3G Mobile Context Sensitive Adaptability - User Friendly Mobile Work Place for Seamless Enterprise Applications

CONSENSUS

Project Rationale and Objectives

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SAP and SAP Corporate Research

❍ SAP:

  ❍ Worldwide leader in collaborative business solutions (ERP, CRM, SCM…)

❍ SAP Corporate Research:

  ❍ Research Lab of SAP.

  ❍ Labs in Germany, South-Africa, Australia, France, US…

  ❍ Topics of interest in Sophia Antipolis: Device Independent Application Engineering and Security.

Objective

Cost-efficient development of *usable device independent* Applications

Problem Statement

Today...

○ Conventional (HTML-) Web Browsers are the primary means of access to applications.

○ Application UI are optimized for them.

○ Adaptation to mobile device access costly and cumbersome.

○ A dissatisfying mobile UI turns people away from using applications via mobile devices.

○ Low number of users + costly adaptation = no business case.

Challenge is ...

... to bring (potentially) all applications to (potentially) all devices

- ❍ Today exist already ~50 different mobile devices with different device capabilities – voice comes on top of that
  - ❍ For a single application to be displayed on 50 devices 50 sets of application UI need to be created!
- ❍ Some enterprises are maintaining hundreds of applications – customer developments & customization comes on top of that
  - ❍ Example: For all SAP applications being able to be displayed on all devices 50.000 sets of application UIs need to be created!
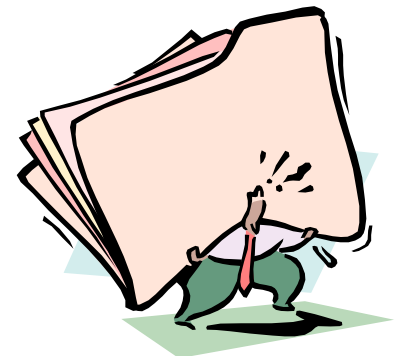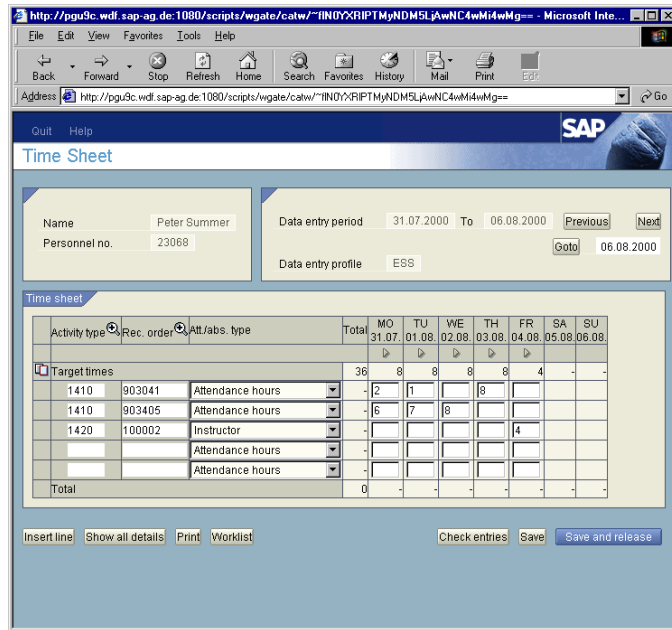
State of the Art: Adaptation - **Transcoding**

