Scuola universitaria professionale della Svizzera italiana
Dipartimento tecnologie innovative

SUPSI

2D Editor for PNM files

Studente/i	Relatore	Correlatore
Dominik Panzarella Mattia Mancino Alessandro Spagnuolo	Corti Giancarlo	Brocco Amos

Corso di laurea	Modulo / Codice Progetto	Anno
Ingegneria Informatica	Ing. Software II	2024-2025

Committente	Data
Corti Giancarlo Brocco Amos	16.12.2024

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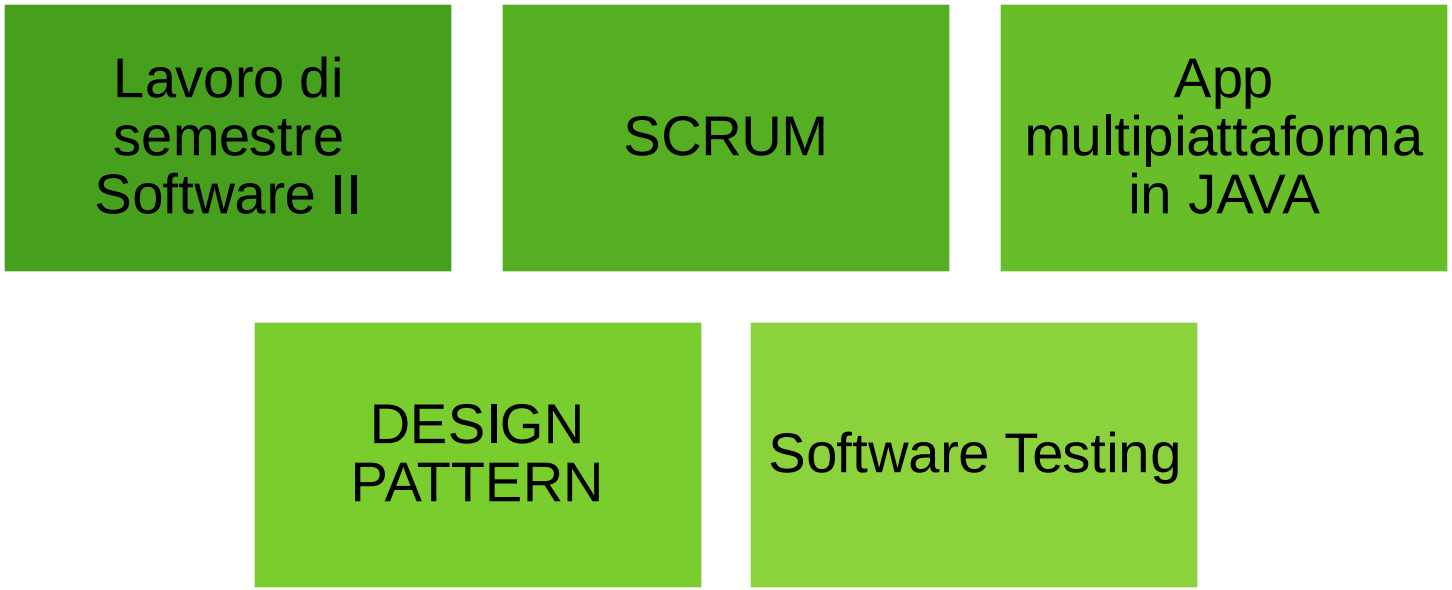
Indice

Contesto e motivazioni
Requisiti
Stato dell’arte
Approccio
Demo
Conclusione

Contesto e Motivazioni



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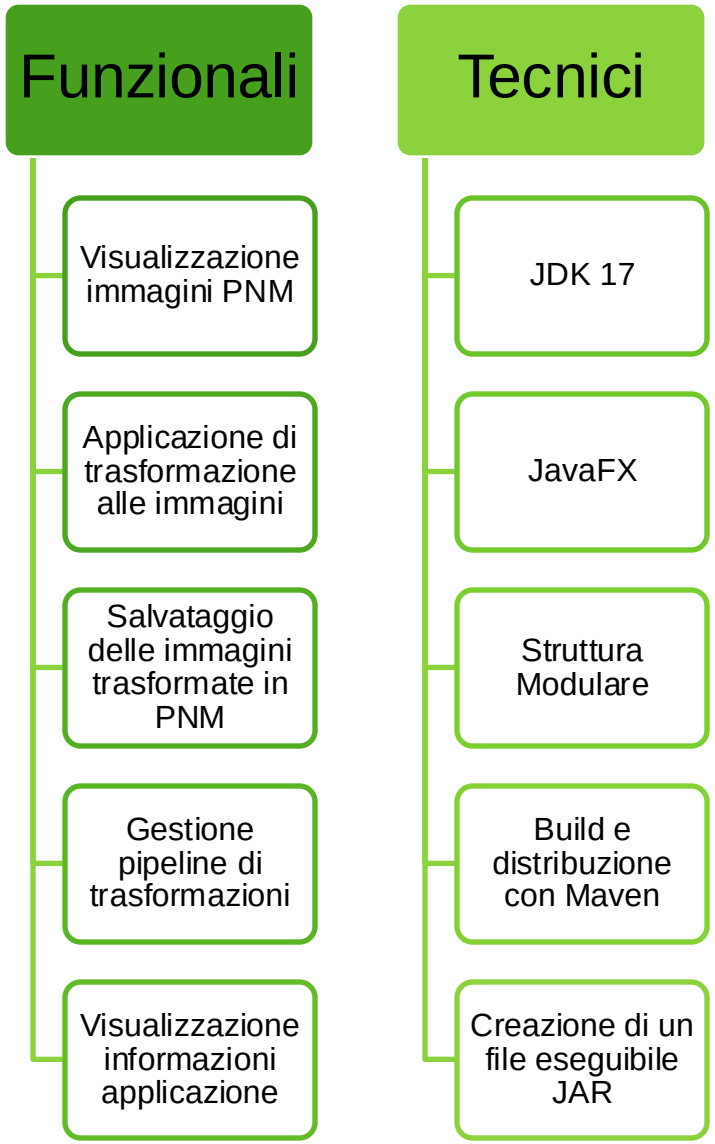
Requisiti



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Stato dell’arte

- XnView
- ImageMagick (solo CMD)
- …

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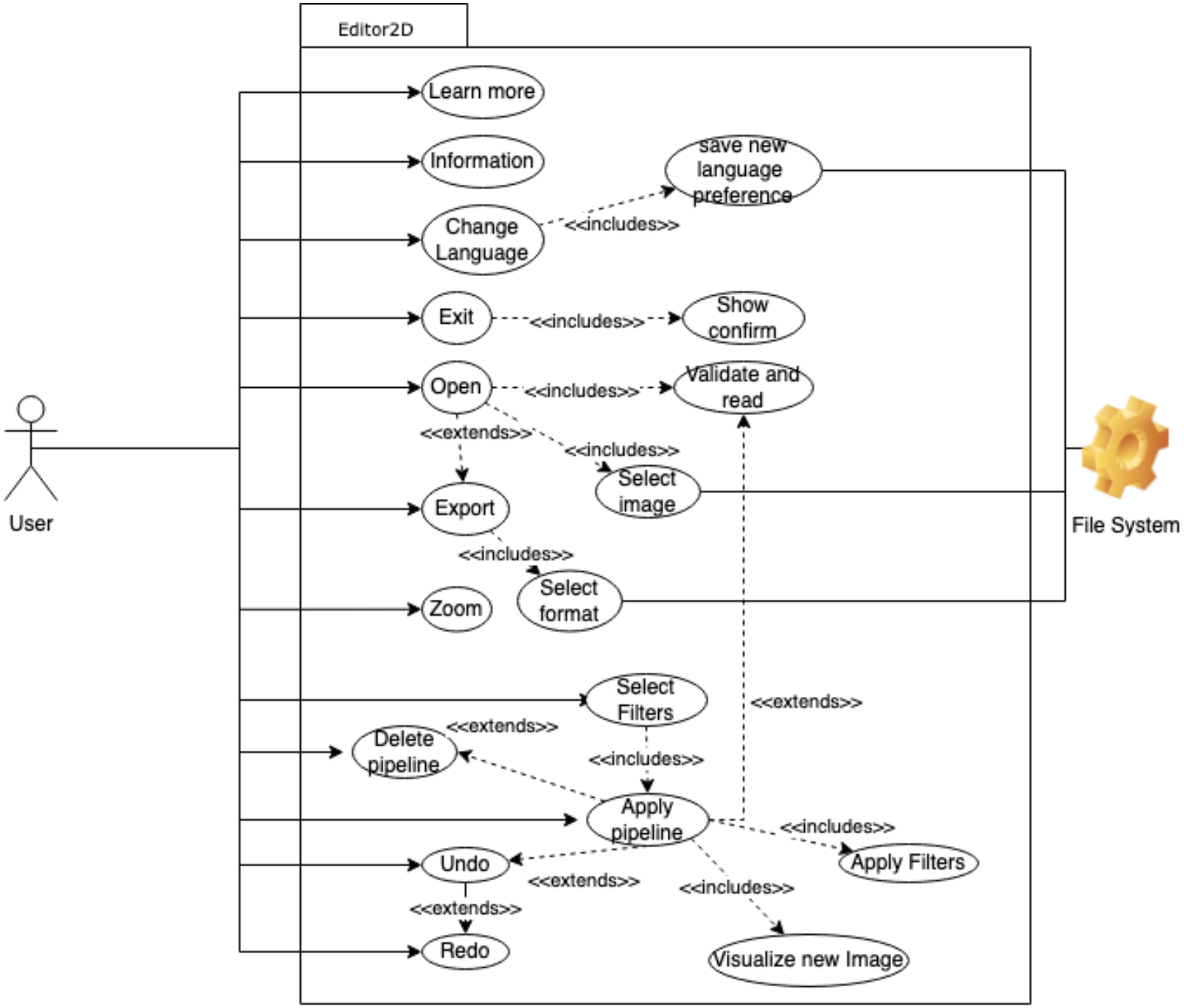
Approccio

Use Case Diagram



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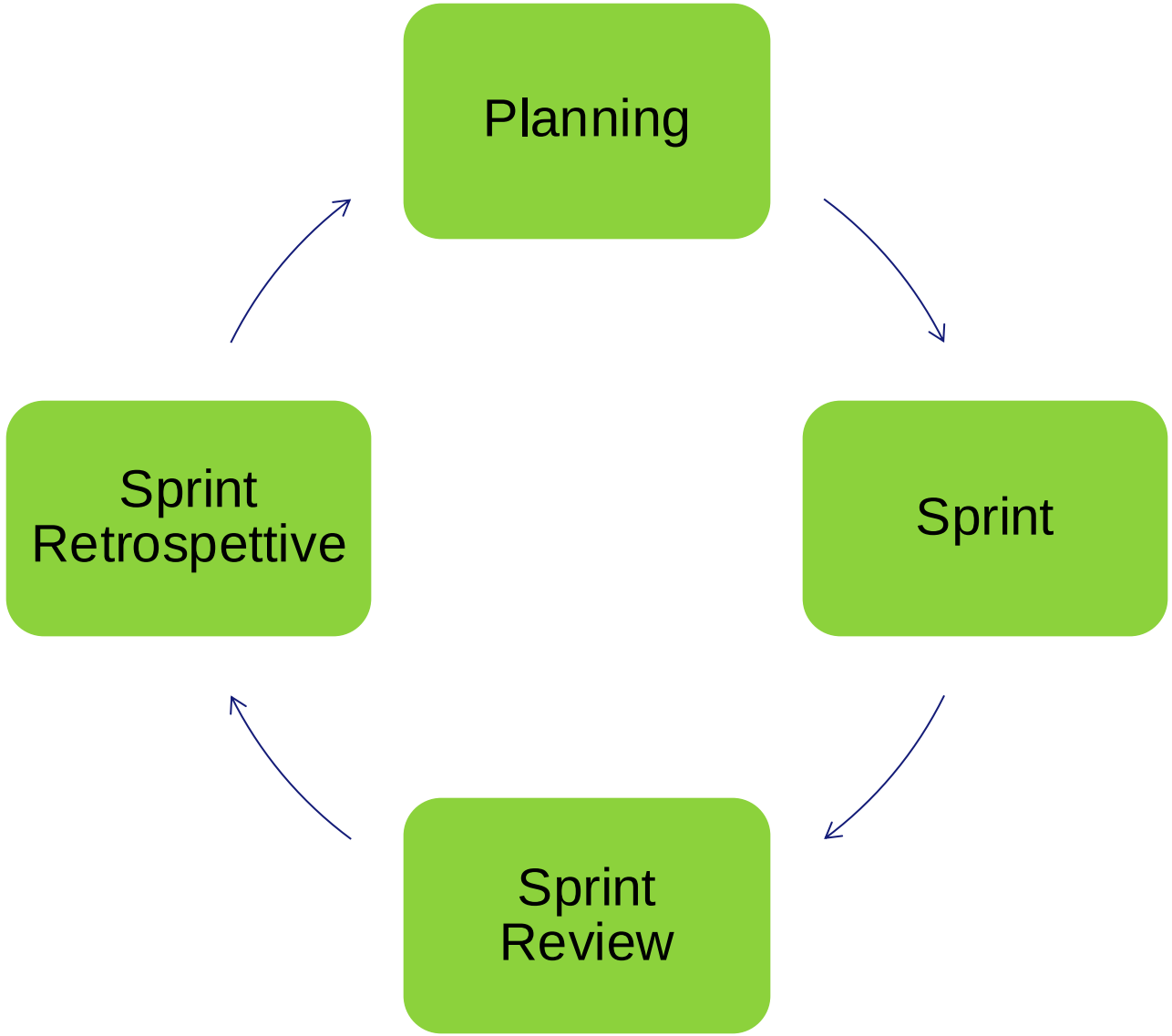
Approccio

