

UIMML

User Interface Markup Language

Schedule

- What is UIML?
- History & Basics
- Hello World Example
- Structure & important tags
- Java Example
- Conclusions
- References

- Discussion & CMap

What is UIML?

- XML-compliant meta-language
- describes user interfaces
- „one language for all devices“
- open specification
- not very common

History

- 1997: UIML
 - 2000: UIML 2
 - 2002: UIML 3
 - 2004: UIML 3.1
 - 2008: UIML 4
-
- since Version 4 maintained by OASIS
(Organization for the Advancement of
Structured Information Standards)

Key Concepts

- abstract tags, independent of any UI metaphor
 - separation of presentation, content, behavior
 - no static structure, dynamic tree structure
 - template support
-
- But: no automatic translation to different UI metaphors
 - Some knowledge about target device needed

Basics

- UI: a set of interface elements (<part>s)
- parts have content, some parts can receive input
- virtual tree of parts, dynamically modifiable
- <behavior> element
 - rule based: conditions, actions
- generic tags, mapping to specific UI toolkits

Hello World

```

<?xml version="1.0"?>
<!DOCTYPE uiml PUBLIC
  "-//OASIS//DTD UIML 4.0 Draft//EN" http://uiml.org/dtds/UIML4_0a.dtd">

<uiml xmlns='http://docs.oasis-open.org/uiml/ns/uiml4.0'>
  <interface>
    <structure>
      <part id="TopHello">
        <part id="hello" class="helloC"/>
      </part>
    </structure>
    <style>
      <property part-name="TopHello" name="rendering">Container</property>
      <property part-name="TopHello" name="content">Hello</property>
      <property part-class="helloC" name="rendering">Text</property>
      <property part-name="hello" name="content">Hello World!</property>
    </style>
  </interface>
  <peers> ... </peers>
</uiml>

```

Hello World: Basic Structure

Prologue

```
<?xml version="1.0"?>
<!DOCTYPE uiml PUBLIC
  "-//OASIS//DTD UIML 4.0 Draft//EN" http://uiml.org/dtds/UIML4_0a.dtd">

<uiml xmlns='http://docs.oasis-open.org/uiml/ns/uiml4.0'>
  <interface>
    <structure>
      <part id="TopHello">
        <part id="hello" class="helloC"/>
      </part>
    </structure>
    <style>
      <property part-name="TopHello" name="rendering">Container</property>
      <property part-name="TopHello" name="content">Hello</property>
      <property part-class="helloC" name="rendering">Text</property>
      <property part-name="hello" name="content">Hello World!</property>
    </style>
  </interface>
  <peers> ... </peers>
</uiml>
```


Hello World: Basic Structure

Prologue

```
<?xml version="1.0"?>  
<!DOCTYPE uiml PUBLIC  
  "-//OASIS//DTD UIML 4.0 Draft//EN" http://uiml.org/dtds/UIML4_0a.dtd">
```

```
<uiml xmlns='http://docs.oasis-open.org/uiml/ns/uiml4.0'>
```

Root Element

```
  <interface>  
    <structure>  
      <part id="TopHello">  
        <part id="hello" class="helloC"/>  
      </part>  
    </structure>  
    <style>  
      <property part-name="TopHello" name="rendering">Container</property>  
      <property part-name="TopHello" name="content">Hello</property>  
      <property part-class="helloC" name="rendering">Text</property>  
      <property part-name="hello" name="content">Hello World!</property>  
    </style>  
  </interface>  
  <peers> ... </peers>  
</uiml>
```

Hello World: Basic Structure

Prologue

```
<?xml version="1.0"?>
<!DOCTYPE uiml PUBLIC
  "-//OASIS//DTD UIML 4.0 Draft//EN" http://uiml.org/dtds/UIML4_0a.dtd">
```

Root Element

```
<uiml xmlns='http://docs.oasis-open.org/uiml/ns/uiml4.0'>
```

UI Element
Definition

```
  <interface>
    <structure>
      <part id="TopHello">
        <part id="hello" class="helloC"/>
      </part>
    </structure>
```

Properties

```
  <style>
    <property part-name="TopHello" name="rendering">Container</property>
    <property part-name="TopHello" name="content">Hello</property>
    <property part-class="helloC" name="rendering">Text</property>
    <property part-name="hello" name="content">Hello World!</property>
  </style>
</interface>
<peers> ... </peers>
</uiml>
```

Basic Structure

- 4 types of child elements for `<uiml>` possible:
- `<head> ... </head>`
 - metadata
- `<template> ... </template>`
 - allowing reuse of fragments
- `<interface> ... </interface>`
 - UI definition
- `<peers> ... </peers>`
 - mapping to UI toolkits

Basic Structure

- 4 types of child elements possible:
- `<head> ... </head>`
 - metadata
- `<template> ... </template>`
 - allowing reuse of fragments
- **`<interface> ... </interface>`**
 - **UI definition**
- `<peers> ... </peers>`
 - mapping to UI toolkits

