

Device-Independence with UIML

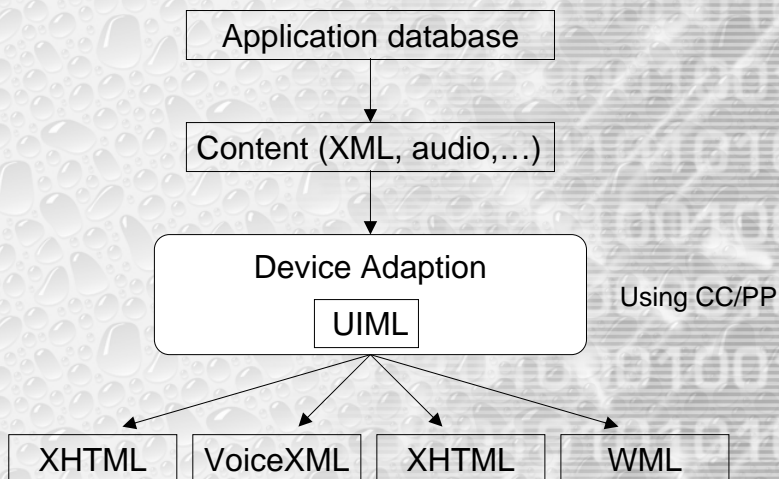
(User Interface Markup Language)

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uiml.org

W3C Workshop on Web Device Independent Authoring
October 2000

Where UIML Fits In*



* Diagram from Dave Raggett's talk

UIML... One Part of a Solution

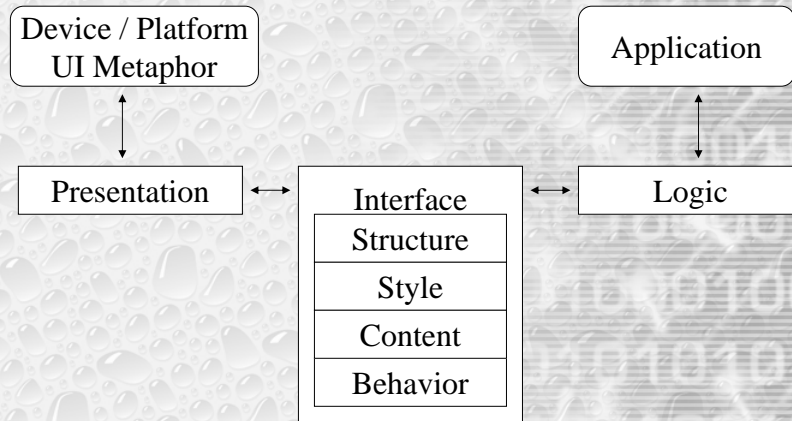
- One canonical representation of UI for any device, language, OS, UI-metaphor
- 3+ years in development at Harmonia, Center for HCI at Virginia Tech
- Tools downloaded in 40+ countries
- Can be compiled to lots of things
- Anyone can freely implement UIML
- Objective is open standard

Key Concept: UIML is a "Meta" Language

- XML
 - Doesn't define tags (<P>,...)
 - Must add doc type definition to make it useful
 - No need to change XML as new tag sets invented
- UIML
 - Doesn't define tool-kit specific tags (<Menu>,...)
 - Uses a few powerful tags (<part>, <property>,...)
 - Must add toolkit vocabulary to make it useful
 - No need to change UIML as new devices invented

UIML Model

Underlying principle of single authoring is MVC [to separate content/structure] [Ralph Case, Stephane Maes]



6-way separation of UI description (vs. 3-way MVC)

UIML Skeleton - Part 1

```
<?xml version="1.0" ... ?>
<uiml version="2.0">
```

```
<interface>
  <structure>
    <part class="Button"> ... </part>
    ...
  </structure>
```

```
</interface>
```

```
</uiml>
```

What parts comprise the UI & what's their relationship?

UIML Skeleton - Part 2

```
<?xml version="1.0" ... ?>
<uiml version="2.0">

  <interface>
    <structure>...</structure>
    <style>...</style>

  </interface>
</uiml>
```

*What presentation style
for each part?*

UIML Skeleton - Part 3

```
<?xml version="1.0" ... ?>
<uiml version="2.0">

  <interface>
    <structure>...</structure>
    <style>...</style>
    <content>...</content>

  </interface>
</uiml>
```

*What content for each part?
(text, sounds, image, ...)*

UIML Skeleton - Part 4

```

<?xml version="1.0" ... ?>
<uiml version="2.0">

  <interface>
    <structure>...</structure>
    <style>...</style>
    <content>...</content>
    <behavior>...</behavior>

  </interface>

</uiml>

```

What behavior do parts have?

UIML Skeleton - Part 5

```

<?xml version="1.0" ... ?>
<uiml version="2.0">

  <interface>
    <structure>...</structure>
    <style>...</style>
    <content>...</content>
    <behavior>...</behavior>

  </interface>
  <peers>...</peers>

</uiml>

```

How to connect to outside world?
(business logic, UI toolkit object)

<peers> Maps Classes to Targets

```
<d-class name="JButton" ... maps-to="javax.swing.JButton">
...
</d-class>
```

