Adapting Existing Applications to a Multi-platform Environment

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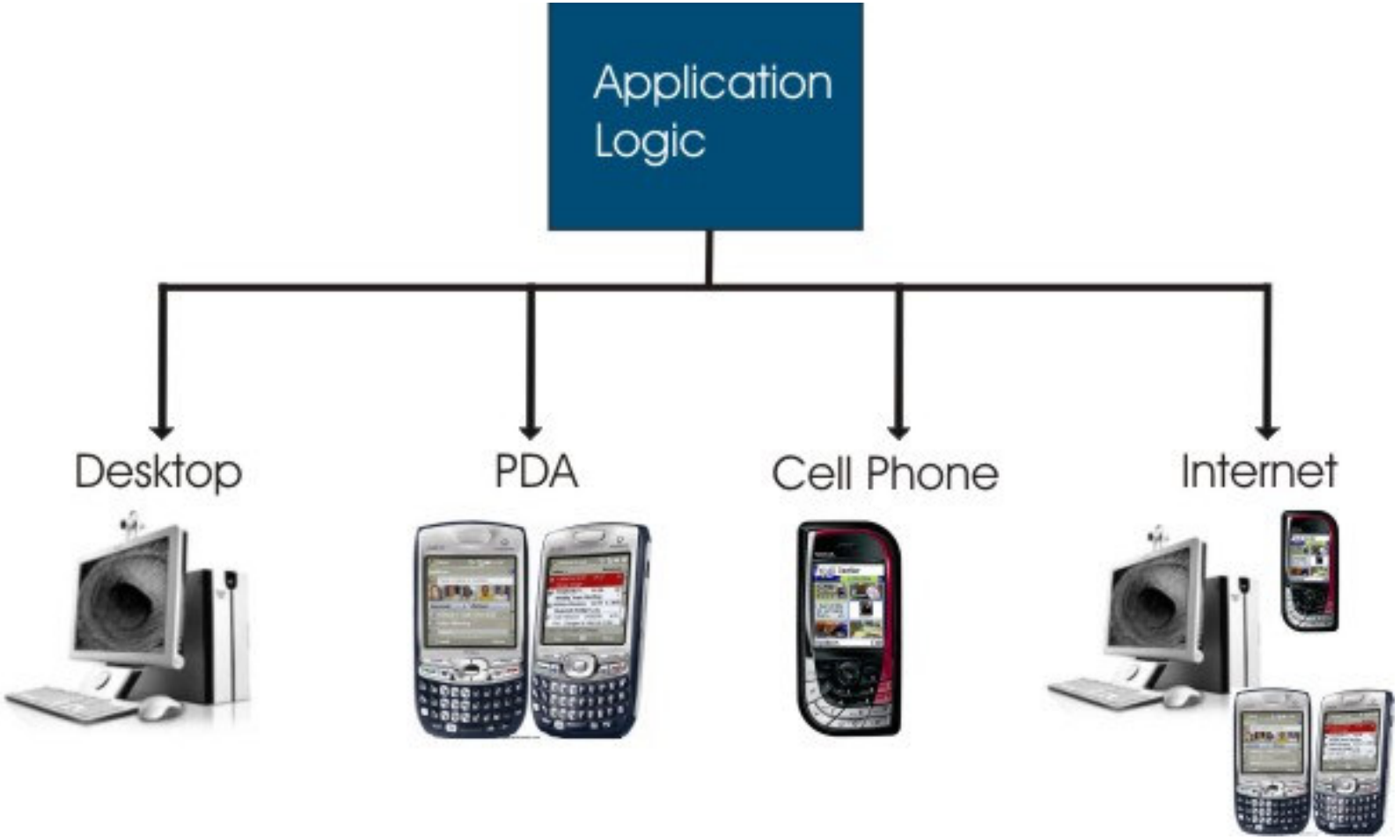
Outline

- Introduction
- UsiXML
- UsiXML4ALL
- Case Study
- Conclusion

Introduction
Multiplatform Software



Introduction
Multiplatform Software

- User wants to choose the platform on which he will execute his application
- Traditional software engineering techniques have not been sufficient
- Developing and mantaining an application for each use context is too expensive
- Fundamental challenge for interactive systems developers