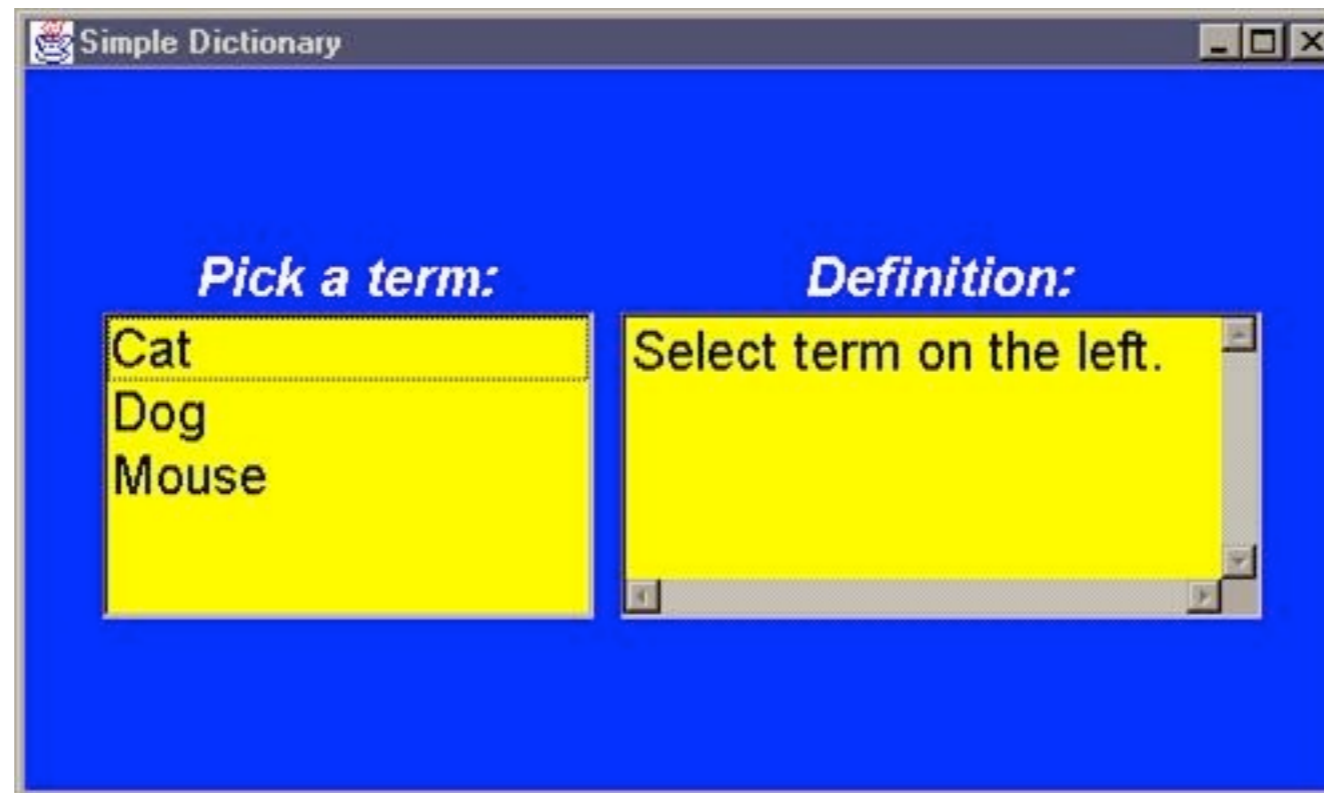
Interface Description

- 4 types of child elements possible (again...):
- `<structure> ... </structure>`
 - organization of interface parts
- `<style> ... </style>`
 - properties of interface parts
- `<content> ... </content>`
 - words, sounds, images associated with interface parts
- `<behavior> ... </behavior>`
 - event handling

Turning UIML into an UI

- interpreting
 - on client device
 - like HTML
- compiling
 - into other language

Java AWT/Swing-Example



(Example taken from UIML 4.0 Specification)

```

<?xml version="1.0"?>
<!DOCTYPE uiml PUBLIC
    "-//OASIS//DTD UIML 4.0a Draft//EN"
    http://uiml.org/dtds/UIML4\_0a.dtd>

<!-- This is Dictionary.ui.
    Displays one window on the screen containing a list of animals
    and a textbox. Clicking an animal's name displays a definition in the
    textbox. -->

<uiml>

    <peers>
        <presentation base="Java_1.5_Harmonia_1.0"/>
    </peers>

    <interface>

        <structure>
            <part class="JFrame" id="JFrame">
                <part class="JLabel" id="TermLabel"/>
                <part class="List" id="TermList"/>
                <part class="JLabel" id="DefnLabel"/>
                <part class="TextArea" id="DefnArea"/>
            </part>
        </structure>

        <style>
            <property part-name="JFrame" name="layout"> java.awt.GridBagLayout</property>
            <property part-name="JFrame" name="background"> blue</property>

