J-Spring

16 april 2008 Spant! - Bussum

Putting Fluent Interfaces to the Test

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Software Improvement Group

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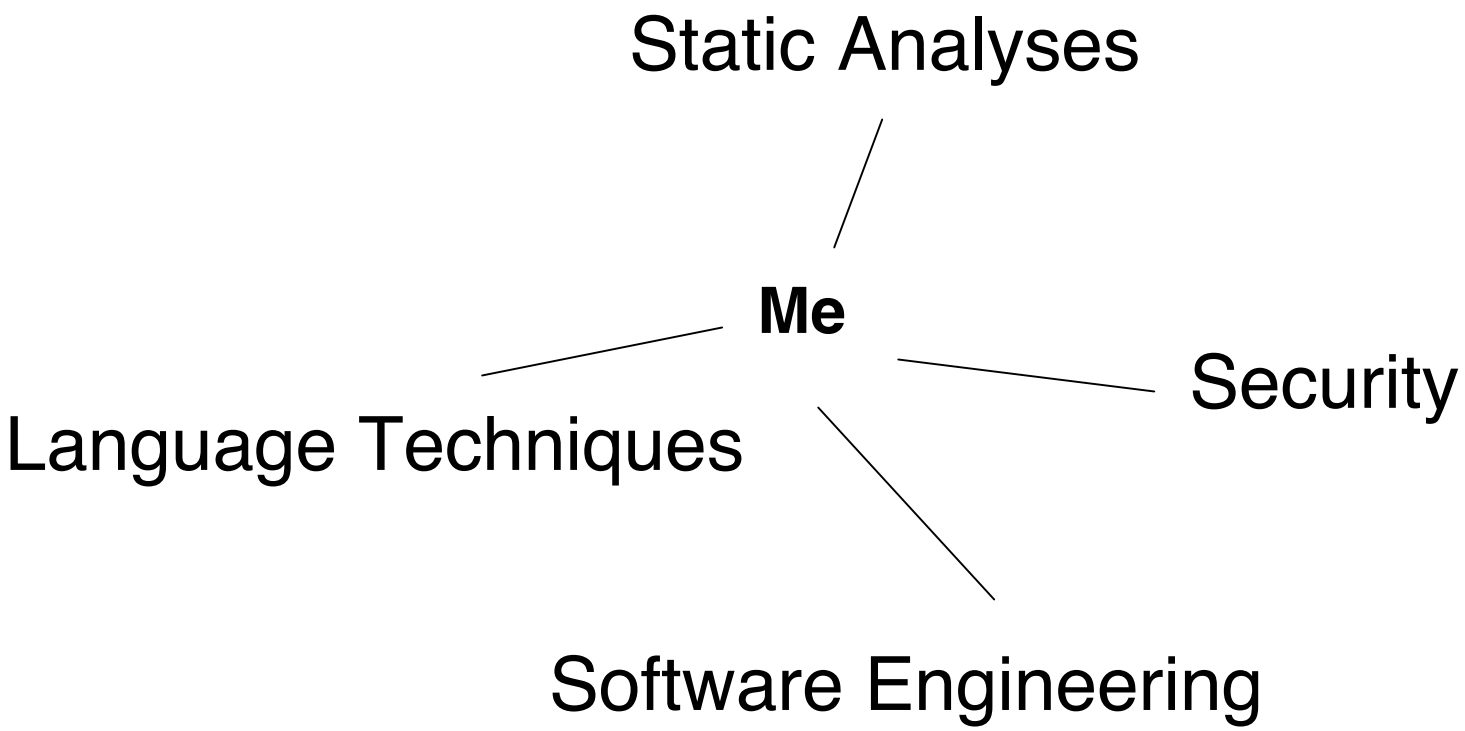

