A Framework for Context-Aware Adaptable Web Services

Markus Keidl and Alfons Kemper

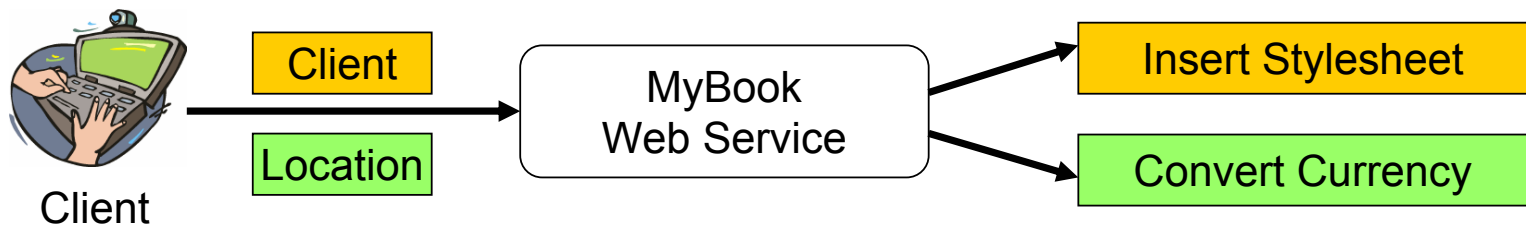**Universität Passau**
Fakultät für Mathematik und Informatik
94030 Passau
`<lastname>@db.fmi.uni-passau.de`

The Context Framework

- Context: Information about clients and their environment that is used by Web services to provide clients with a customized and personalized behavior
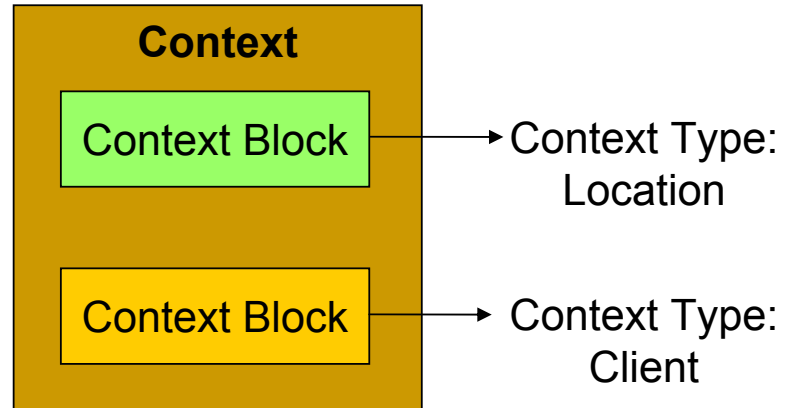- Examples: client location or device type
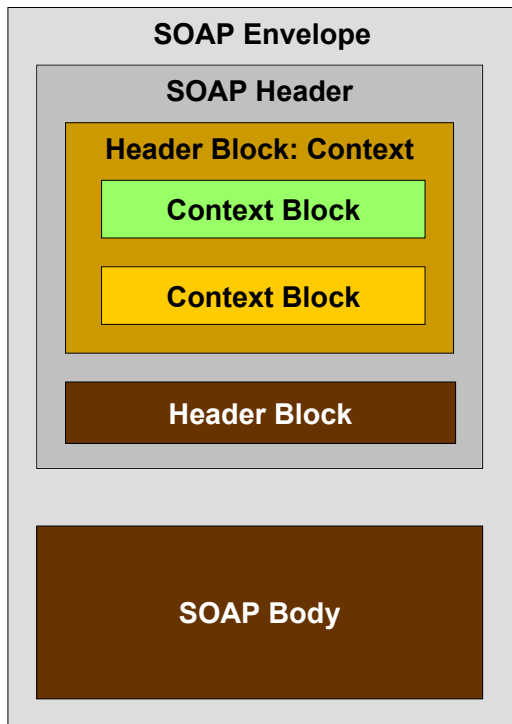
Features of the Context Framework

- Separation of functional duties into external components: *context plugins and context services*

- Transparent and automatic usage of these components

- Generic solution, i.e., components are usable for a variety of Web services

The Context Model

- Context consists of several context blocks
- A context block is associated to one context type
- A context type defines the type of context information in a context block, e.g., location, client device
- At most one context block is allowed for a context type within a context
- Context is transmitted as a SOAP header block