```



```
</part>
</structure>
```



```
<style>
```

```
<property part-name="JFrame" name="layout"> java.awt.GridBagLayout</property>
<property part-name="JFrame" name="background" >blue</property>
<property part-name="JFrame" name="location" >100,100</property>
<property part-name="JFrame" name="size" >500,300</property>
<property part-name="JFrame" name="title" >Simple Dictionary</property>

<property part-class="JLabel" name="foreground" >white</property>
<property part-class="JLabel" name="gridx" >RELATIVE</property>
<property part-class="JLabel" name="gridy" >RELATIVE</property>
<property part-class="JLabel" name="font" >Helvetica-bolditalic-20</property>

<property part-name="TermLabel" name="text" >Pick a term:</property>

<property part-name="DefnLabel" name="text">Definition:</property>
<property part-name="DefnLabel" name="gridx" >1</property>
<property part-name="DefnLabel" name="gridy" >0</property>
<property part-name="DefnLabel" name="insets" >0,10,0,0</property>

<property part-name="TermList" name="background" >yellow</property>
<property part-name="TermList" name="gridx" >0</property>
<property part-name="TermList" name="gridy" >RELATIVE</property>
<property part-name="TermList" name="fill" >BOTH</property>
<property part-name="TermList" name="font" >Helvetica-20 </property>
<property part-name="TermList" name="content">
  <constant model="list">
    <constant id="Cat" value="Cat"/>
    <constant id="Dog" value="Dog"/>
    <constant id="Mouse" value="Mouse"/>
  </constant>
```

```
<behavior>
```

```
  <rule>
```

```
    <condition>
```

```
      <op name="and">
```

```
        <event part-name="TermList" class="ItemListener.itemStateChanged"/>
```

```
        <op name="equal">
```

```
          <property event-class="ItemListener.itemStateChanged" name="item"/>
```

```
          <constant value="0"/>
```

```
        </op>
```

```
      </op>
```

```
    </condition>
```

```
    <action>
```

```
      <property part-name="DefnArea" name="text"
```

```
        >Carnivorous, domesticated mammal that's fond of rats and mice</property>
```

```
    </action>
```

```
  </rule>
```

```
  <rule>
```

```
    <condition>
```

```
      <op name="and">
```

```
        <event part-name="TermList" class="ItemListener.itemStateChanged"/>
```

```
        <op name="equals">
```

```
          <property event-class="ItemListener.itemStateChanged" name="item"/>
```

```
          <constant value="1"/>
```

```
        </op>
```

```
      </op>
```

```
    </condition>
```

```
    <action>
```

```
      <property part-name="DefnArea" name="text">Domestic animal related to a wolf that's
```

```
    </action>
```

```
  </rule>
```

```

        <property event-class="ItemListener.itemStateChanged" name="item"/>
        <constant value="1"/>
    </op>
</op>
</condition>
<action>
    <property part-name="DefnArea" name="text">Domestic animal related to a wolf that's
</action>
</rule>

<rule>
    <condition>
        <op name="and">
            <event part-name="TermList" class="ItemListener.itemStateChanged"/>
            <op name="equals">
                <property event-class="ItemListener.itemStateChanged" name="item"/>
                <constant value="2"/>
            </op>
        </op>
    </condition>
    <action>
        <property part-name="DefnArea" name="text"
            >Small rodent often seen running away from a cat</property>
    </action>
</rule>

</behavior>

</interface>

</uiml>

```

So what do we have?

- A markup language to define User Interfaces
- applicable to all kinds of User Interfaces
 - if mapping definition exists

But...

- no further development (?)
- uiml.org down
- Harmonia Inc. no longer cares for UIML
- Interpreting Software no longer available

References

- ABRAMS, PHANOURIOU, BATONGBACAL, WILLIAMS, SHUSTER. **UIML: An Appliance-Independent XML User Interface Language**. Proceedings to 8th International World Wide Web Conference, Toronto, 1999
- PHANOURIOU. **UIML: A Device-Independent User Interface Markup Language**. PhD Thesis. 2000
- HELMS, J. AND ABRAMS, M. **Retrospective on UI description languages, based on eight years' experience with the User Interface Markup Language (UIML)**, Int. J. Web Engineering and Technology, Vol. 4, No. 2, pp.138–162. 2008
- OASIS UIML 4.0 Committee Draft. http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=uiml (Apr 16th, 2012)
- **uiml.org** <http://web.archive.org/web/20110719172319/http://www.uiml.org/index.php> (Snapshot from Jul 19th, 2011)
- **Harmonia UIML Resources** <http://web.archive.org/web/20060712210738/http://www.harmonia.com/resources/presentations/index.htm> (Snapshot from Jun 6th, 2006)