Introduction
Plastic User Interfaces

- Have as goal the development of UI's capable of adapting themselves to different use contexts
- Techniques*
  - Single Authoring
  - Multiple Authoring
  - Flexible Authoring

**W3C note on authoring techniques for device independence*

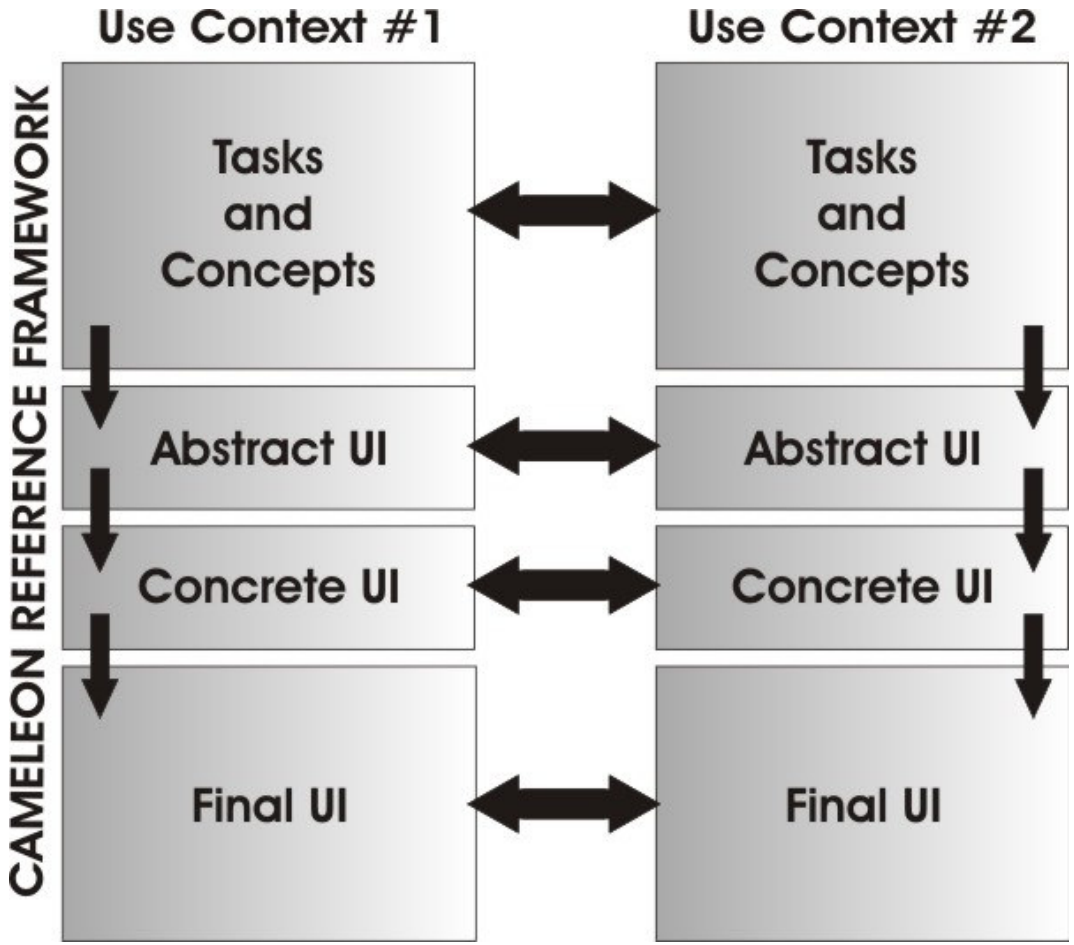
UsiXML

- User Interface eXtensible Markup Language
- XML based UIDL (User Interface Description Language)

- Goal
  - *"Capture the essential properties of interest that turn out to be vital for specifying, describing, designing, and developing UIs"* [Limbourg 2004].

