Software Development Life Cycle (SDLC)

A mini-lecture series

CSE498 Collaborative Design (W) - Secure and Efficient C++ Software Development

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Introductions

- Software Development Life Cycle (SDLC)
  - Sometimes called **Software Development Process**
- Describes the **process** in which a software is developed
- In small teams, you can kind of just agree on how to code up the software
- In bigger teams (1000+), there are a lot more challenges to nonstructured teams
- Different time zones, different languages, different cultures

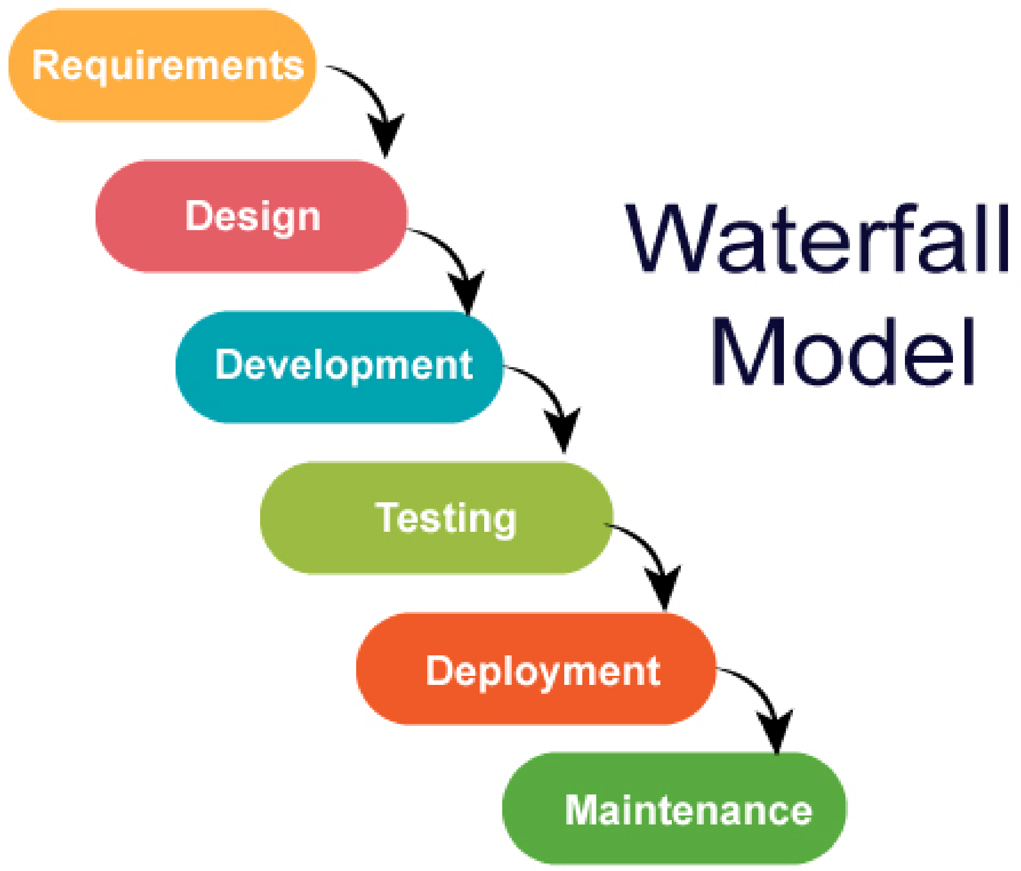
Motivation

- There is a need for structure in how teams develop the software together
- Let’s walk through the steps of creating a software system.

Life cycle

1. Requirements gathering (figure out what needs to be built)
2. Design (how will you build it?)
3. Coding (build the product!)
4. Testing (test the product!)
5. Deploying (ship the product.)
6. Maintenance (fix? Update the product if needed)

Oh, look we have a process!



https://medium.com/@chathmini96/waterfall-vs-agile-methodology-28001a9ca487

Process model

- Describes the way we can structurally develop a piece of software

Waterfall Model

- Pros:
  - Simple, concise, and details are clearly outlined
- Cons:
  - Rigid
  - Testing only comes towards the end

Agile

- Focuses on **flexibility, collaboration, and customer satisfaction**
- Quick iterable changes
- Focuses on developer creativity
- Often, the customer will literally have an office in the room
  - Pair Programming
  - Test Driven Development
  - Cross functional team
  - Daily Standup

Agile: Pair Programming

- Two programmers work together at one station
  - One person is writing the code
  - The other person is “navigating”

