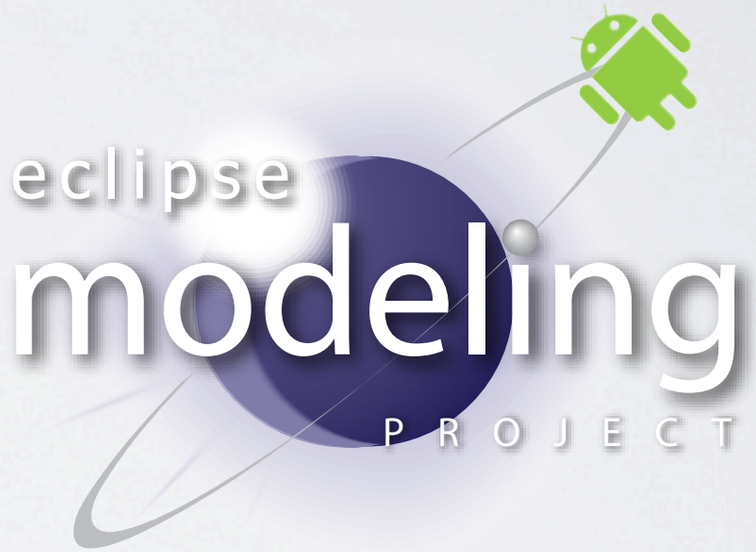
INSTALLATION

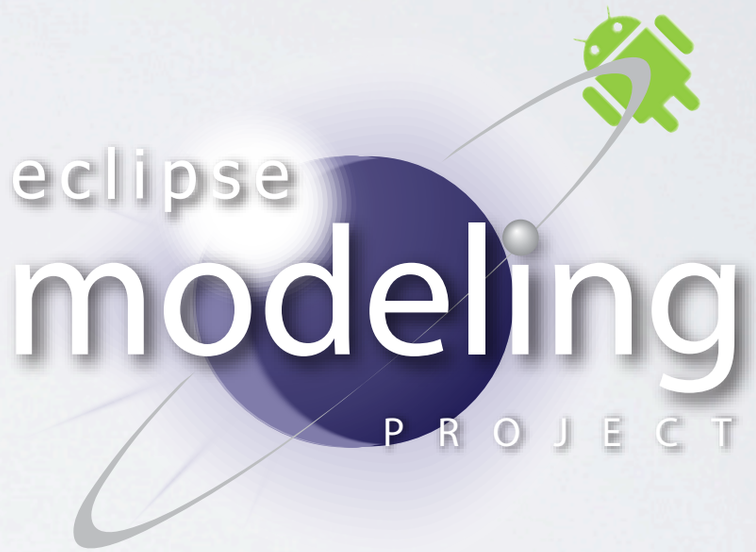
- Get a grip on one of the USB sticks.
- Install the Eclipse SDK and the Android SDK matching your platform from the memory stick.
- Start Eclipse and set the location of the Android SDK in *Preferences > Android*
- Import the *tutorial.zip* into your workspace using *File > Import > Existing Projects into Workspace > Archive File*

CREATING A LANGUAGE FOR ANDROID APPS WITH ECLIPSE MODELING



Mikaël Barbero, Stéphane Begaudeau - OBEO
Jan Köhnlein, Holger Schill, Dennis Hübner - itemis