UsiXML

- Based on the *Cameleon Reference Framework*



UsiXML

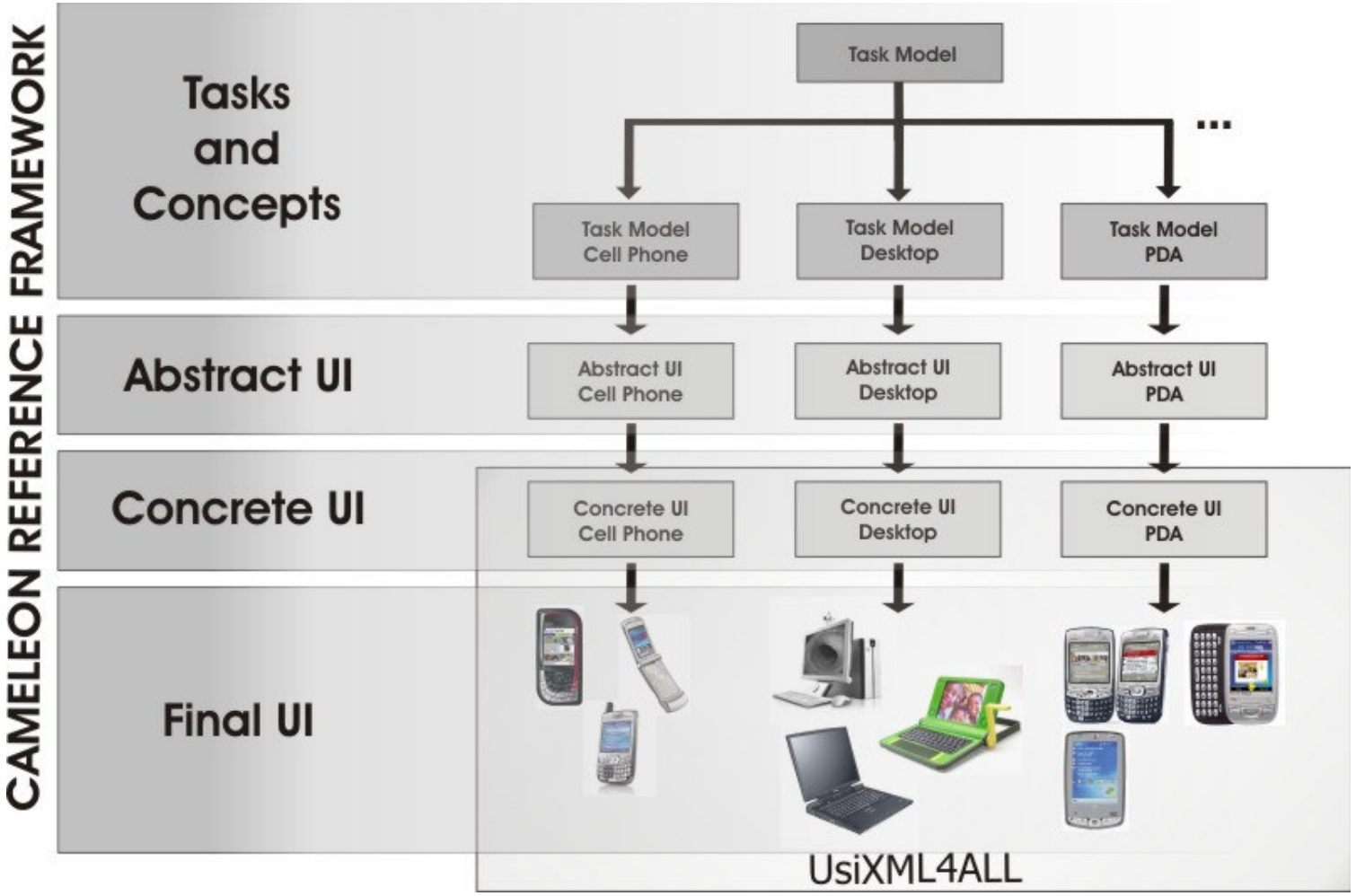
- *Concrete User Interface* Example

```
<window id="W1" name="Main Window">
        <box … type = "main" splittable=true detachable=false… >
                <box … type = "horizontal" >
                <textComponent id="TX1" name="Text1" offsetVertical="top"
                        offsetHorizontal="center" defaultContent="Hello World!"/>
                </box>
                <box type="horizontal">
                        <button id="B1" name="OkButton" defaultContent="OK" />
                </box>
        </box>
</window>
```

UsiXML4ALL

- Objectives
  - UsiXML CUIs rendering in multiple devices
  - Allow logic application connection to multiple programming languages

UsiXML4ALL


CAMELEON REFERENCE FRAMEWORK
Tasks and Concepts
Abstract UI
Concrete UI
Final UI
Task Model
...
Task Model Cell Phone
Task Model Desktop
Task Model PDA
Abstract UI Cell Phone
Abstract UI Desktop
Abstract UI PDA
Concrete UI Cell Phone
Concrete UI Desktop
Concrete UI PDA
UsiXML4ALL

