Google

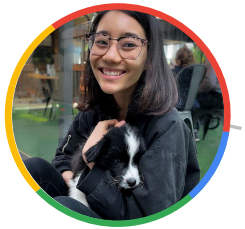
Technical Documentation

Communicating Effectively & The Engineering Design Doc

Anna Truffet

Hello!

My Path



2016

Started @ UQ!

2017

Tutor

CSSE1001, CSSE2002, CSSE2010, CSSE2310, COMP3506

2020

Internships

Financial Tech Firms & Technical Firms

2021

Graduation!

From Science (Computer Science) & Commerce (Accounting)

2022

Software Engineer

Investigate solutions, Write code, Solve problems & Implement new features.

Agenda

1. Technical documentation
2. Engineering Design Docs
    a. Initial definition
    b. Examples
    c. A deeper look at Engineering Design Docs
3. The audience
4. Good practices when writing an Engineering Design Doc
5. The review process

Technical Documentation

Types of Technical Documentation

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Instructional, Authoritative & Backwards Looking

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- Architectural Records Design
- Wikis
- Read Me files
- Coding Labs

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Decision-making, Discussion-based & Forwards Looking

- Product Requirements Document
- Scoping Document
- Engineering Design Document
- Implementation Plan

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Decision-making, Discussion-based & Forwards Looking

- Product Requirements Document
- Scoping Document
- **Engineering Design Document**
- Implementation Plan

Engineering Design Docs

What is an engineering design doc?

Google

A document written by engineers,
designing and discussing, with many,
an upcoming feature's design and implications.

Google

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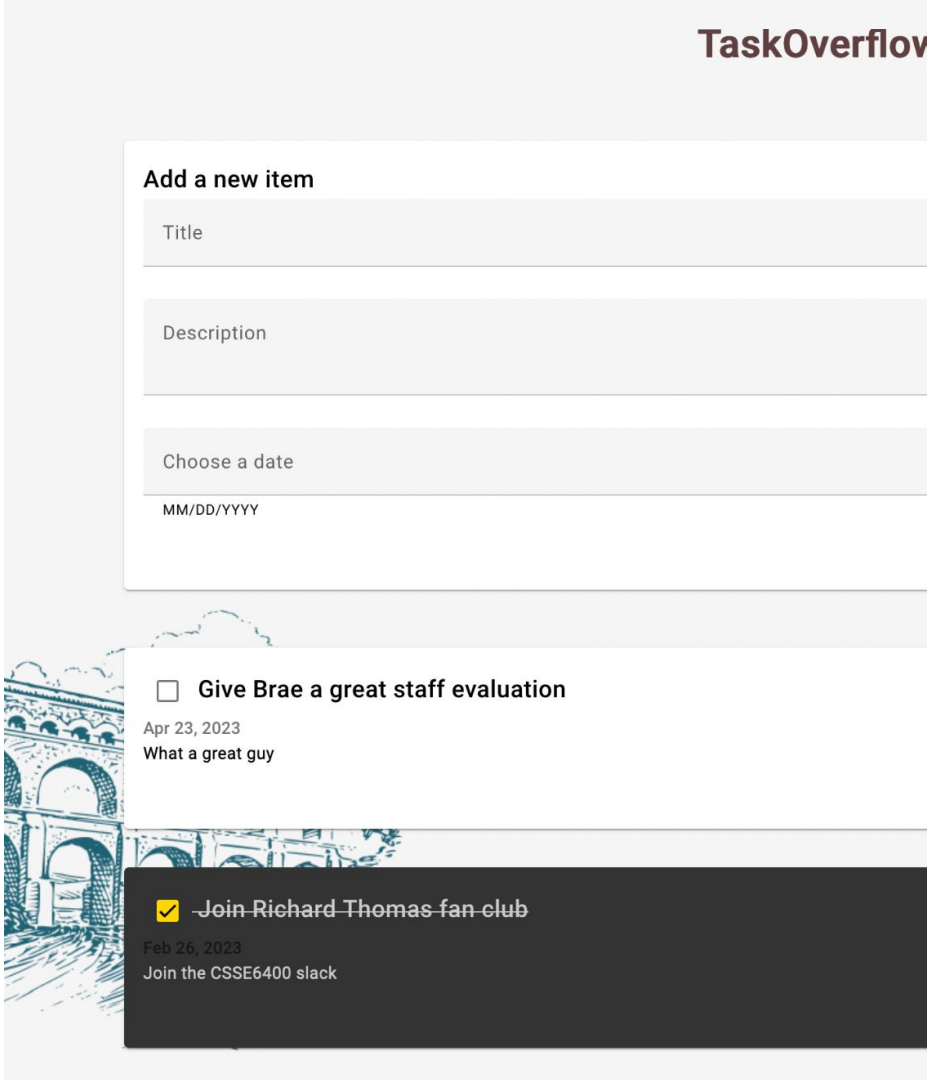
An example