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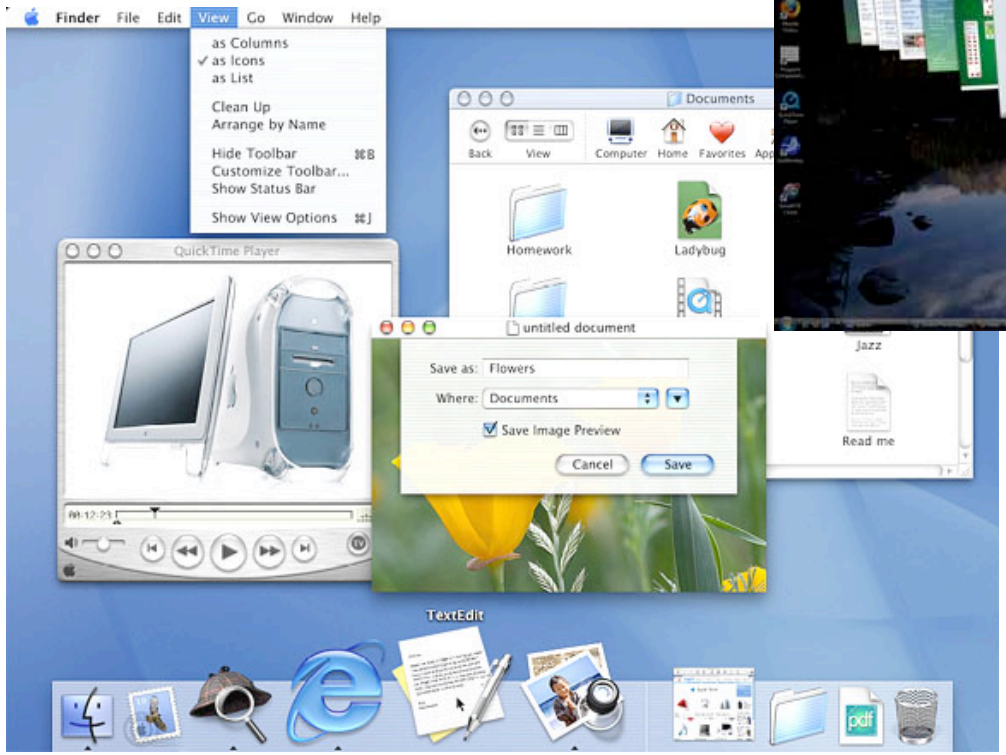
Software Risk Assessment

Software Monitoring

DocGen

Fluent Interface



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History of Fluent Interfaces

2005 Now

http://martinfowler.com/bliki/FluentInterface.html

Definition (wikipedia)

In software engineering, a fluent interface is an objected oriented construct that defines a behavior capable of relaying the instruction context of a subsequent call

Classic example


```
private void makeUsualOrder(Customer customer) {
  Order o = new Order();
  customer.addOrder(o);
  Product p1 = new Product(1,Product.find(“Billy”));
  o.addProduct(p1);
  Product p2 = new Product(2,Product.find(”Janso"));
  o.addProduct(p2);
  Product p3 = new Product(4,Product.find(“Traby"));
  o.addProduct(p3);
   p2.setSkippable(true);
   o.setPriorityRush(true);
}
```

Classic example cont'd


```
private void makeFluentUsualOrder(Customer customer) {
   customer.newOrder()
        .with(1, “Billy”)
        .with(2, "Janso").skippable()
        .with(4, ”Traby")
        .priorityRush();
}
```

Definition (revised)

A Fluent Interface is a way to present your API as simply as possible while making its usage easy to read and write.

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Real world usage

Evolving an Embedded Domain-Specific Language in Java,
Steve Freeman, Nat Pryce,
In Proceedings OOPSLA 2006

Real world usage

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```
import org.jmock.Expectations;
import org.jmock.Mockery;

public class JmockTestClass extends TestCase {

    Mockery context = new Mockery();

    public void testMockObject() {

        final Order mockOrder = context.mock(Order.class);

        Expectations expect = new Expectations(){{
            exactly(3).of(mockOrder).addOrder(with(an

