The Knowledge
Towards a culture of engineering documentation
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### VI. Challenges At Work

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrealistic Expectations</td>
<td>34.9%</td>
</tr>
<tr>
<td>Poor Documentation</td>
<td>34.7%</td>
</tr>
<tr>
<td>Unspecific Requirements</td>
<td>33.6%</td>
</tr>
<tr>
<td>Inefficient Development Processes</td>
<td>30.3%</td>
</tr>
<tr>
<td>Fragile Code Base</td>
<td>29.6%</td>
</tr>
<tr>
<td>Changing Requirements</td>
<td>28.1%</td>
</tr>
<tr>
<td>Outdated Technologies</td>
<td>24.8%</td>
</tr>
<tr>
<td>Limited Resources</td>
<td>22.6%</td>
</tr>
<tr>
<td>Poor Team Dynamics</td>
<td>22.3%</td>
</tr>
<tr>
<td>Non-Technical Management</td>
<td>22.2%</td>
</tr>
<tr>
<td>Interacting with Stupid People</td>
<td>19.8%</td>
</tr>
<tr>
<td>Poor Scheduling</td>
<td>19.6%</td>
</tr>
<tr>
<td>Corporate Policies</td>
<td>17.7%</td>
</tr>
<tr>
<td>Interacting with Non-Technical People</td>
<td>14.9%</td>
</tr>
<tr>
<td>Poor Infrastructure</td>
<td>11.9%</td>
</tr>
</tbody>
</table>

**Source:** Stack Overflow
Developer Survey 2016

*Poor docs 34.7% (ouch)*
You cannot mix certain types of flights with certain other types of flights.
CAUTION

THIS SIGN HAS
SHARP EDGES

DO NOT TOUCH THE EDGES OF THIS SIGN

ALSO, THE BRIDGE IS OUT AHEAD
Viceroy filter cigarettes

As your Dentist, I would recommend Viceroy's
Bad documentation is bad

- Bad for velocity
- Bad for quality
- Bad for reliability
Docs: Everybody's problem, nobody's job
But culture is not immutable
Software testing 2005 ...
Software testing today

A professionalized discipline integrated into the software development process
Good documentation is good ...

... and achievable
Documentation, disrupted
How Google transformed its internal documentation process
48%

Google engineers citing docs as #1 productivity issue (Googlegeist 2014)
SRE: 50%+ issues cited problems with docs
Previous efforts

- Fix the culture (bottom up)
- Fix the tooling (top down)
We were inflicting help :-(

Time to listen.
The trouble with docs

- They "don't exist."
- They're "impossible to find."
- They're "wrong."
● “No time”
● “No incentive”

No doc culture
Fragmentation is bad

Multiple repositories:

- Hard to create
  - Context switching
  - Horrible tooling
- Hard to maintain
  - No explicit connection to code
  - No clear ownership
- Hard to find
Documentation will never be part of engineering culture until it is integrated into the codebase and workflow.
g3doc
Radically simple documentation
g3doc vision

Engineers find, create, and maintain docs using their regular workflow and developer tools.
g3doc design

- Store Markdown source in google3 codebase
- Serve docs as webpages at a predictable URL:
  - Render Markdown to HTML
  - Then apply theme
  - Ship finished HTML to user
- Small / meaningful integrations
June - August: It begins ugly, ugly proof of concept

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# Foo

## This is what foo does

- List item 1
- List item 2
- List item 3

## How long does Foo take?

- 30 minutes.
- Running all tests takes about 10 minutes

## For Users

### Status

- Supported and maintained by [Foo SRE](mailto:foo-sre@google.com)
- [Monitoring dashboard](http://dashboard.foo.com)

### Using Foo with Bar

Foo is used automatically by Bar:

```
bar build
bar test
```

Here's a sample command line:

```
bar test --test_tricks=hello
```
Simple source

```bash
dgl.md

From my client (`google/src/cloud/{{USERNAME}}/devguide/google3`):

    $ mkdir storage/f1/g3doc/devguide

### Create any necessary subdirs

The F1 devguide has a "SQL Reference" subdir, so I created a directory for that.

    $ mkdir storage/f1/g3doc/devguide/sql

Tip: Consider using a shorter name that that used in Sites. Shorter URLs are better for everybody.

### Convert file content to Markdown on your local machine

TODO(rionom): Update with alternative methods, or explanations, should this doc be made available to a wider audience.

1. Switch to the directory of your source devguide. For instance:

    $ cd google/src/cloud/{{USERNAME}}/devguide/eng/doc/devguide/f1

2. Make a local target directory:

    $ mkdir /tmp/f1

3. Copy **only** the files with an `.shtml` extension to your local machine:

    rsync -a *.shtml /tmp/f1

4. Use Pandoc to convert from SHTML to Markdown.

    pandoc -s
```
Migrating Developer Guide Library content

This doc outlines the steps necessary to migrate Developer Guide Library content to g3doc. The paths etc. are specific to the DGL, but the general steps should be useful for anybody migrating content from

//depot/eng/doc.