CREATING A LANGUAGE FOR ANDROID APPS WITH ECLIPSE MODELING



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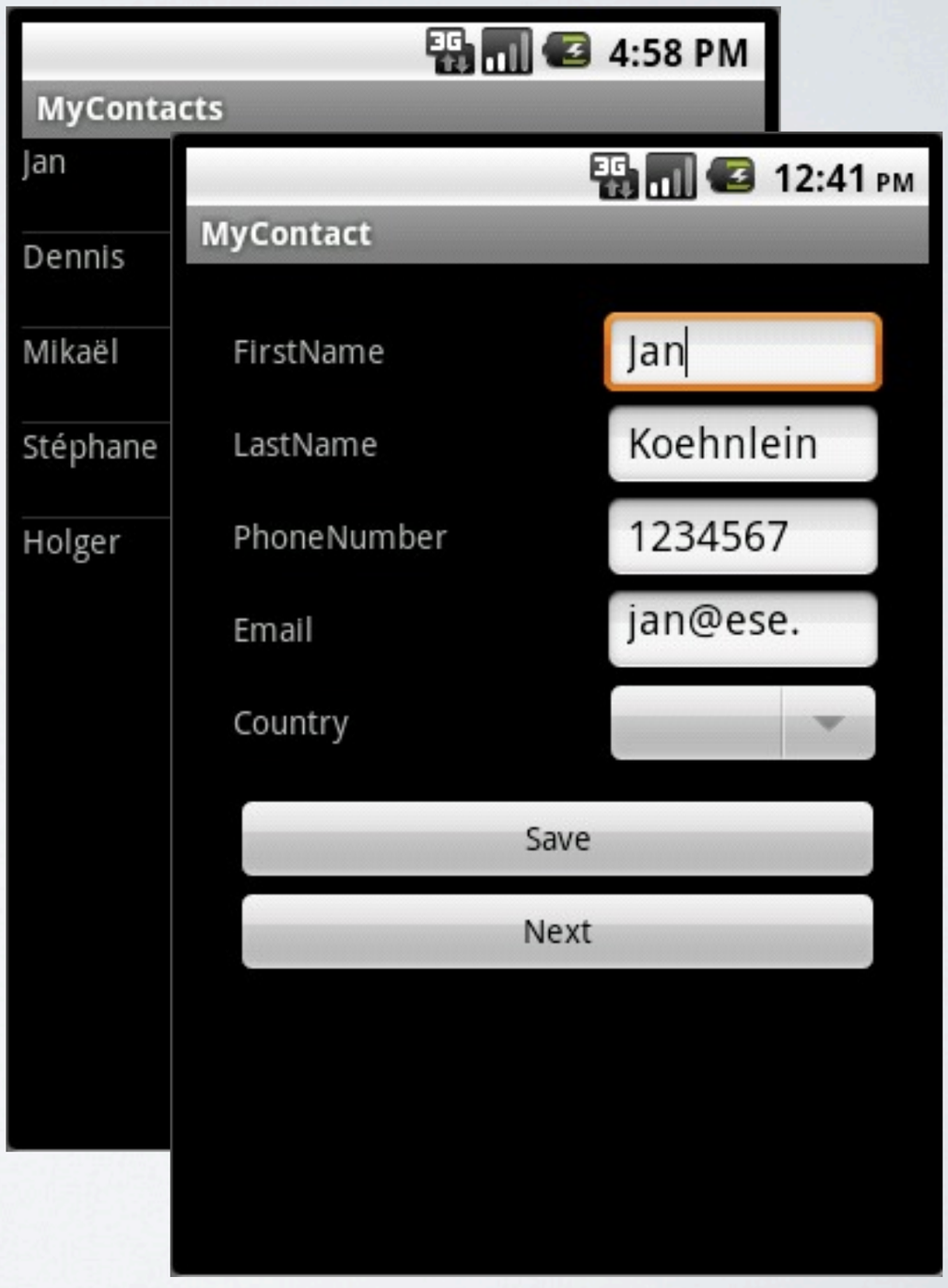
APP CONCEPTS

