

Details of Digital NOTAM System

By: Alex Yoon
Aeronautical Information Management

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**Federal Aviation
Administration**



Details of the Digital NOTAM System

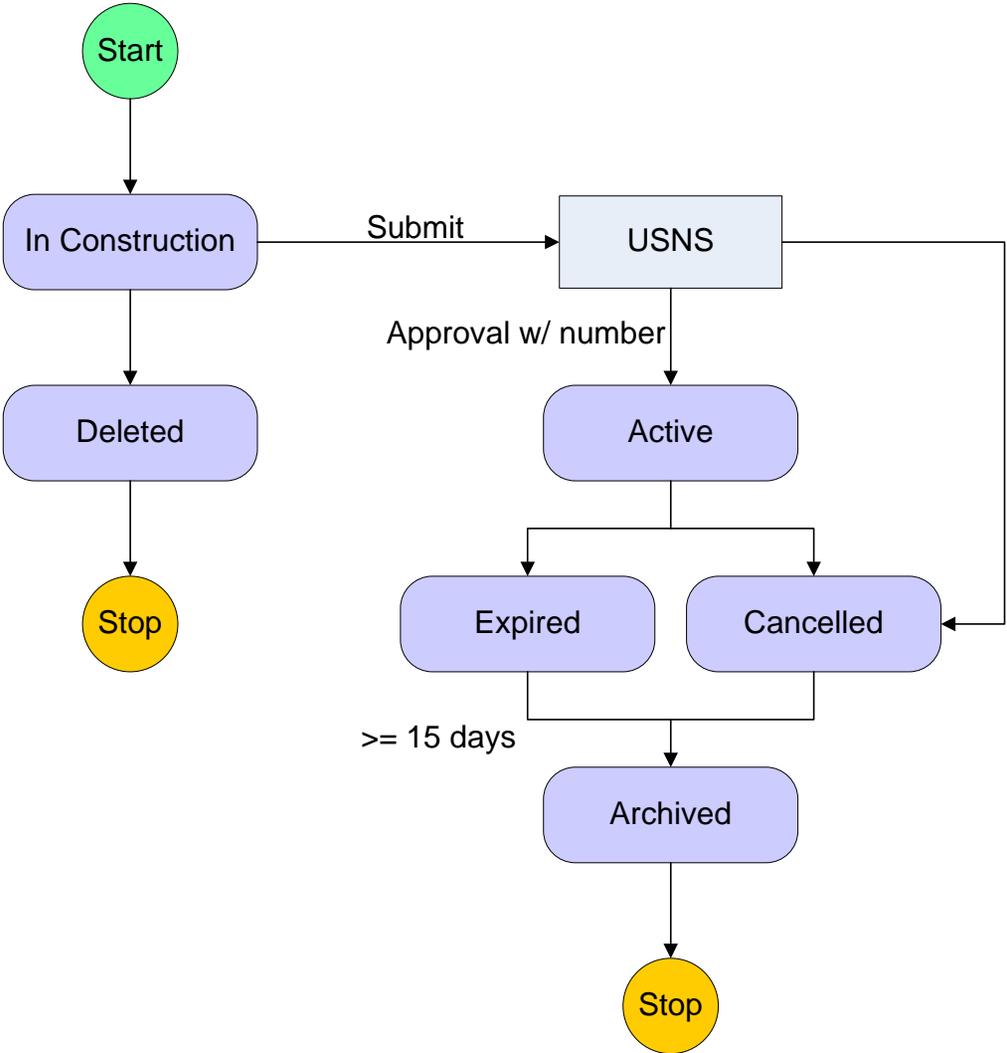
- **Scope of Initial Effort**
- **Application Workflow**
- **Technical Details of Key Components**
- **System Interface – Web Services**
- **User Interface – UI Demonstration**