Context

Context Block → Context Type: Location

Context Block → Context Type: Client

Context in a SOAP Message


```
<env:Envelope xmlns:env="...">
  <env:Header>
    <Context
       xmlns="http://sg.fmi.uni-passau.de/context">
      <Client>
        <Hardware>
          <Defaults>
             http://example.com/PDA
          </Defaults>
          <ScreenSize>320x320</ScreenSize>
          <IsColorCapable>Yes</IsColorCapable>
        </Hardware>
      </Client>
    </Context>
  </env:Header>
  <env:Body>
    <!-- serialized object data -->
  </env:Body>
</env:Envelope>
```
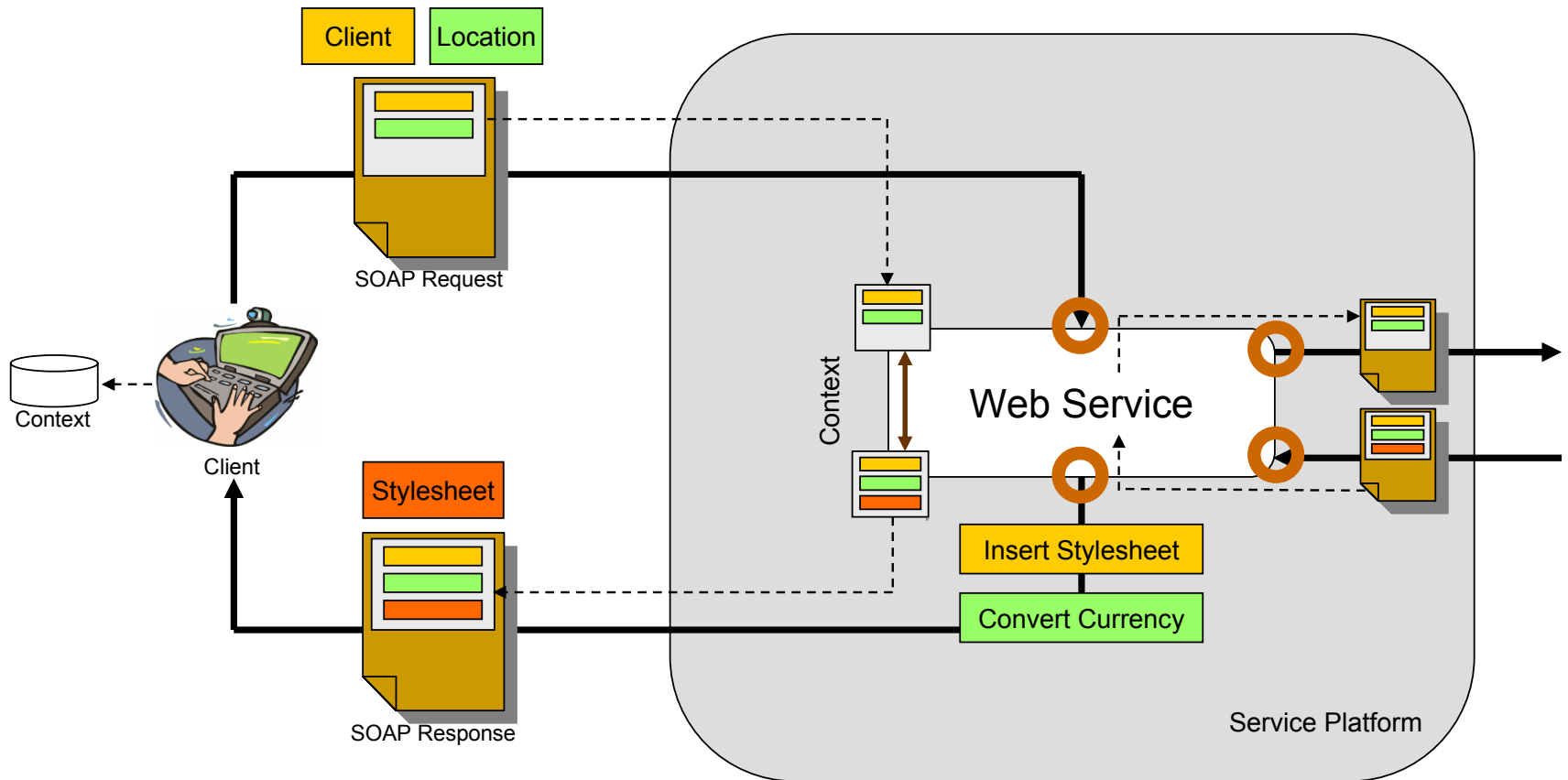
SOAP Envelope

