IIP-Ecosphere

Next Level Ecosphere for Intelligent Industrial Production

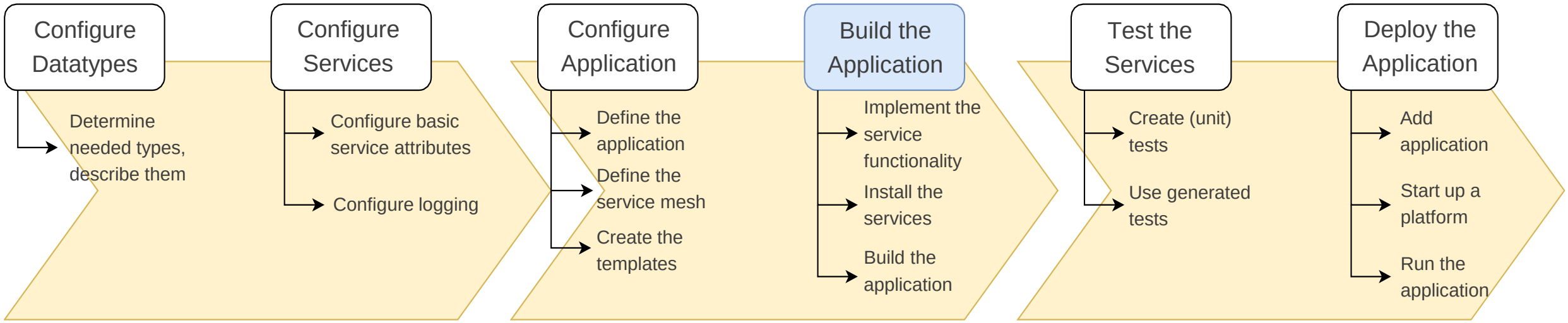
Service Integration: How to Build an Application

Gefördert durch:

Bundesministerium für Wirtschaft und Klimaschutz

IIP-Ecosphere Platform

Build the Application



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- **Prerequisites**
- Building an Application

Prerequisites

- Required:
  - Installed the platform and its dependencies or the development container
  - Installed the IDE for IIP-Ecosphere Platform (provided Eclipse Version)
  - How to configure datatypes
  - How to configure services
  - How to configure an application
- Optional:
  - Introduction to code generation

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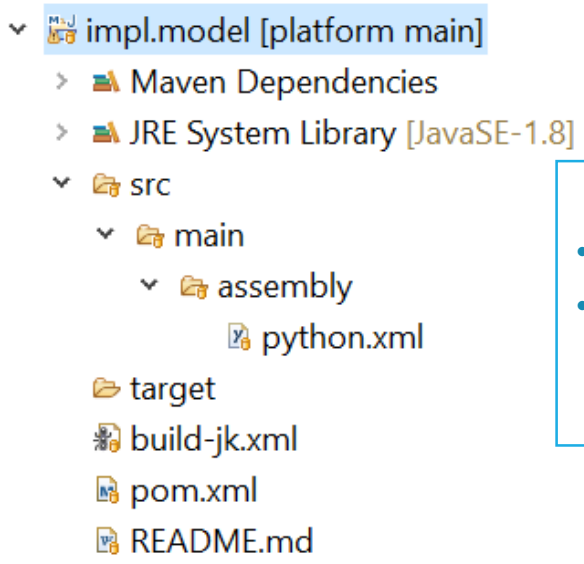
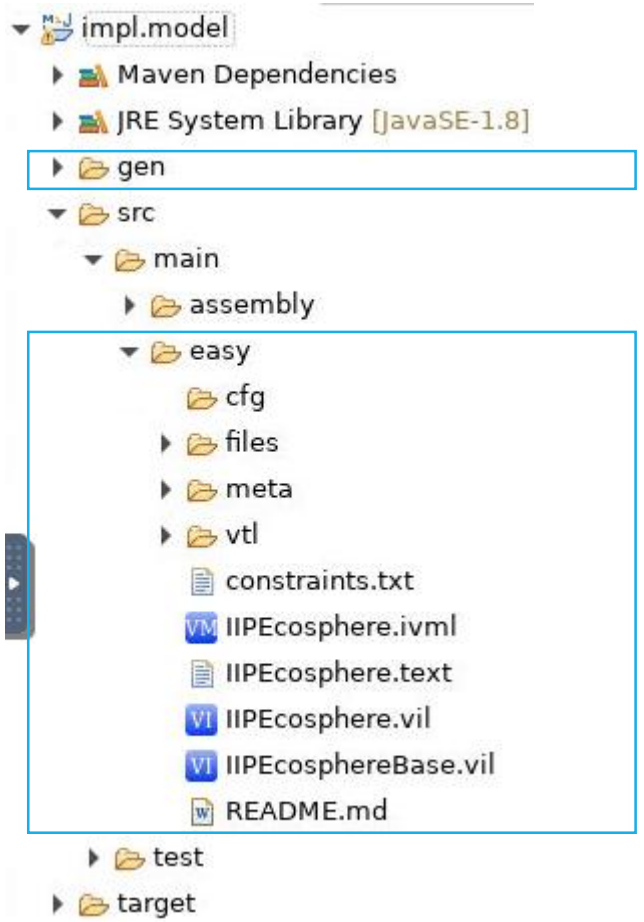
- Prerequisites
- **Building an Application**