        }};
```

```
an(Class<T> type) Matcher<T> - Expectations
any(Class<T> type) Matcher<T> - Expectations
anything() Matcher<T> - Expectations
aNonNull(Class<T> type) Matcher<T> - Expectati
aNull(Class<T> type) Matcher<T> - Expectations
AncestorEvent - javax.swing.event
AncestorIterator - com.sun.org.apache.xml.interna
AncestorIterator - com.sun.org.apache.xml.interna
AncestorListener - javax.swing.event
And - com.sun.org.apache.xpath.internal.operation
Press '^.' to show Template Proposals
```

```
Syntax error on token ",", Expression expected after this token
```

Real world usage

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```
t.mock(Order.class);

ctations(){{
ddOrder(with(an
```

an(Class<T> type) Matcher<T> - Expectations
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Press '^_' to show Template Proposals

Use cases

Pattern matching & Mdx-queries

Use cases

Pattern matching & Mdx-queries

Demand-driven Specification

Use cases

Pattern matching & Mdx-queries

Demand-driven Specification

Loose Strict

Use case 1

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Pattern Matching

Method - Extraction

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```
public class Example {
       String name

     public Example(){
          this.name = "default”;}

     public void testExample(int message){
         System.out.println(this.name);
         System.out.println(message);
     }
}
```

Method - Extraction


```
public class Example {
       String name

     public Example(){
          this.name = "default”;}

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     }
}
```

Tokenized Source


```
[public,class,Example,{,String,name,public,Exampl
  e,(,),{,this.name,=,"default",;,},public,void,
testExample,(,int,message,),{,System.out.println,
  (,this.name,),;,System.out.println,(,message,),
  ;,},}]
```

Method - Pattern


```
TypePredicate PUBLIC = new TypePredicate(LITERAL_PUBLIC);
TypePredicate PRIVATE = new TypePredicate(LITERAL_PRIVATE);
BackReferenceablePredicate IDENTIFIER = new
    BackReferenceablePredicate(new TypePredicate(IDENT));
TypePredicate RETURN_TYPE = new TypePredicate(TYPE);
TypePredicate VOID = new TypePredicate(LITERAL_VOID);
TypePredicate LCURLYT = new TypePredicate(LCURLY);
TypePredicate RCURLYT = new TypePredicate(RCURLY);

OrPredicate PUBLIC_OR_PRIVATE = new OrPredicate(PUBLIC, PRIVATE);
OrPredicate RETURN_TYPE_OR_VOID = new OrPredicate(RETURN_TYPE, VOID);

Expression method = new Expression(new Object[] {
    PUBLIC_OR_PRIVATE,RETURN_TYPE_OR_VOID, IDENTIFIER,
    new BalancedTextPredicate("(", ")"),
    new BalancedPredicate(LCURLYT, RCURLYT)});
```

Method - Pattern

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```

Method - Fluent Pattern


```
PatternBuilder pb =
   matchA(LITERAL_PUBLIC).or(LITERAL_PRIVATE)
.followedByA(IDENT)
        .withReference("method_name")
.followedByA(balanced("(", ")"))
.followedByA(balanced(LCURLY, RCURLY));
```

Method - Fluent Pattern

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Software Improvement Group

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```

Implementation

PatternBuilder
- 25 public - 8 static - 250 LOC

Implementation


