	Mark Tomczak
May 14, 5:40 PM	Mark Tomczak
May 14, 4:58 PM	Mark Tomczak
May 14, 2:37 PM	Mark Tomczak
May 14, 11:25 AM	Mark Tomczak
May 14, 11:25 AM	Mark Tomczak

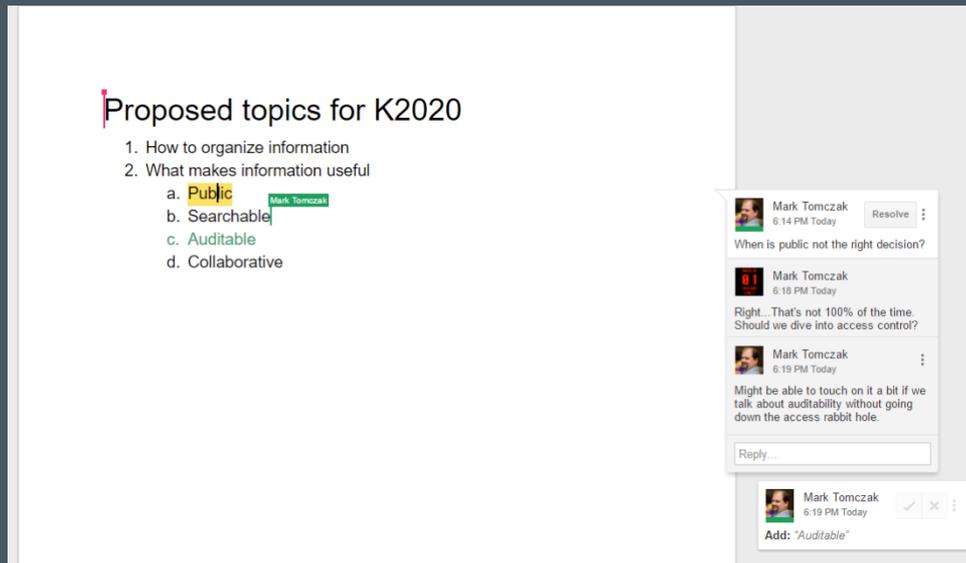
# Example: Google Drive Document Sharing

Collaborative

All docs can be edited  
simultaneously

Changes are reflected in  
real time on all users'  
machines

Everyone edits the same  
copy



The screenshot displays a Google Drive document titled "Proposed topics for K2020". The document content is as follows:

- 1. How to organize information
- 2. What makes information useful
  - a. Public
  - b. Searchable
  - c. Auditable
  - d. Collaborative

On the right side, there is a comment thread:

- Mark Tomczak (6:14 PM Today): "When is public not the right decision?"
- Mark Tomczak (6:18 PM Today): "Right... That's not 100% of the time. Should we dive into access control?"
- Mark Tomczak (6:19 PM Today): "Might be able to touch on it a bit if we talk about auditability without going down the access rabbit hole."

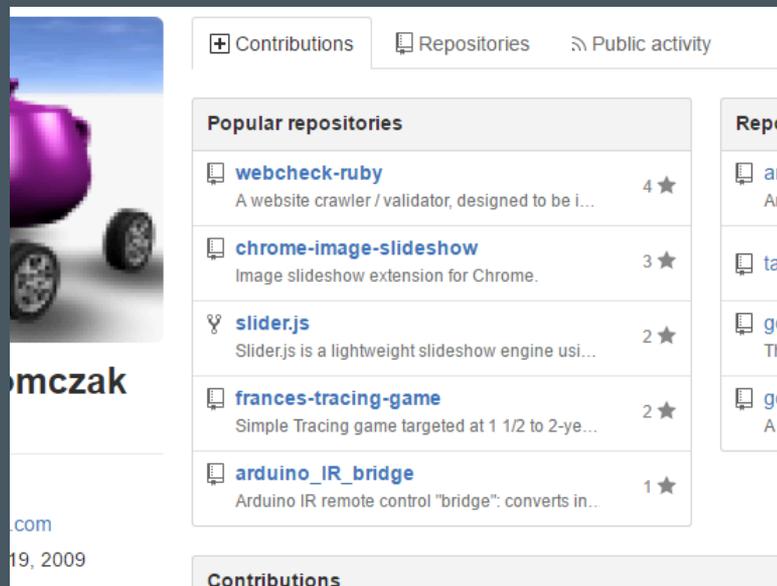
At the bottom, there is a "Reply..." input field and a confirmation dialog box that says "Add: 'Auditable'" with a checkmark and a close button.