Note: This guide gives the location of a sample devguide (F1). You should replace the F1 directory name(s) with the name(s) of your own directories.

- Create a google3 client
- Create the directory structure in your target google3 directory.
  - Create any necessary subdirs
- Convert file content to Markdown on your local machine
- Copy the original .html files to the new devguide location
- Replace the content of /g3doc/devguide/*.md with the converted content from your local machine
- Edit the metadata headers in each file.
- Redirect the original files
- Clean up your new Markdown files in google3/path/g3doc/devguide
- Create or update index.md
- Add navigation
- Update OWNERS
- Update METADATA
Richly linked

Convert to Markdown

g3doc can render HTML, but Markdown creates a much better experience for engineers who access your docs via Code Search or view them in Cider.

See below for specific guidelines on migrating from Sites, Drive, Wiki, and HTML.

From Sites

The Sitesimporter script by who/cdeforest exports the contents of a specific site to a specified target location.

- Usage:

```bash
$ blaze run //corp/playbookserver/sitesimporter:sitesimporter
    sites_url /full/path/to/target/directory
```

- Example:

```bash
$ g4d -f convert-x20-site
$ mkdir /tmp/x20
$ mkdir storage/x20/g3doc
$ blaze run //corp/playbookserver/sitesimporter --
    https://sites.google.com/a/google.com/x20 /tmp/x20
$ cp /tmp/x20/somefile.md storage/x20/g3doc/
```

All flags:

- `google3/corp/playbookserver/sitesimporter/sitesimporter.py`
- `google3/corp/playbookserver/sitesimporter/url2file.py`
- `google3/corp/playbookserver/sitesimporter/html2markdown.py`

Known issues

- Sitesimporter currently doesn't convert Sites tables to Markdown tables.
- See the Sitesimporter hotlist for a complete list of known issues.
"This is the best thing ever. Thank you!"

"Wow, this is fantastic!"
“This is fantastic. So excited to write docs!”
Shit got real.
Core principles

- Focus on the **engineer**
- Separate presentation from content
- Keep it **drop-dead simple**
Growth strategy

- Don't inflict help
- Form **alliances** with high-profile, influential engineers
- **Partner** with workflow teams to create small, meaningful integrations
- Release and iterate
- Create **buzz**
Culture and values

- Open, transparent, and generous
- Don't lick the cookie, pass the plate
- Opportunity for impact
- Governance belongs to the contributors
July–December 2014

- September: 18 projects
- October: 42
- November: 100
- December: 159

Goal for end Q1: 300
930 projects
Q1 2015
New features ...

- Sequence diagrams
- .DOT graphs
- Shortlinking (larry@, etc.)
- Syntax highlighting for code samples
- Auto Analytics support
- ...
Here's an expression: \(x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}\).
```go
package main
import "fmt"

func main() {
    fmt.Println("Hello, 世界")
}
```
EngPlay - g3doc for SRE playbooks

- Supports Markdown
- Integrated with our Alert Manager
- Meets security requirements
- Completeness checked
- Predictable location for all playbooks
• "g3doc is officially better than anything non-g3doc now. Sequence diagrams!"

• "g3doc or it didn't happen."

• "I just opened g3doc now and re-remembered that it's REAL and I didn't DREAM IT UP."
"g3doc is so good. So good. The intersection of 'brain-dead easy' with 'incredibly useful and well-integrated with all our tools' makes it just insane."
1,796 projects
Q2 2015
Shit really got real.
move to g3doc plz k
thx bai
See go/g3doc-langstats for additional statistics about Markdown usage in g3doc.
g3doc today
Adoption
10,362 projects
Maintenance
30%

doc changelists contain code
200K+ doc changelists
200K files
3 CLs / file / month
Usage
3.9M
30-day page views
1.6M
30-day sessions
bye, wiki!
Team
● Fully staffed engineering team
● Part of Developer Infrastructure core toolset
● 20%: "By engineers for engineers"

#bestteam
We **believe** these things are **true**
First tooling, then culture
Be audacious but not reckless
Release and iterate
Predictable, standardized location for docs
Partner
Focus on the engineer
Focus on the engineer