- Enforce communication
- Catch code issues, bugs, consistency
- Real-time design and updates
- Less error introduced during coding

Agile: Test Driven Development

- Write the tests first
- Then develop the code to pass the test

- Minimizes testing bias
- Create complete testing suite
- Better help scopes out the project and function to be built

Agile: Cross functional teams

- Encourages employees with different background and expertise to work together
- Improves efficiency
- Improves innovation
- Improves individual employee skills

Agile: Daily Standup

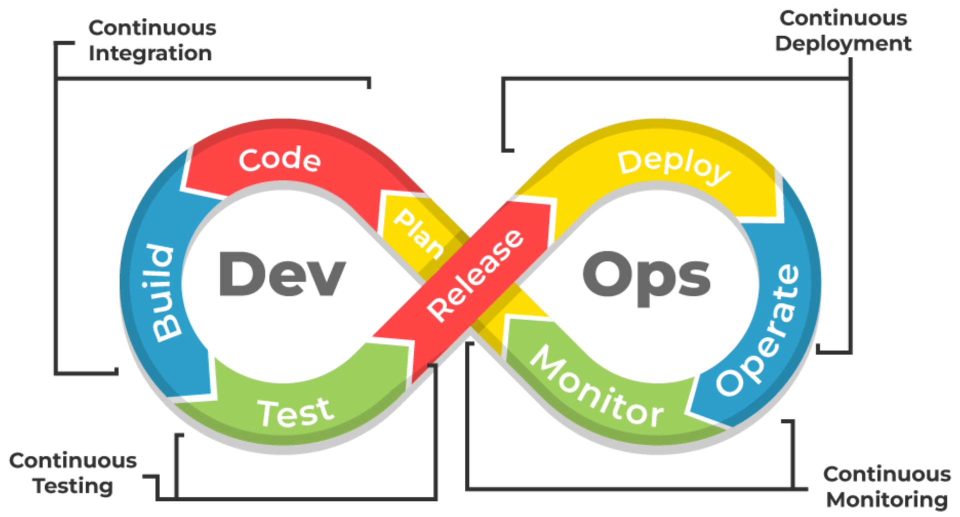
- At the start of each day, everyone quickly summarizes
  - What they worked on yesterday
  - What they plan to work on today
  - Any challenges that they are running into

Agile

- Pros
  - Fast delivery
  - Customer satisfaction
  - Changes in requirement is not that bad
- Cons
  - **Requires really good programmers and a high level of expertise**
  - Not really suitable for large projects that require planning and meticulous design
  - Difficult to estimate effort or time resources needed
  - Uncertainty and stress on developer
  - Developer burnout