# Example: GitHub

Public

Almost all source control repositories can be accessed

(private repositories are available as a for-pay feature)



The screenshot shows a GitHub profile page for a user named 'mcmczak'. The page is divided into several sections. At the top, there are navigation tabs for 'Contributions', 'Repositories', and 'Public activity'. Below these is a 'Popular repositories' section, which is a table listing several repositories with their names, descriptions, and star counts. The repositories listed are 'webcheck-ruby' (4 stars), 'chrome-image-slideshow' (3 stars), 'slider.js' (2 stars), 'frances-tracing-game' (2 stars), and 'arduino\_IR\_bridge' (1 star). To the right of the main content, there is a partial view of another 'Popular repositories' section for a different user, showing repositories like 'an...', 'ta...', 'gc...', and 'gc...'. At the bottom of the profile, there is a 'Contributions' section.

Popular repositories		
 <a href="#">webcheck-ruby</a>	A website crawler / validator, designed to be i...	4 ★
 <a href="#">chrome-image-slideshow</a>	Image slideshow extension for Chrome.	3 ★
 <a href="#">slider.js</a>	Slider.js is a lightweight slideshow engine usi...	2 ★
 <a href="#">frances-tracing-game</a>	Simple Tracing game targeted at 1 1/2 to 2-ye...	2 ★
 <a href="#">arduino_IR_bridge</a>	Arduino IR remote control "bridge": converts in...	1 ★

# Example: GitHub

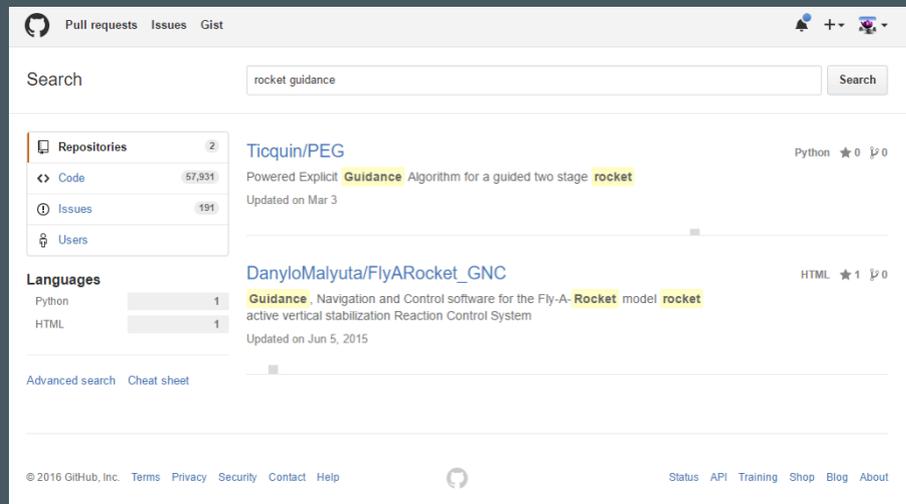
## Searchable

Repositories findable via keyword search

Within repository, source code is searchable by keyword

Consistent repository naming convention

user/repository-name



The screenshot shows the GitHub search interface. At the top, there are navigation links for 'Pull requests', 'Issues', and 'Gist'. A search bar contains the text 'rocket guidance' and a 'Search' button. Below the search bar, there are two search results:

- Ticquin/PEG**: Python, 0 stars, 0 forks. Description: 'Powered Explicit **Guidance** Algorithm for a guided two stage **rocket**'. Updated on Mar 3.
- DanyloMalyuta/FlyARocket\_GNC**: HTML, 1 star, 1 fork. Description: '**Guidance**, Navigation and Control software for the Fly-A-**Rocket** model **rocket** active vertical stabilization Reaction Control System'. Updated on Jun 5, 2015.

