C++ Software Design

Design Principles and Patterns in Modern C++

Klaus Iglberger
October, 9th-10th, 2023

1. Introduction

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Introduction of the Trainer

C++ Trainer since 2016

Author of the bl🔥ze C++ math library

Author of "C++ Software Design"

(Co-)Organizer of the Munich C++ user group
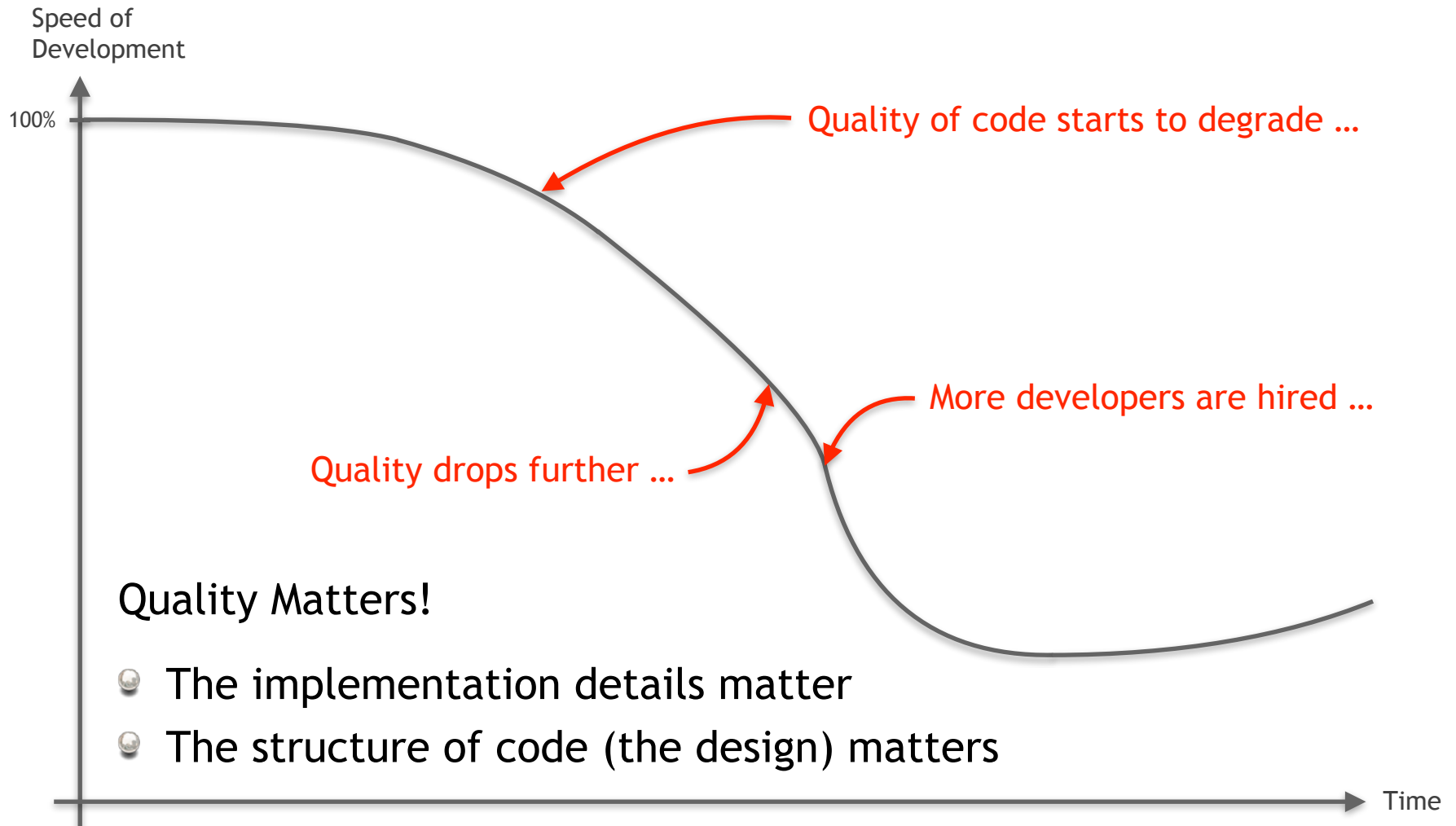
Regular presenter at C++ conferences

Klaus Iglberger

Motivation

"There is no point in developing software unless you care about doing it well." (Andrew Hunt, David Thomas, The Pragmatic Programmer)

Motivation

Speed of
Development

100%

Quality of code starts to degrade ...

More developers are hired ...

Quality drops further ...

Quality Matters!

- The implementation details matter
- The structure of code (the design) matters

Time

Scope of this Training

In this training I will address …

- … software design principles and patterns;

- … design patterns in a multi-paradigm programming language;

- … classical and modern design patterns;

- … the philosophy of "Modern C++".

Scope of this Training

In this training I will NOT address ...

- ... all possible (classical and modern) design pattern;

- ... all variations of design patterns;

- ... all implementation details of modern design patterns.

Content of this Training

1. Introduction
2. C++ Software Design
3. Summary/Literature

Schedule

Monday, October, 9th, 2023 (EDT time zone)

10:00am - 10:10am	*Introduction*
10:10am – 11:00am	*Understanding Software Design and Patterns*
11:00am – 11:10am	*Break*
11:10am - 12:00pm	*The Visitor Design Pattern*
12:00pm – 12:10pm	*Break*
12:10pm – 1:00pm	*The Visitor/Strategy Design Patterns*
1:00pm – 1:10pm	*Break*
1:10pm - 2:00pm	*The Strategy Design Pattern*

Schedule

Tuesday, October, 10th, 2023 (EDT time zone)

10:00am - 10:10am	*Recap*
10:10am – 11:00am	*The Prototype and Adapter Design Patterns*
11:00am – 11:10am	*Break*
11:10am - 12:00pm	*The Bridge Design Pattern*
12:00pm – 12:10pm	*Break*
12:10pm – 1:00pm	*The External Polymorphism Design Pattern*
1:00pm – 1:10pm	*Break*
1:10pm - 2:00pm	*The Type Erasure Design Pattern*

Miscellaneous

I assume you have some experience with C++. If something remains unclear or somewhat vague, **please ask**!

Miscellaneous

Also remember: **You are in control!**

Guidelines

(Core) Guideline: ...

The green boxes represent ...

- ... the most important take-aways;

- ... common idioms and best practice;

- ... markers in the slides.

Programming Tasks

Task (Subchapter/Name): …

The yellow boxes represent …

- … hands-on programming tasks;

- … links to the provided source code examples.

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