Giving Your Technical Vision a Voice

Here for the workshop? Move to the front and introduce yourself to your neighbors.

Giving Your Technical Vision a Voice

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Introductions

- Me to you
- You to your neighbors
- You to me

Supplies

- 8 sheets of paper
- With laptop, only 2

Technical design documents

Why do devs hate writing them?

- Nobody reads them.
- They get out of date.
- I'm not a good writer.
- I know what I'm doing.
- I don't know what I'm doing.
- I just want to write code.

Workshop guidelines

- Everyone is included
- Feedback is actionable, specific and kind

My goal

By the end of today...

- You will have written most of a technical design document.
- You will know how to do it again.

What is a technical design document?

- Blueprint for software
- Describes what and how

What isn't it?

- Functional spec
- Visual mockups
- Implementation tasks
- Operational playbook

Who writes it?

Developer or architect

Who reads it?

Developers and architects

What is it for?

- Uncover complexity early
- Collect team expertise
- Build team support
- Increase product lifetime

Why me?

- Grow as an engineer
- Earn teammates' trust
- Earn your own trust
- Increase your visibility

Questions?

Document structure

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4GIFs

Document goals

- What you are building
- How you are building it

Document structure

- Overview
- Requirements
- Data model
- System components

Write ideas

Think of a piece of software that...

- You understand
- Has multiple components

You have 30 seconds to write your idea down.

You have 30 more seconds to write down two more ideas.

Share ideas

Choose one idea, explain it to a neighbor, and ask for feedback. In particular...

- If too simple, can other components be included?
- If too complicated, can components be combined or removed?

Actionable, specific, kind.

You have 60 seconds.

Write title

On a new piece of paper, write down your title:

<Project> Technical Design

My example:

WeatherWise Technical Design

Purpose

Problem being solved?

WeatherWise example:

Getting dressed every day is hard. Sometimes people pick the wrong outfit and are too hot or cold, or they get wet because it rains. Weather Wise helps people choose weather-appropriate outfits every day.

Write purpose

Write down the problem being solved.

- Why does your software exist?
- What real-world problem does it solve?

You have 60 seconds.

Share purpose

Trade with your neighbor and ask for feedback. In particular...

- Does the purpose make sense?
- Is it compelling?

Actionable, specific, kind.

You have 60 seconds.

Users

Who uses it?

WeatherWise example:

WeatherWise helps professionals who hate getting up in the morning and can't think before they've had coffee.

Write user description

Write down the users of your software.

- Who are they?
- How does your software make their lives better?

You have 60 seconds.

Share user description

Trade with your neighbor and ask for feedback. In particular...

- Does the user exist?
- Does the user need the software?

Actionable, specific, kind.

You have 60 seconds.

Requirements

What does it do?

WeatherWise example:

- Show weather forecast in relation to yesterday's weather; e.g. "warmer & wetter"
- Suggest outfit from user's wardrobe
- Remember favorite outfits

List requirements

New page; list what your software does.

- Hit the high points
- Be concise

You have 60 seconds.

Share requirements

Trade with your neighbor and ask for feedback. In particular...

- Do the items make sense?
- Is anything big missing?

Actionable, specific, kind.

You have 60 seconds.

Non-requirements

What doesn't it do?

WeatherWise example:

- No offline support
- No web version
- No locale-based ad integration

List non-requirements

List what the software might do, but does not.

- Look for obvious gaps
- Be concise

You have 60 seconds.

Share non-requirements

Trade with your neighbor and ask for feedback. In particular...

- Do the items make sense?
- Is anything big missing?

Actionable, specific, kind.

You have 60 seconds.

Design summary

How does it work?

WeatherWise example:

WeatherWise is a **native mobile app** for **Android** and **iPhone**. The app uses a **REST API** to communicate with a **backend service** to get the relative forecast and general outfit suggestions, e.g. blazer and pants. Using the **device cache**, the app maps the outfit suggestions to the user's wardrobe, e.g. black wool blazer and sparkly leggings. The backend service...

Write design summary

New page; write "elevator pitch."

- General architecture
- Major technologies

You have 60 seconds.

Share design summary

Trade with your neighbor and ask for feedback. In particular...

- Is the general architecture clear?
- Are the main technologies named?

Actionable, specific, kind.

You have 60 seconds.

Data entities

What concepts are needed?

Data entities

What is the internal data?

Forecast

- date (datetime)
- postalCode (string)
- precipRange (int, int)
- tempRange (int, int)
- windRange (int, int)
- warmthIndex (float)

Entity relationships

Which concepts are related?

Garment

- warmthIndex (float)
- category (string)
- userFavorite (bool)

Outfit

- warmthIndex (float)
- garments (Garments list)

List entities and relationships

New page; list entities.