UsiXML4ALL

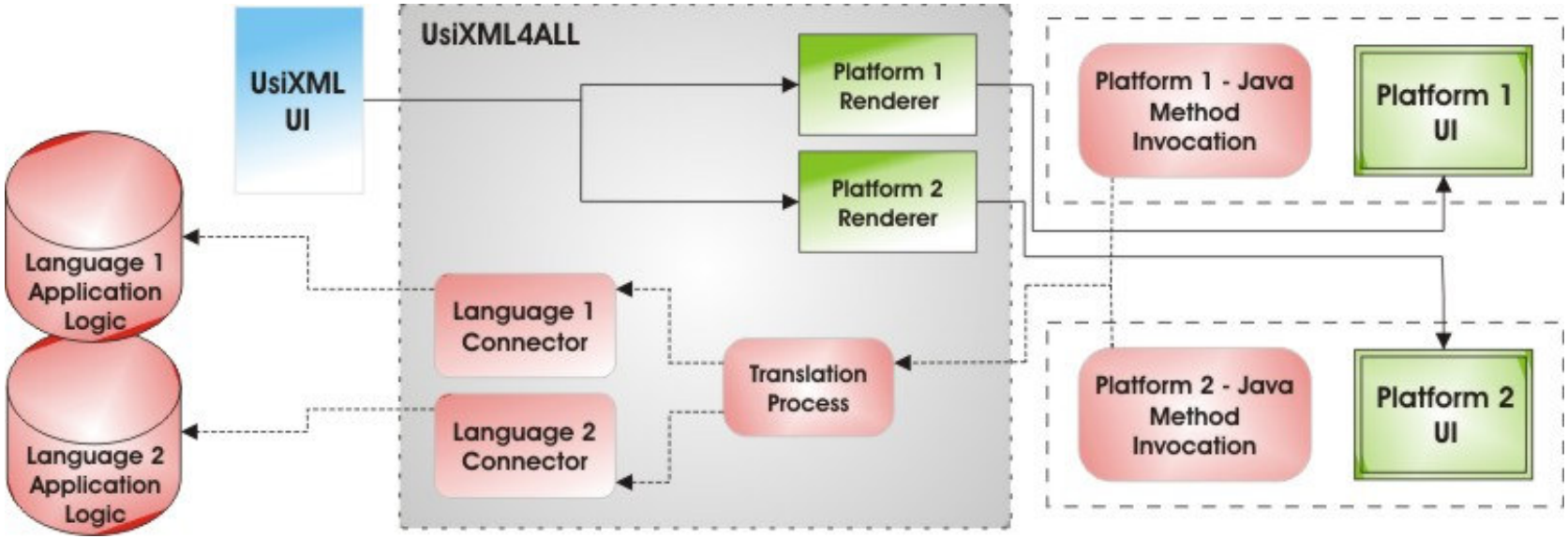
- Benefits
  - Helps the UI developer
    - Acts in the UI engineering process
  - The UI developer needs to know only UsiXML
  - Can be used with multiple programming languages

UsiXML4ALL

- Limitations
  - UsiXML4ALL is a rendering tool, and not a design tool
  - UsiXML4ALL does not detect or solve usability problems of the specified UI
  - This kind of problems should be solved in earlier phases of the UI mapping process

UsiXML4ALL

- Architecture Overview

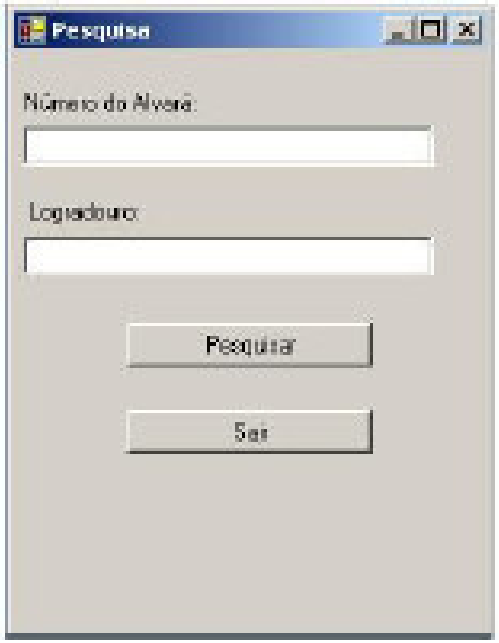


Case Study

- Eletronic Inspection Project
  - Developed in cooperation with PROCEMPA (The Data Processing Public Company of the City of Porto Alegre)
- Adaptation of an existing system to a multi-device environment
  - *Java Swing* (J2SE) - desktop
  - *Java Swing (*J2ME CDC) - mobile.