At the bottom of the page, there are links for 'Advanced search' and 'Cheat sheet', and a footer with copyright information and links for 'Terms', 'Privacy', 'Security', 'Contact', 'Help', 'Status', 'API', 'Training', 'Shop', 'Blog', and 'About'.

# Example: GitHub

Auditable

Repository history tracked  
via git's algorithms

GitHub generates statistics  
for changes to repository

The image shows a screenshot of a GitHub repository page for 'fixermark/webcheck-ruby'. The page displays the commit history for the 'master' branch, listing several commits from January 20, 2010, to January 21, 2010. The most recent commit is titled 'Correction to documentation on usage (Webcheck methods aren't static ...)' with commit hash 'af79ae5'. A diff view is open for this commit, showing changes to the file 'README.rdoc'. The diff highlights three additions and two deletions. The code changes are as follows:

```
@@ -13,10 +13,11 @@ webcheck-ruby is a simple web site crawler / checker, inspired by the Python pro
13 13 To crawl a web page:
14 14
15 15     require 'webcheck'
16 16 - results = Webcheck.check("http://example.com")
17 17 + checker = Webcheck.new
18 18 + results = checker.check("http://example.com")
19 19     print results[:uris404]
20 20     print results[:urisUnknown]
21 21 - Webcheck.prettyPrint(results)
22 22 + checker.prettyPrint(results)
23 23
24 24 The default format of the results is a hash with the following keys
```

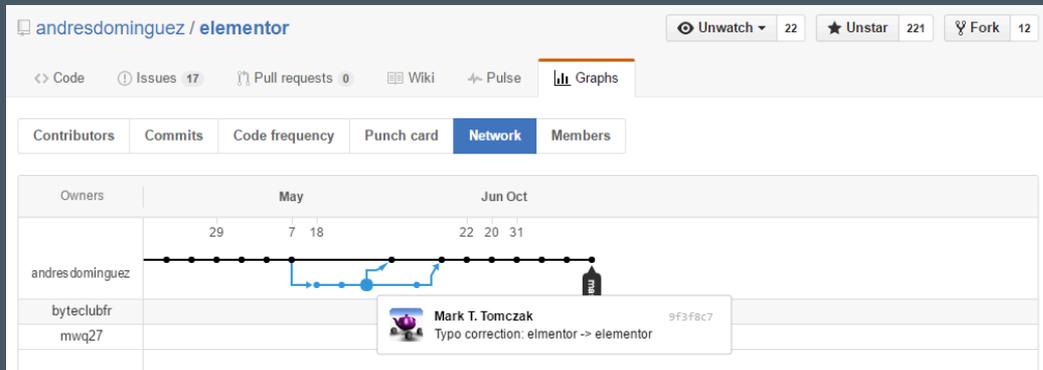
# Example: GitHub

Collaborative

Issue tracker

Forking

"Pull request" model



## Typo correction: Wrong markdown #17

**Merged** andresdominguez merged 1 commit into andresdominguez:master from fixermark:master on May 18, 2015

Conversation 0 | Commits 1 | Files changed 1

**fixermark** commented on May 18, 2015

Incorrect markdown exposes the link (oops!). This should fix it.

**Typo correction: Wrong markdown** c9fa145

**andresdominguez** merged commit c61f903 into andresdominguez:master on May 18, 2015 [Revert](#)

Write Preview AA B i “ < > ☰ ☷ ☹ ↶ @ 📧

Your Information Is Most Useful When It Is

Public

Searchable

Auditable

Collaborative

# Thank You!



[mtomczak@google.com](mailto:mtomczak@google.com)

(Backup slides)

# Knowledge Management is Everyone's Business

"Google's mission is to organize the world's information and make it universally accessible and useful."

~Mission Statement