Metodologia SCRUM



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Approccio

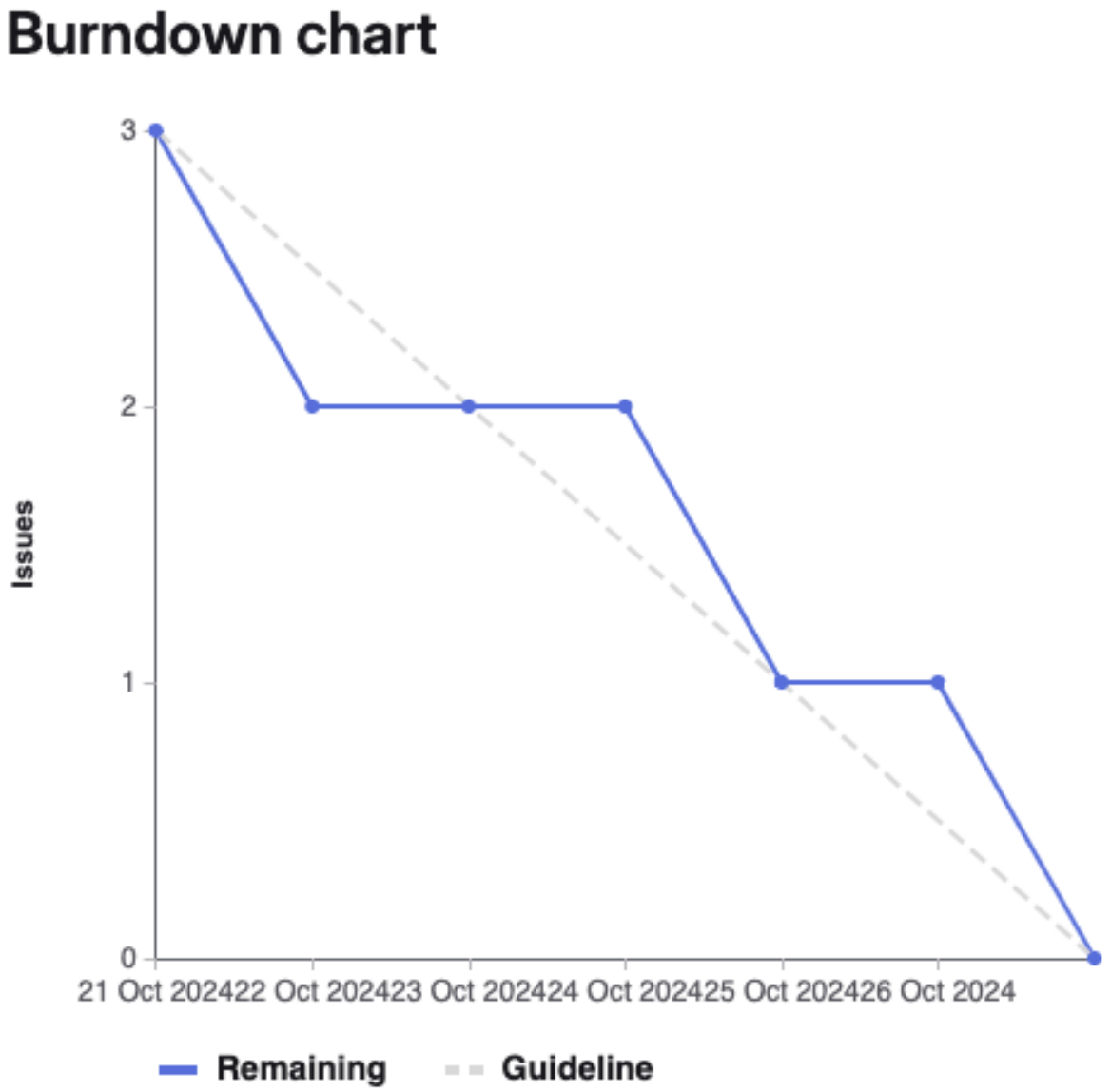
Sprint

- Sprint di una settimana
- Average Team Velocity: 76 Punti

ITERATION-01	DTI-ISIN / labingsw / labingsw02 / 20242025 / group08	Oct 7, 2024–Oct 13, 2024	Closed	7/7 complete 100%
ITERATION-02	DTI-ISIN / labingsw / labingsw02 / 20242025 / group08	Oct 14, 2024–Oct 20, 2024	Closed	9/9 complete 100%
ITERATION-03	DTI-ISIN / labingsw / labingsw02 / 20242025 / group08	Oct 21, 2024–Oct 27, 2024	Closed	6/6 complete 100%
ITERATION-04	DTI-ISIN / labingsw / labingsw02 / 20242025 / group08	Oct 28, 2024–Nov 3, 2024	Closed	2/2 complete 100%
ITERATION-05	DTI-ISIN / labingsw / labingsw02 / 20242025 / group08	Nov 4, 2024–Nov 10, 2024	Closed	2/2 complete 100%
ITERATION-06	DTI-ISIN / labingsw / labingsw02 / 20242025 / group08	Nov 11, 2024–Nov 17, 2024	Closed	0/0 complete 0%
ITERATION-07	DTI-ISIN / labingsw / labingsw02 / 20242025 / group08	Nov 18, 2024–Nov 24, 2024	Closed	6/6 complete 100%
ITERATION-08	DTI-ISIN / labingsw / labingsw02 / 20242025 / group08	Nov 25, 2024–Dec 1, 2024	Closed	3/3 complete 100%
ITERATION-09	DTI-ISIN / labingsw / labingsw02 / 20242025 / group08	Dec 2, 2024–Dec 8, 2024	Closed	2/2 complete 100%

Approccio

Sprint



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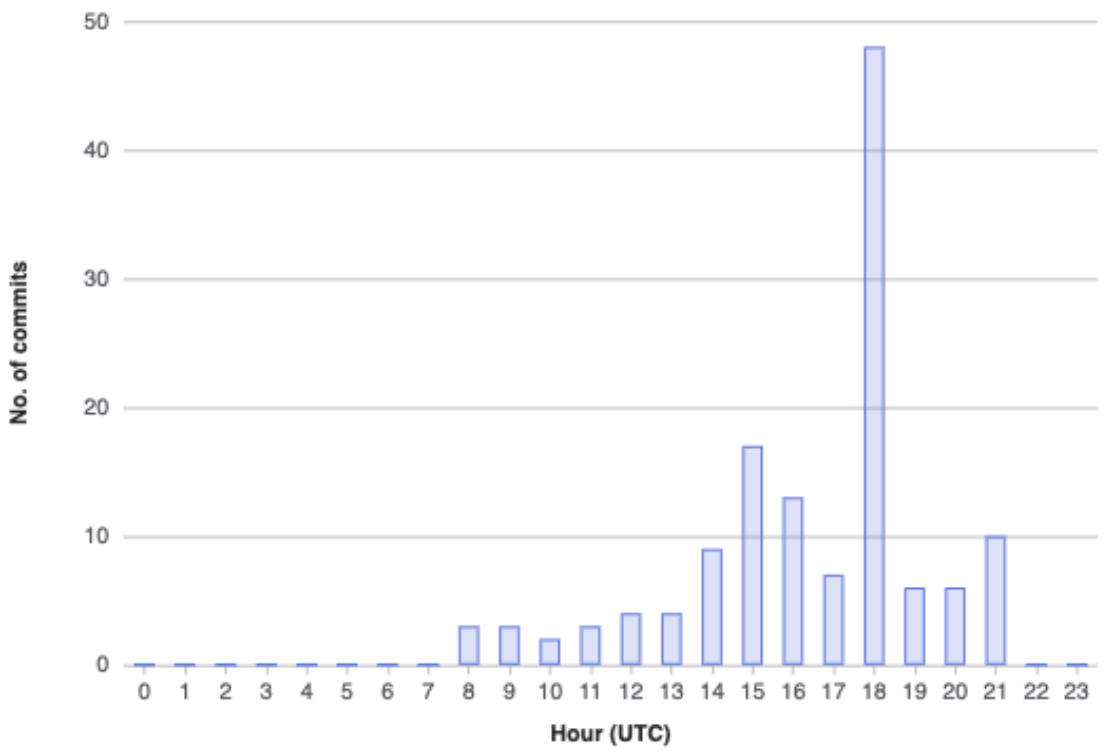
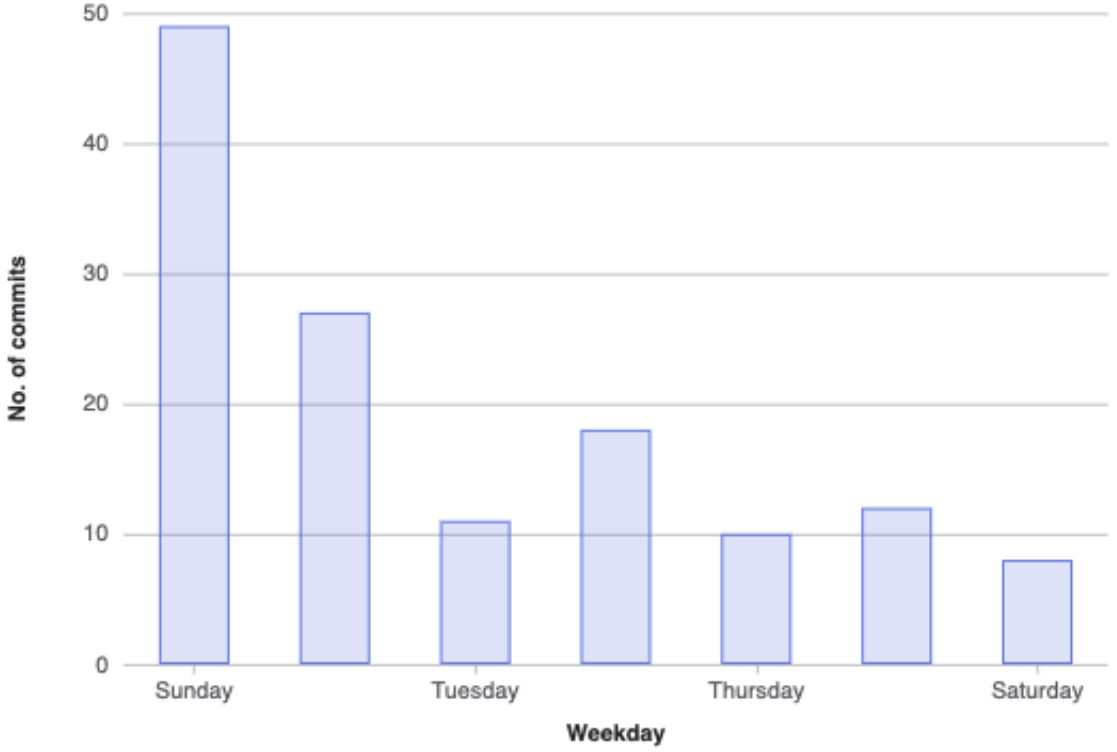
Approccio

Sprint

Commits per day hour (UTC)



Commits per weekday



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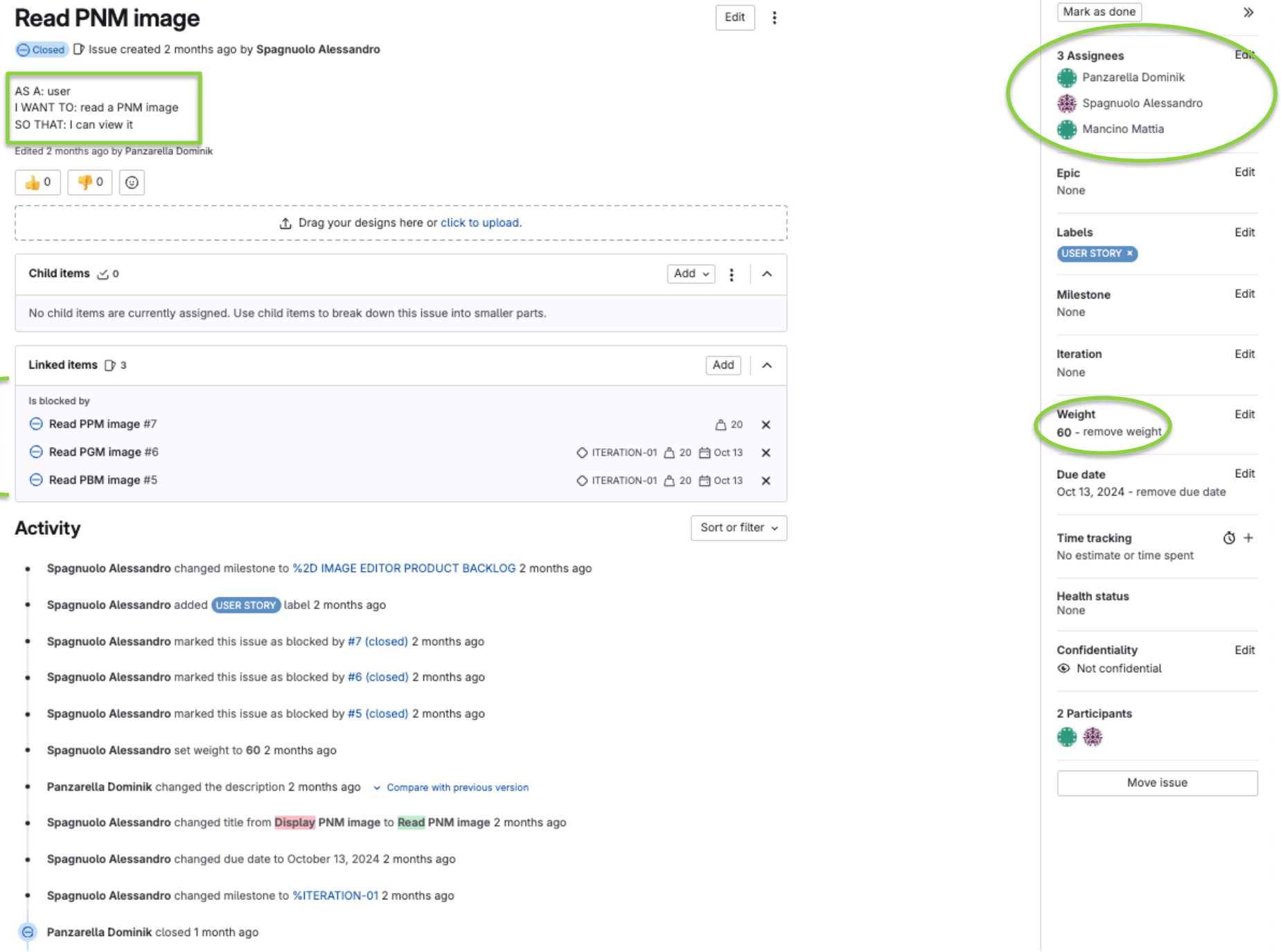
Approccio

