Software project management methods:

The waterfall method

Sacha Alidadi Heran
Diana Fonseca
Nick Ecker
Iman Barkan

31/01/2023

Outline

Introduction

Overview of the method

-Waterfall methodology, also known as Waterfall model is a linear process model used in project management

-Sequential process divided into phases

-Each phase must be completed before the next one can begin

-Outputs of each phase are used as inputs for the next phase

-After their completion, a phase can't be revisited

-Best adapted to projects with well-defined requirements

-Often used in the development of software

Introduction

Histoire

Initially the model comes from the construction industry

First description of a Waterfall model was in 1956 for the development of the software SAGE

First detailed diagram of this process was introduced by Winston Walker Royce in 1970

First use of the term "Waterfall" was around 1976

Outline

Stages of the Waterfall method

Methodology

- A sequential approach to software development (Linear SDLC)
- Proceeds in distinct phases, with each phase needing to be completed before moving on to the next one.

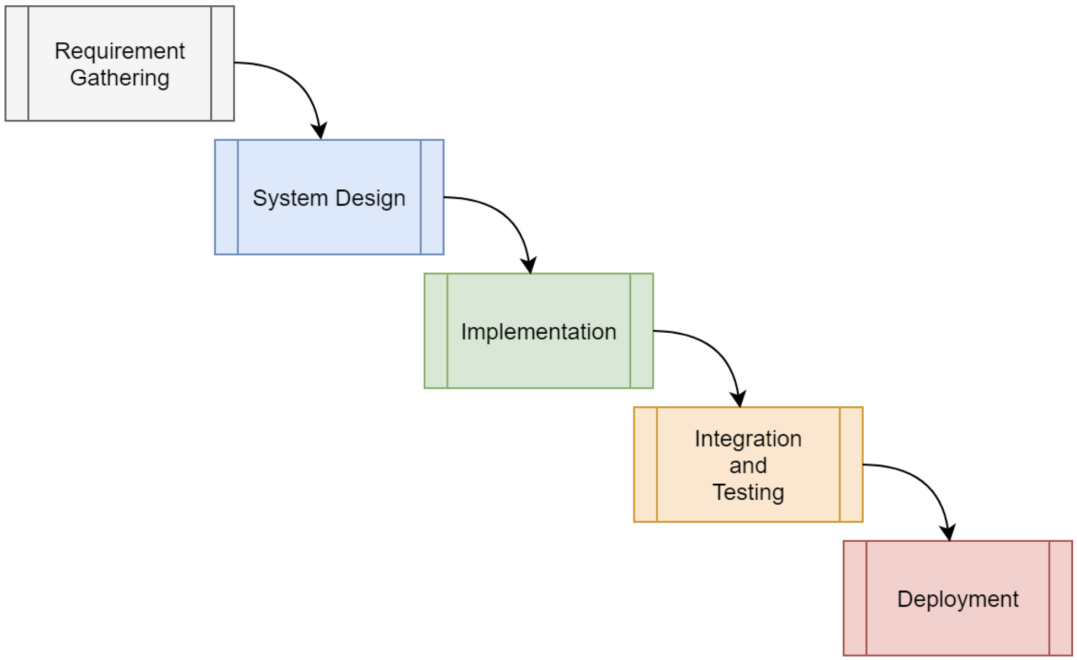

Figure: Waterfall Model

Stages of the Waterfall method

Requirement Gathering Analysis

- First phase of the software development process
- Involves gathering information from stakeholders
- Requirements translated into a comprehensive document
- Document outlines project goals, features, and functionalities
- Serves as a reference point for the rest of the project
- Helps manage stakeholder expectations

Stages of the Waterfall method

Design

- Involves creating a detailed plan
- Technical design document outlines specifications
- Includes hardware and software components, database design, and system architecture
- Prototypes created to visualize the final product
- Minimizes risks and reduces chances of rework later in the process

Stages of the Waterfall method

Implementation

- Involves actual coding and building of the software
- Close collaboration between development team and stakeholders
- Regular testing and debugging performed to identify and fix issues
- Marks the transition from planning and design to actual software creation

Stages of the Waterfall method

Testing

- Involves evaluating the software
- Various types of testing performed, including:
    - Unit Testing: individual component testing
    - Integration Testing: multiple component integration testing
    - System Testing: full system testing
    - User Acceptance Testing: testing with actual users
- Helps to ensure the quality and reliability of the final product
- Identifies and resolves any issues or bugs in the code

Stages of the Waterfall method

Deployment and Maintenance

- Involves making the software available to end-users
- Software deployed to the production environment
- Deployment process carefully managed to minimize disruptions and ensure a smooth transition
- Development team provides ongoing maintenance and support
- Fixes bugs, updates software to address changing requirements,

Outline

Advantages and limitations

Advantages

It provides a clear set of processus that must be followed.

There is a planning and documentation step.

It emphasizes on quality and completeness.

It is the ideal model for projects that have a clear scope, well-defined requirements.

Predictability is key.

Advantages and limitations

Limitations

It relies heavily on detailed upfront planning.

The sequential order of the stages makes it difficult to identify and fix problems early on.

It is inflexible, which can be a disadvantage in dynamic environments.

It can result in missed requirements if the planning is not thought well enough from the beginning.

Testing and debugging are not integrated into the process.

Outline

Use of Waterfall in Real World

Discussion of a project that used the Waterfall method

Different projects that could use the Waterfall method

Fintech company

Edtech company

Medical software company

Use of Waterfall in Real World

Watefall method for a Fintech company

Process of waterfall method

Requirements: Fintech company must be compliant with the regulations of the country.

Creation: The company must also consider the customer experience

Use of Waterfall in Real World

Outcome and Lessons Learned

Suited for large projects

Better resource management

Better control over the budget

Outline

Waterfall vs Agile

Comparison

- There are applications and specific projects that are more driven to one or the other.
- Agile is about fast iteration and waterfall is about totality and completeness.
- Difference in approach, waterfall is sequential and agile is iterative.
- The size of the project is a factor.
- The approach to planning is different in both.
- Testing is done in different stages in both.
- Communication and customer involvement is also different in both.

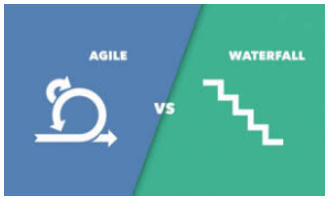

Figure: Agile vs Waterfall

Outline

Conclusion

Recap of the Waterfall method

What is the Waterfall method ?

- A linear and sequential process

The pros of the Waterfall method

Scalability

Predictability

Conclusion

Final thoughts and recommendations

Process recap

5 steps of the Waterfall method:

- Requirements
- Design
- Implementation
- Testing
- Maintenance

References