10/19/2011

Observer & Whiteboard Pattern

Jasmin Metzger

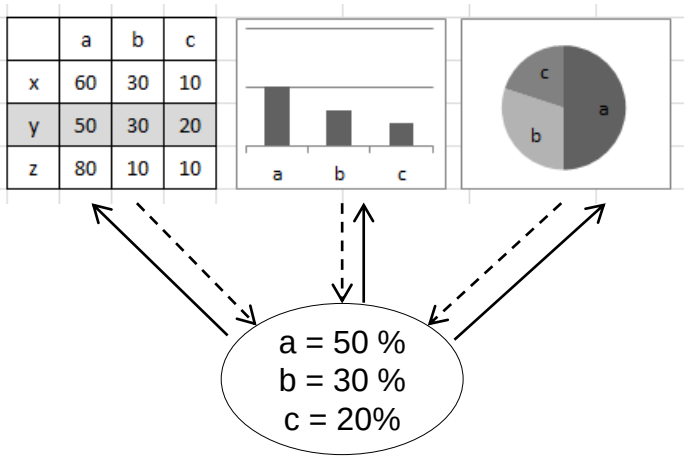
dkfz.
GERMAN
CANCER RESEARCH CENTER
IN THE HELMHOLTZ ASSOCIATION

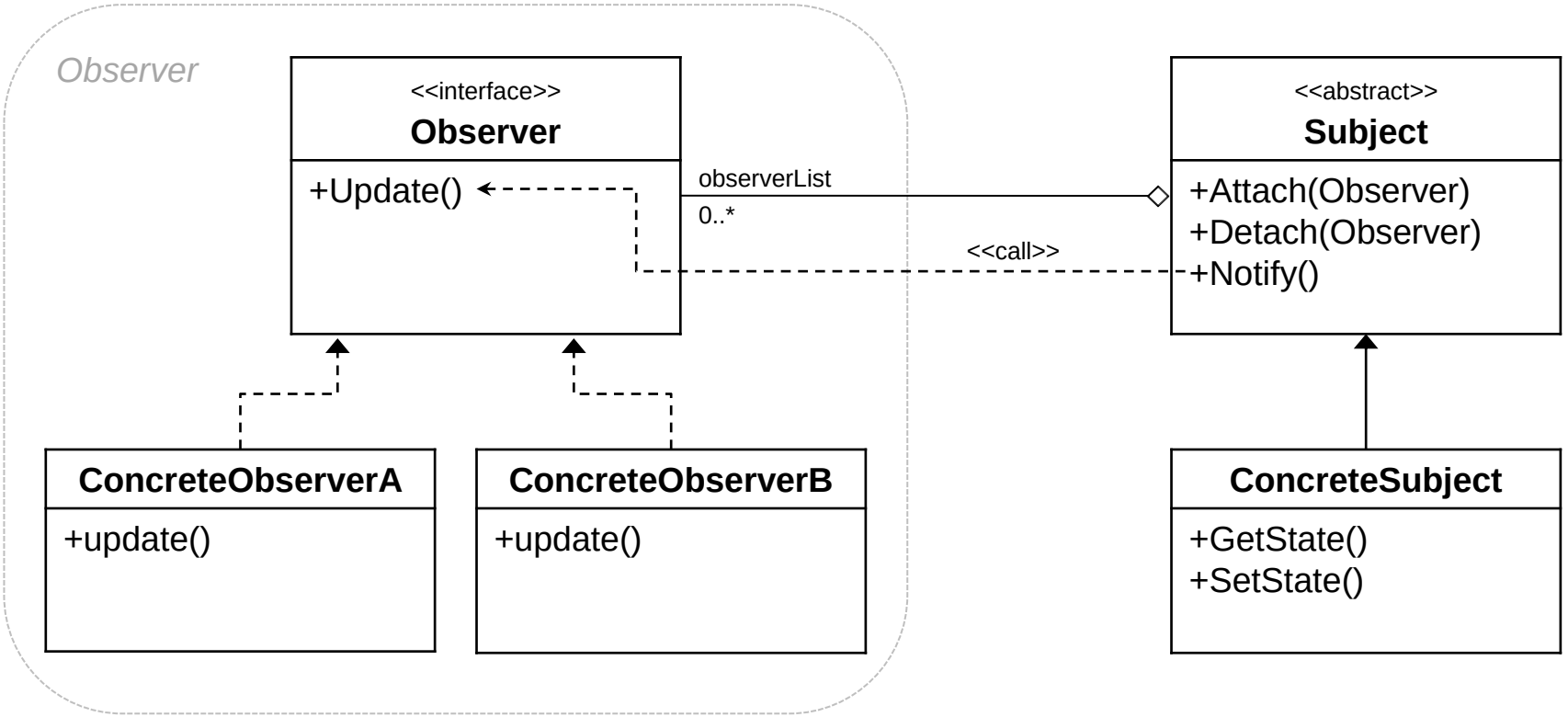
Design Pattern

- Guidelines for implementing software
- Approved designs to solve architectural problems
- Different types:
  - Creational
    - Deal with initializing and configuring classes and objects
  - Structural
    - Deal with decoupling interface and implementation of classes and objects
    - Composition of classes or objects
  - Behavioral
    - Deal with dynamic interactions among societies of classes and objects
    - How they distribute responsibility
  - Concurrency
    - Deal with multi-threaded programming paradigm

The Observer Pattern

- A Behavioral Pattern
- Also known as *‚Publish-Subscribe', Dependents*
- Define one-to-many dependency between objects → one object changes state, all its dependents notifier and updated automatically
- Usage:
  - Between GUI-Modules
  - Key-Value-Pair
  - MVC





Subject: Knows its observers. Provides interface for attaching and detaching Observer objects.