Esempio User Story

Features



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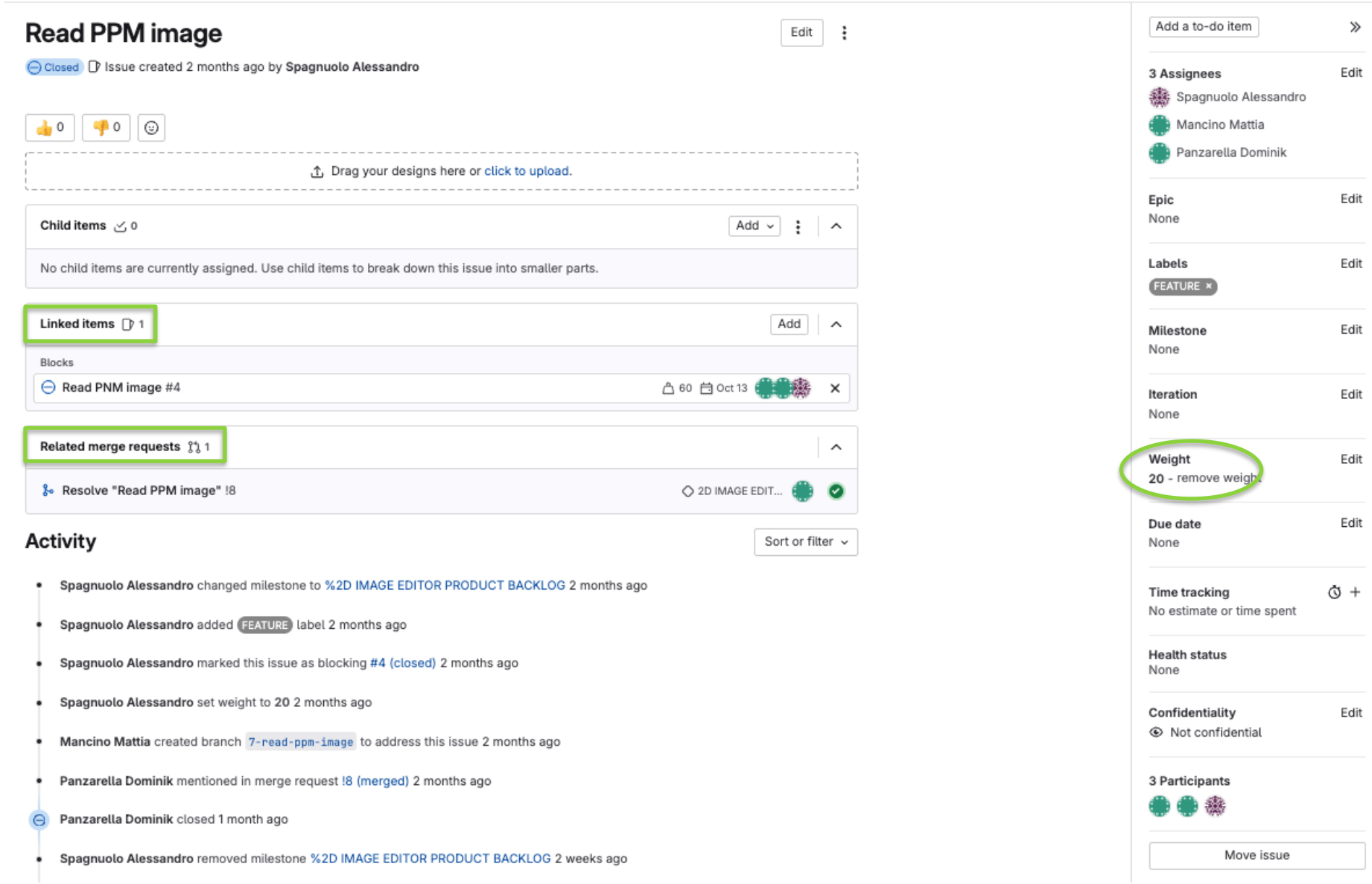
Approccio

Esempio Feature



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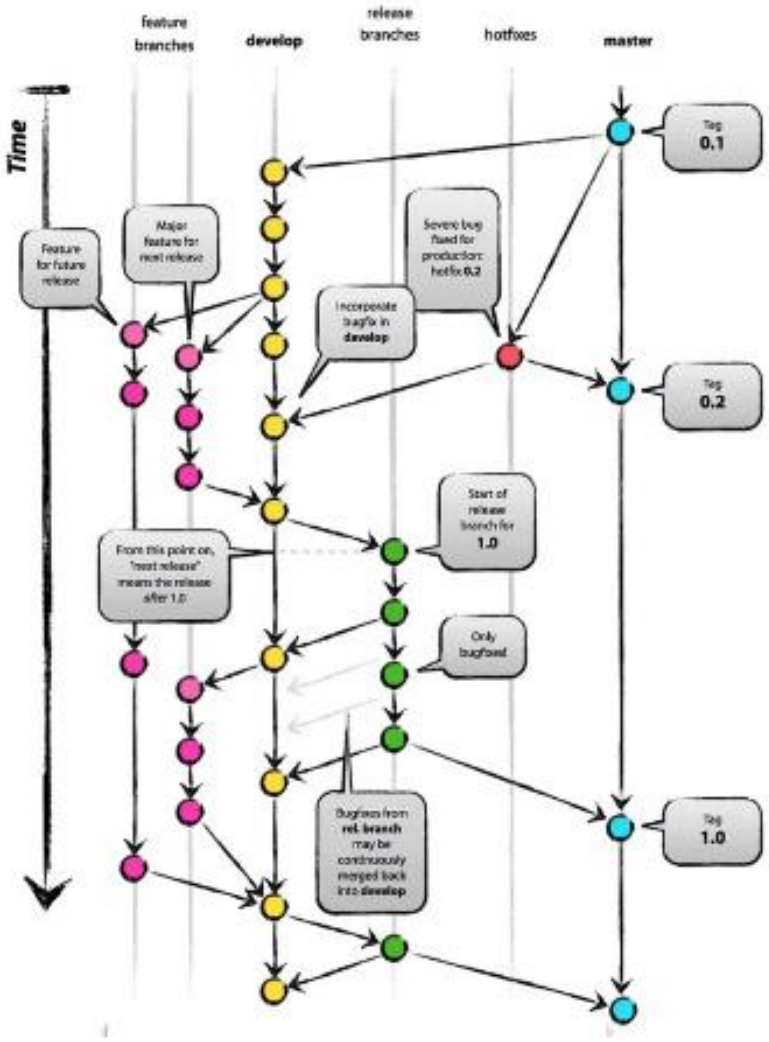
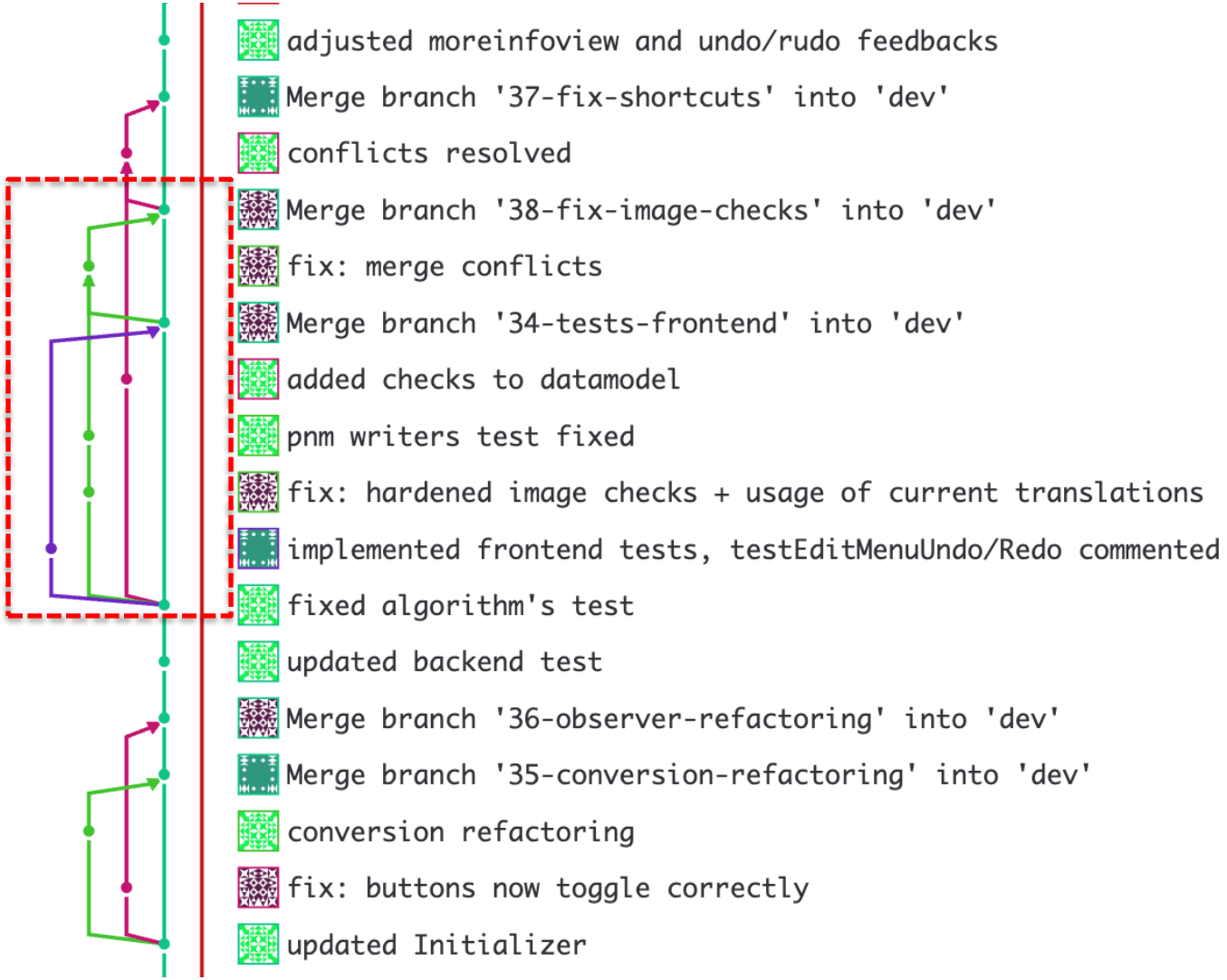
Approccio

Repository Graph





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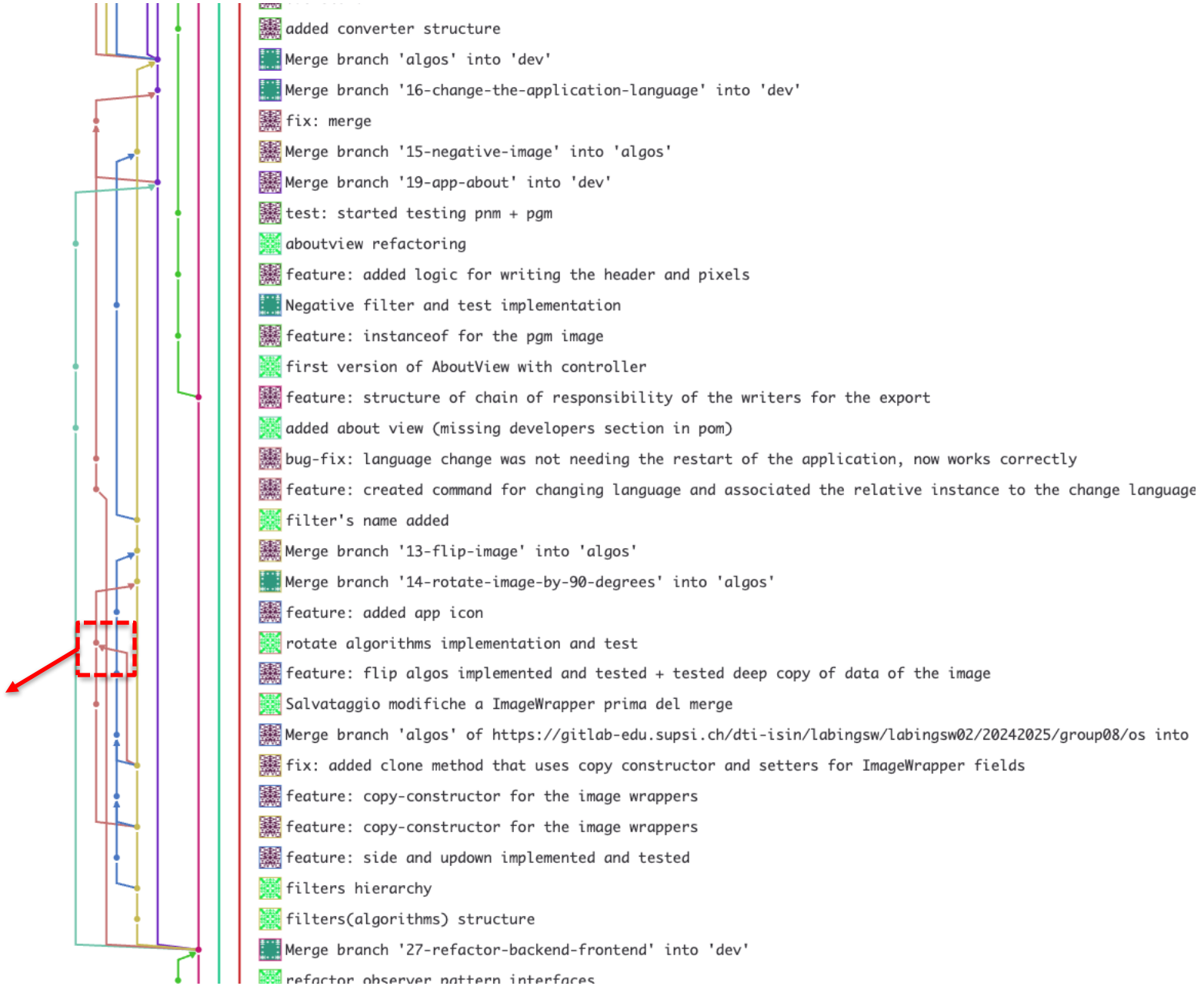
Approccio