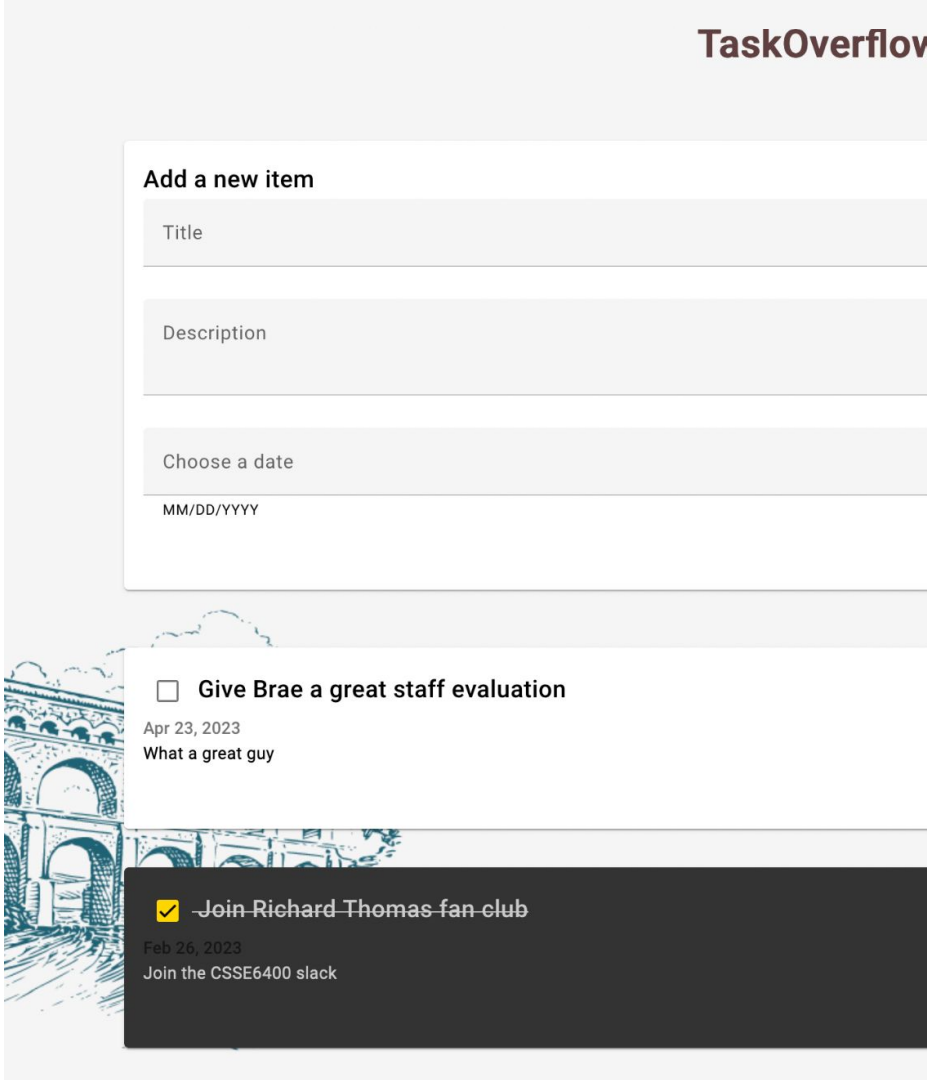
A Task Overflow example

- Task Overflow needs a new feature.
- It is your job to implement it, but...
  - There are several ways to implement it.
  - There are several unknowns.
  - You need agreement with domain experts in Europe.
  - You are new to the code base.



A Task Overflow example

Given a github repository link, we are to get all the TODO comments from the code and create tasks.