Building an Application (1)

- The templates for the *.ivml* files should enable you to now build a application right away
  - If you followed the videos chronologically this is already done

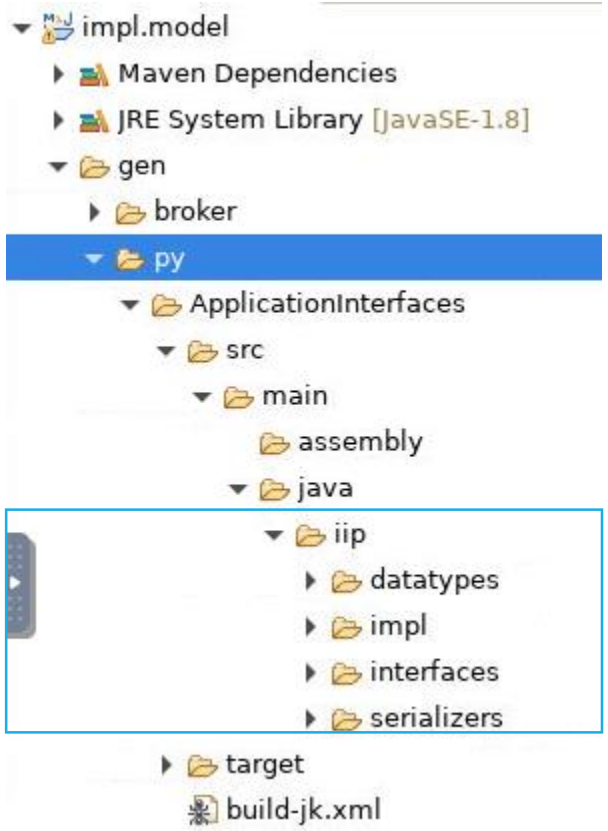


- Rename the *"impl.model"* as needed/desired
- Use `cmd` to run *"mvn -U generate-sources -Dunpack.force=true"* in the *"impl.model"* directory



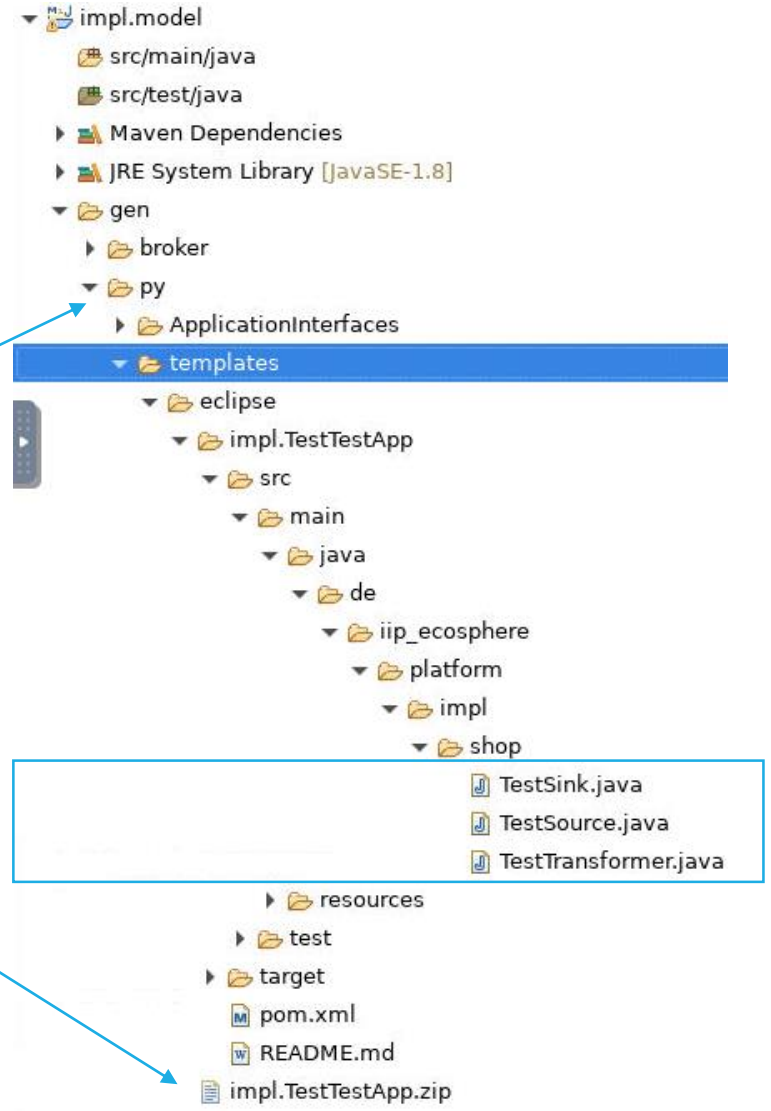
Building an Application (2)