Usability: Declined!
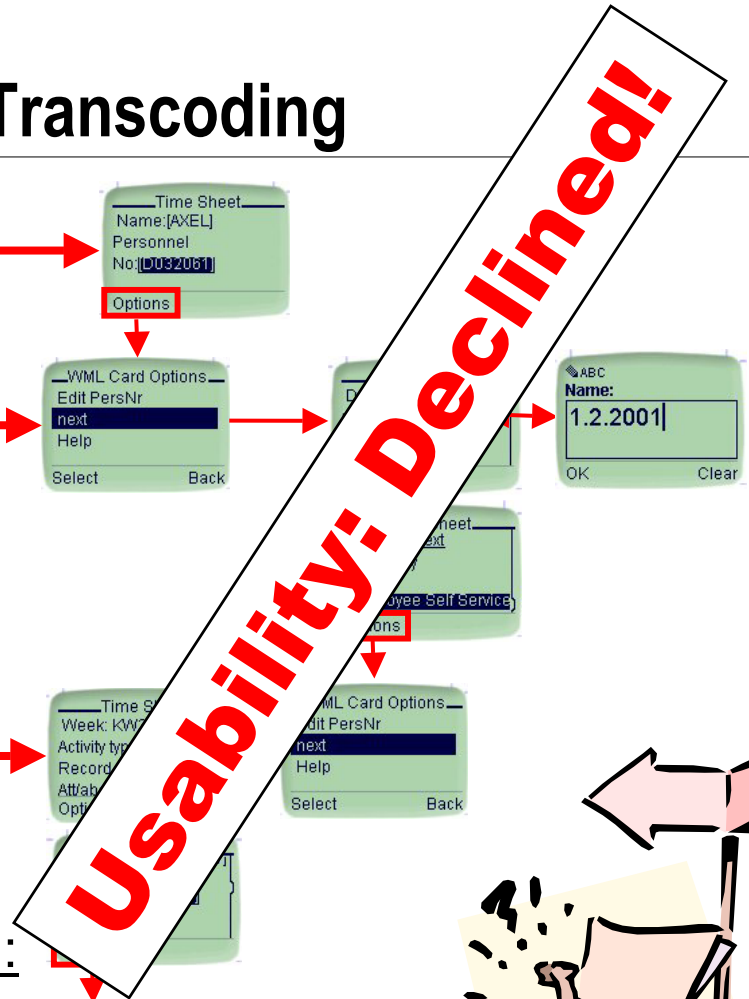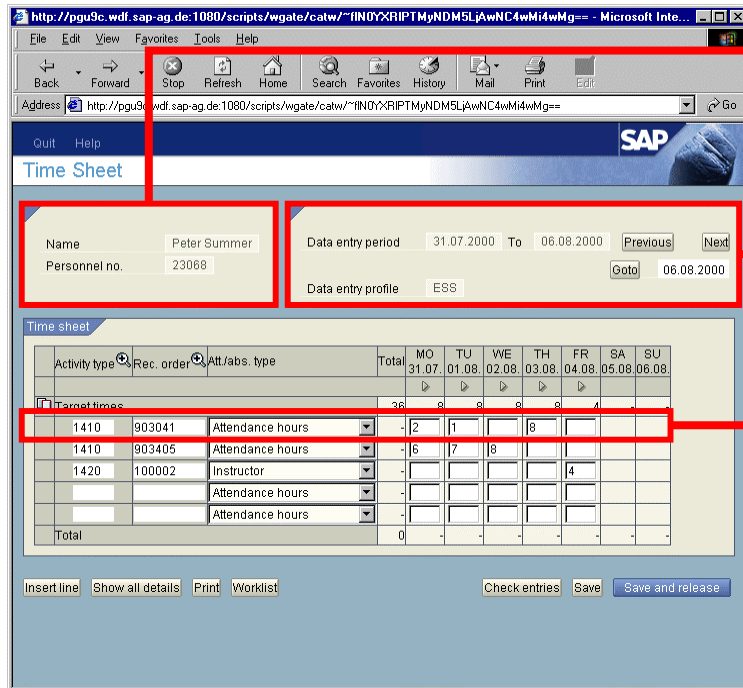
Application-independent adaptation:

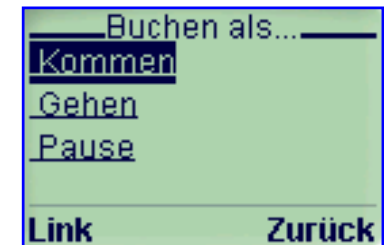- A multitude of screens
- 15 numbers have to be entered

