PV 168: Úvod

Petr Adámek (adamek@fi.muni.cz)

Pavel Hrdina (polecek@mail.muni.cz)

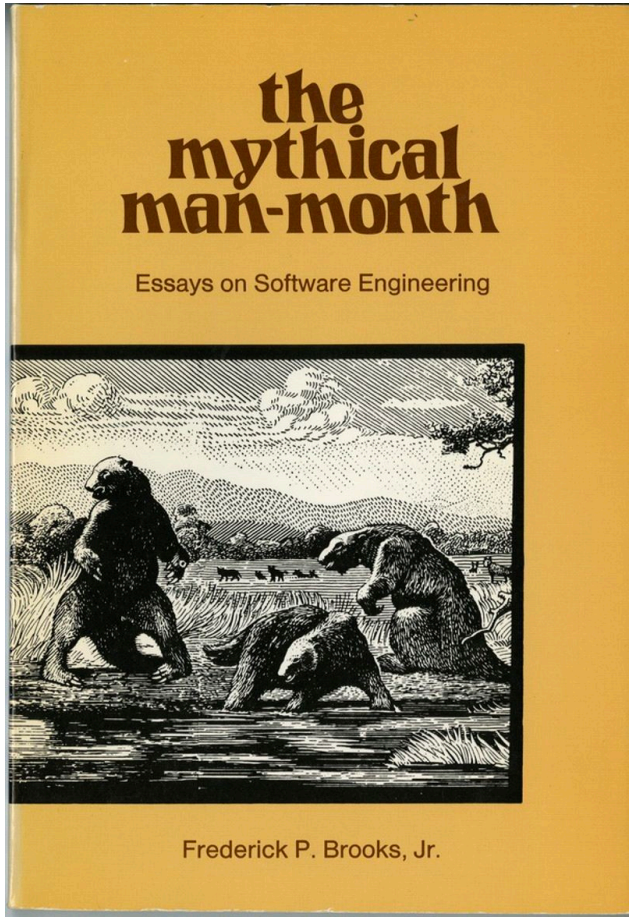
Course goal

How to design and develop software to fulfill all requirements and maximize the added value for customer.

Common Key Requirements

- Fulfilling customers requirements
- Usability (for end users)
- No bugs
- Short *Time To Market*
- Total costs (including maintenance)
- Flexibility / adjustability for changes (during development or in future, problem with data migration, compatibility of API / WS)

Resources

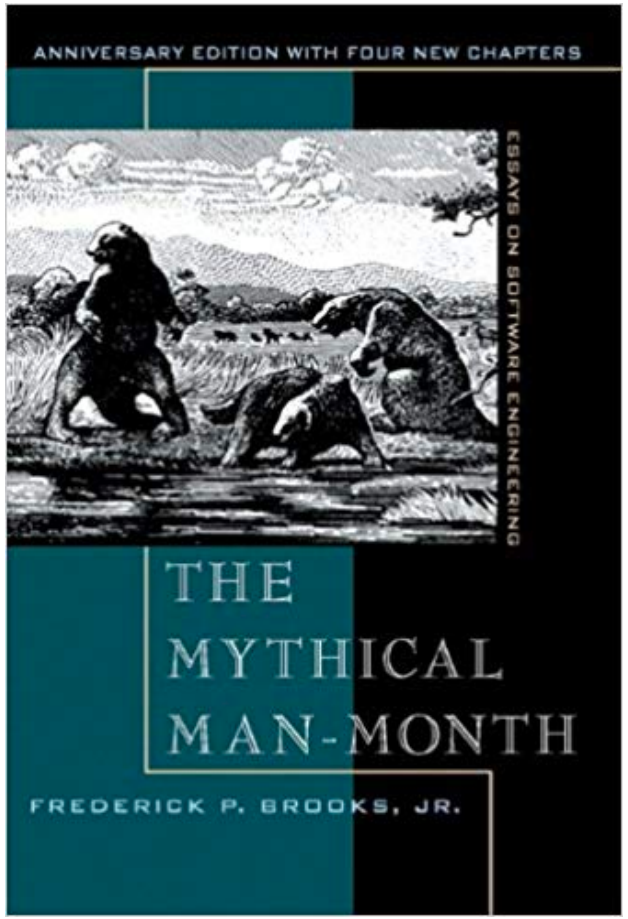


The Mythical Man-Month: Essays on Software Engineering

Frederick P. Brooks, Jr.

Addison-Wesley, 1975.

Resources



The Mythical Man-Month: Essays on Software Engineering, Anniversary Edition

Frederick P. Brooks, Jr.

