Software Engineering Essentials

User Interface Design

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Learning goals

1) Describe the concept of boundary objects

2) Design user interfaces in JavaFX

3) Explain best practices for user interface design

Motivation

Failures are helpful

Henry Petrovski's paradoxical approach to design:

- Better information comes from designs that fail rather than from those that succeed

- Reason: failures lead to investigations —> without failure, satisfaction sets in

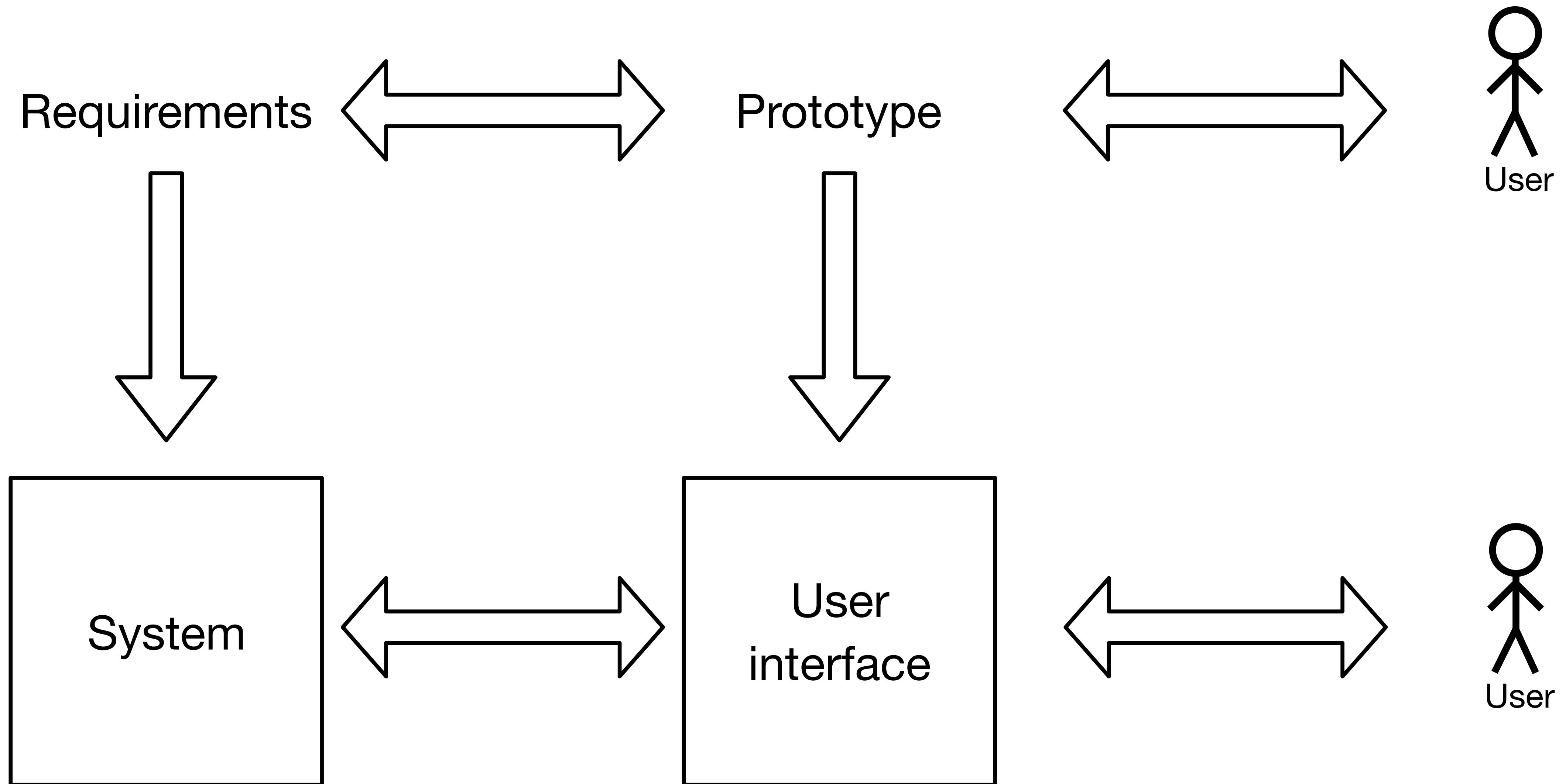Famous quote by Petrovski: „success in engineering is defined by its failures"