Versus

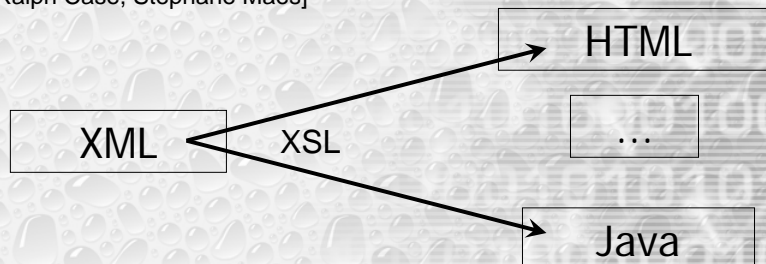
```
<d-class name="JButton" ... maps-to="html:input">
...
</d-class>
```

*This part is written once, like a device driver for an OS.
Events and calls to outside world handled similarly.*

NxM Problem (Old Way)

- App composed on
 - M "pages"
 - accessed via N devices
 - requires NxM authoring steps

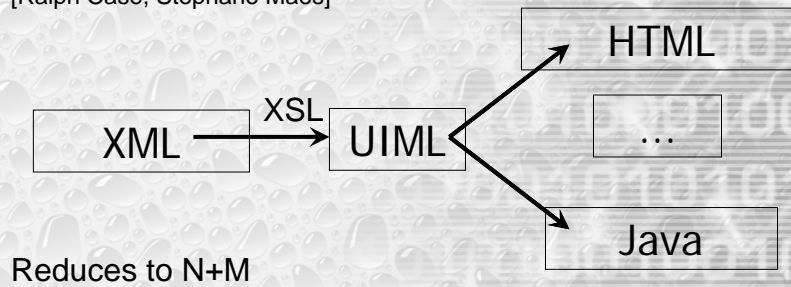
[Ralph Case, Stephane Maes]



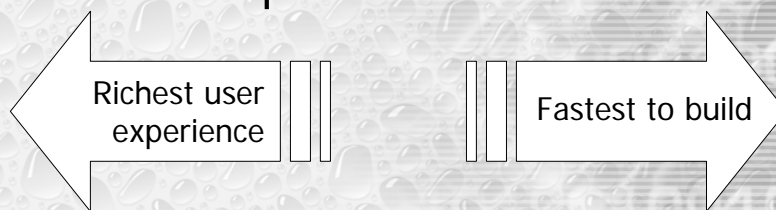
NxM Problem (New Way)

- App composed on
 - M "pages"
 - accessed via N devices
 - requires NxM authoring steps

[Ralph Case, Stephane Maes]



UIML Permits Development Continuum



Use device-specific vocabulary:

```
<part Class="JPopupMenu">  
versus  
<part Class="Select">
```

Use generic vocabulary:

```
<part Class="Menu">
```

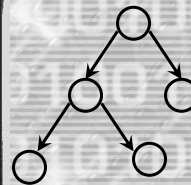
UIML Permits Families of UIs

Date	Check No./Trans	Payee/Location	Withdrawal	Deposit	Balance
12/6/97	205	Grand Food	\$15.50	-	605.87
12/7/97	206	Media Owner of C...	\$32.55	-	\$573.32
12/8/97	207	Washington Gas	\$182.08	-	\$491.24
12/9/97	208	Carroll City	\$20.00	-	\$471.24
12/15/97	ATM Withdrawal	Fair Oaks Mall	\$75.00	-	\$396.24
12/17/97	DEPOSIT	Branch 1103	-	\$98.54	\$494.78
12/28/97	210	CEBANK VISA	\$156.07	-	\$338.71
1/1/98	211	Carroll City	\$20.00	-	\$318.71
1/2/98	ATM Withdrawal	2022 Siding Rd	\$400.00	-	\$-81.29

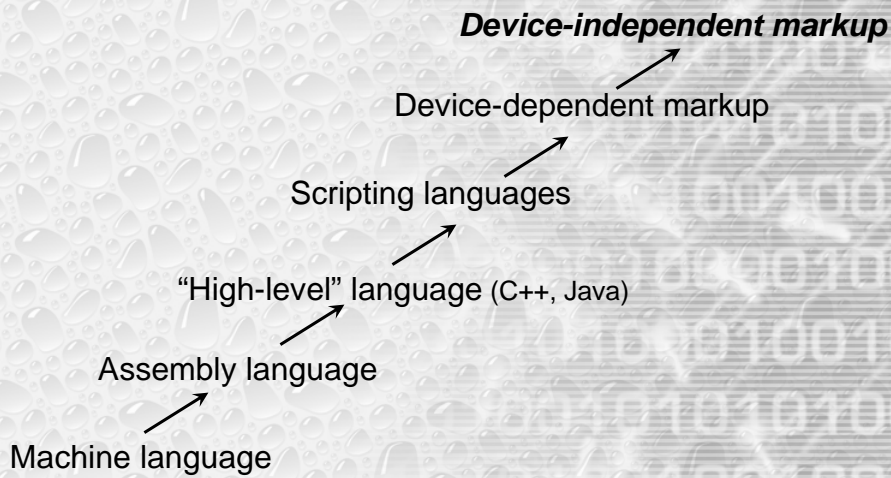
Current Balance: \$877.57

Pay To: Washington Gas \$ 142.44

Amount: One hundred forty two and 44/100 Dollars



Another Perspective...



Still...

UIML is Not a Silver Bullet...

Some open problems:

- Aid/enforce accessibility guidelines [Jon Wu]
- Support auto adaptation/personalization [Ruud Siebelink]
- Reorganizing UI:
 - Many apps will need to be re-designed entirely [Guido Grasse]
 - 1 page in a desktop Web browser might be split into 2 screens for TV [Peter Ferne]

For More Info

Visit uiml.org

Upcoming: European Workshop on UIML –
January 2001 in Paris