APPLICATION

- Declared in AndroidManifest.xml
- Defines Activities
  - One default Activity

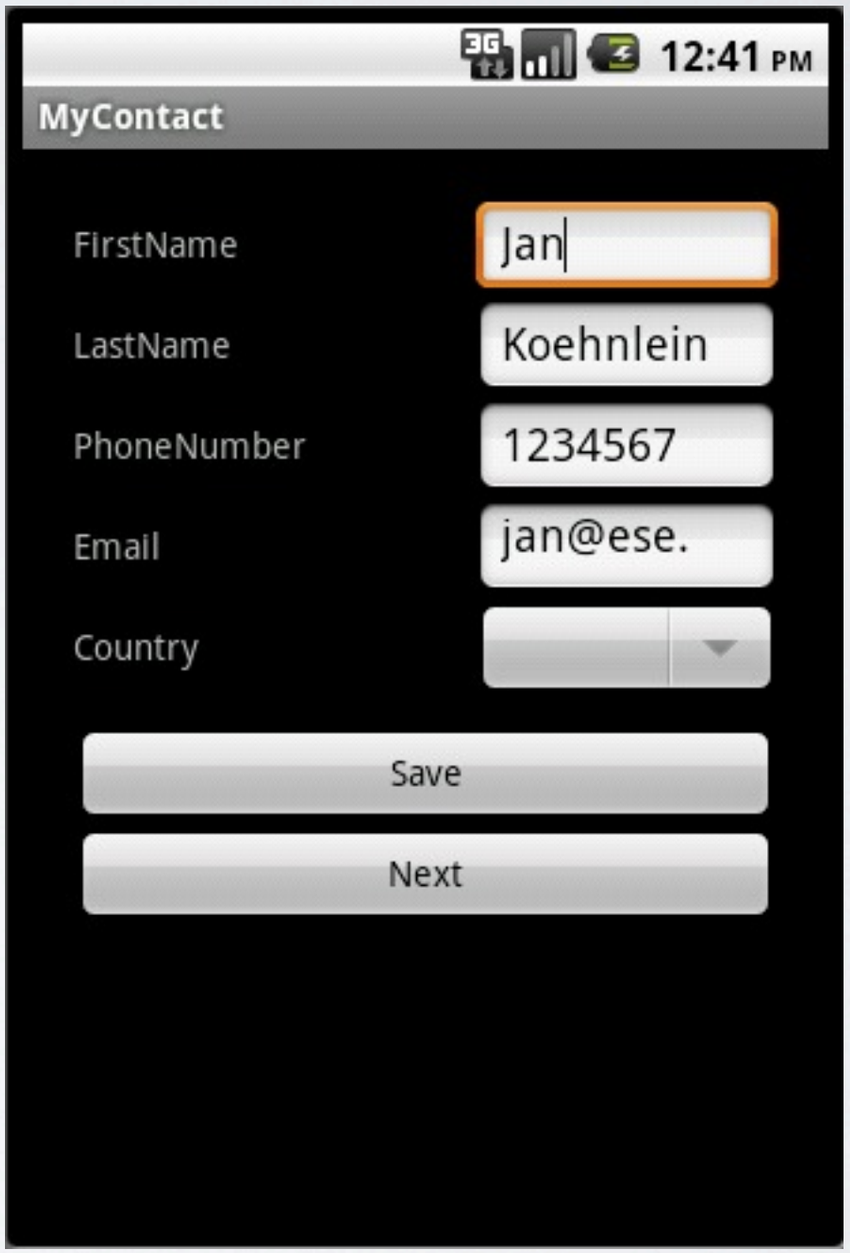
ACTIVITY

- One page of an App
- Java class extends android.app.Activity
- Entry in AndroidManifest.xml
- Layout in separate XML file



