

Technical Documentation

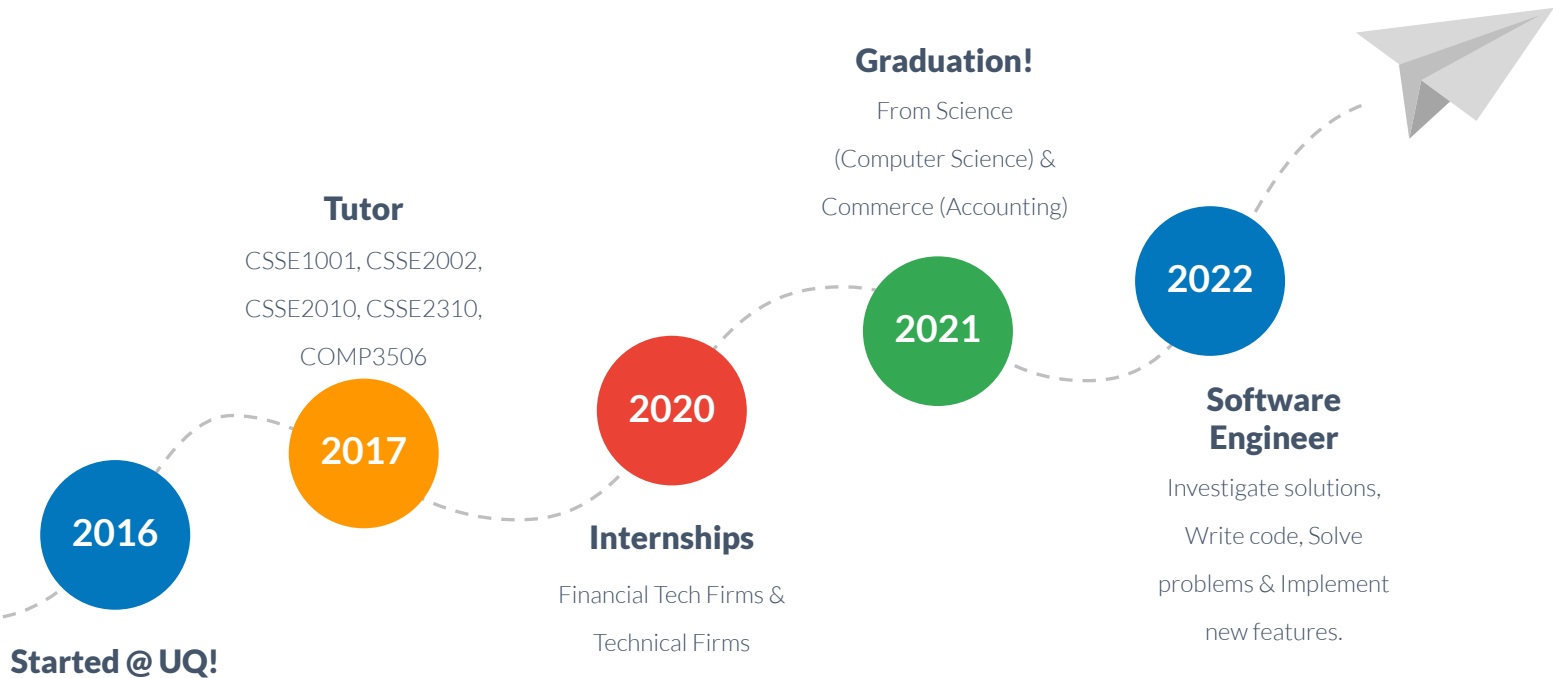
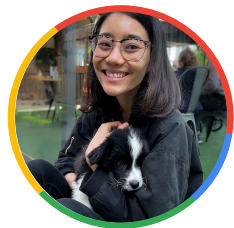
Communicating Effectively & The Engineering Design Doc



Anna Truffet

Hello!

My Path



Agenda

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

Technical Documentation

Types of Technical Documentation

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**Instructional, Authoritative
& Backwards Looking**

Types of Technical Documentation

Instructional, Authoritative & Backwards Looking

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

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

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

Engineering Design Docs

What is an engineering design doc?