- Name everything
- Show relationships with ordinality

You have 60 seconds.

List typed attributes of one important entity.

You have 60 seconds.

Share entities and relationships

Trade with your neighbor and ask for feedback. In particular...

- Do the entities make sense?
- Is naming consistent?
- Are the relationships clear?

Actionable, specific, kind.

You have 60 seconds.

Components

What are the deployables?

WeatherWise example:

- Native mobile app
- Backend service
- Third-party weather service

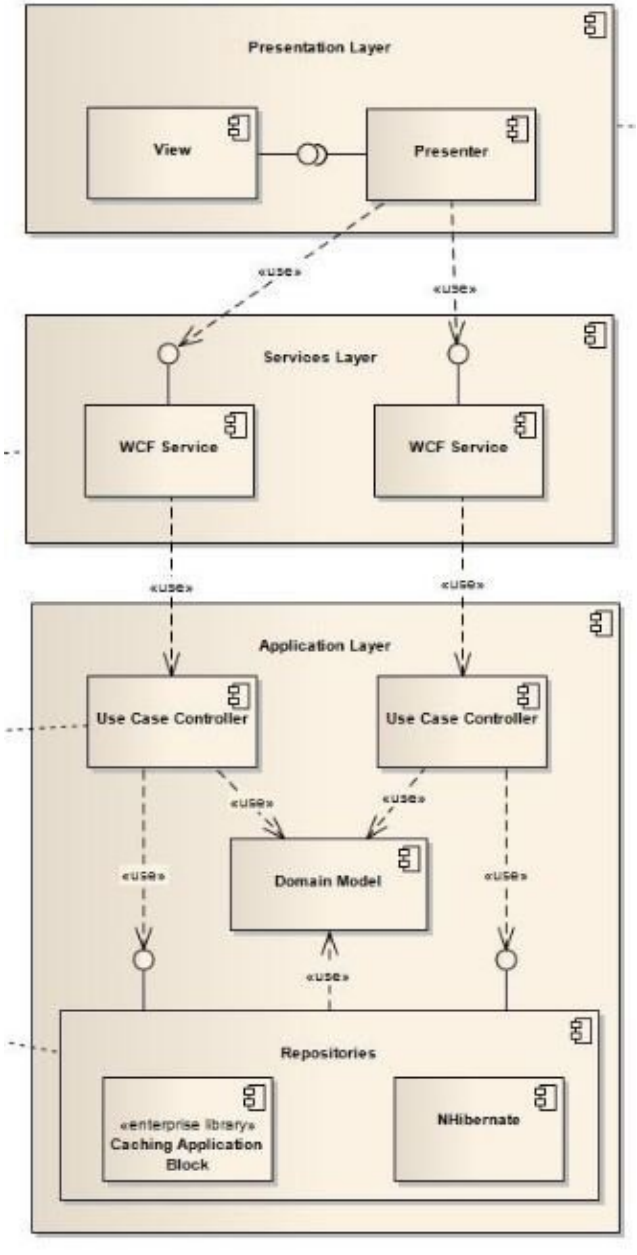
List components

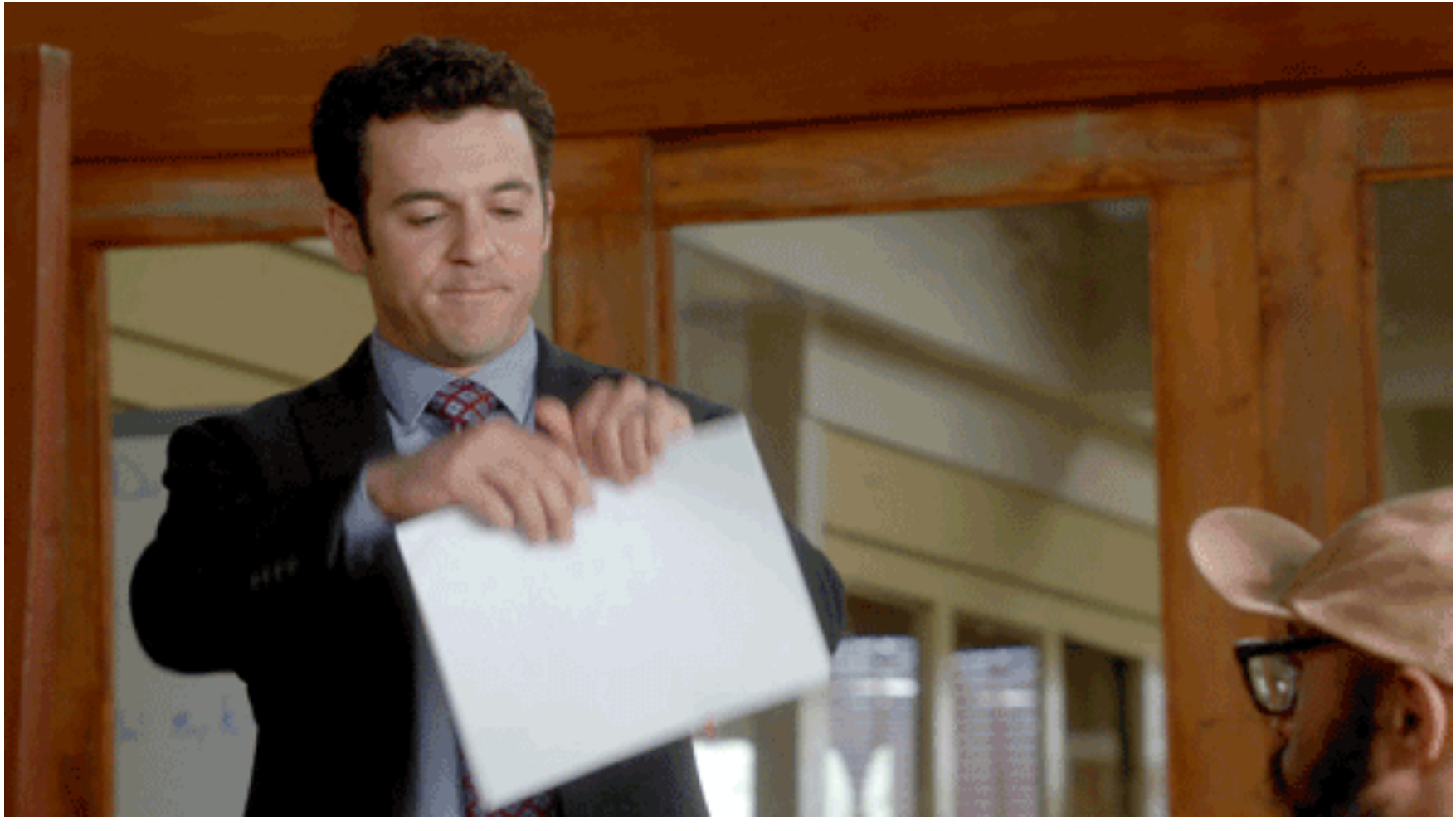
New page; list components.

- Name everything

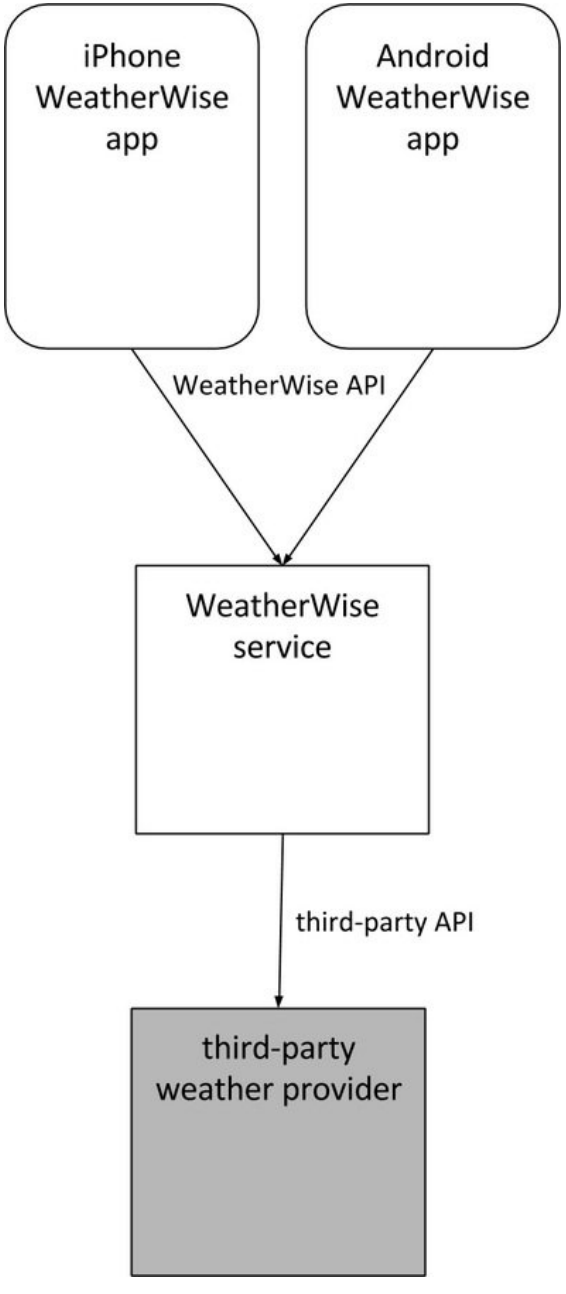
You have 30 seconds.