SOAP Header

Header Block: Context

Context Block

Context Block

Header Block

SOAP Body

Context Life-Cycle
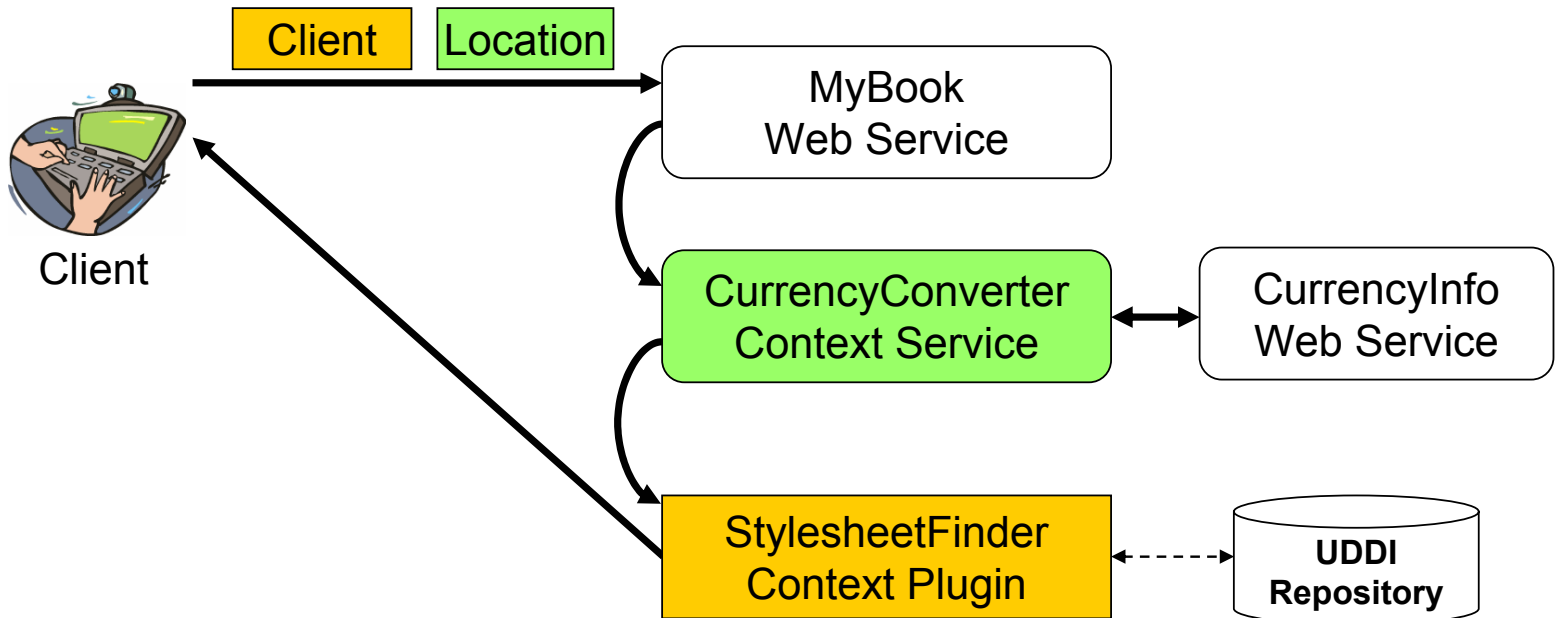
Automatic Context Processing

- Processing of context blocks within a SOAP message in arbitrary order
- Invocation of appropriate context plugins and context services
- Context plugins and context services:
  - Associated to one dedicated context type
  - Input: context block and message
  - Output: possibly modified message

Components for Context Processing

- Context plugins: Java objects implementing the `ContextPlugin` interface
  - Installation on local host
  - Access to internal data structures of service platform
- Context services: Web services implementing the `ContextService` WSDL interface
  - Available anywhere on the Internet
  - Extendible at runtime
  - Only access to context and Web service messages

Example Scenario

Thank you for your attention!