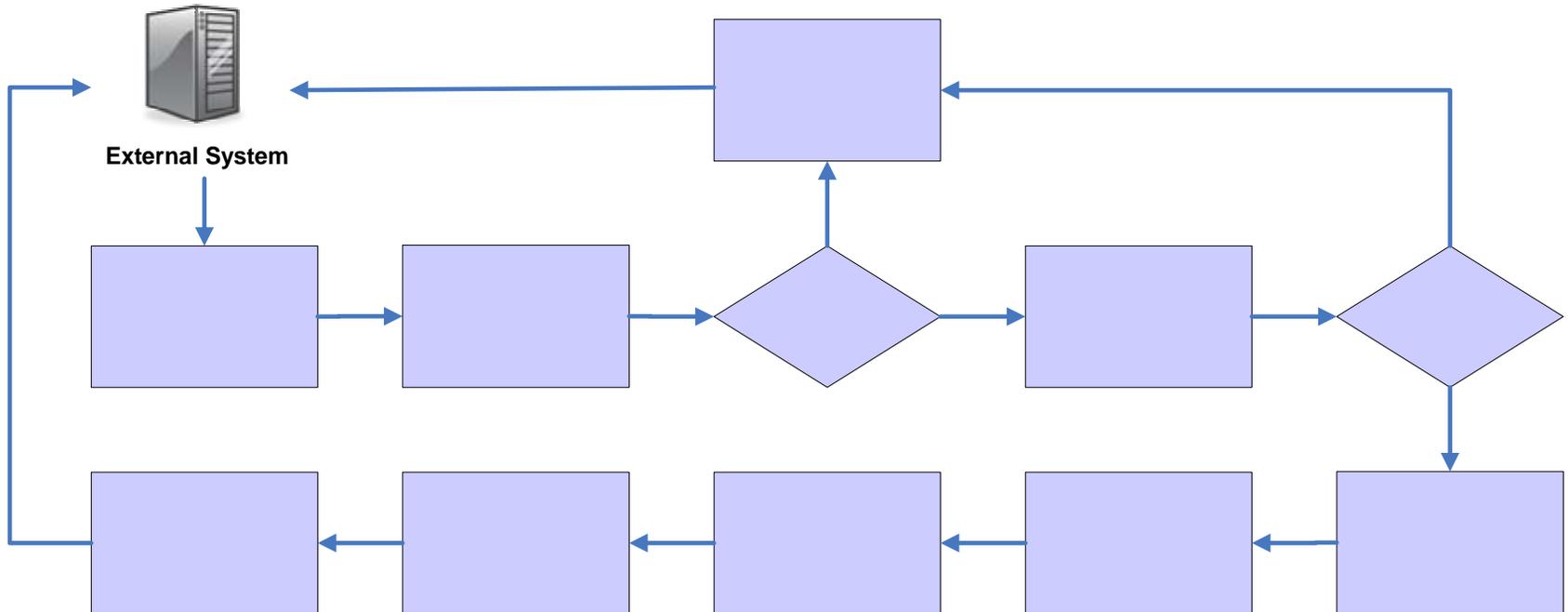
Scope of Initial Effort

- **Runway related NOTAMs only**
- **Scenarios considered**
 - Runway Closures
 - Partial Closure of Runways (example: West 600 ft closed)
 - Threshold Displacement
 - Changing Declared Distances (TODA, TORA, ASDA, LDA)
- **How did we come up with these scenarios?**
 - Runway related NOTAMs cover about 25% of All US Civilian NOTAMs
 - These four scenarios cover about 50% of Runway NOTAMs
 - Based on analyses of data from USNS
 - Validating it using EUROCONTROL Gap Analyses