A real example

Operation Agent's Tool: Determining the Display Order for Card Shown

Document self link

Username	Role	Status	Last Change
Person A	Approver	PENDING	2023-03-20
Person B	Approver	APPROVED	2023-03-24

Status: Draft > Current > Needs update > Obsolete

Authors: Anna Truffet

Key Contributors & Collaborators: Person A, Person C, Person D

Objective

For Project Operation Agents Tool (Ops Tool), the sorted display order of the cards need to be changed to accommodate for the increased number card types. The new order will include sorting based on who created the card. This one-ish page doc aims to determine the best location for the required sorting logic.

Background (Optional)

Current Sorting

Let’s break that down

What is an engineering design a doc?

- Explains how the proposed solution solves (most of) the problems
- Communicates decisions with reasoning
- Generates discussion & feedback from others
- Gives sufficient detail that:
  - Others (without context) can understand and provide feedback
  - A knowledgeable engineer can build it... without making major design decisions

What an engineering design doc is not:

- A persuasive essay
- An implementation plan
- A list of features
  - This is a product requirements doc! A product manager would have written this prior.
- a TODO list

When do I write an engineering design doc?

- Not for small code changes

For features that may:

- Be **large** & affecting **significant** amounts of functionality
- Affect **other teams**
- Have **many unknowns**
- Have **several potential solutions**
- Need you to **provide information/explanation** for **future** readers

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Context: Google & Communications of scale

The **number of people** involved:

- My direct team is based in Sydney, Brisbane and the US
- I work with other teams in EMEA and APAC

Changing **the unknown**:

- Our user base size
- Many moving parts
- Written by many different people at varying times

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The audience

Who will read your engineering design doc?

The name is deceptive!

Who will read your engineering design doc?

- Team members
- Future engineers
- People who are affected by your change
- Leadership (approvers)
- Implementers
- Security & privacy reviewers
- Product managers

Your audience = multiple audiences!

A recipe for beginners

Pasta & Pine Nuts

Ingredients (serves 2-4)

- 8 oz (225g) of pasta
- 2 tsp (12g) salt
- ½ cup (110g) of salted butter
- ¼ cup (35g) pine nuts
- ⅓ cup (30g) freshly grated Parmesan cheese
- Coarsely ground black pepper

Browned butter, pinenuts, and pasta combine for simple comfort food at its finest. The butter and pine nuts start and finish together with the pasta – in about 10 minutes. (If you've never browned butter before, read through this tutorial first.)

Instructions

1. Add 8 cups (2 liters) of water to a pot. Place over high heat. Add salt.
2. When the water is boiling, add the pasta.
3. Add butter and pine nuts to a skillet over medium heat.
4. After the butter has melted (about 5 minutes), stir frequently so that the nuts cook evenly.
5. When the butter has browned (usually another 5 minutes), transfer the butter and nuts to a heatproof bowl (no plastic).
6. Drain the pasta in a colander and then add to the butter and pine nuts. Toss until the pasta is coated with butter.
7. Divide onto plates and top with Parmesan and pepper.

A recipe for experienced cooks

> Put a stick of butter and a handful of pine nuts in a skillet. Cook over medium heat until both are brown. Toss with cooked pasta, grated Parmesan and black pepper.

– #51 of Summer Express: 101 Simple Meals Ready in 10 Minutes or Less

Mark Bittman for the *New York Times*

What do your readers need to know? What are their goals?

Who will read your engineering design doc?

- Team members
- Future engineers
- People who are affected by your change
- Leadership (approvers)
- Implementers
- Security & privacy reviewers
- Product managers

Writing a good engineering design doc

Writing a good thing

1. What does your reader need?

2. Keep it concise

3. Outline & Dot point first

4. Improve readability

Example:

In order to well understand the information at hand about load balancers, it is important to understand the components of a load balancer. There are effectively three components of the digital load balancer: the first component is the listener, it allows traffic to enter the Load Balancer and each listener has a port (e.g. port 80) and a protocol (e.g. HTTP) associated with it. The second component are Target Groups are groups of nodes which the load balancer can route to. Each target group has a protocol and a port associated with it, allowing us (the programmer) to switch ports on the way through the load balancer. This is useful if the targets are using a different port to the ports we want to expose. The 3rd component is the load balancer routes the traffic to the target groups based on rules that we set up.

