

XML Rule Engine



Ing. Pablo Pazos Gutiérrez

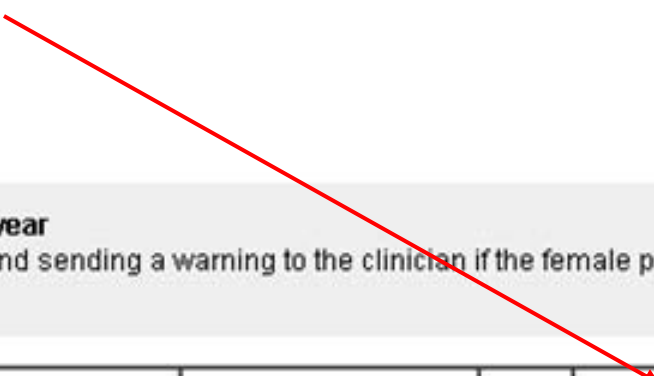
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XRE Requirements

- Requirement:
 - Women should have a PAP test once a year.
- Rule:
 - If last PAP test of a patient was done more than a year ago, then send an alert

Rule: every woman should should have a Papanicolaou Test once a year

This demo test that rule, marking male patients as "not applicable", and sending a warning to the clinician if the female patient last PAP test was made more than a year ago.

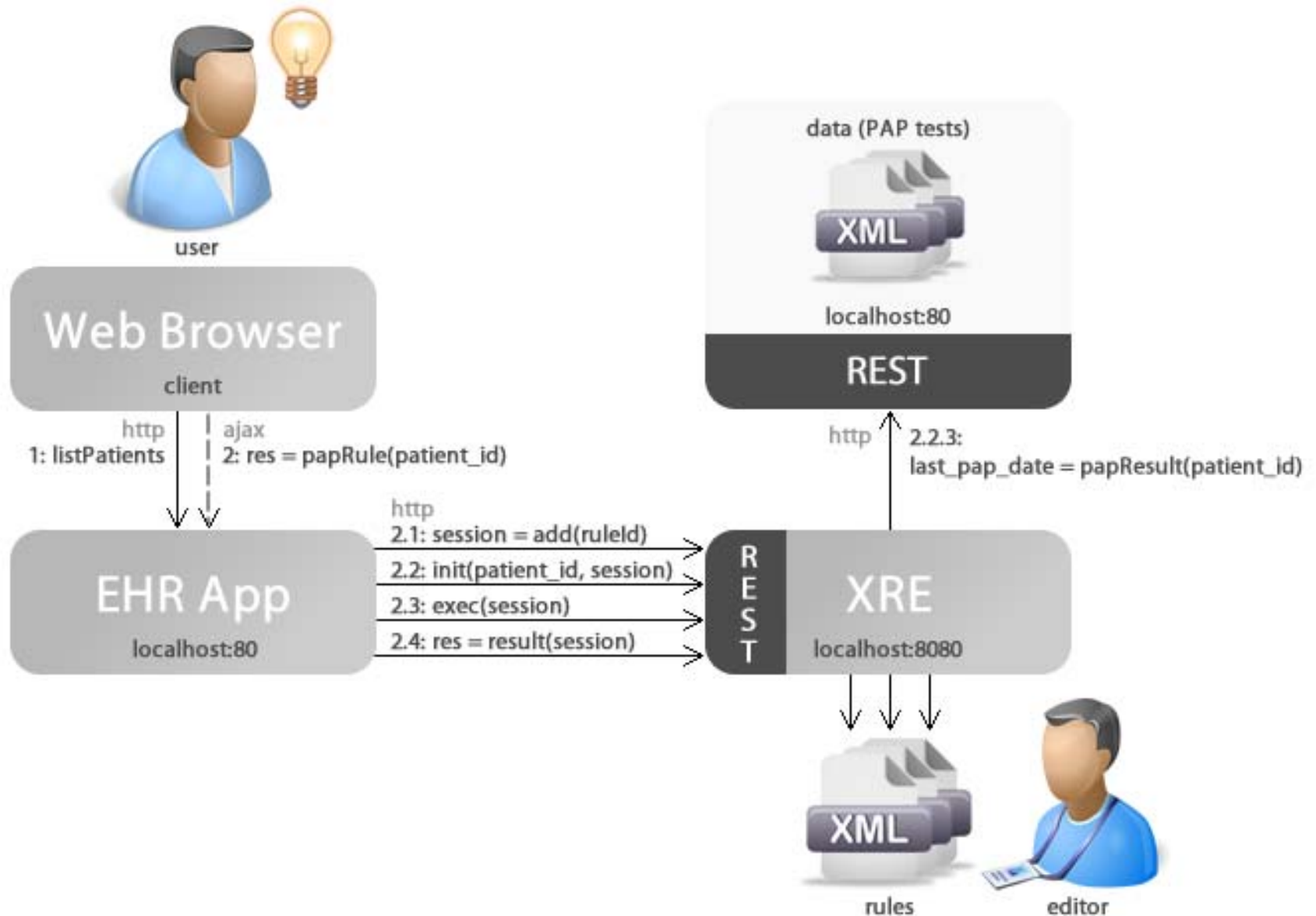


id	primer nombre	segundo nombre	primer apellido	segundo apellido	fecha de nacimiento	sexo	alertas
abc123	Pablo	Federico	Pazos	Gutierrez	19811024	M	Not applicable
abc234	Carla	Cristina	Lopez	Santos	19690325	F	Last PAP 2.8 months ago
abc345	Ana	Camila	Rodriguez	Zas	19930621	F	Last PAP 10.6 years ago