NOTAM Process Flow States



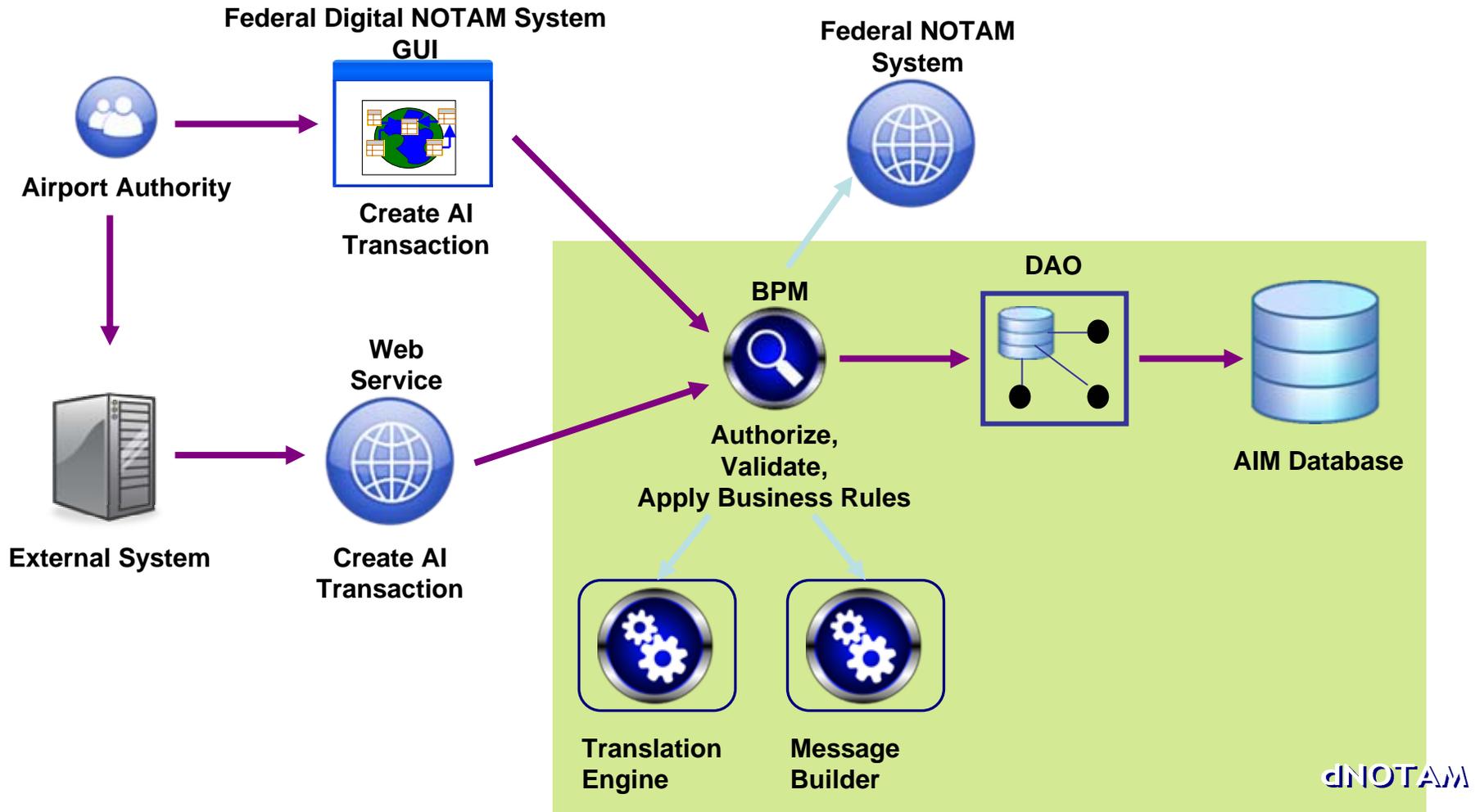
Digital NOTAM Proposed Workflow – Creation (System Interface)



Technical Details of Key Components

- **Application Components**
 - Business Process Manager (BPM)
 - Translation Engine
 - Message Builder
 - Database/Data Model