Addison-Wesley, 1995.

http://www.amazon.com/dp/0201835959/

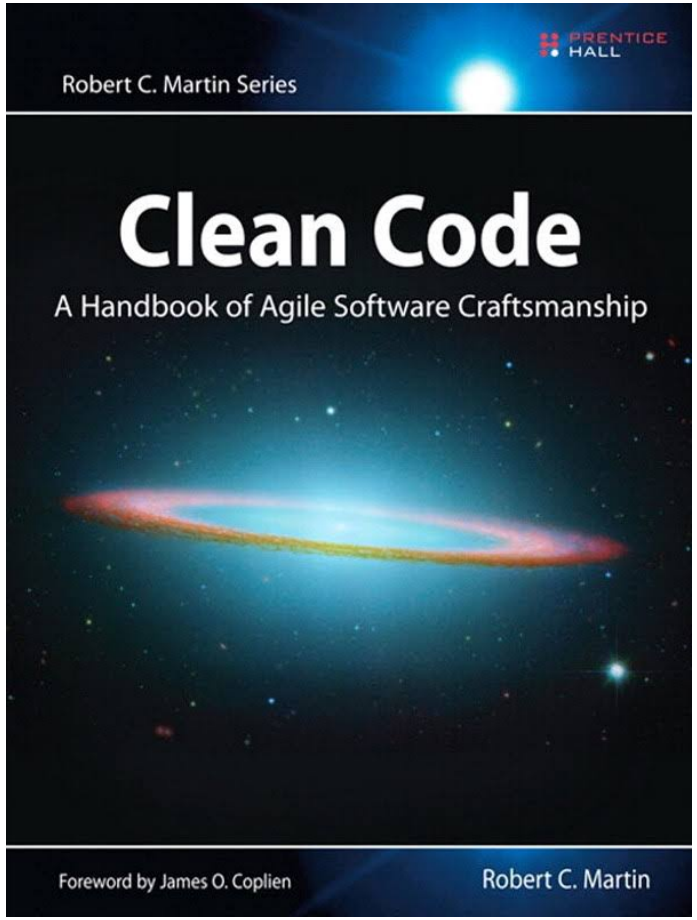
What makes it difficult?

- Complexity – many requirements, complicated domain, complicated technologies, complicated design
- Lack of clarity – complicated and hard to understand code
- Irresponsible attitude – not paying attention to important details, low work ethic (*botcher/fušer*)
- Interpersonal communication (both direct and indirect) – problem with understanding between involved humans, missing common vocabulary

Course organization

- Lectures
  - A little theory, examples and demonstrations
- Seminars
  - Practical experience
- Tasks / Project
- Technologies
  - Swing, Threads, JDBC, Unit tests, Java Servlets, JSP