WIDGETS

- Member in activity class
- Layout in XML
- Refer to DB entry



Text

Spinner

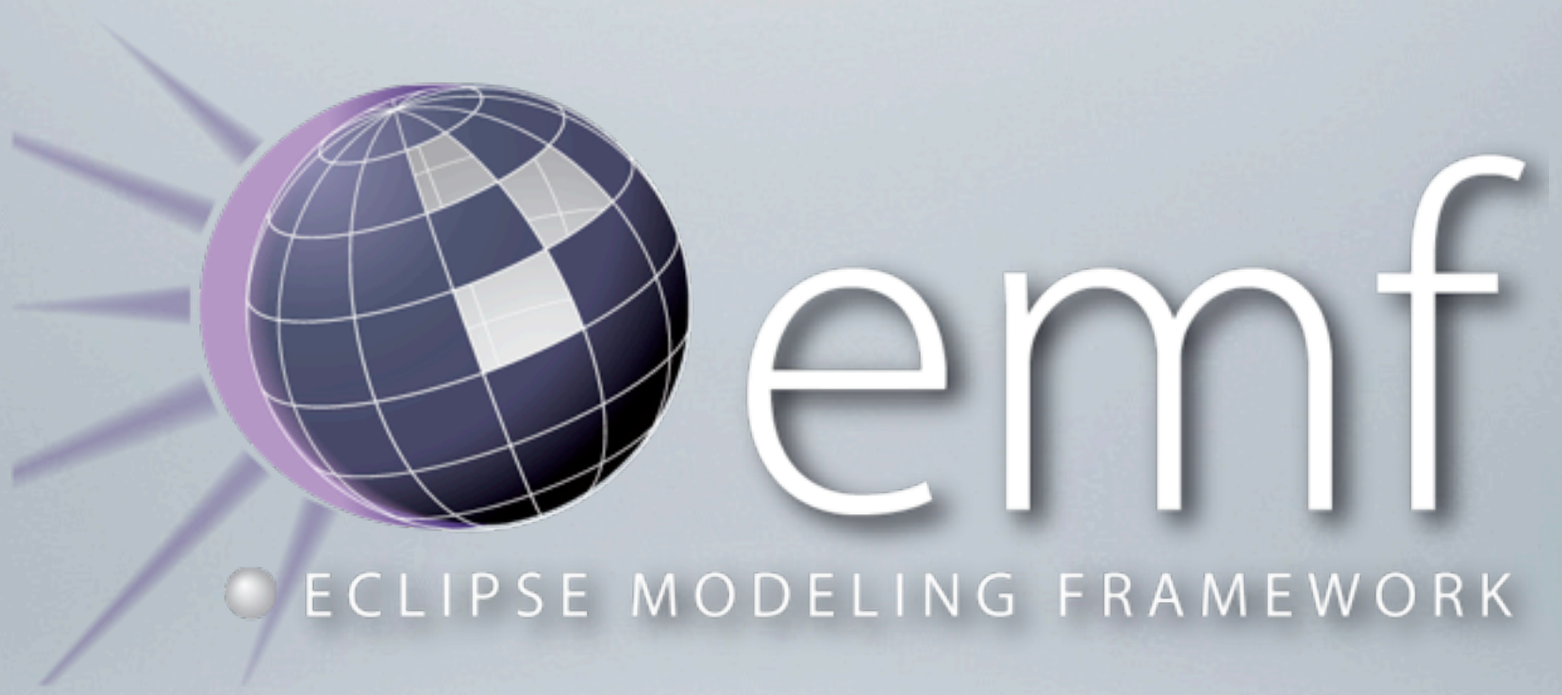
Link

PROBLEM

- Concepts span across XML as well as Java code
- No common abstraction mechanism