- To view the generated classes go to *impl.model/gen/py/ApplicationInterfaces/*
  - You should NOT edit these classes, if they do not behave as you expect double check if the corresponding *.ivml* file is correct
  - IF you have a python service you will find *ApplicationInterfaces/python* as well as *ApplicationInterfaces/java*



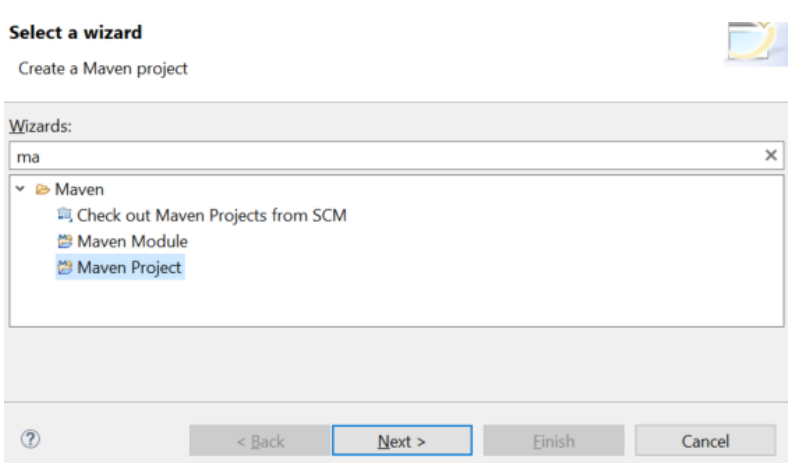
Building an Application (3)

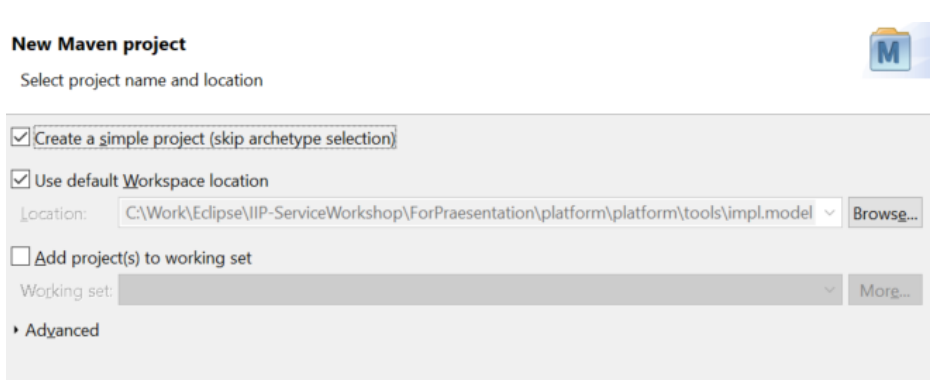
- Templates is the location where you can find your main service classes
  - Here you can quickly confirm that the generation looks like you intended
  - The "*gen/…*" location will be overwritten if you re-generate the templates to change i.e. datatypes
  - To create functionality import the .zip file