High-level Component Diagram



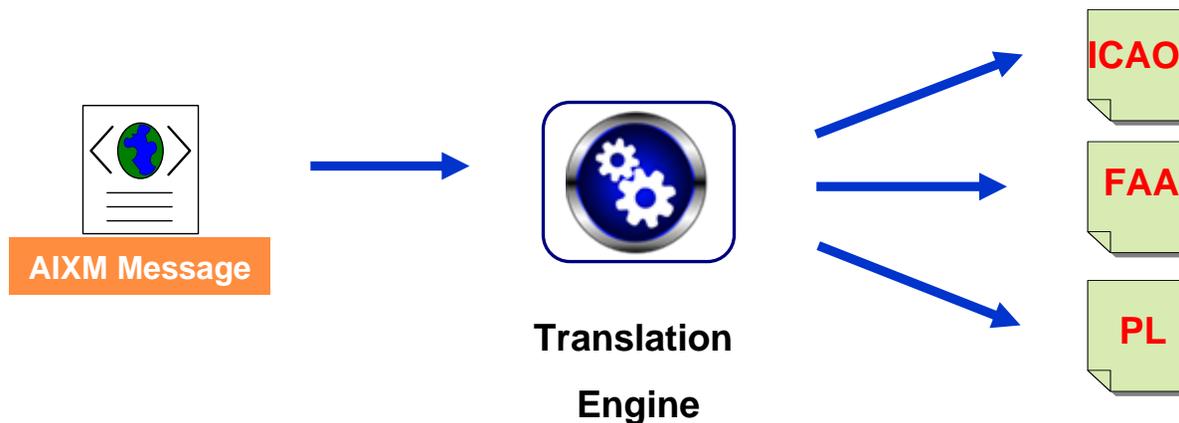
Business Process Manager (BPM)

- **Functions**
 - Authentication / Authorization
 - Validation
 - Application of business rules
 - Manage process flows

Translation Engine

- **Independent pluggable component**

- Takes AIXM message DOM object/XML message as input
- Java based component
- Produces three message formats
 - ICAO
 - FAA (Traditional)
 - Plain Language



Translation Engine Outputs

FAA (Traditional)

MEM 08/004 MEM 17R/35L CLSD EXC PPR 15 MIN FOR MILITARY ACFT CALL 703-999-9999 WEF 0708200001-0708212359

ICAO

A1234/07 NOTAMN

Q) KZME/QMRAP/IV/NBO/A/000/030/3503N08959W005

A) KMEM

B) 0808200001

C) 0808212359

E) RWY 17R/35L CLSD EXC PPR 15 MIN FOR MILITARY ACFT CALL 703-999-9999

Plain Language

NOTAM Number: 08/004

Affected Airport: Memphis Intl

Affected Feature: Runway: 17R/35L

Operational Status: CLOSED

Effective Time Frame:

Beginning: 20 August 2007 00:01 (UTC)

Ending: 21 August 2007 23:59 (UTC)

Exception: Open with 15 minutes prior permission for Military Aircraft, Contact 703-999-9999

Message Builder

- **Component for reading and writing AIXM XML documents**
- **Methodology: XML binding**
 - Avoid brute-force coding
 - Adapt to changing schema definition
 - Handle complexity
- **Two interfaces**
 - USNS message for submission
 - NOTAM message (NOTAM metadata + AIXM Feature)