Observer: Defines updating interface for objects that should be notiefied of changes in a subject

ConcreteSubject: Stores state of interest to ConcreteObserver objects and sends notification, when its state changes.

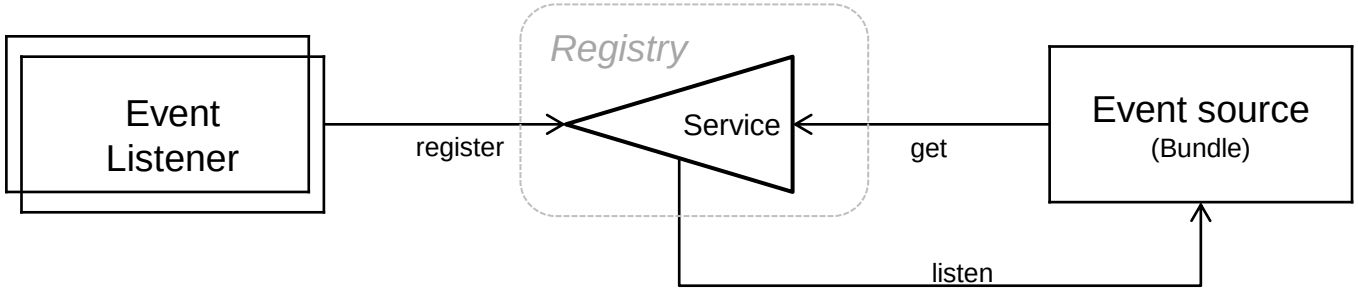
ConcreteObserver: Implements the updating interface keeping the state consistent with the subject‘s

Pros and Cons

+ Abstract coupling between Subject and Observer
+ Support for broadcast communication
+ Reusability
+ Data consistency
+ Flexibility and modularity

- Unexpected updates, deadlocks
- Life cycle issues
- Extra Vector in subject for observer

The Whiteboard Pattern



- Uses framework‘s service registry
  - + Life Cycle Management
  - + Implementation
  - + Debugging
  - + Properties

Sources

- Design Patterns. Elements of Reusable Object-Oriented Software, Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides
- http://en.wikipedia.org/wiki/Design_pattern_%28computer_science%29
- http://www.philipphauer.de/study/se/design-pattern.php
- http://www.osgi.org/wiki/uploads/Links/whiteboard.pdf