Repository Graph



Conflict solved

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Approccio

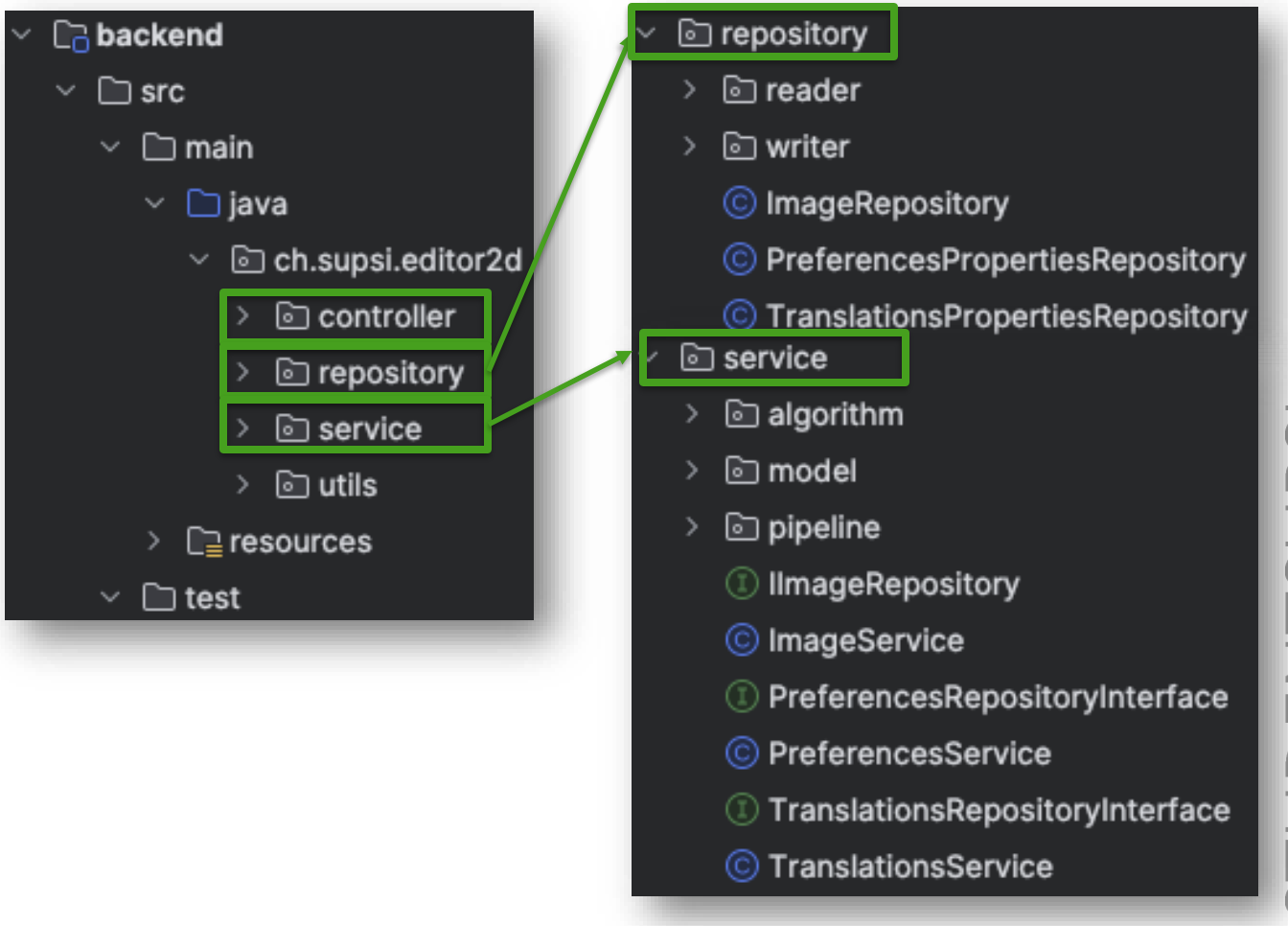
Backend - Struttura

- **Backend** -> Multi-Layer

  - Import/Export immagini
  - Internazionalizzazione
  - Pipeline di esecuzione dei filtri

- **Dipendenze**

  - JUnit



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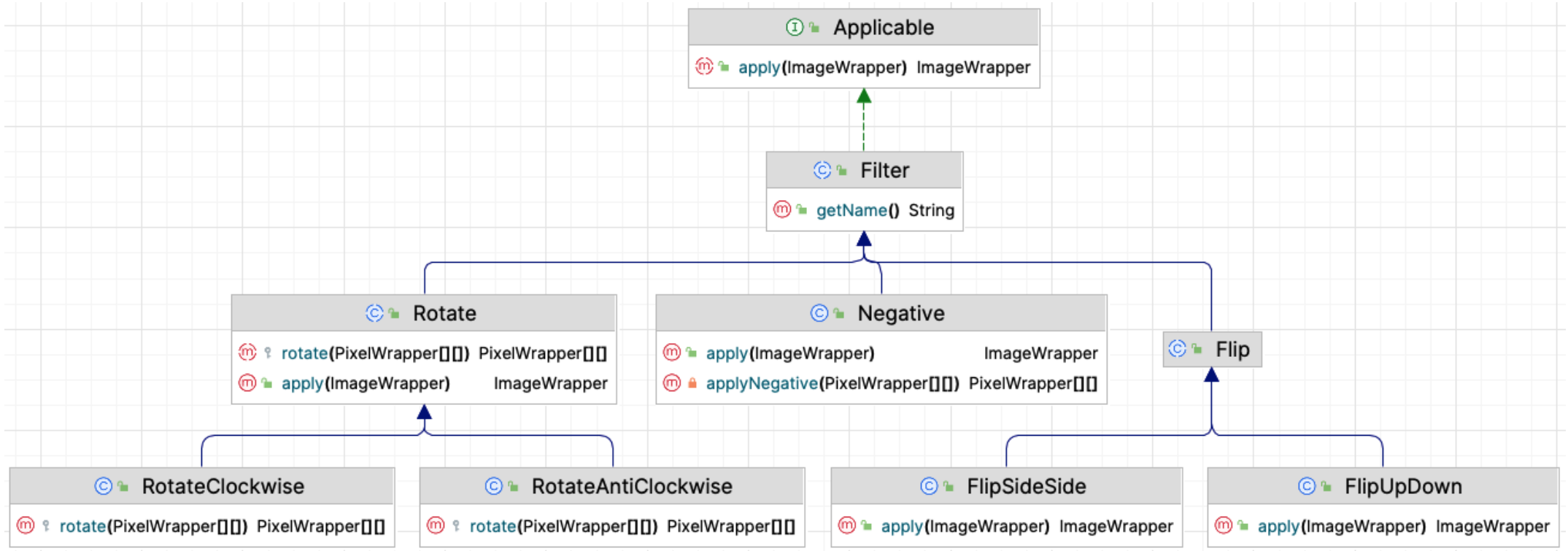
UML – Class diagram

Filtri – Strategy Pattern



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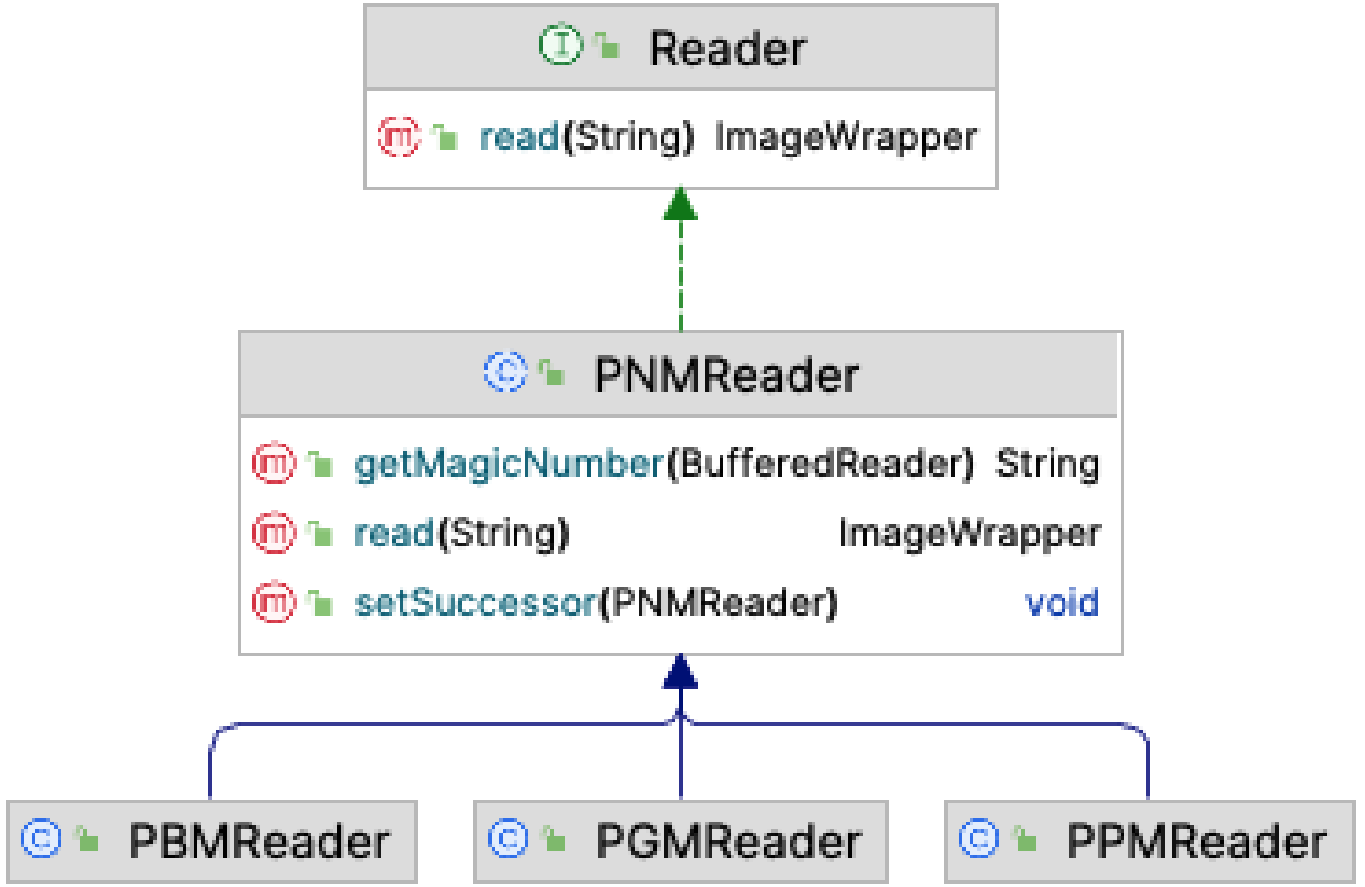
UML – Class diagram