Case Study

- Two use cases:
  - *Search License and Enable License*
- Original Interfaces
  - Microsoft .Net

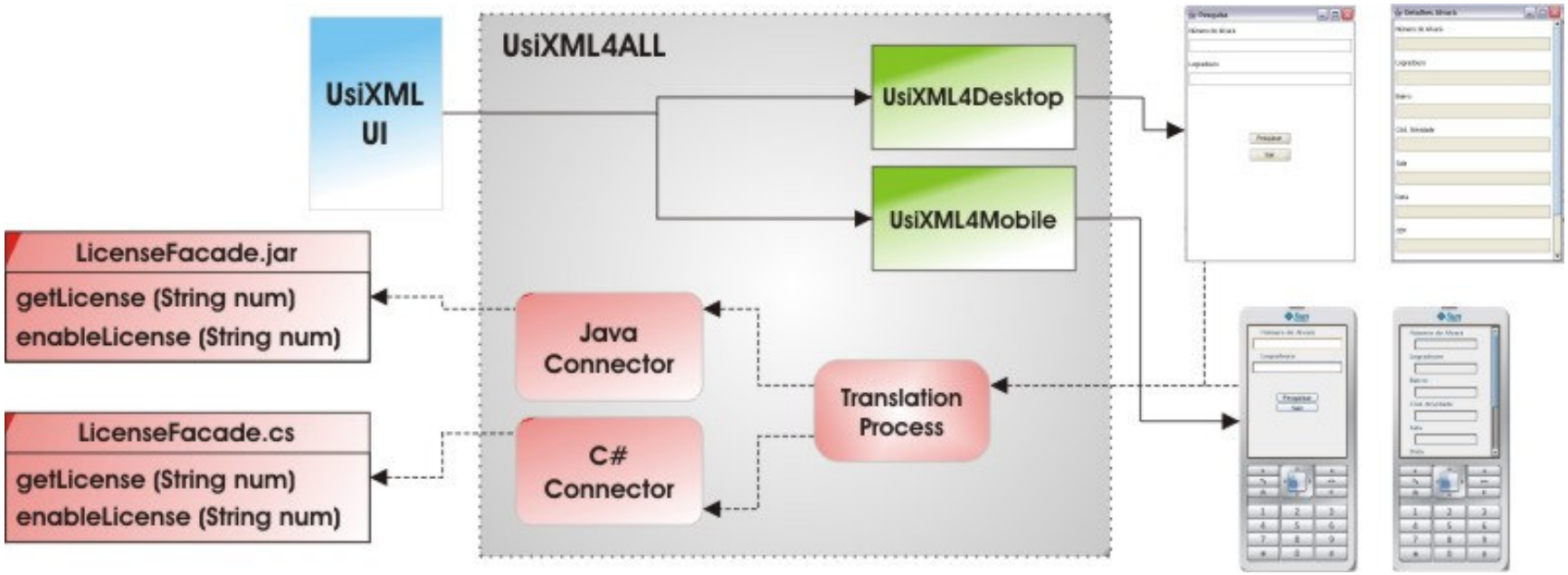


Case Study

- Process
  - The original UIs were specified in UsiXML
    - Not only the UI **components** description, but also the UI **behavior** and **content definition**
  - The original application logic source code could be used without any modification
    - C#
    - UsiXML4ALL programming language independence

Case Study

- Result



Conclusion

- Practical approach to the adaptation of existing applications to a multi-device environment
- UsiXML4ALL is both:
  - UI renderer in multiple platforms
  - UI connection to application logic developed in multiple programming languages

Conclusion

- Future work consists in the evolution of UsiXML4ALL
  - Creation of UI's to other devices and platforms
    - conventional or not
  - Multimodal UI's.

Thank you!

- Questions?
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