```
public PatternBuilder followedBy(Object o) {
    addToList(o);
    return this;
}
```

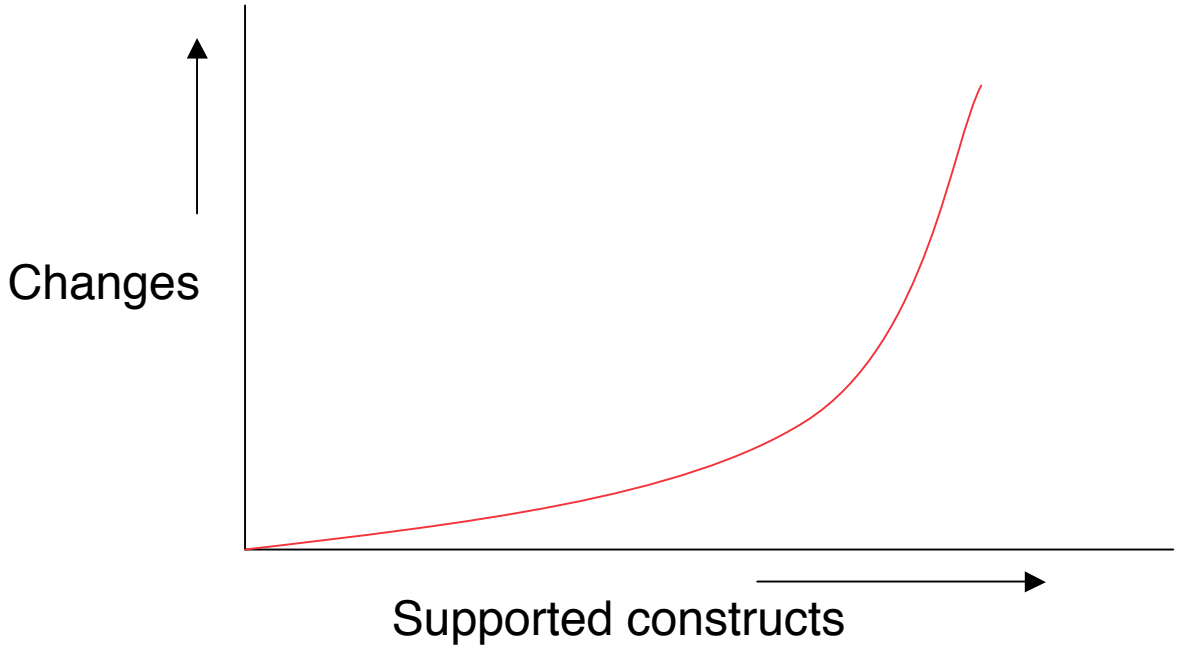
PatternBuilder
- 25 public - 8 static - 250 LOC

Implementation


```
public PatternBuilder untilFirst(Integer i) {
    TypePredicate p =
                new TypePredicate(i);
    addToList(
        new ZeroOrMore(
                new NotPredicate(p)));
    addToList(p);
    return this;
}
```

PatternBuilder
- 25 public
- 8 static
- 250 LOC

Lessons Learned



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Lessons Learned

A good name, like good will, is got by many actions and lost by one.

Lord Jeffery

Use case 2

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Mdx-queries

Use case 2, MDX-queries


```
with
Member [Measures].[Name] as
                        [Time].currentMember.Name
select
   {[Measures].[Name],[Measures].[LINES_OF_CODE]}
ON COLUMNS,
{[Time].Children}
ON ROWS
from [cube]
```

Use case 2, MDX-queries

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Use case 2, MDX-queries

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from [cube]
```

	Name	Lines of Code
2008-01	2008-01	140000
2008-02	2008-02	140500
2008-03	2008-03	100000

Mdx - Normal usage

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```
public void normalUsage(MDXDatasource ds) {
  String query =
      "with member [Measures].[Name] as "
    + "            [Time].currentMember.name "
    + "select {[Measures].[Name], "
    + "     [Measures].[LINES_OF_CODE]}"
    + "ON COLUMNS, "
    + "{[Time].Children } "
    + "ON ROWS from [cube]";

  MDXDao.query(ds,query);
}
```

Mdx - Fluent Interface


```
MdxQuery.with()
  .member("Name").onHierarchy("Measures").as()
     .currentMember().name().ofHierarchy("Time").
.onColumns()
    .showFromHierarchy("Measures")
        .member("Name","LINES_OF_CODE")
.onRows()
    .showFromHierarchy("Time")
        .children()
.from("cube");
```

Fluent Interface - broken down


```
WithMember member =
   MdxQuery.with().member("Name")
               .onHierarchy("Measures");
Axis columns =
   member.as().currentMember().name()
               .ofHierarchy("Time").onColumns();
Axis rows =
   columns.showFromHierarchy("Measures")
        .member("Name","LINES_OF_CODE").onRows();
MdxQuery query =
   rows.showFromHierarchy("Time").children()
        .from("cube");
```

Fluent Interface - broken down


```
WithMember member = ...