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

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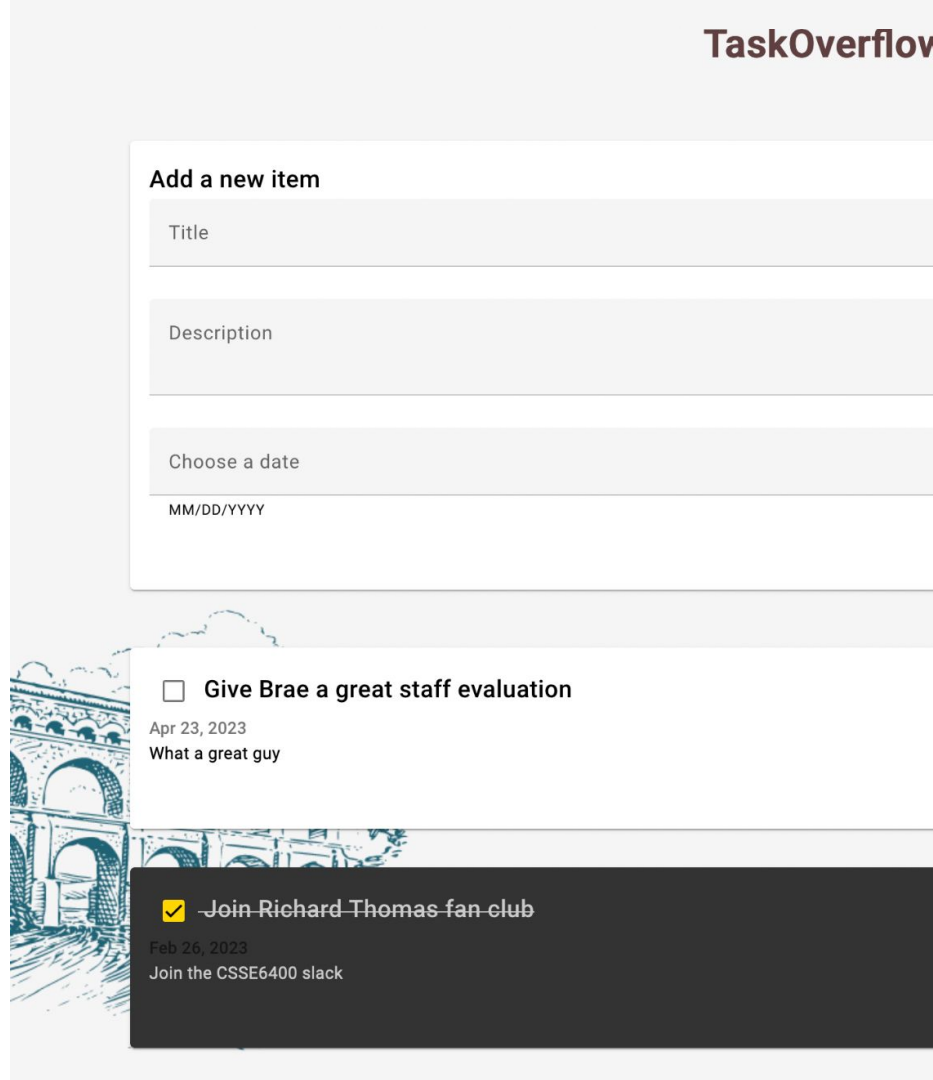
A document written by engineers,
designing and discussing, with many,
an **upcoming** feature's design and implications.

An example

A Task Overflow example

Task Overflow needs a new feature:

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



A Task Overflow example

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.

Add a new item

Title

Description

Choose a date

MM/DD/YYYY

Give Brae a great staff evaluation

Apr 23, 2023

What a great guy

Join Richard Thomas fan club

Feb 26, 2023

Join the CSSE6400 slack

A real example

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

ary + Confidential

[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

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

Bonus documentation

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



Writing resources

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)