Resources

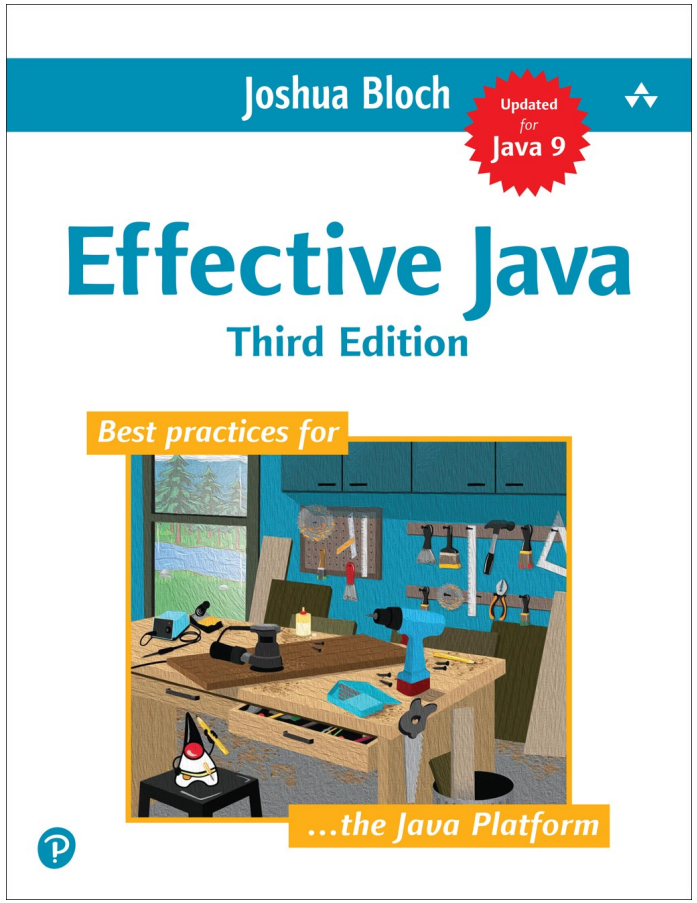


Clean Code: A Handbook of Agile Software Craftsmanship

Robert C. Martin

http://amazon.com/dp/0132350882/

Resources

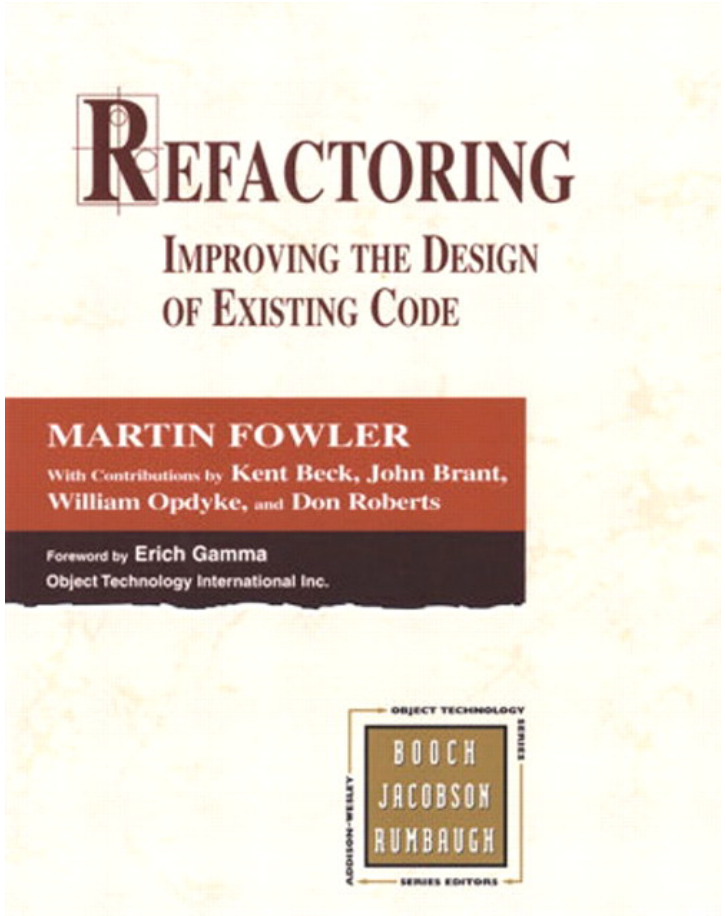


Effective Java (3rd Edition)

Joshua Bloch

https://www.amazon.com/dp/0134685997

Resources



Refactoring: Improving the Design of Existing Code

Martin Fowler, Kent Beck, John Brant, William Opdyke, Don Roberts

http://amazon.com/dp/0201485672/

Swing

Swing

- Java GUI toolkit, based on Java AWT
- Part of JFC
- Part of Java Cora API since Java 1.2
- Alternatives
  - AWT (Abstract Windows Toolkit)
  - SWT (Standard Widget Toolkit)
  - JavaFX
- https://docs.oracle.com/javase/tutorial/uiswing/index.html

Event driven programming

- Application is reacting to events, which are delivered to appropriate component
- Source of event
  - User (mouse, keyboard, or other input device)
  - Other component
- Type of event
  - Low level (e.g. *user pressed or released some key, user moved the mouse cursor, user clicked/double clicked at specific position*)
  - High level (usually generated as reaction to some low level event, e.g. *user pressed some button, user selected some menu item, user moved cursor*)

Event handling

- For each type of event, there is an:
  - Event object – represents the event, contains the reference to the source component and possible other attributes (e.g. *mouse cursor position*).
  - Event listener – interface representing the component which is receiving the event (it must be implemented by any component which is receiving this type of events).
- If we want to react to some event, we have to:
  - Create event listener (it can be implemented as regular java class, anonymous local class, or lambda expression / method reference – if the event listener interface is functional interface).
  - Register the event listener at the component which is emitting the events.
- Events must be handled in *Event Dispatcher Thread (EDT)*!

Example

```
// Create instance of button component
JButton button = new JButton(“My button");

// Create event listener
ActionListener actionListener = new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        // Zobrazíme dialogový box s informací o stisknutí tlačítka
        JOptionPane.showMessageDialog(null,"Stisknuto tlačítko: " +
            e.getActionCommand());
    }
};
// Register the event listener
button.addActionListener(actionListener);
```

First Swing Application

Závěr

?