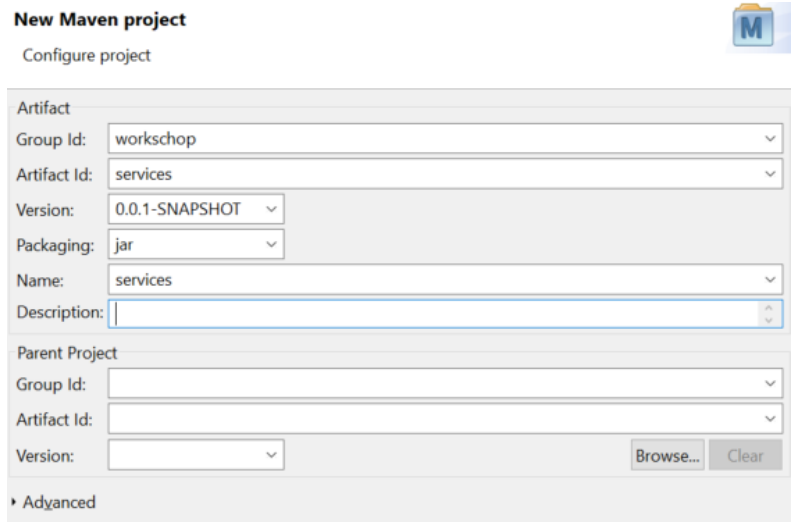


Importing the Implementation Template (1)

- Import the template into Eclipse to work on them
  - Create a new, empty Maven project (preferably in the same workspace)
  - Select “Create a simple project”
  - Fill in the fields (only *“Artifact Id”* will remain and be the project name in Eclipse)
  - Press finish to create the project