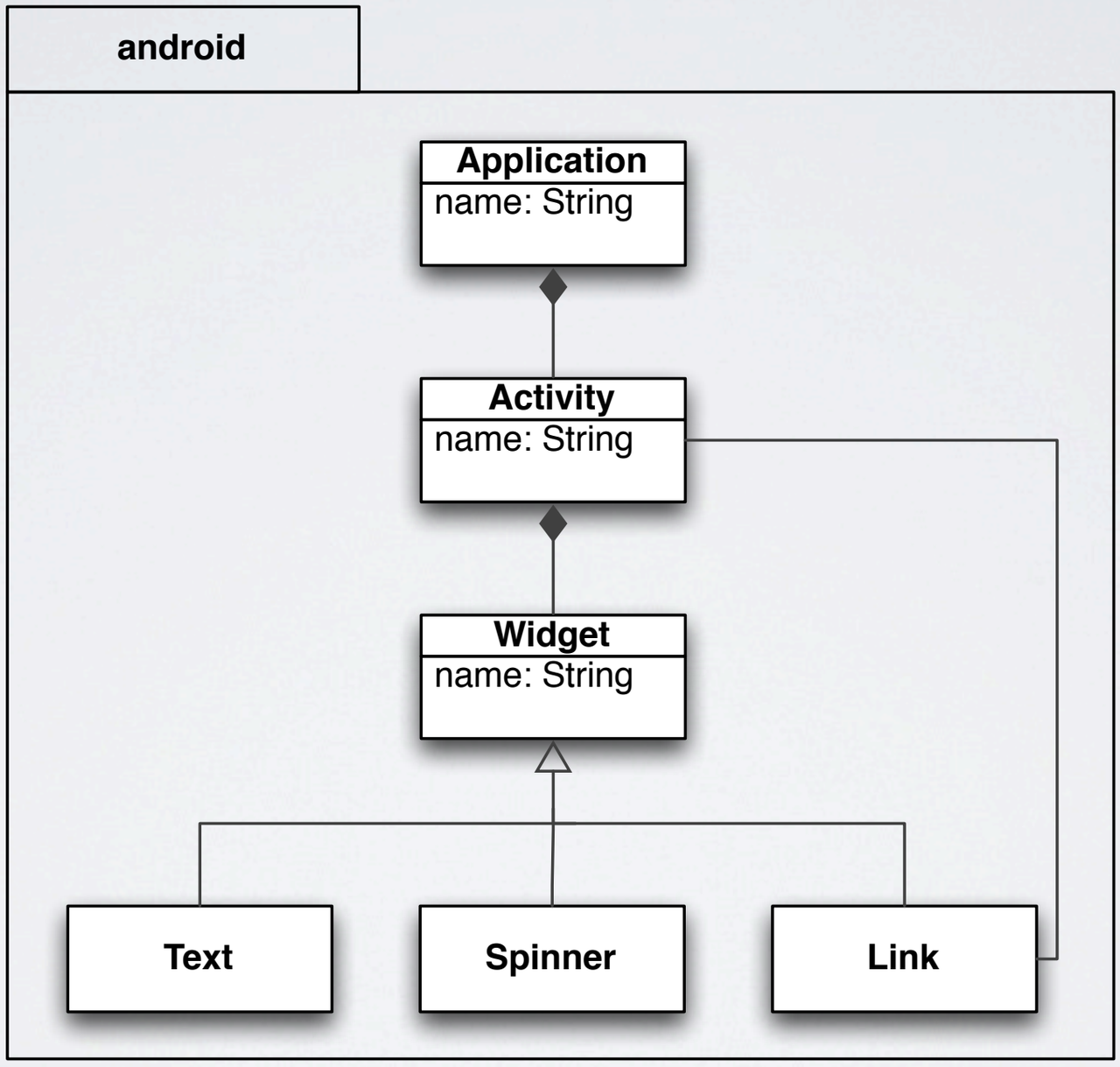
SOLUTION

- Define concepts in an Ecore model
- Use Xtext to create an editor for model instances
- Use Acceleo to generate code from model instances