Axis columns =
   ...

Axis rows =
   ...

MdxQuery query =
    ...
```

Implementation


```
public class Axis {
  protected MdxQuery query;
...
  public Axis(MdxQuery query) {
     this.query = query
  }
...
  public MdxQuery from(String cubeName){
     query.addRows(this);
     query.setName(cubeName);
     return query;
  }
...
}
```

MdxQuery
- 6 classes - 380 LOC

Lessons Learned

SELECT <axis_specification> [, <axis_specification>...]
FROM <cube_specification>
WHERE <slicer_specification>

<axis_specification> ::= <set> ON <axis_name>
<axis_name> ::= COLUMNS | ROWS | PAGES
| SECTIONS | CHAPTERS | AXIS(index)

From: http://msdn2.microsoft.com/en-us/library/ms713682(VS.85).aspx

Lessons Learned

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Divide et impera

Overall Lessons


```
import static java.new.feature.VarArgs;
```

Overall Lessons

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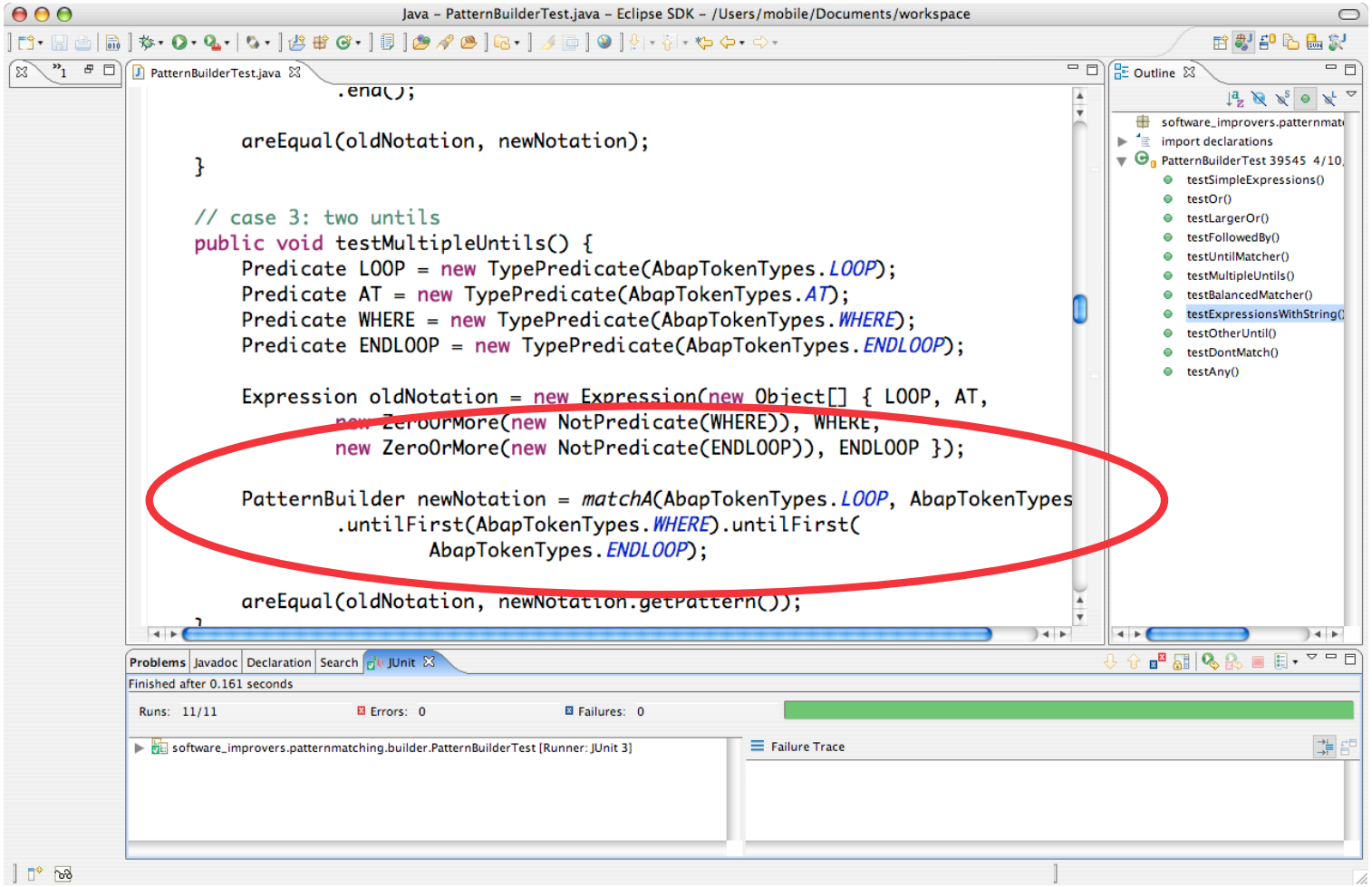

Ideas

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Possibilities

Possibilities