State of the Art: Adaptation - **Recoding**

CATS BAPI
85 parameters

CATS @ PC
36 IO parameters

CATS @ Palm
7 IO parameters

CATS @ WAP
3 Buttons

State of the Art: Dilemma - Cost vs. Usability

Integrated adaptation

Recoding
- semantic adaptation
- **device & application** specific

Usability

Transcoding
- syntactic adaptation
- **technology** specific

Integrated Adaptation
- **semantic information**
- **context information**

Cost
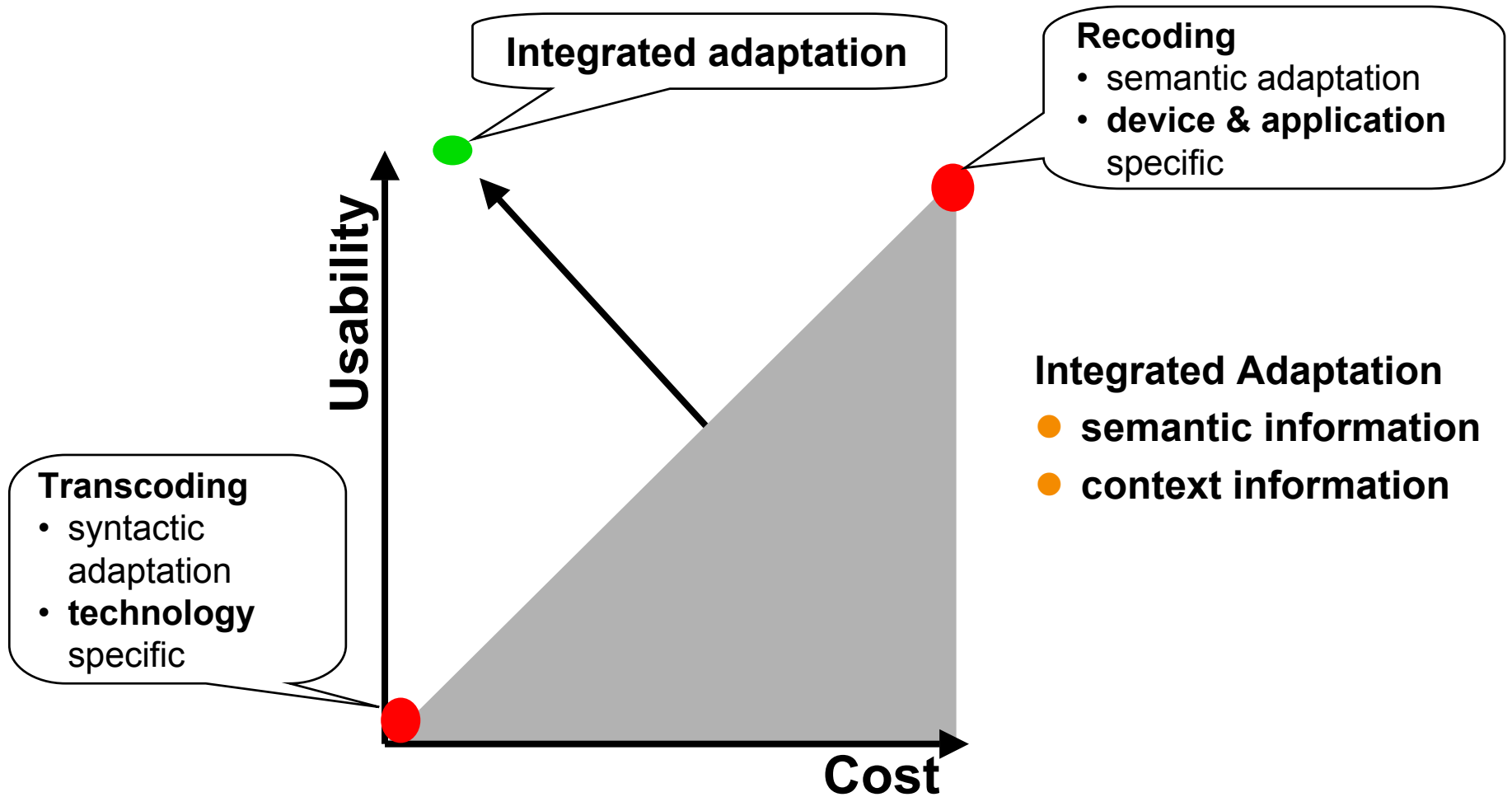
Visible Parts of the project

○ Markup Language

  ○ Based on existing standards

○ Adaptation Technologies

  ○ Based on context information

  ○ Semantics

  ○ Syntax

○ Authoring Tools

  ○ Open source ... Eclipse integrated

○ Usability Guidelines

  ○ Application developers

  ○ Adaptation engine developers

Renderer Independent Markup Language: RIML

Tools:
Context-sensitive
Annotation Editor

Semantic Information:
Relevance, splitting hints,
context conditions,...