Reader* – Strategy + Chain of Responsibility + Template Method



* UML in questo caso non presenta tutti i metodo all'interno delle classi

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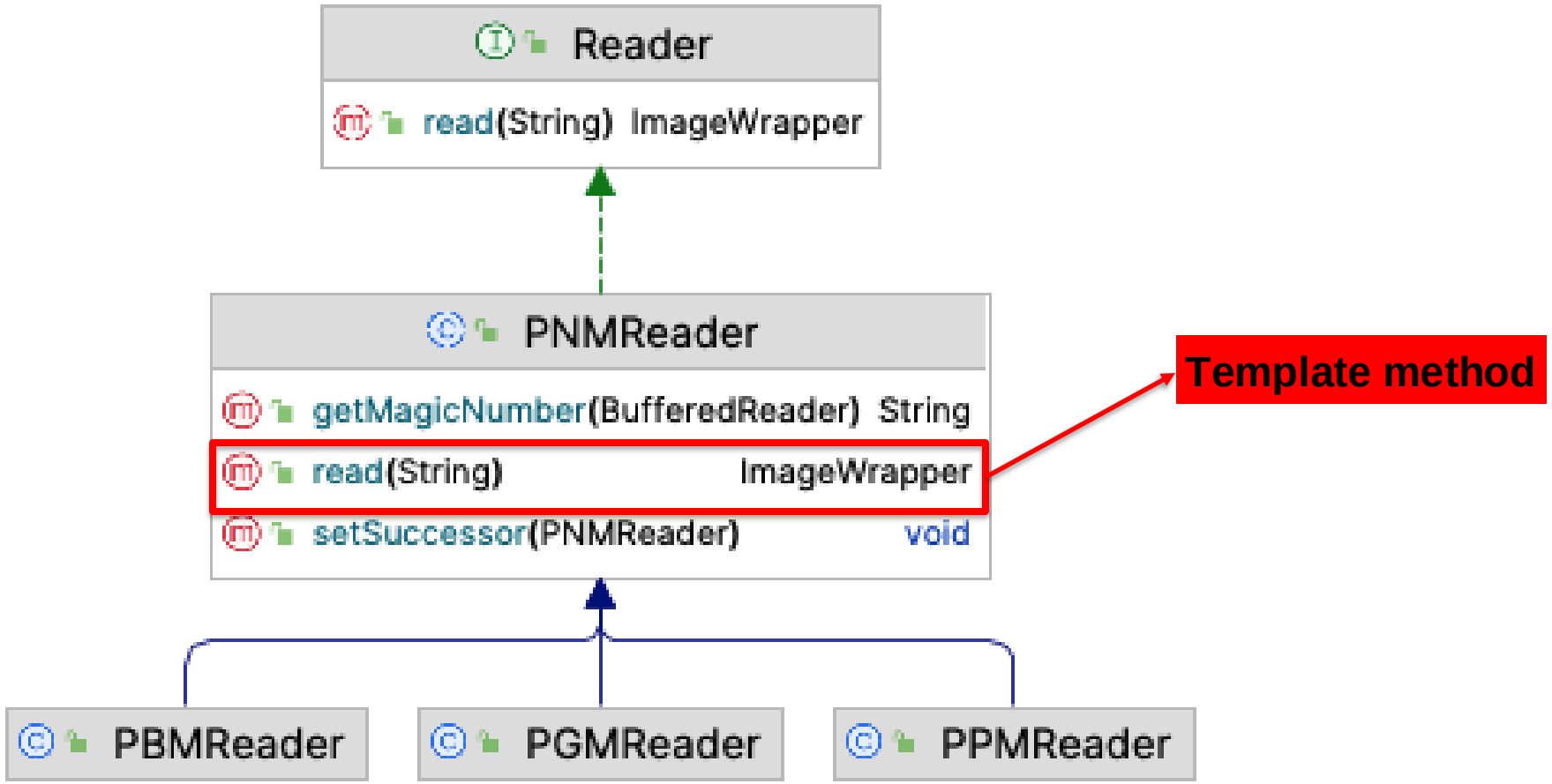
UML – Class diagram

Reader* – Strategy + Chain of Responsibility + Template Method



* UML in questo caso non presenta tutti i metodo all'interno delle classi

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Approccio

Reader* – Strategy + Chain of Responsibility + Template Method

```java
public ImageWrapper read(final String path) throws FileReadingException, IOException {
    try(BufferedReader reader = new BufferedReader(new FileReader(path))){
        final String magicNumber = getMagicNumber(reader);
        if(canHandle(magicNumber)){
            return helperReader(reader,magicNumber);
        }
        else if(successor!=null){
            return successor.read(path);
        }else{
            throw new FileReadingException(translationsController.translate( key: "label.cantHandle"));
        }
    }
}
```

Template method

* UML in questo caso non presenta tutti i metodo all'interno delle classi

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Approccio

Reader* – Strategy + Chain of Responsibility + Template Method

```
public ImageWrapper read(final String path) throws FileReadingException, IOException {
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        }
        else if(successor!=null){
            return successor.read(path);
        }else{
            throw new FileReadingException(translationsController.translate( key: "label.cantHandle"));
        }
    }
}
```

Template method

La richiesta viene propagata lungo la catena

* UML in questo caso non presenta tutti i metodo all'interno delle classi

STUDENTSUPSI

Approccio

Reader* – Strategy + Chain of Responsibility + Template Method

```java
public ImageWrapper read(final String path) throws FileReadingException, IOException {
    try(BufferedReader reader = new BufferedReader(new FileReader(path))){
        final String magicNumber = getMagicNumber(reader);
        if(canHandle(magicNumber)){
            return helperReader(reader,magicNumber);
        }
        else if(successor!=null){
            return successor.read(path);
        }else{
            throw new FileReadingException(translationsController.translate( key: "label.cantHandle"));
        }
    }
}
```

Template method

```java
protected abstract boolean canHandle(final String magicNumber);
```

* UML in questo caso non presenta tutti i metodo all'interno delle classi

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Approccio

Reader* – Strategy + Chain of Responsibility + Template Method

```
public ImageWrapper read(final String path) throws FileReadingException, IOException {
    try(BufferedReader reader = new BufferedReader(new FileReader(path))){
        final String magicNumber = getMagicNumber(reader);
        if(canHandle(magicNumber)){
            return helperReader(reader,magicNumber);
        }
        else if(successor!=null){
            return successor.read(path);
        }else{
            throw new FileReadingException(translationsController.translate( key: "label.cantHandle"));
        }
    }
}
```

Template method

```
private ImageWrapper helperReader(BufferedReader reader, final String magicNumber) throws IOException {
    String[] header = getHeader(reader);
    PixelWrapper[][] pixels = getPixels(reader,header);
    return createImageWrapper(header, pixels);
}
```

```
protected abstract ImageWrapper createImageWrapper(final String[] header, PixelWrapper[][] pixels);
```

* UML in questo caso non presenta tutti i metodo all'interno delle classi

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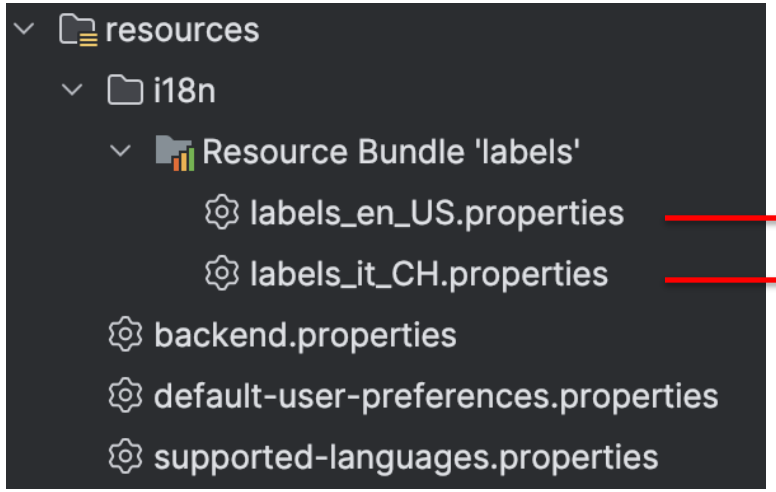
Internationalization

Labels




```
String currentLanguage = preferencesModel.getCurrentLanguage();
this.translationsModel.changeLanguage(currentLanguage);
```

TranslationController

```
label.pipelineCleared=The pipeline has been emptied
```

```
label.pipelineCleared=La pipeline è stata svuotata
```

```
notifyFeedbackObservers(translationsController.translate( key: "label.pipelineCleared"));
return text.getText().contains(translationsController.translate( key: "label.pipelineCleared"));
```

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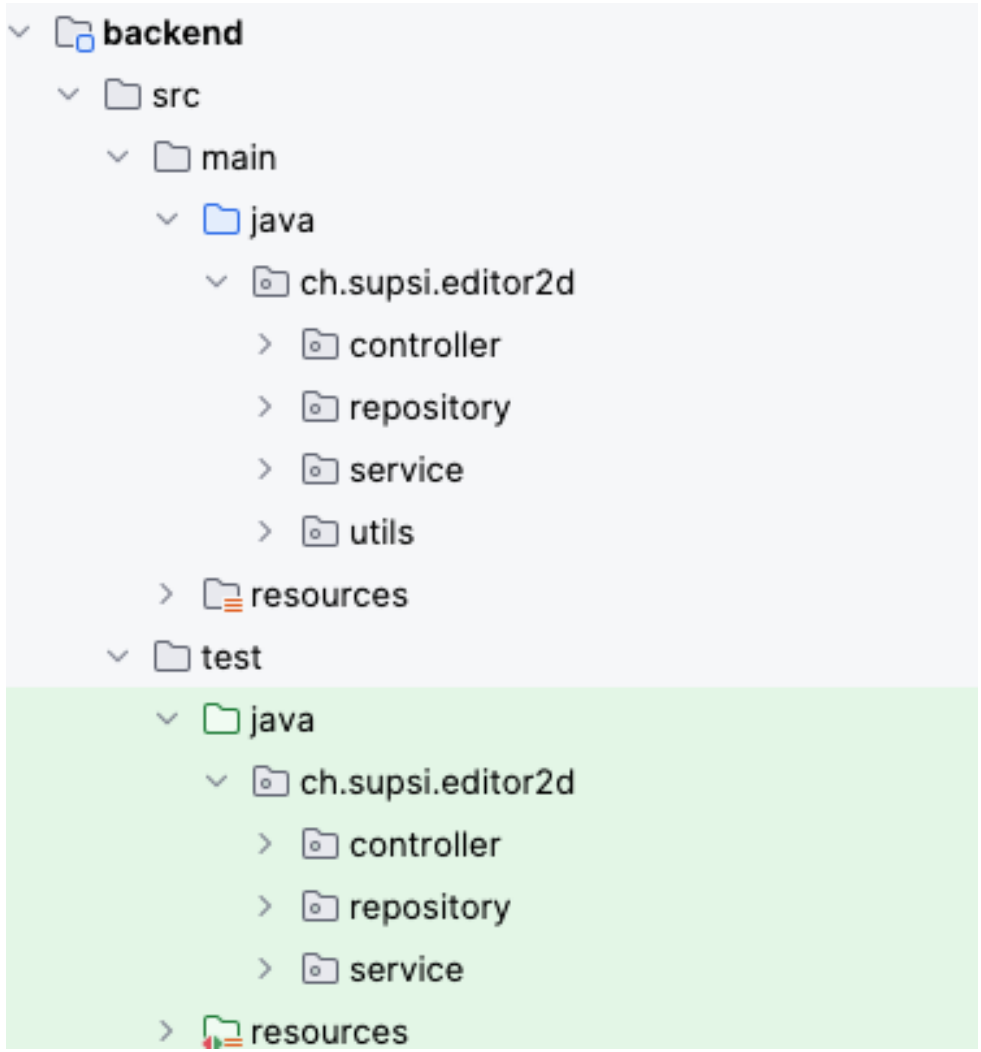
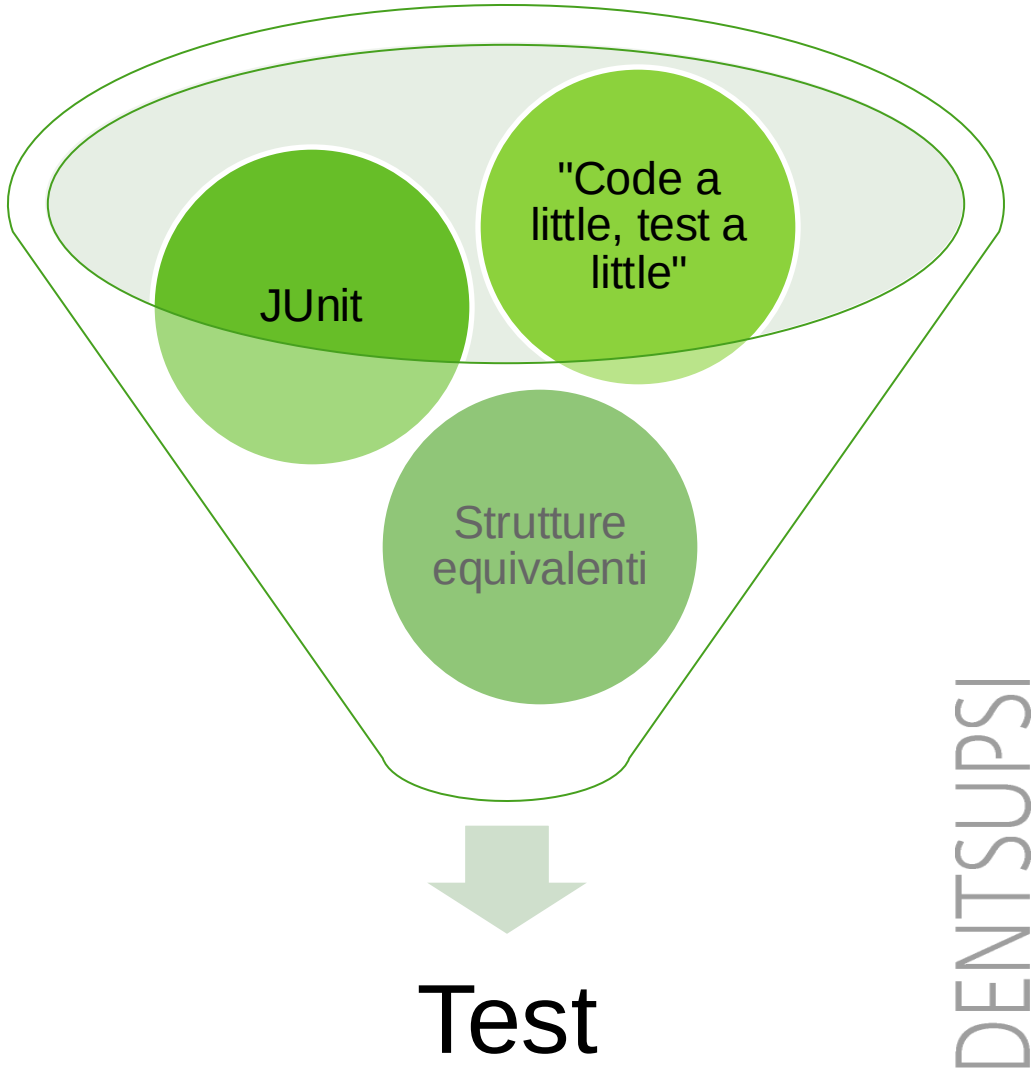
Test