```
public Query valueLike(String userInput){
    escapeEvilThings(userInput);
    updateInternalState(userInput);
    return this;
}
```

Possibilities

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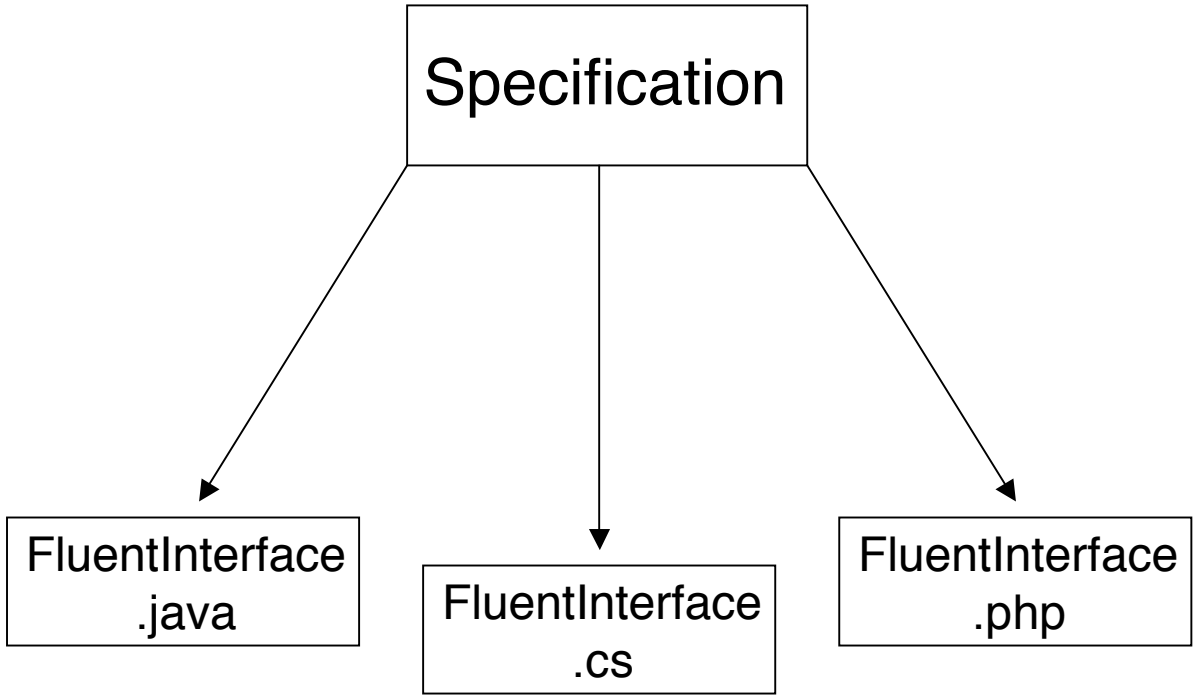

Conclusion

- Configuring value objects
- Easy access to library
- Typed embedded languages

Conclusion

- Support everything
- Mix fluent and OO-interfaces

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Thank you for your attention

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http://www.sig.eu