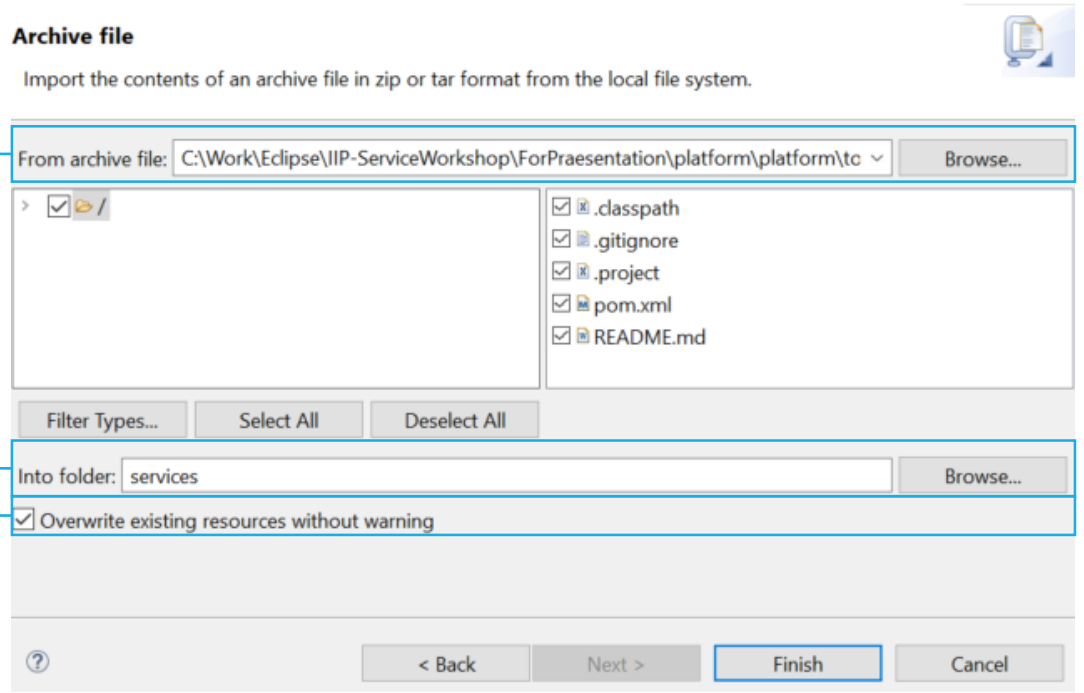






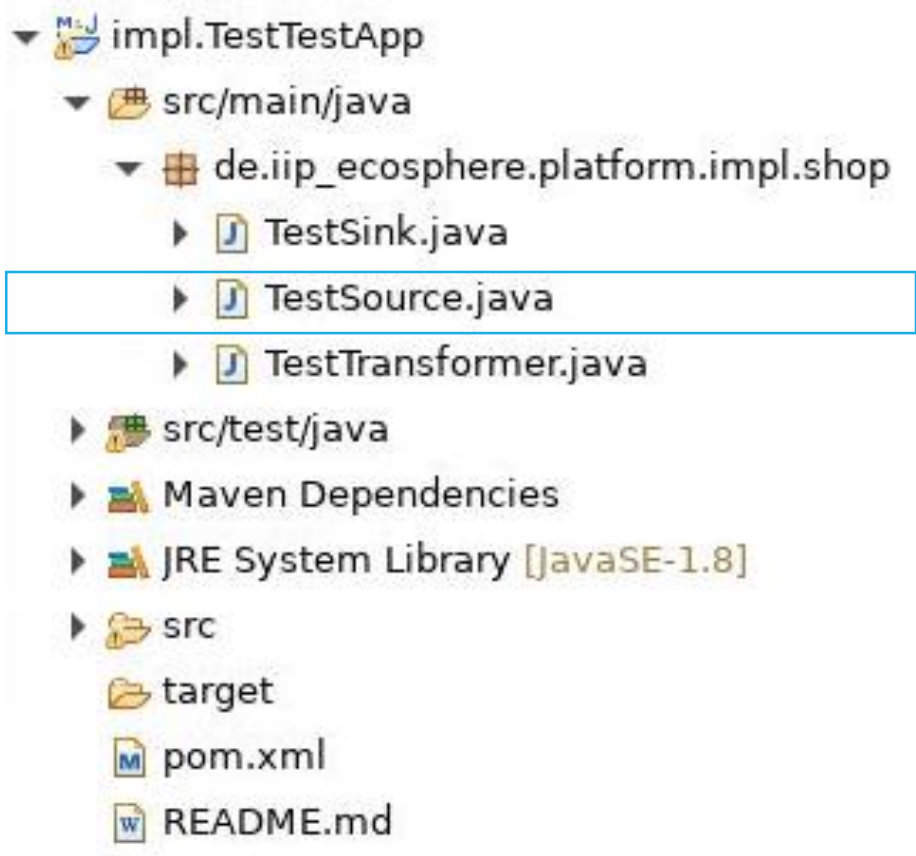
Importing the Implementation Template (2)

- Import the templates to work on them
- Choose *import → General → Archive file*
  - Select the template .zip located in "*/gen/py/templates/eclipse/*"
  - Select the new Maven project
  - Tick to overwrite existing files
  - Run Maven Update on the project
    - *Right click → Maven → Update Project…*



Building an Application (4)

- Go to your imported project
  - The path is dependent on your naming choices!
  - Edit the *produce<YourInputDataName>()* method to return a new instance of your datatype

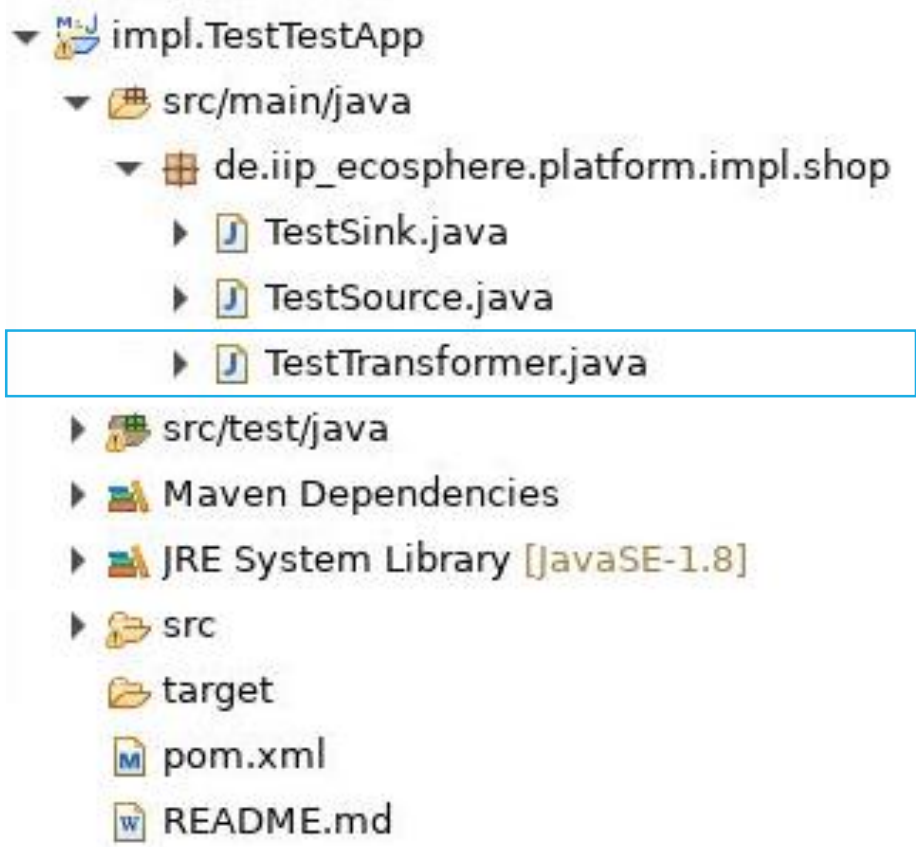



```java
@Override
public InData produceInData() {
    InData result = new InDataImpl();
    result.setIntExample(1);
    result.setFloatExample(1);
    result.setStringExample("1");
    result.setDoubleExample(1);
    // TODO add your code here
    return result;
}
```