Backend





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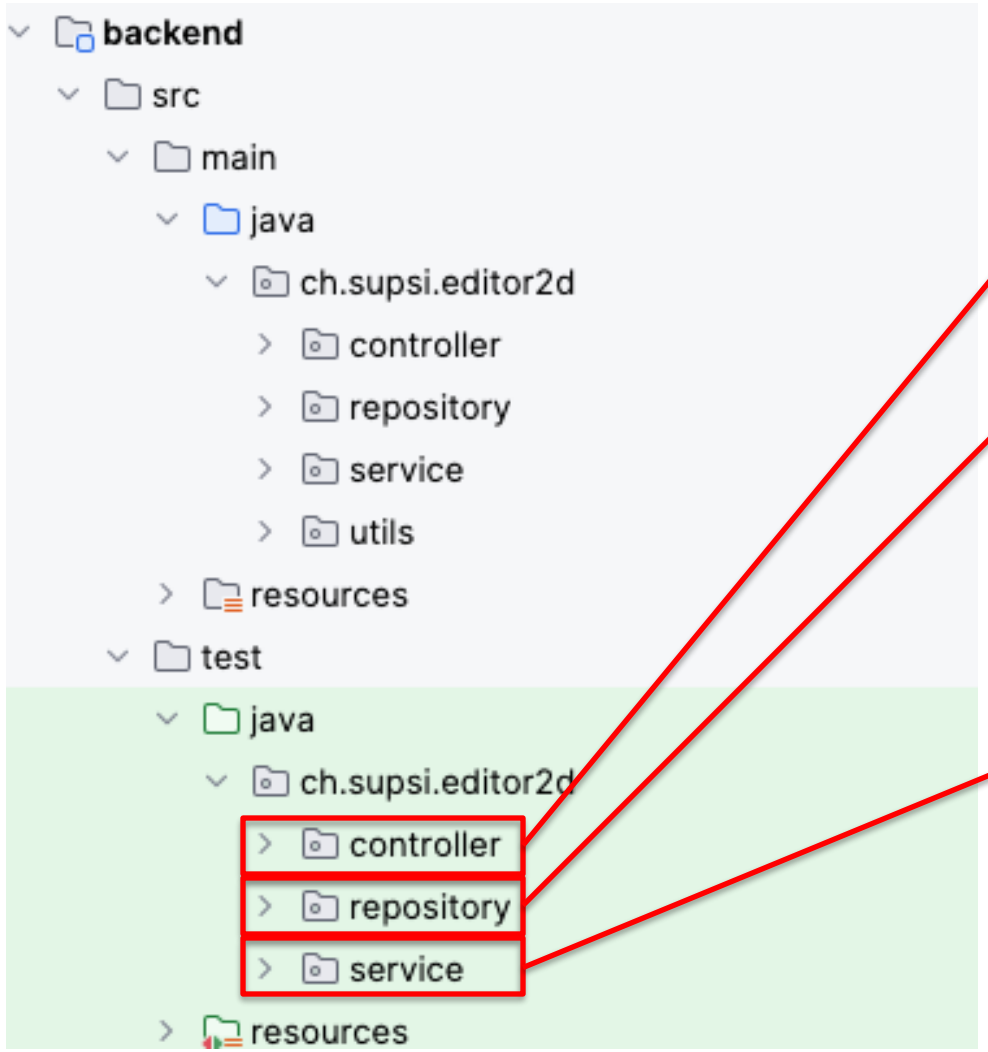
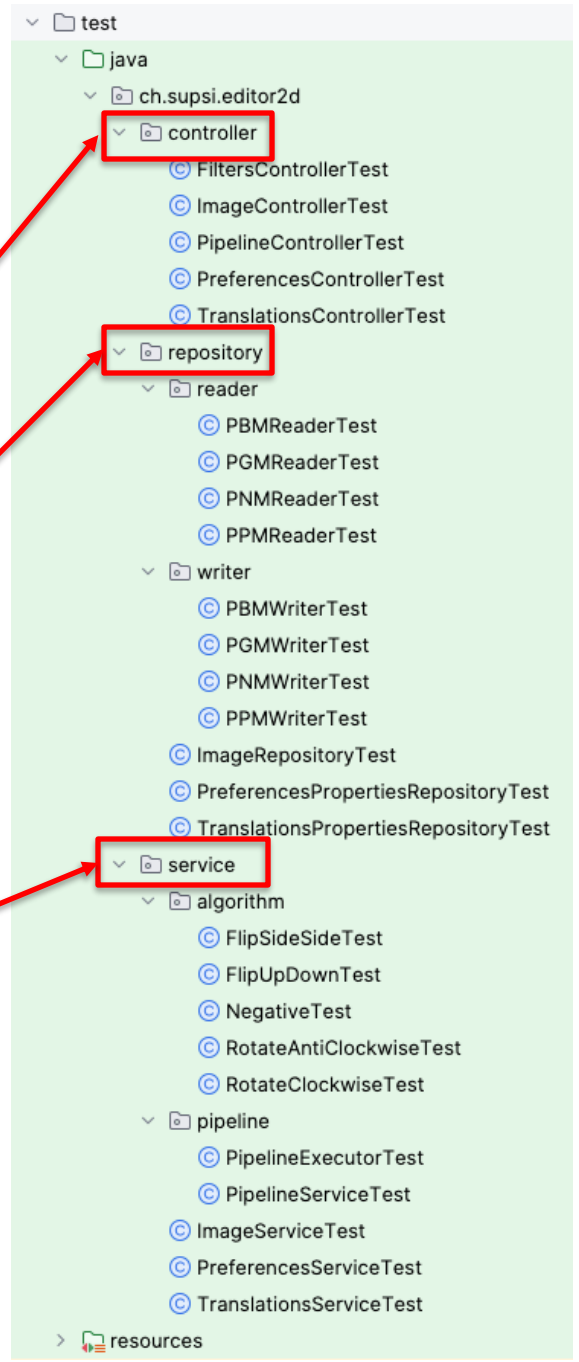
SUPSI

Test

Backend





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Approccio

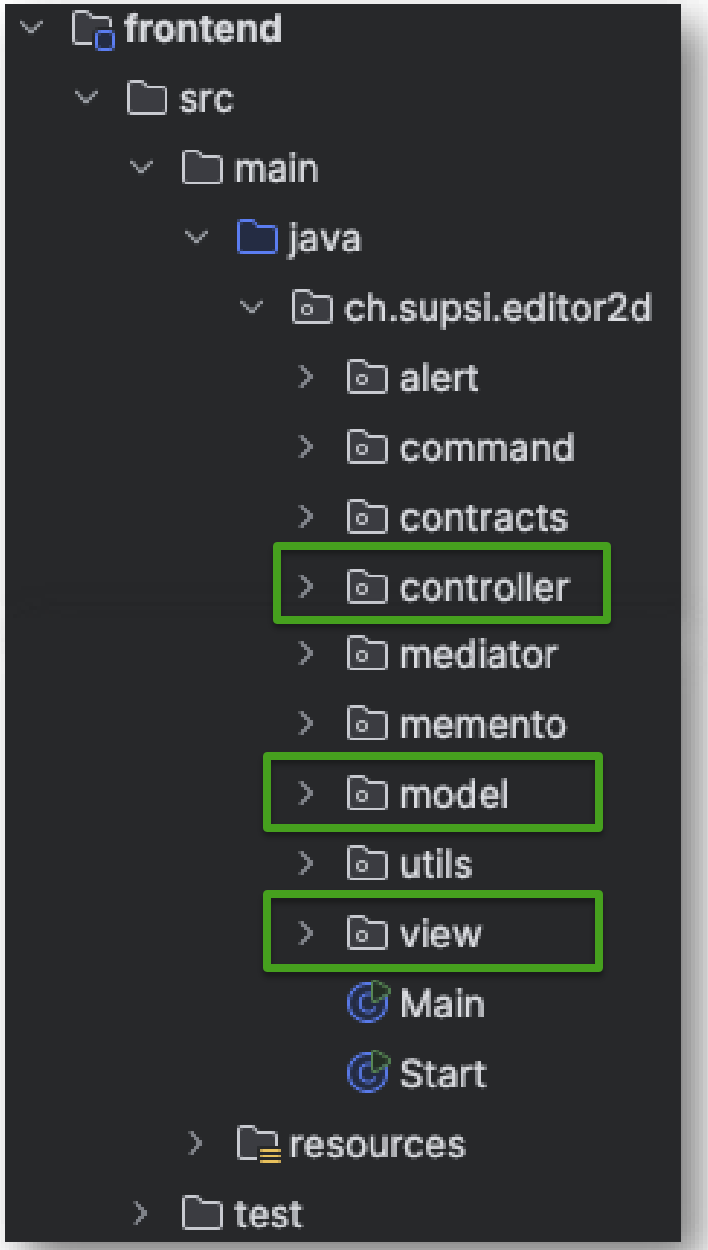
Frontend - Struttura

- **Frontend** -> MVC

  - Interfaccia grafica
  - Apertura/Salvataggio immagine
  - Editing immagine
  - Help & About

- **Dipendenze**

  - Backend
  - JavaFX
  - Junit
  - TestFX
  - Mockito



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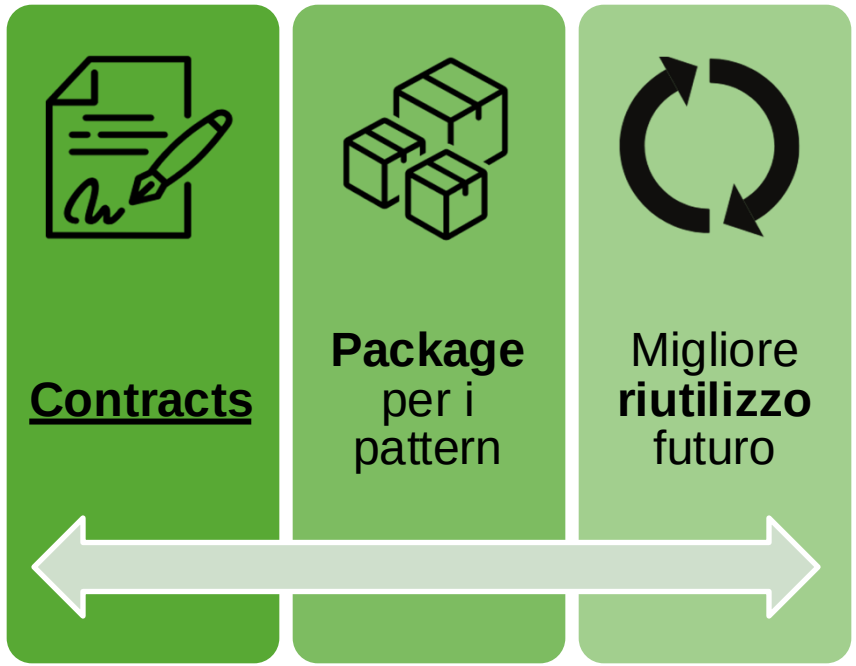
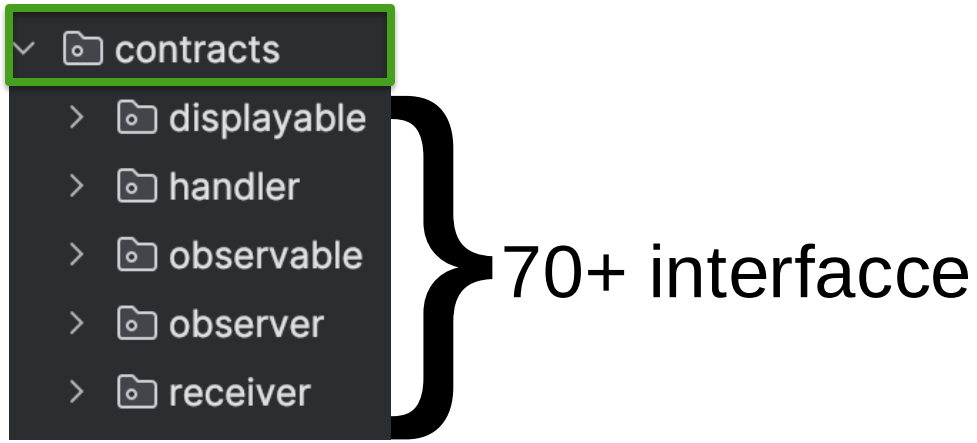
Approccio

