Drawbacks of Waterfall Model
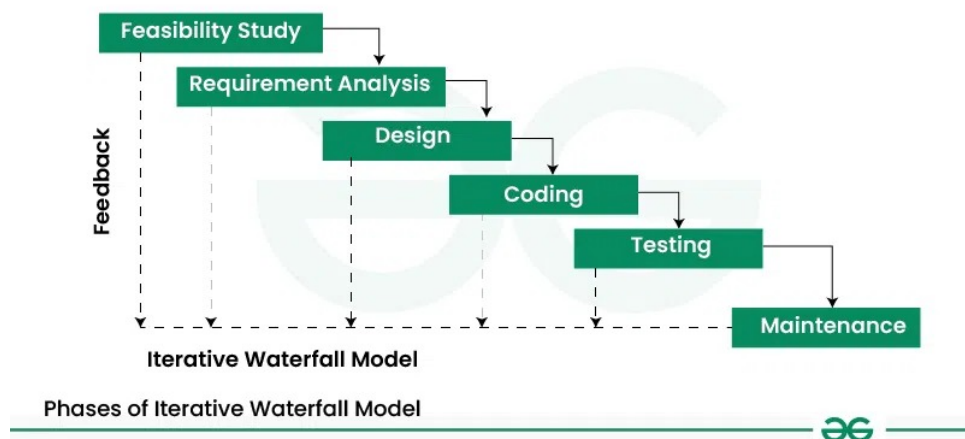

Figure 1: Waterfall Model Diagram

1 Introduction

The Waterfall model is one of the earliest software development methodologies, following a linear and sequential approach. While it has been widely used, it comes with several significant drawbacks that limit its effectiveness in modern software development.

2 Major Drawbacks

2.1 Inflexibility to Changes

Once a phase is completed in the Waterfall model, it is difficult and costly to go back and make changes. Requirements are fixed early in the project, making it challenging to accommodate evolving business needs or technological advances.

2.2 Late Testing Phase

Testing occurs only after the implementation phase is complete. This means that bugs and issues are discovered late in the development cycle, making them more expensive and time-consuming to fix.

2.3 No Working Software Until Late

The client does not see a working version of the software until very late in the development process. This increases the risk of delivering a product that does not meet expectations or requirements.

2.4 Poor Risk Management

Since all requirements are gathered at the beginning, there is little room to identify and mitigate risks throughout the project. Problems may only surface during later stages when they are harder to address.

2.5 Assumes Clear Requirements

The model assumes that all requirements can be defined clearly and completely at the start. In reality, requirements often evolve, and stakeholders may not fully understand their needs until they see working software.

2.6 Limited Customer Involvement

Customer interaction is primarily limited to the requirements phase and final delivery. This lack of continuous feedback can result in a final product that doesn't align with customer expectations.

3 Conclusion

While the Waterfall model offers simplicity and clear structure, its drawbacks make it unsuitable for projects with uncertain or evolving requirements. Modern iterative and agile methodologies have largely addressed these limitations, offering more flexibility and customer collaboration.