DevOps

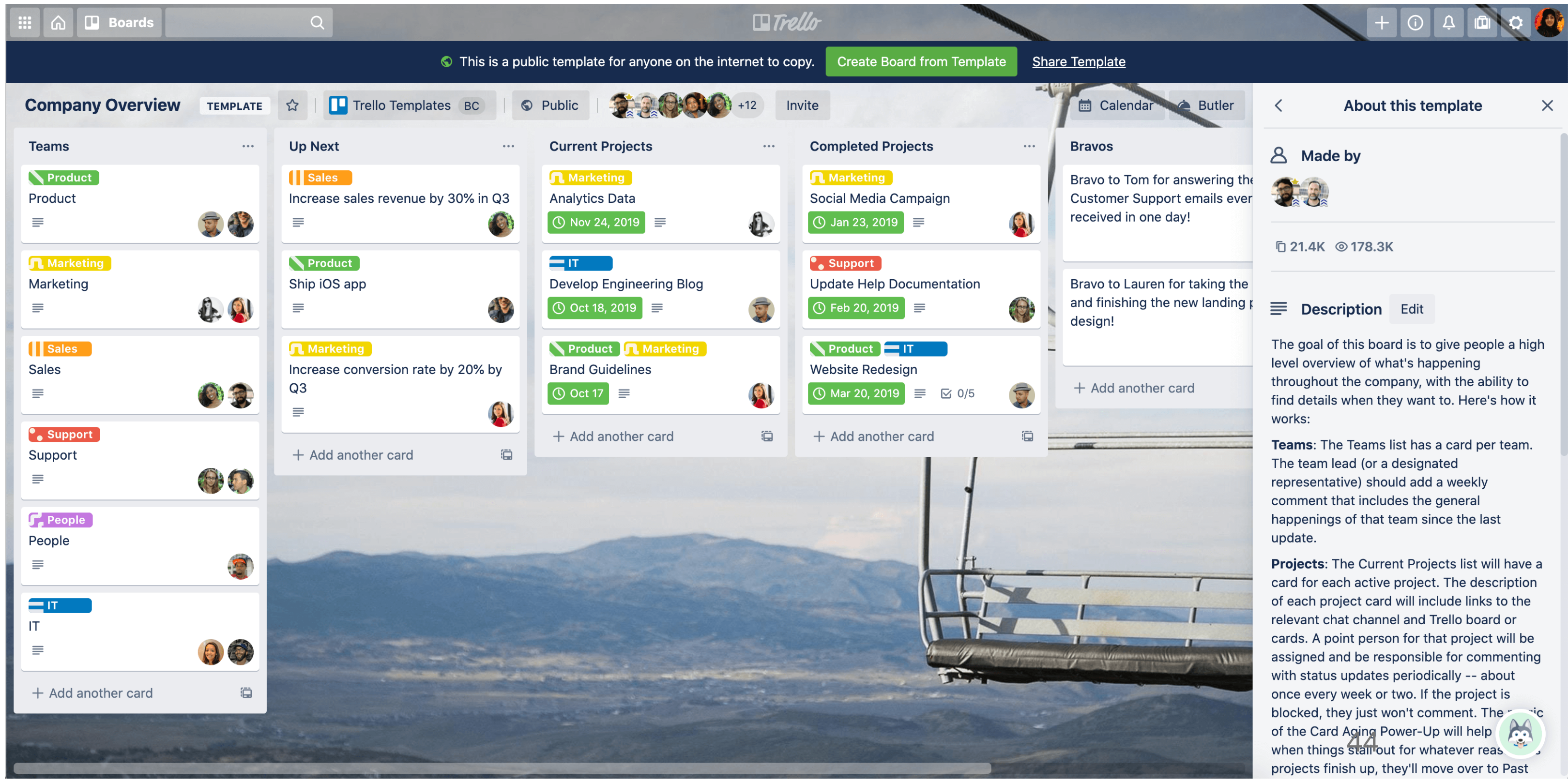
- Developments and operations
- Promotes the collaboration between development team and operations team
- Intention: increase speed to delivery



geeksforgeeks

Kanban

- Card Issue-based approach
- Outline the stages of your steps (features or tasks)
- Tackle each step one piece at a time
  - JIRA board
  - Trello board



Boards

This is a public template for anyone on the internet to copy. Create Board from Template Share Template

Company Overview TEMPLATE | Trello Templates BC | Public | +12 | Invite | Calendar | Butler

Teams
- Product — Product
- Marketing — Marketing
- Sales — Sales
- Support — Support
- People — People
- IT — IT
- + Add another card

Up Next
- Sales — Increase sales revenue by 30% in Q3
- Product — Ship iOS app
- Marketing — Increase conversion rate by 20% by Q3
- + Add another card

Current Projects
- Marketing — Analytics Data — Nov 24, 2019
- IT — Develop Engineering Blog — Oct 18, 2019
- Product, Marketing — Brand Guidelines — Oct 17
- + Add another card

Completed Projects
- Marketing — Social Media Campaign — Jan 23, 2019
- Support — Update Help Documentation — Feb 20, 2019
- Product, IT — Website Redesign — Mar 20, 2019 — 0/5
- + Add another card

Bravos
- Bravo to Tom for answering the Customer Support emails ever received in one day!
- Bravo to Lauren for taking the and finishing the new landing p design!
- + Add another card

About this template

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Description Edit

The goal of this board is to give people a high level overview of what's happening throughout the company, with the ability to find details when they want to. Here's how it works:

Teams: The Teams list has a card per team. The team lead (or a designated representative) should add a weekly comment that includes the general happenings of that team since the last update.

Projects: The Current Projects list will have a card for each active project. The description of each project card will include links to the relevant chat channel and Trello board or cards. A point person for that project will be assigned and be responsible for commenting with status updates periodically -- about once every week or two. If the project is blocked, they just won't comment. The [illegible]ic of the Card Aging Power-Up will help when things stall out for whatever reas[illegible] projects finish up, they'll move over to Past

Current model

- Mix-n-match of agile, DevOps, kanban, etc.
- Jira style
- “Agile but nobody really sticks to it, just get your tickets and do them” – friend from startup

Summary

- Process models intend to provide a structured approach to developing software
- You can mix and match processes
- Should figure out what works best for you and your team. There is no one size fit all answer
- Each process has pros and cons

Person of the day: Winston W. Royce

- Developed and proposed the first process model
- First discussed around 1970s
- One of the first attempts to address increasingly large software development