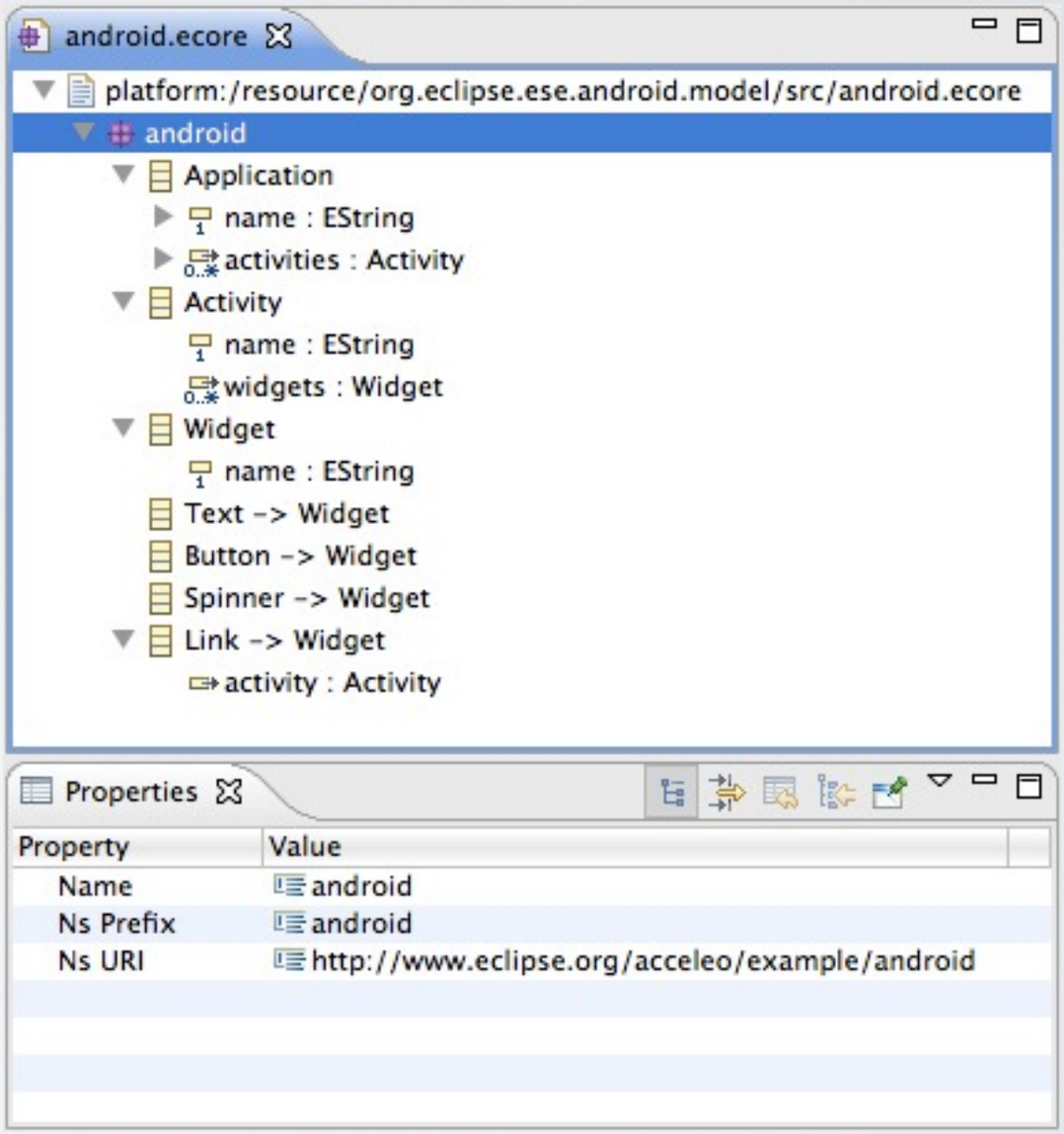
THE MODEL

THE MODEL


android
Application
name: String
Activity
name: String
Widget
name: String
Text
Spinner
Link

ECORE CONCEPTS

- EPackage
- EClass
- EAttribute
- EReference
  - (non-)containment
  - upper bound



TEXTUAL MODELING

REFERENCE MODEL

```
Application MyContacts

Activity MyContact {
   Text firstName
   Text lastName
   Link phoneNumbers -> PhoneNumber
   Spinner country
}

Activity PhoneNumber {
   Text prefix
   Text number
}
```

LABELS

```
public class AndroidLabelProvider
    extends DefaultEObjectLabelProvider {

    public Object image(Application app) {
        return "Application.gif";
    }

    public Object text(Application app) {
        return "<<" + app.getName() + ">>";
    }
}
```

VALIDATION

```
public static final String CAPITALIZE =
    "org.eclipse.ese.android.validation.Captalize";

@Check
public void checkApplicationNameWithCapital(Application app) {
    if (!Character.isUpperCase(app.getName().charAt(0))) {
        warning("Name should start with a capital", app,
                AndroidPackage.APPLICATION__NAME, CAPITALIZE);
    }
}
```

QUICK FIX

```
@Fix(AndroidJavaValidator.CAPITALIZE)
public void capitalizeName(final Issue issue,
                           IssueResolutionAcceptor acceptor) {
    acceptor.accept(issue,
        "Capitalize name", "Capitalize the name.", "upcase.gif",
        new ISemanticModification() {
            public void apply(EObject o, IModificationContext c) {
                Application application = (Application) o;
                String name = application.getName();
                application.setName(name.substring(0,1).toUpperCase()
                      + name.substring(1));
            }
    });
}
```

WHERE TO GO NEXT...

- Add Template Proposals
- Define Scopes
- Implement a Formatter
- Highlight Cross-References
- ...