AIXM 5 Message – From Message Builder

```
<?xml version="1.0" encoding="UTF-8"?>
<aixm:FeatureMembers xmlns:aixm="http://www.aixm.aero/schema/5.0"
  xmlns:asXML="http://www.isotc211.org/asXML" xmlns:gml="http://www.opengis.net/gml"
  xmlns:gmX="http://www.isotc211.org/smXML" xmlns:scXML="http://www.isotc211.org/scXML"
  xmlns:ssXML="http://www.isotc211.org/ssXML" xmlns:stXML="http://www.isotc211.org/stXML"
  xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <aixm:Runway>
    <aixm:identifier>RWY0</aixm:identifier>
    <aixm:timeSlice>
      <aixm:RunwayTimeSlice>
        <gml:validTime>
          <gml:TimePeriod>
            <gml:beginPosition>07012007</gml:beginPosition>
            <gml:endPosition>07102007</gml:endPosition>
          </gml:TimePeriod>
        </gml:validTime>
        <aixm:designator>18L/36R</aixm:designator>
        <aixm:status>INACTIVE</aixm:status>
        <aixm:situatedAt_AirportHeliport xlink:href="aixm:AirportHeliport[identifier='Airport0']"/>
      </aixm:RunwayTimeSlice>
    </aixm:timeSlice>
  </aixm:Runway>
  <aixm:AirportHeliport>
    <aixm:identifier>Airport0</aixm:identifier>
    <aixm:timeSlice>
      <aixm:AirportHeliportTimeSlice>
        <aixm:designator>MEM</aixm:designator>
      </aixm:AirportHeliportTimeSlice>
    </aixm:timeSlice>
  </aixm:AirportHeliport>
</aixm:FeatureMembers>
```

System Interface - Web Services

- **USNS web services (Internal)**
 - Activate
 - Cancel
 - Query
- **Digital NOTAM web services (External)**
 - NOTAM create (submit, accept) service
 - Input: Temporary change data in AIXM
 - Output: NOTAM metadata, feature data and translated output
 - NOTAM (preview, review) validation service
 - Input: Temporary change data in AIXM
 - Output: NOTAM metadata, feature data and translated output or validation error message
 - NOTAM query services
 - List of active NOTAMs for current time
 - Input: Location
 - Output: Location and NOTAM number(s)
 - NOTAM Details
 - Input: Location, NOTAM number
 - Output: NOTAM metadata, Feature data and Transformed output

User Interface

- **Thin client web application**
 - Access application using a web browser
 - Use of dropdowns, radio buttons and eliminate free form text
 - Pre-populate information where possible
- **Built using Portal technology**
 - Portal manages a set of portlets which are pluggable UI components (JSR-168 compliant)
 - Allows easy customization by different users
- **Demonstration**

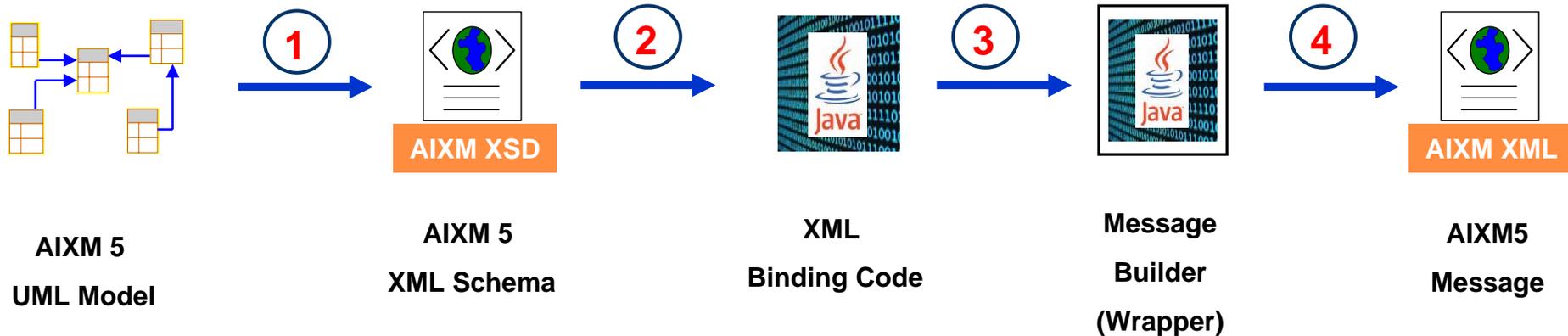
Questions & Discussion



Backup Slides



Message Builder Approach



- 1** XML Schema generated from UML Model
- 2** XML binding code generated (no MANUAL CODING)
- 3** Custom code to simplify access and use
- 4** Read and Write AIXM XML documents

Table112

Table11
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