Layout Templates – Let Users Rule User Interfaces

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Structure of the Talk

- Current Situation
- Layout Templates
- Current Implementation
- Further Possibilities of Implementation
Current Situation

Same Purpose, Different GUI

Windows Default (e.g. Notepad)

MS Word
Current Situation

Same Purpose, Different GUI

Windows Default (e.g. Notepad++)

Gtk (e.g. Dia)
Current Situation

Same Purpose, Different GUI

Inkscape
Dia
MS Word
Current Situation

UI Toolkit Guidelines

Diagramm schließen, ohne zu speichern

Das Diagramm wird nicht gespeichert. Änderungen jetzt speichern?

Abbrechen  Lösungen verwerfen  Speichern

Änderungen an Dokument > Neues Dokument

Wollen Sie die Änderungen speichern?

Schließen, ohne zu speichern  Abbrechen  Speichern

Möchten Sie die Änderungen an Unbenannt speichern?

Speichern  Löschen  Abbrechen

Really close?

There are unsaved changes in file untitled0. tyr, what should I do?

Close  Save  Cancel
Current Situation

Unoptimized Layouts

![Print dialog box](image)
Current Situation

Difficulties for Users

- Recognition of certain dialog boxes
- Usage of certain dialog boxes
- Getting used to frequently repeated series of clicks
- Changing operating systems or versions thereof
- Vendor lock-in
Existing Solutions

Basics

GUIs *could* be created from scratch ...
Existing Solutions

Basics

GUIs *could* be created from scratch ...

... but we focus on the modification of existing GUIs!
Existing Solutions

Pre-Defined Options
Existing Solutions

Pre-Defined Options
Existing Solutions

Pre-Defined Options
Existing Solutions

Pre-Defined Options
Existing Solutions

Virtually Unrestricted Configuration

- User Interface Façades
  by Stuerzlinger, Chapuis, Phillips and Roussel

- XSLT
Existing Solutions

Remaining Problems

Layout is easily destroyed
Existing Solutions
Remaining Problems

Complicated to use

Source: http://www.w3.org/TR/xslt20/
Existing Solutions

Remaining Problems

No Configuration Across Applications
The Layout Templates Concept

Our Solution: Layout Templates

Existing UI
The Layout Templates Concept

Our Solution: Layout Templates

1 Select area

Existing UI
The Layout Templates Concept

Our Solution: Layout Templates

1. Select area
2. Define Layout Template

Existing UI
The Layout Templates Concept

Our Solution: Layout Templates

1. Select area
2. Define Layout Template
3. Tag controls

Existing UI

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Layout Templates

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The Layout Templates Concept

Our Solution: Layout Templates

1. Select area
2. Define Layout Template
3. Tag controls
4. Restructure UI

Existing UI

Define Layout Template

Restructure UI
The Layout Templates Concept

Example of Application
The Layout Templates Concept

Example of Application

1. Select area

Find what:

Find next  Cancel
The Layout Templates Concept

Example of Application

① Select area

Find what:  
Find next   Cancel

② Define Layout Template

A B
The Layout Templates Concept

Example of Application

① Select area
Find what:
Find next  Cancel

② Define Layout Template
A  B

③ Tag controls
Find what:
Find next  Cancel
The Layout Templates Concept

Example of Application

1. Select area
   - Find what:
   - Find next
   - Cancel

2. Define Layout Template
   - A
   - B

3. Tag controls
   - Find what:
   - Find next
   - Cancel

4. Restructure UI
   - Find what:
   - Find next
   - Cancel
The Layout Templates Concept

Controls are Tagged with Property/Type Filters
The Layout Templates Concept

Features

- Three clearly-defined steps
- Filters are extensible
- Can be applied hierarchically
- Can be implemented for any widget tree-based UIs
- Settings can be reused for various implementations
Implementation in HyperBraille

HyperBraille
Implementation in HyperBraille

HyperBraille Processing Chain
Implementation in HyperBraille

HyperBraille Processing Chain

Layout Templates

HyperBraille Processing Chain
Possible Alternative Implementations

System APIs

Window Manager API

Layout Templates
Possible Alternative Implementations

GUI Toolkits

Layout Templates

custom code, XSLT, ...
Conclusion

Layout Templates ...

- ... are a concept to restructure UIs.
- ... can be applied to several applications with one configuration.
- ... can be implemented for various windowing systems and GUI toolkits.

Further info: {haag, taras, ertl}@vis.uni-stuttgade.de
Layout Templates

Layout Template Classes

- Layout Template
  - +CatchAllRegion: int
  - +Regions: int
  - +Categories: String[]

- BasicLayout
  - +BasicLayout: int
  - +Regions: int

- FlowLayout
  - +FlowDirection: Direction

- GridLayout
  - +Columns: int
  - +Rows: int
Layout Templates

Settings Classes

```
Settings

+DefinedLayoutTemplates 0..1

+AppliedLayoutTemplates 0..1

AppliedLayoutTemplate

CategoryTag
+CategoryName: String
+Priority: int = 0

WidgetTag
+Categories 0..1

Rule
+Selector 1
+Children 0..1

LayoutTemplate

+UsedLayoutTemplate 0..1
```

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Layout Templates
Architecture

Layout Templates in Action

![Diagram of two print screens showing options for printing and collation.](Image)
Layout Templates

Architecture

Layout Templates in HyperBraille

Find what:

Find next
Cancel

Find what:

Find next
Cancel
HyperBraille

History

Tactile Display
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HyperBraille

History

Tactile Display
HyperBraille

History

Tactile Display
HyperBraille Results

Structure and Data Flow

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Windows

Filters
- MSAA
- IAccessible
- BHO
- UI-Automation
- DOM
- Mouse, keyboard

Interaction

Audio- and graphical tactile output

Off-Screen-Model (OSM)

```
<osm>
  <window name="..." x="..."/>
  <titlebar>...
  ...
  </window>
  ...
  <window name="..." x="..."/>
  <titlebar>...
  ...
  </window>
</osm>
```
HyperBraille in Action

Möchten Sie die Änderungen an Unbenannt speichern?

Speichern  Nicht speichern  Abbrechen
HyperBraille in Action

- Braille readable due to Latin letter overlays

- Graphics data format „BrailleMap“
HyperBraille

Further Information

http://www.hyperbraille.de/