Coesione + Coupling ridotto





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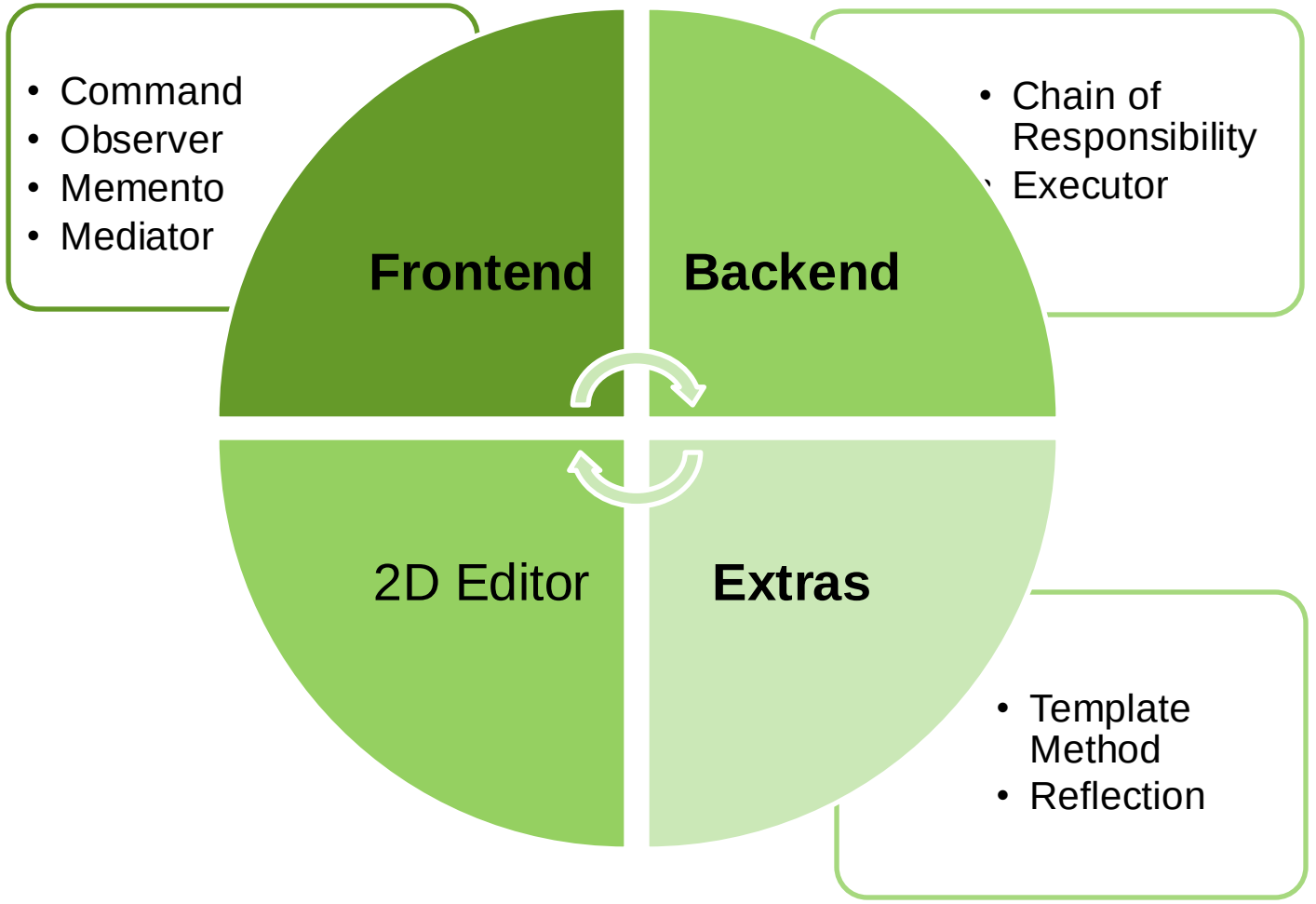
Approccio

Design Patterns



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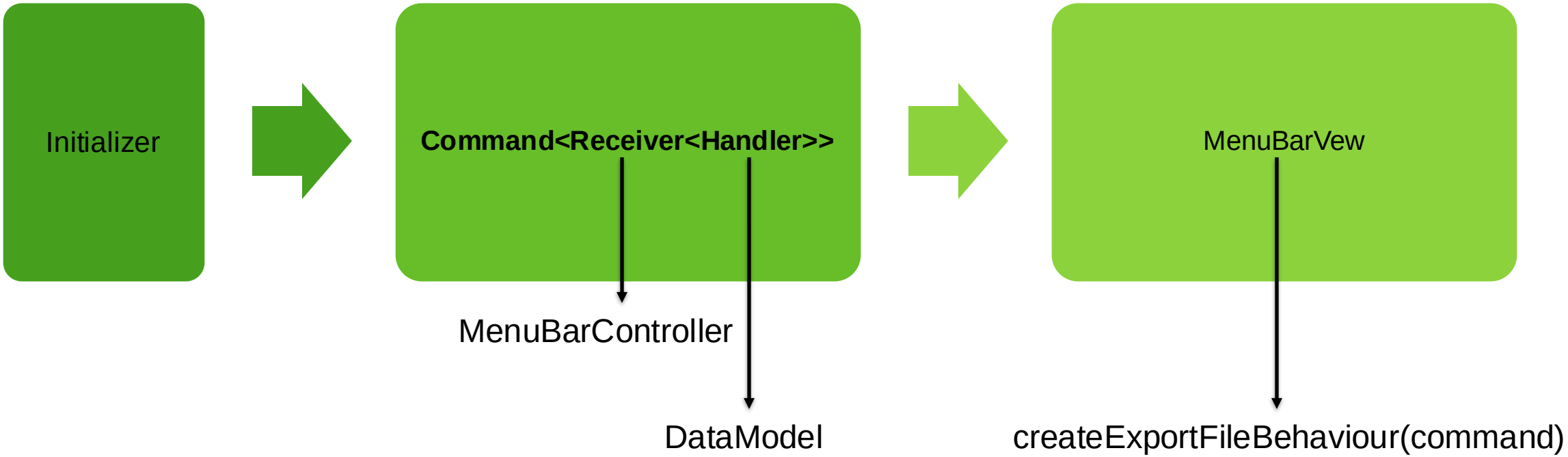
Approccio

Export Immagine

- Come viene associata **l'azione dell'export dell'immagine?**



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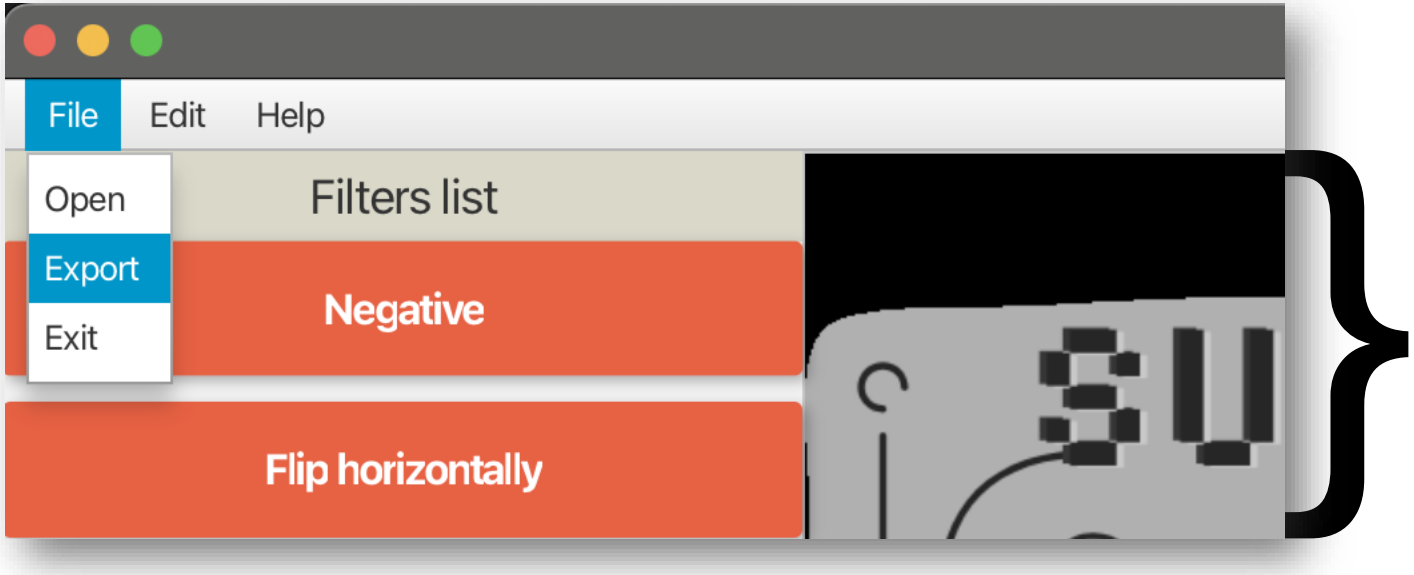
Approccio

Export Immagine

- **Come avviene l'export?**



- **PPM**
- **PGM**
- **PBM**

- Esempio **Parte 1: UML sequence diagram** per l'export in **PGM**

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Frontend

Backend

USER

MenuBarController

DataModel

ImageController

Export

exportModel.exportFile(Filechooser)

filechooser.showSaveDialog()

Save

imageController.exportImage(file.toURI().getPath(), filenameAndExtension, currentImage)

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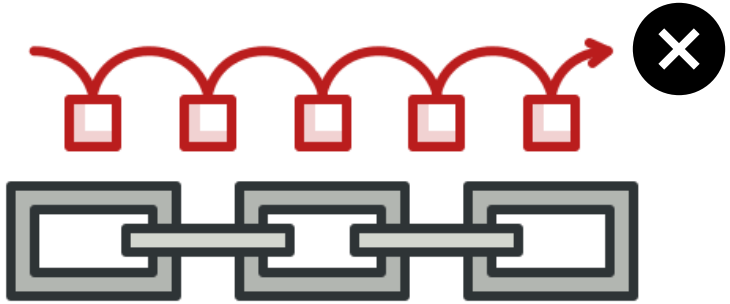
Approccio

Export Immagine



- Come viene associata la **chain of responsibility dei writer?**

ImageRepository → Imposta la **catena** di sucessione **da PBM → PGM → PPM** → **Campo writer** : Writer di partenza assegnato al PBMWriter

- Esempio **Parte 2: UML sequence diagram** per l'export in **PGM**

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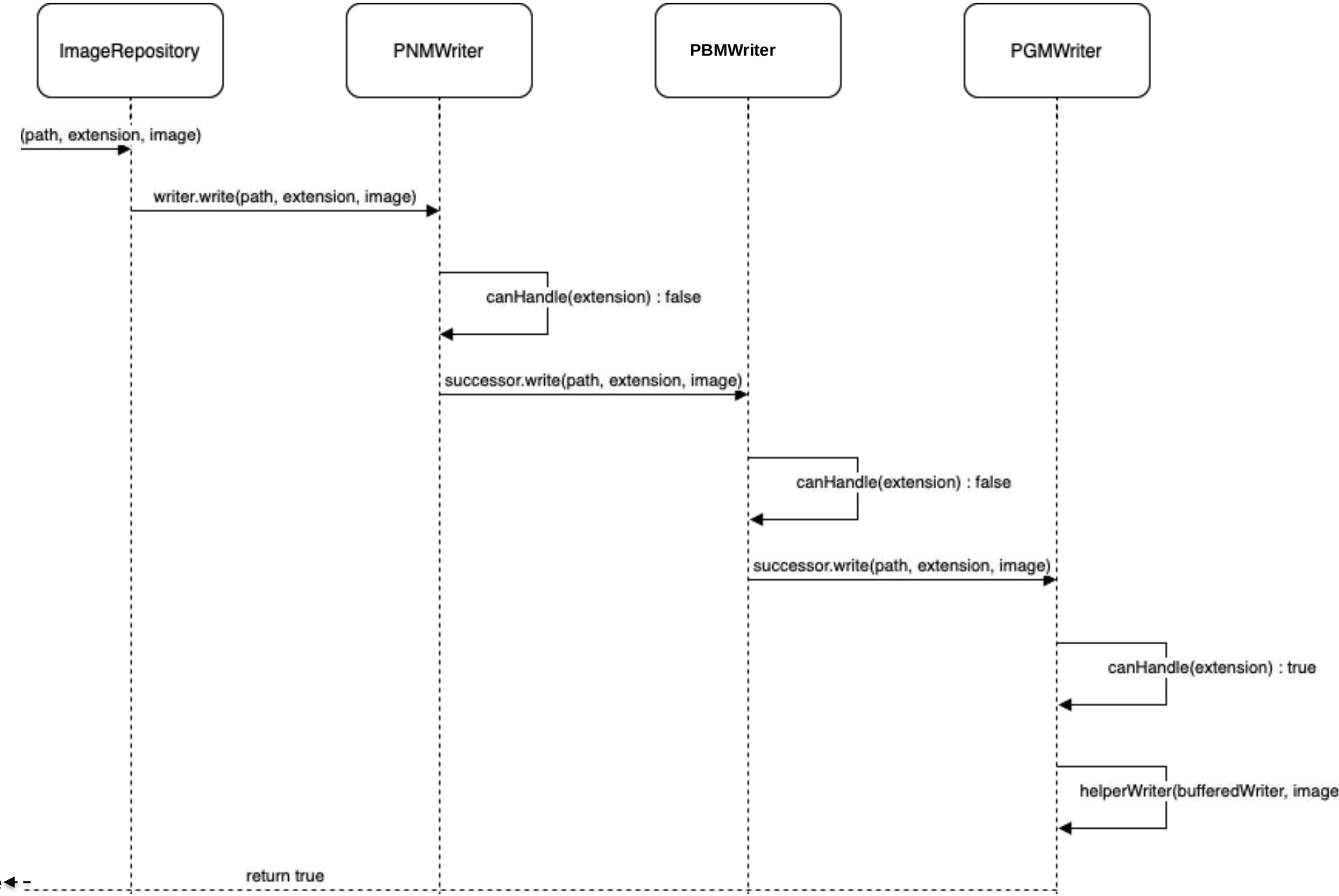