- Input data is named *InData*
- In this example we just use 1 as a value for each datapoint

Building an Application (5)

- Go to your imported project
  - Edit the method receiving your datatype in a way that it passes on an instance of the output datatype

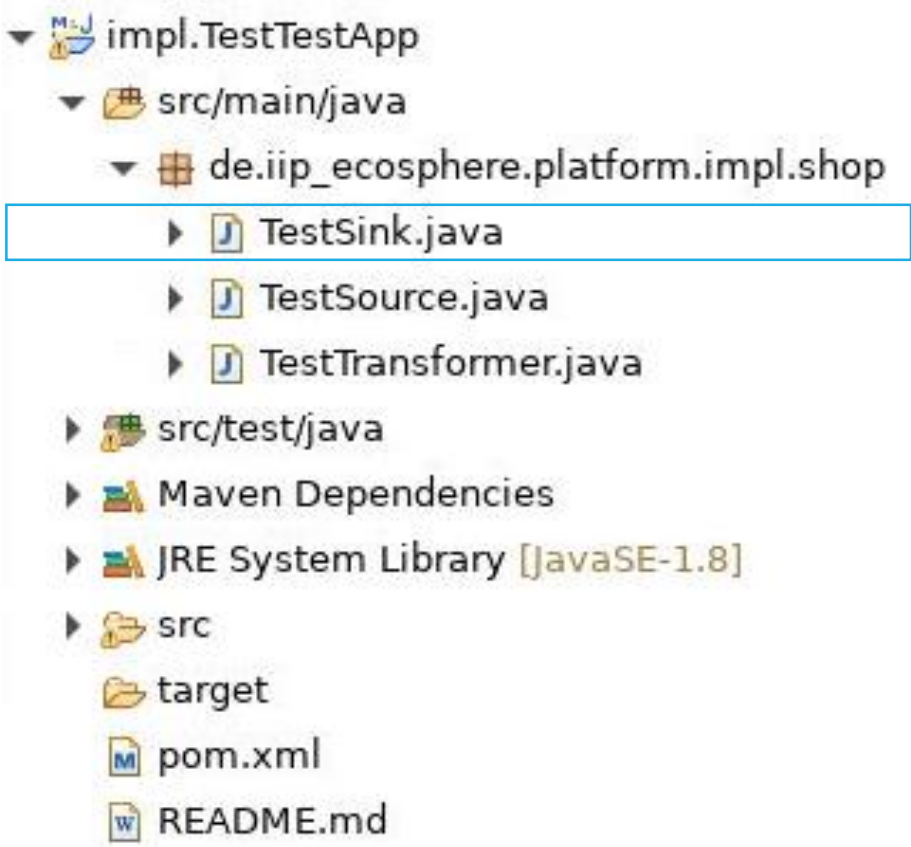



```
@Override
public void processInData(InData data) {
    OutData out = new OutDataImpl();
    out.setResult(2);
    out.setStringExample("2");
    ingestOutData(out);
}
```

- Create an instance of your output datatype
- Call *ingest<outputName>(<instance>)*

Building an Application (6)

- Go to your imported project
  - Edit the method receiving your output datatype to print the values to the console




```
@Override
public void processOutData(OutData data) {
    System.out.println(data.getStringExample());
    System.out.println(data.getResult());
}
```