Augment applications with metadata for adaptation engines to prepare presentation *context-* and device-*specific*

Context: User
Prefs, bandwith,..

Device Classes:
UI/Technical aspects

Klaus-Dieter Platte / Platte.Consult

Renderer Independent Markup Language: RIML (contn'd)

○ UI-Info to be expressed with application data

○ In order to define RIML, we needed:

  ○ Language Research

    ● Existing MLs

    ● Requirements

    ● Extensions

○ Usability Research based on

  ○ Focus on mobile devices

  ○ How easy / hard is it to use specific UI Components on different devices (not usability on application / process level)

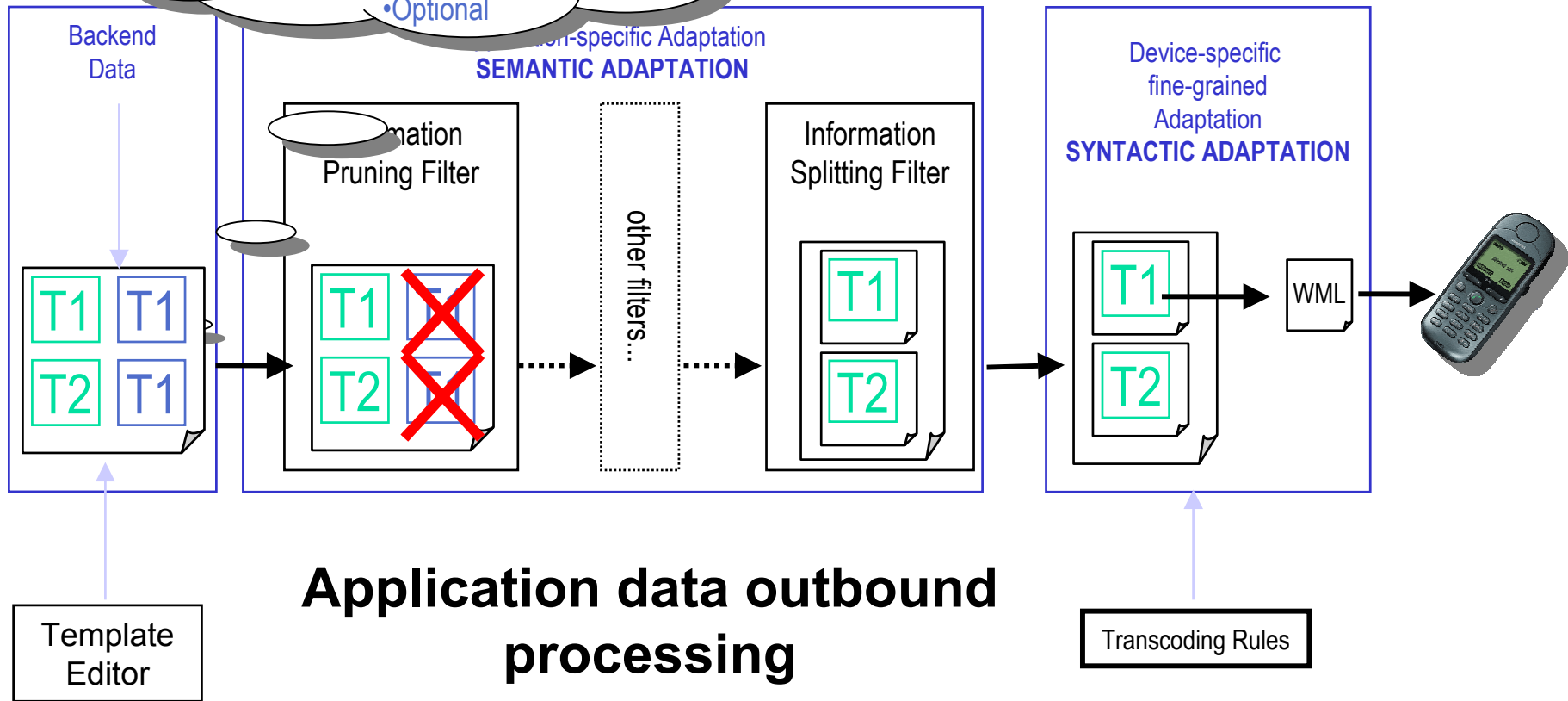 ○ Definition of device classes

Concept: Device Clustering
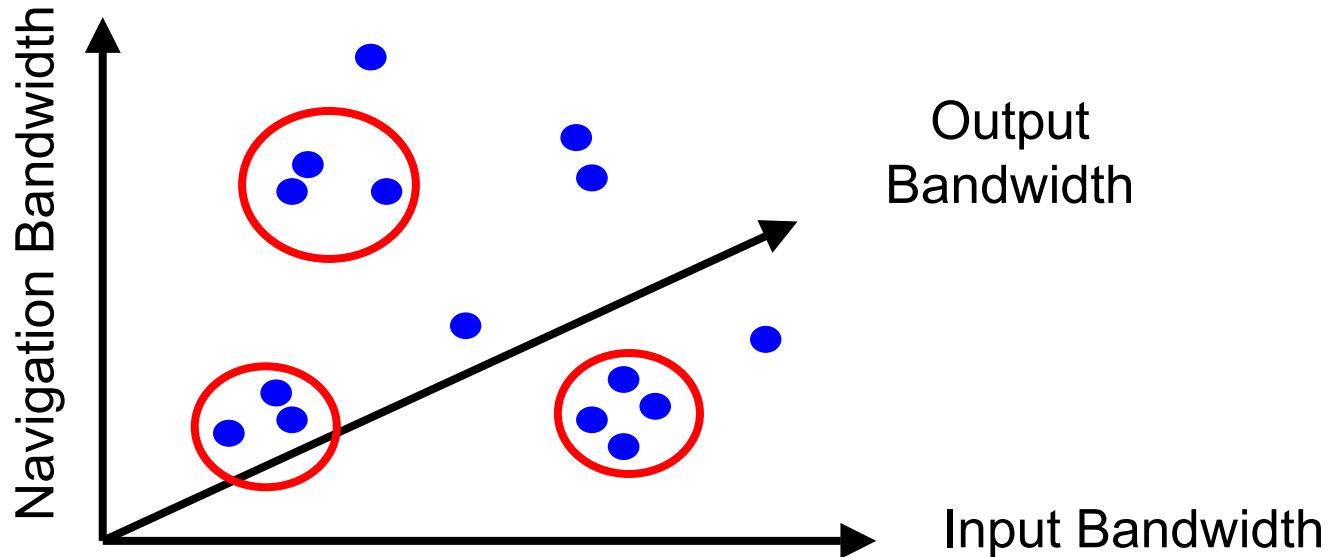
Usability Analysis leads to a *limited number of Device*

Classes which represent devices *behaving similar*

from a users / usability perspective

Adaptation Concept

- T1/T2 = UI info Templates
- Colors indicate importance
  - Mandatory
  - Optional

Backend
Data

...tion-specific Adaptation
SEMANTIC ADAPTATION

Device-specific
fine-grained
Adaptation
SYNTACTIC ADAPTATION

...mation
Pruning Filter

other filters...

Information
Splitting Filter

| T1 | T1 |
| T2 | T1 |

| T1 | ✗ |
| T2 | ✗ |

| T1 |
| T2 |

| T1 |
| T2 |

WML

Application data outbound processing

Template
Editor

Transcoding Rules

Expected Benefits

○ Advantages for Application Programmers
  ○ Abstraction from devices
    ● No need to learn dedicated languages
    ● No need to deal with devices
  ○ Easy integration
○ Advantages for Users
  ○ Better usability
    ● compared to pure syntactic methods
  ○ Free choice of devices
○ Advantages for Portal Operators
  ○ Instant support of new devices
    ● Only adding a new syntactic render is needed
  ○ XML based Open Standard supports development and integration of Web Applications into mobile Portals

Consensus Outcome

❍ Usability know how

- ❍ Usability of UI Components on different devices
  (not usability on application / process level)
- ❍ Definition of device classes

❍ Software Methods for efficient mobile application development technology

- ❍ Renderer Independent Programming for device classes
- ❍ Application level hints for automated semantic adaptation
- ❍ Compile & runtime tools for syntactic & semantic adaptation