← ImageController ← ImageService

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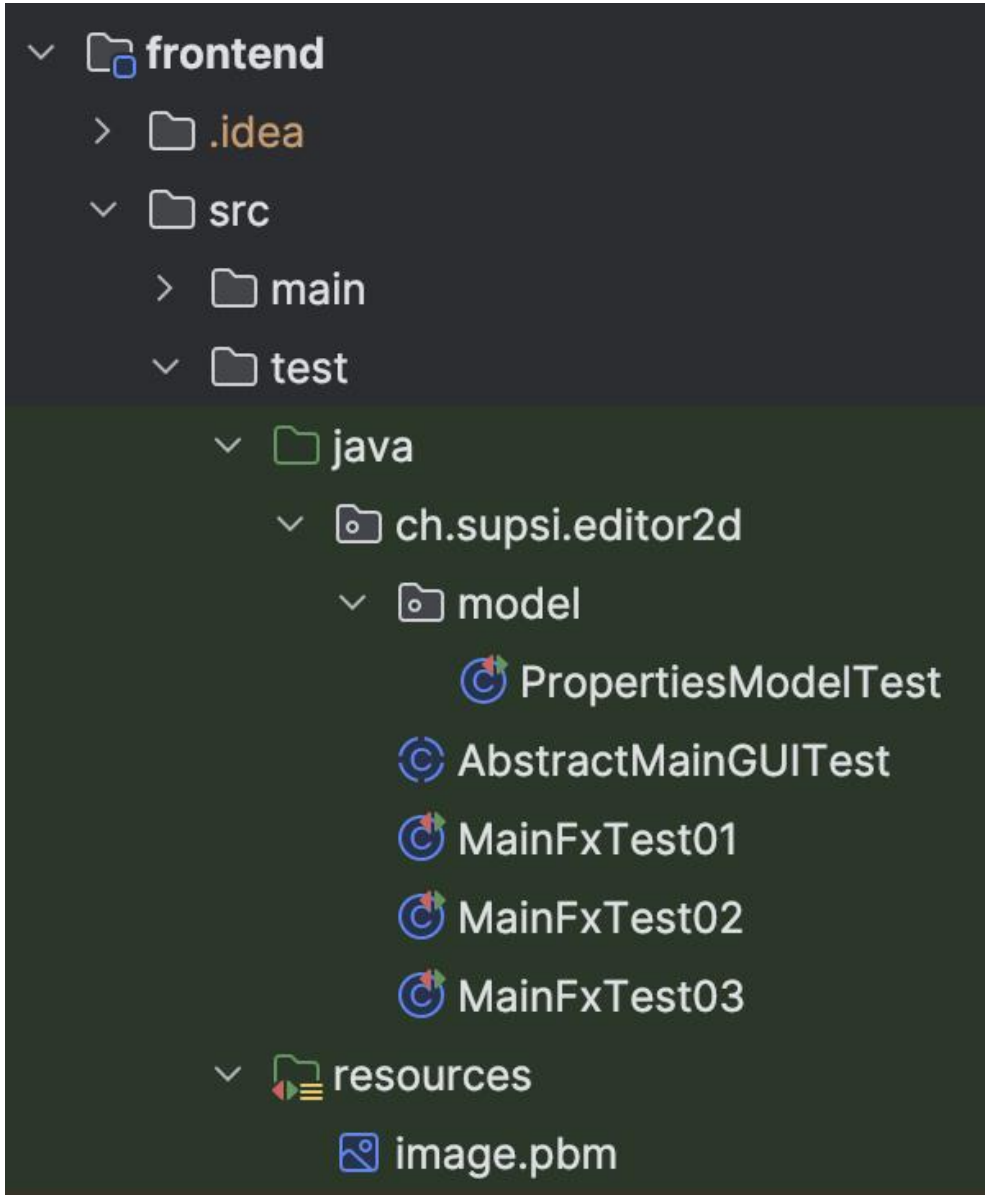
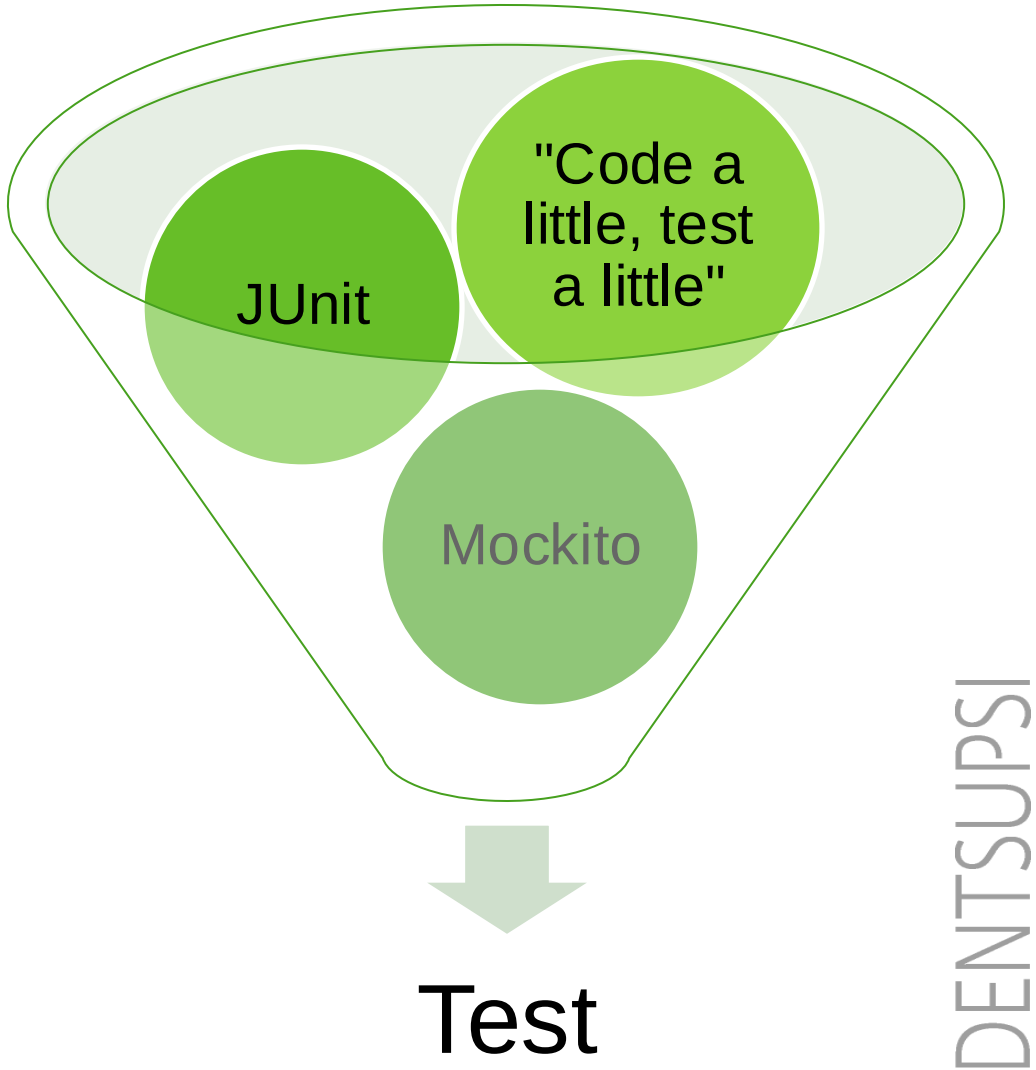
Test

Frontend





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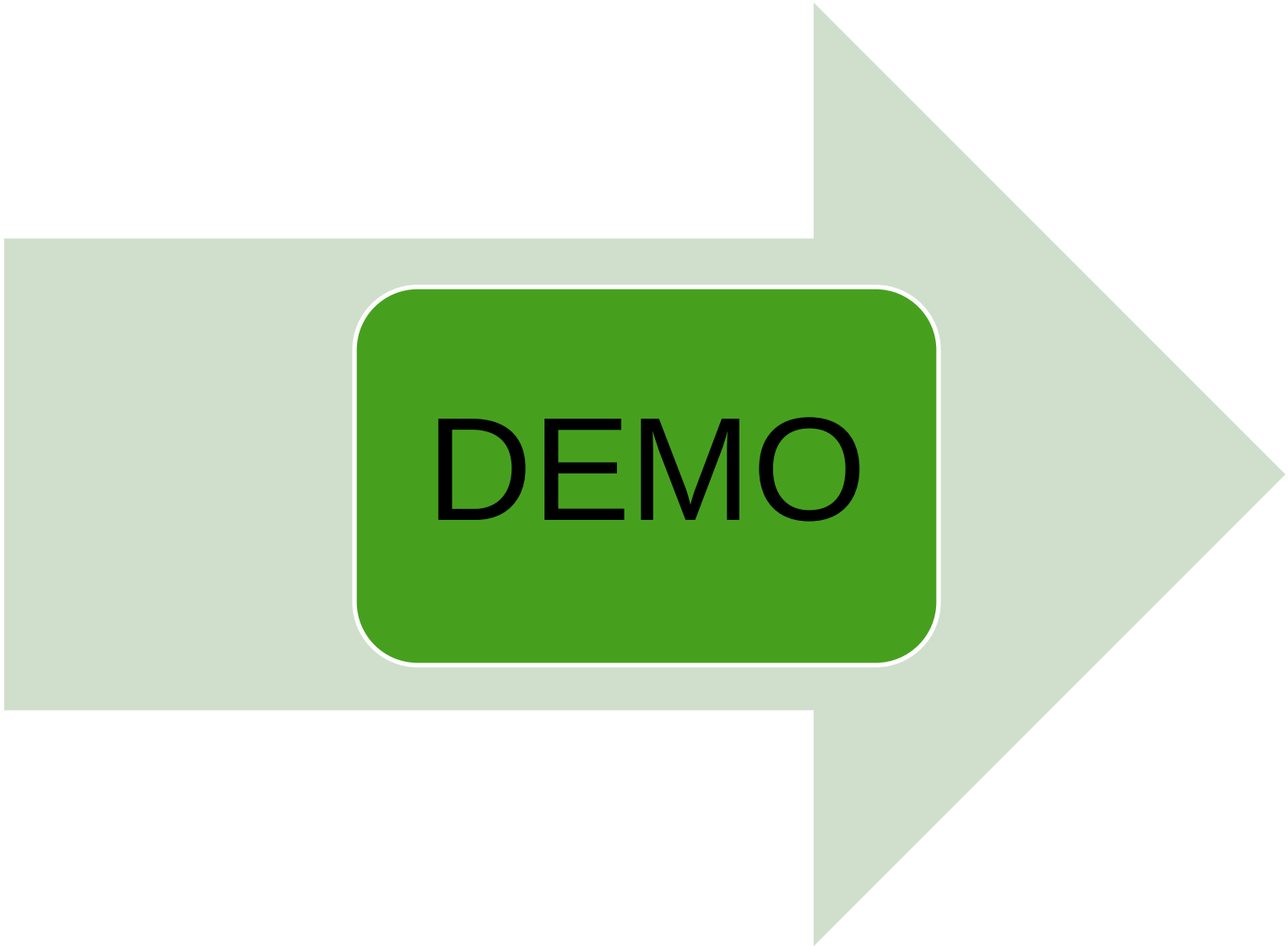
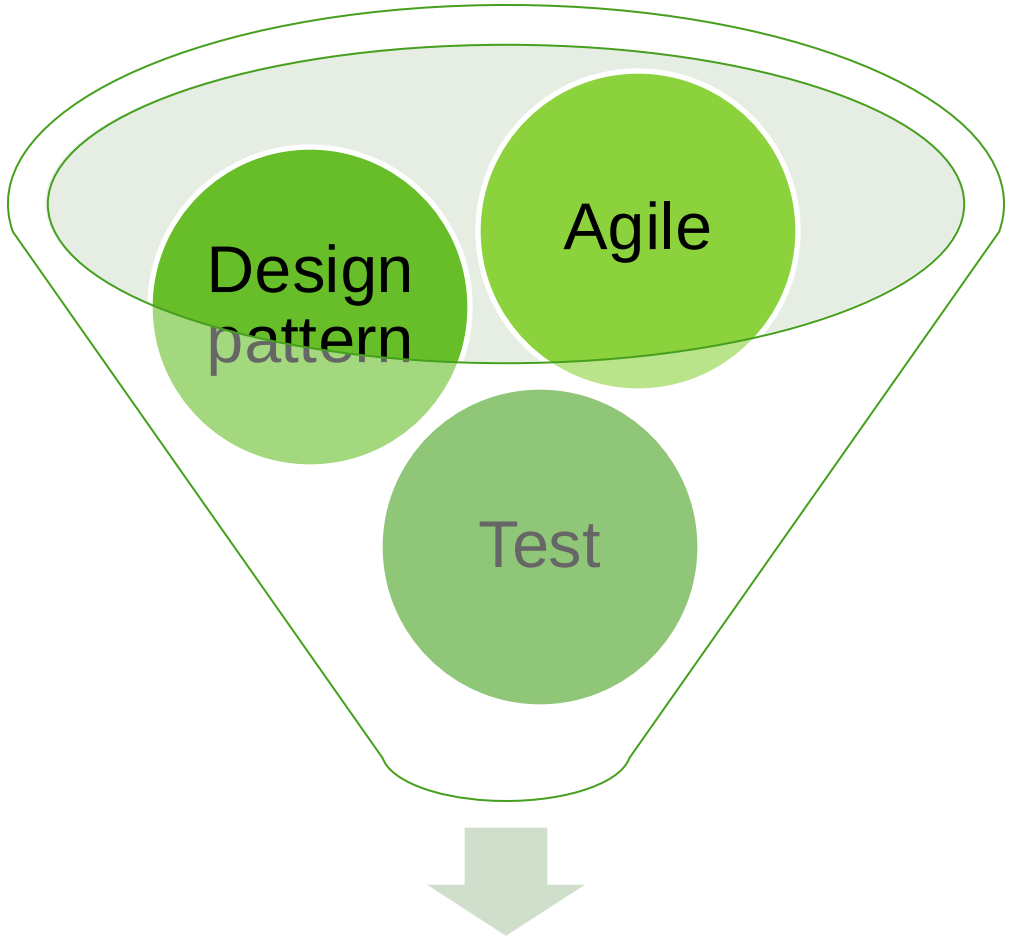

DEMO

Conclusione



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