XRE Features

- Simple & Effective:
 - Complexity is hidden from the user
- Scalable & Extendible:
 - New rules, new actions, new variable resolutions
- Consistency & Reuse:
 - Many systems using the same rules, the same way
- Distributed:
 - Access data from many systems via HTTP
- REST API:
 - JSON & XML output
- Complete lifecycle logs:
 - Something wrong? Each step & state change is logged

XRE Interactions & Architecture



XRE Interactions

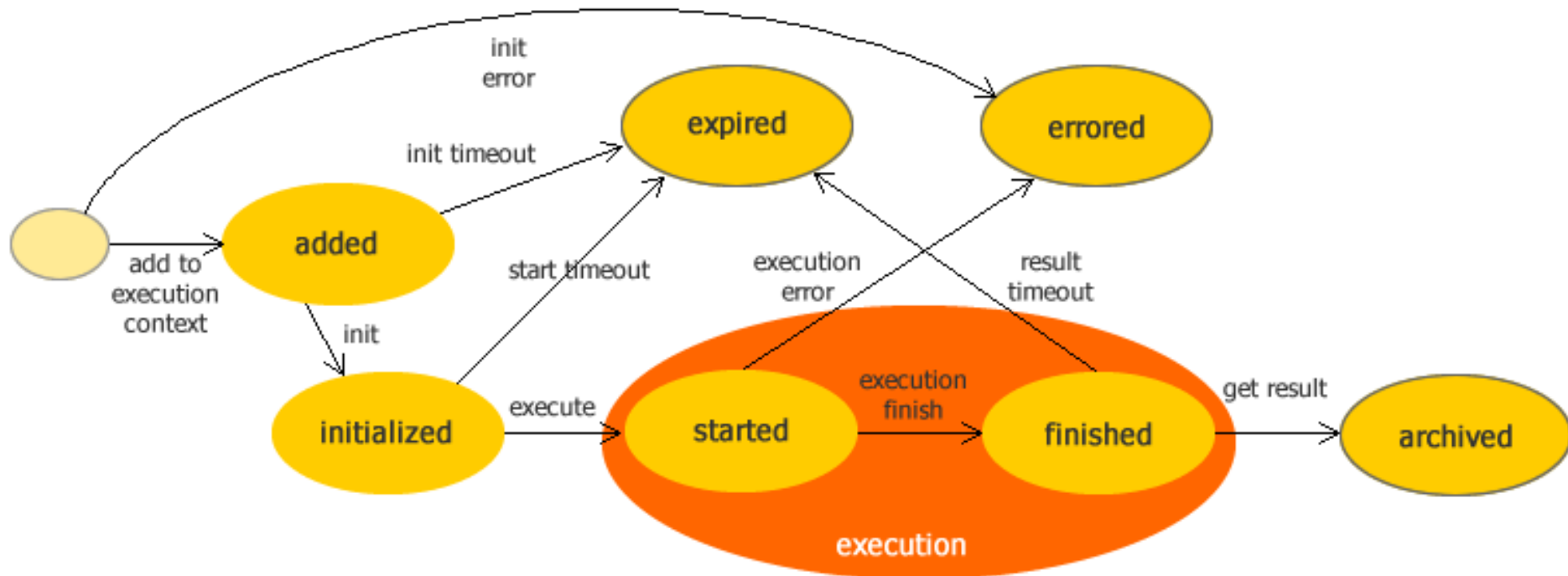
- `session = add(ruleId)`
 - clone rule & add to executer
 - state = ADDED
 - synchronous (send & wait)
- `init(params, session)`
 - `params = [patient_id: abc234]`
 - input params are used for http resolution
 - variable resolution (http, action, constant)
 - state = INITIALIZED
 - asynchronous (send & forget)

XRE Interactions

- `exec(params, session)`
 - receive input values
 - evaluate rule logic
 - state = **STARTED** → **FINISHED**
 - asynchronous (send & forget)
- `res = result(session)`
 - get execution result
 - state = **ARCHIVED**
 - synchronous (send & wait)

XRE States

- Rules are defined and loaded into the engine
- Then can be added to the execution context



XRE Rule logic

```
<if>
  <gt in1="days_from_last_pap" inc2="365" />
  <do>
    <action type="print" in1="last_pap_test_date"></action>
    <action type="print" in1="days_from_last_pap"></action>
    <action type="assign" var="code" value="ret_warning" />
    <return name="last_pap_test_date" />
    <return name="days_from_last_pap" />
    <return name="code" />
  </do>
</if>
<else>
  <do>
    <action type="assign" var="code" value="ret_ok" />
    <return name="last_pap_test_date" />
    <return name="days_from_last_pap" />
    <return name="code" />
  </do>
</else>
```


XRE TODOs

- More actions
 - Calculations over values (-, *, /, ...)
 - Collection mgt. (lists, sets)
 - Transformation operations (toLowerCase, ...)
- More rules
 - Complete test cases with real life rules
 - Suggestions are welcome!
- SOAP API
- Rule Editor (WYSIWYG)
- Standalone WAR/JAR
 - For easy deployment and integration

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