- This is the end of the application, utilise your results as needed

Example Sources File

- The complete source class as created in the videos.

```java
import java.io.*;

/**
 * Service implementation for net node 'Source'.
 * Generated by: EASy-Producer.
 */
public class TestSource extends SourceImpl {

    /**
     * Fallback constructor, also used for testing main program.
     */
    public TestSource() {
        super(ServiceKind.SOURCE_SERVICE);
    }

    /**
     * Creates a service instance from a service id and a YAML artifact.
     *
     * @param serviceId the service id
     * @param ymlFile the YML file containing the YAML artifact with the service descriptor
     */
    public TestSource(String serviceId, InputStream ymlFile) {
        super(serviceId, ymlFile);
    }

    @Override
    public InData produceInData() {
        InData result = new InDataImpl();
        result.setIntExample(1);
        result.setFloatExample(1);
        result.setDoubleExample(1);
        result.setStringExample("1");
        return result;
    }
}
```

Example Transformer File

- The complete transformer class as created in the videos.

```java
package de.iip_ecosphere.platform.impl.shop;

import java.io.*;

/**
 * Service implementation for net node 'PyService'.
 * Generated by: EASy-Producer.
 */
public class TestTransformer extends PyServiceImpl {

    /**
     * Fallback constructor, also used for testing main program.
     */
    public TestTransformer() {
        super(ServiceKind.TRANSFORMATION_SERVICE);
    }

    /**
     * Creates a service instance from a service id and a YAML artifact.
     *
     * @param serviceId the service id
     * @param ymlFile the YML file containing the YAML artifact with the service descriptor
     */
    public TestTransformer(String serviceId, InputStream ymlFile) {
        super(serviceId, ymlFile);
    }

    @Override
    public void processInData(InData data) {
        OutData out = new OutDataImpl();
        out.setStringExample("Out");
        out.setResult(2);
        ingestOutData(out);
    }
```