Component diagram





Component diagram



Draw component diagram

New page; draw component diagram.

- Name everything
- Label connections
- Indicate directionality

You have 90 seconds.

Share component diagram

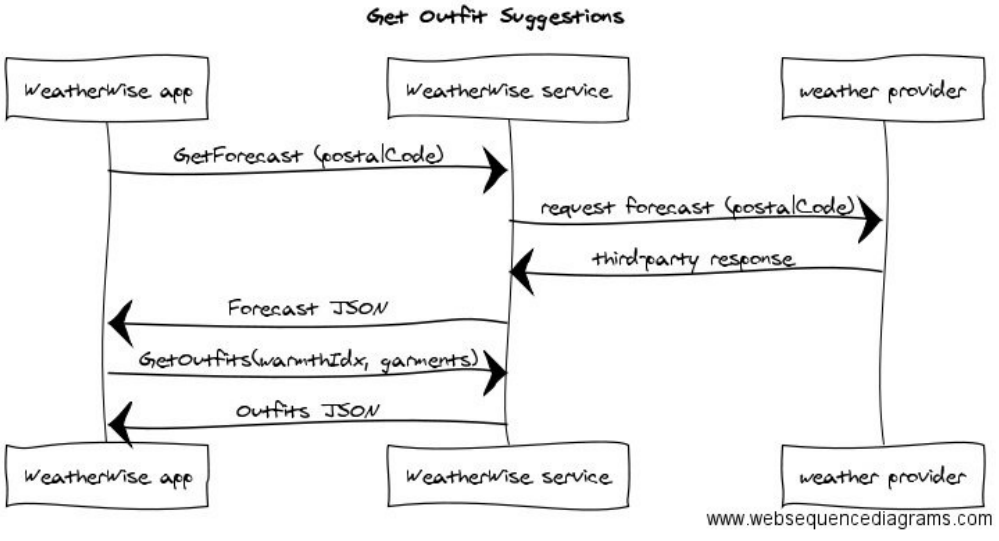
Trade with your neighbor and ask for feedback. In particular...

- Is anything missing?
- Is naming consistent?
- Are the connections directed and labeled?

Actionable, specific, kind.

You have 60 seconds.

Interaction diagrams



Draw interaction diagram

New page; draw component interaction diagram.

- Components are actors
- Separate requests and responses
- Requests show API and params
- Responses show return data

You have 90 seconds.

Share interaction diagram

Trade with your neighbor and ask for feedback. In particular...

- Does sequencing make sense?
- Are the requests and responses directional and labeled?

Actionable, specific, kind.

You have 60 seconds.

Component details

What's inside each box?

WeatherWise example:

The WeatherWise mobile app

The app communicates with the backend service using a REST API over HTTPS. All user data is kept on device, so no authentication is required. The app maintains user wardrobe database in the device cache. To get outfit suggestions, the app calls the GetOutfits API, providing warmth index and list of available garments....

Write detailed component description

New page; explain one component in detail.

- Responsibilities
- Dependencies: data, other
- Logic
- Technologies and infrastructure

You have 90 seconds.

Share component description

Trade with your neighbor and ask for feedback. In particular...

- Are responsibilities clear?
- Are dependencies clear?
- Do technologies make sense?
- Is anything missing?

Actionable, specific, kind.

You have 60 seconds.

That's everything!

Overview

- Purpose
- Users
- Design summary

Requirements

- Requirements
- Non-requirements

Data model

- Entities
- Entity relationships

System components

- Component diagram
- Component details
- Interaction diagrams

Put it together!

Overview

- Purpose
- Users
- Design summary

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- Non-requirements

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- Entity relationships

System components

- Component diagram
- Component details
- Interaction diagrams

Appendices

But what about...?

- API specs
- Class diagrams
- Future work
- Links to resources
- etc.

Put it in an appendix.

Production system

Overview

Requirements

Data model

System components

Metrics, monitoring, logging

Security

Deployment plan

Appendices

All done?

By now...

- You have written most of a technical design document.
- You know how to do it again.

You've also practiced giving and receiving feedback that is actionable, specific and kind.

Yes, and...

Gathering team feedback

- While writing, discuss with trusted teammate.
- After writing, share with team and request feedback.
- Organize and lead a design review.
- Incorporate feedback.
- Start coding!

Resources

http://stackoverflow.com/questions/677901/how-do-i-write-a-technical-specification-document-for-my-software-project

http://www.joelonsoftware.com/articles/AardvarkSpec.html

http://blog.slickedit.com/2007/05/how-to-write-an-effective-design-document/

http://www.yegor256.com/2015/11/10/ten-mistakes-in-specs.html

https://github.com/jpowerwa/tech-talks/act-w-2016/

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