4. Improve Readability

- Use lists if you list things
- Remove redundant sentences, words and phrases
- Consider your voice (active vs passive voice)
- Keep your sentences concise
- Use formatting

5. It is a tool in communication, but it is not the only tool

Getting reviews

The document review process

Opportunities

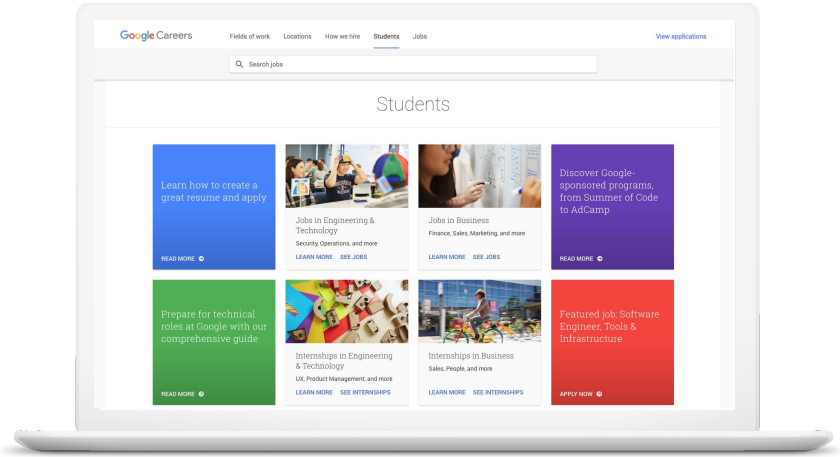
Internship Opportunities

Software Engineering Internship
Open for applications from 27 Feb / 29 March

STEP Internship
Open for applications from 27 Feb / 29 March

Information Technology Internship
Open for applications from 27 Feb / 29 March

Security Engineering Internship
Open for applications from 27 Feb / 29 March



Visit google.com/students

Graduate opportunities

- Not open yet!
- But when they are, visit here.

Google Developer Student Clubs

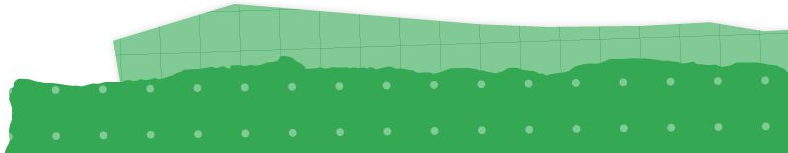
Google Developer Student Clubs (GDSC)

Learn more at **goo.gle/GDSC**

What are Google Developer Student Clubs?

Helping students bridge the gap between theory and practice

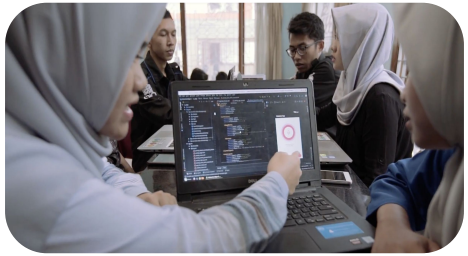
- Google Developer Student Clubs are **university based community groups** for students interested in Google developer technologies.
- Students from all undergraduate or graduate programs with an interest in growing as a developer are welcome.
- By joining a GDSC, students grow their knowledge in a peer-to-peer learning environment and build solutions for local businesses and their community.



What should you expect?

Learn

You will learn Google technologies like (Android, Google Cloud, etc) together



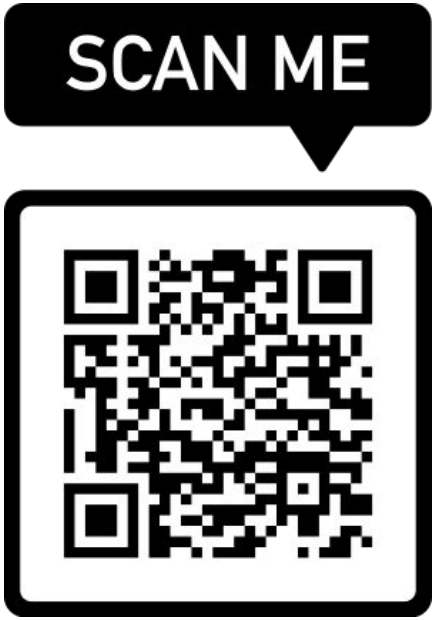
Build

Create & build solutions for local problems through project-based code labs and content

Connect

Share solutions through fun meetups, study jams and events like demo days

Learn more!



Writing resources

- These Overview of technical writing courses
- Software Engineering at Google's Documentation Chapter
- "On writing well" by William Zinsser (a book about non-fiction writing styles)

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