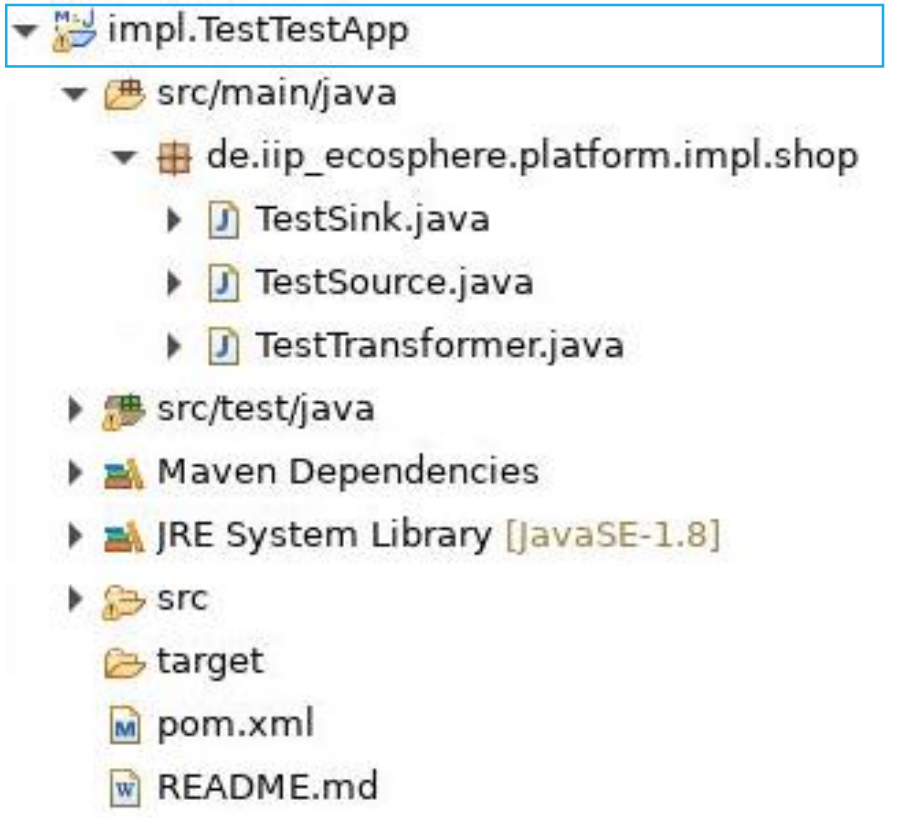
Example Sink Services

- The complete sink class as created in the videos.

```java
package de.iip_ecosphere.platform.impl.shop;

import java.io.*;

/**
 * Service implementation for net node 'Sink'.
 * Generated by: EASy-Producer.
 */
public class TestSink extends SinkImpl {

    /**
    * Fallback constructor, also used for testing main program.
    */
    public TestSink() {
        super(ServiceKind.SINK_SERVICE);
    }

    /**
    * Creates a service instance from a service id and a YAML artifact.
    *
    * @param serviceId the service id
    * @param ymlFile the YML file containing the YAML artifact with the service descriptor
    */
    public TestSink(String serviceId, InputStream ymlFile) {
        super(serviceId, ymlFile);
    }

    @Override
    public void processOutData(OutData data) {
        System.out.println(data.getStringExample());
        System.out.println(data.getResult());
    }
}
```

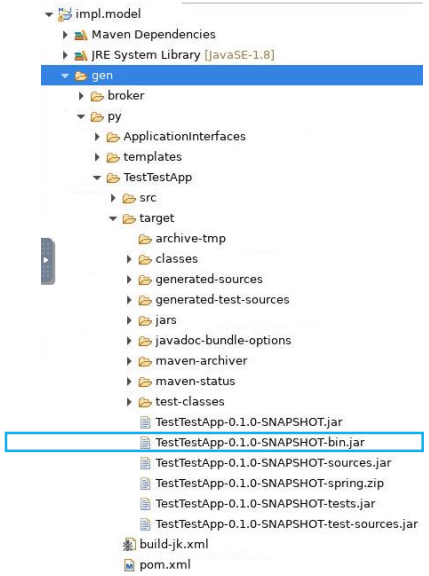
Building an Application (7)

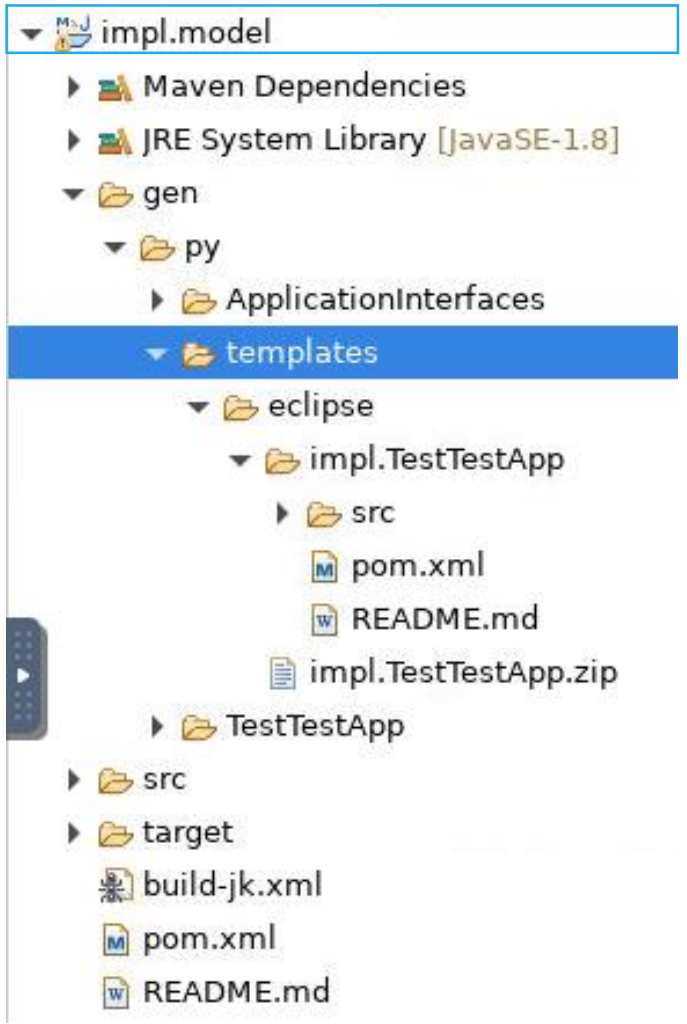
- In *your imported project* run "*mvn install*" to make the services available to your main application through maven



Building an Application (8)

- After successfully installing the templates run "*mvn install*" in *impl.model* again to finish creating the application
- Your finished App will be in *impl.model/gen/py/<Appname>/target/<Appname><Version>-SNAPSHOT-bin.jar*





Summary

- What we learned
  - How to add functionality to the services
  - How to build an application from the template project
- How to go on
  - How to test an application
  - Running the application in the platform