❍ Standardization

- ❍ Open Standard for specifying Web applications in a device-independent way.
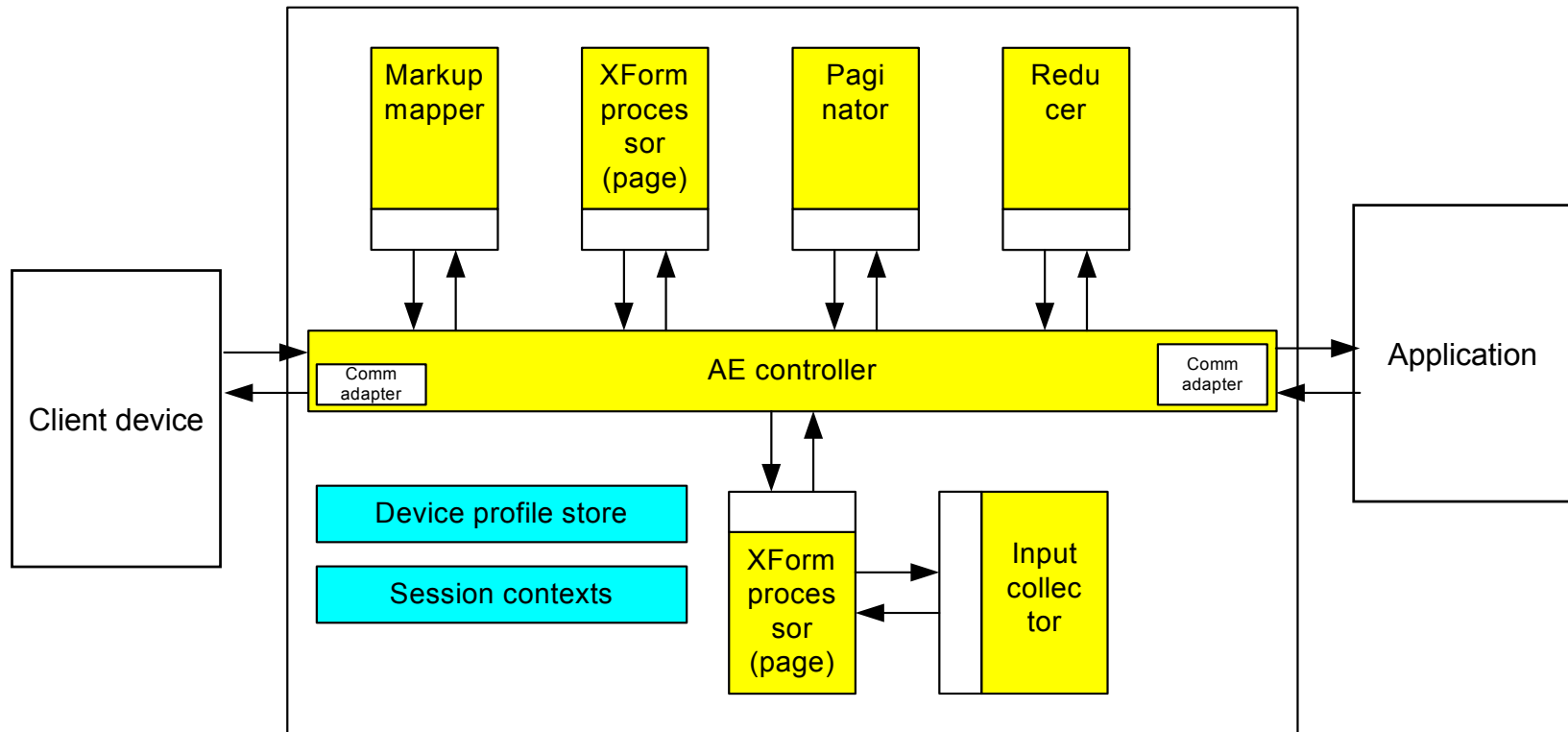
Current status of Consensus (1/2)

❍ RIML language specified:

    ❍ Combination of XHTML, XForms, SMIL plus some specific tags

❍ Implementation phase started in April

    ❍ RIML aware Application server

    ❍ Test applications

    ❍ Set of tools

    ❍ Adaptation engine

Current status of Consensus (2/2)

○ Adaptation architecture defined:

The End

❍ Thank you

❍ Further info:

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