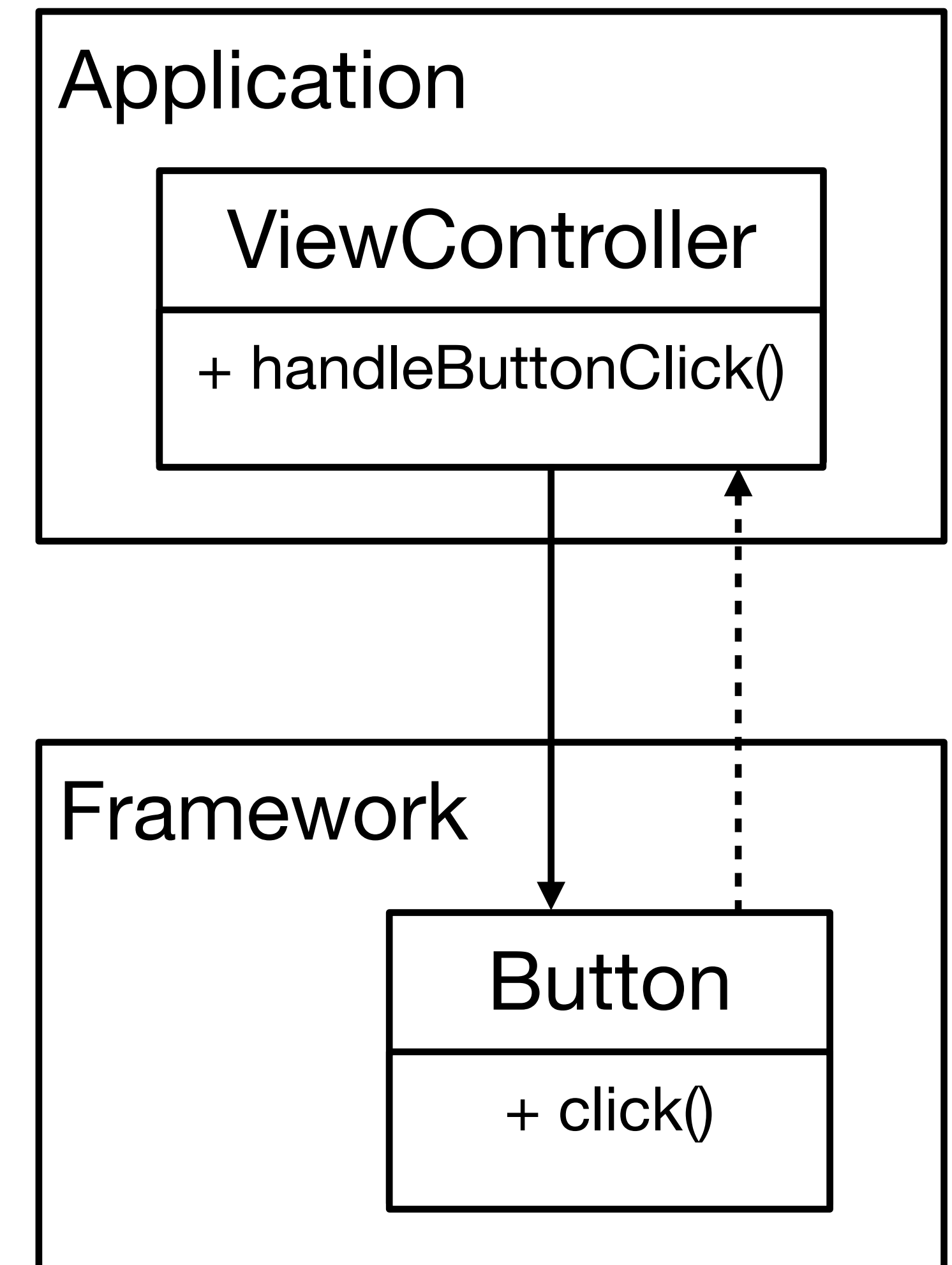➡ Successful failure

Henry Petrovski

From prototypes to user interfaces

Boundary objects

- Represent the interactions between users and system.

- **Examples:** label, button, tables, lists, view hierarchies, layout constraints

- Rich variety of standard user interface controls in standard libraries and frameworks

- No need for implementation —> configuration

- Possibilities for configuration:

  - Manipulation of attributes, e.g. size, color, shadow

  - Manipulation of behavior by implementing actions (callbacks)

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┌─────────────────────────────────────┐
│ Application                         │
│   ┌─────────────────────────────┐   │
│   │     ViewController          │   │
│   ├─────────────────────────────┤   │
│   │ + handleButtonClick()       │   │
│   └─────────────────────────────┘   │
└─────────────────────────────────────┘

┌─────────────────────────────────────┐
│ Framework                           │
│              ┌──────────────────┐   │
│              │      Button       │   │
│              ├──────────────────┤   │
│              │ + click()         │   │
│              └──────────────────┘   │
└─────────────────────────────────────┘
```

JavaFX

- Interface standard library extension for Java with rich UI controls

- Integrated into Java 8

- Scene builder application (integrated into Eclipse) allows to create and generate FXML documents using a drag and drop interface

- Powerful way to control the design of an application using CSS-like syntax

Best practices for user interface design

- Focus on maximizing usability and user experience: facilitate the task at hand

- Apply general guidelines, but also specialize in the given problem domain

- Analyze users and their activities

- Apply prototyping to iteratively improve the design

- Inspect usability and user experience with real end users

- Apply human interface guidelines

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