



Update on PIANO

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Why?

- Data Overload
- SIG Feedback
- **SEA** Change
 - Simple
 - Enterprise Aware
 - Highly Available

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Service Oriented, not just Products

RtPM Platform Core Services



Each Service is a Unique Platform Service

- Time Series
- Data Directory
- Smart Connectors
- Data Access
- Update
- Analytics
- Notification
- Scheduler
- Material & Products
- Event Frame
- Context
- ...

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PIANO Delivers

RtPM Platform Core Services



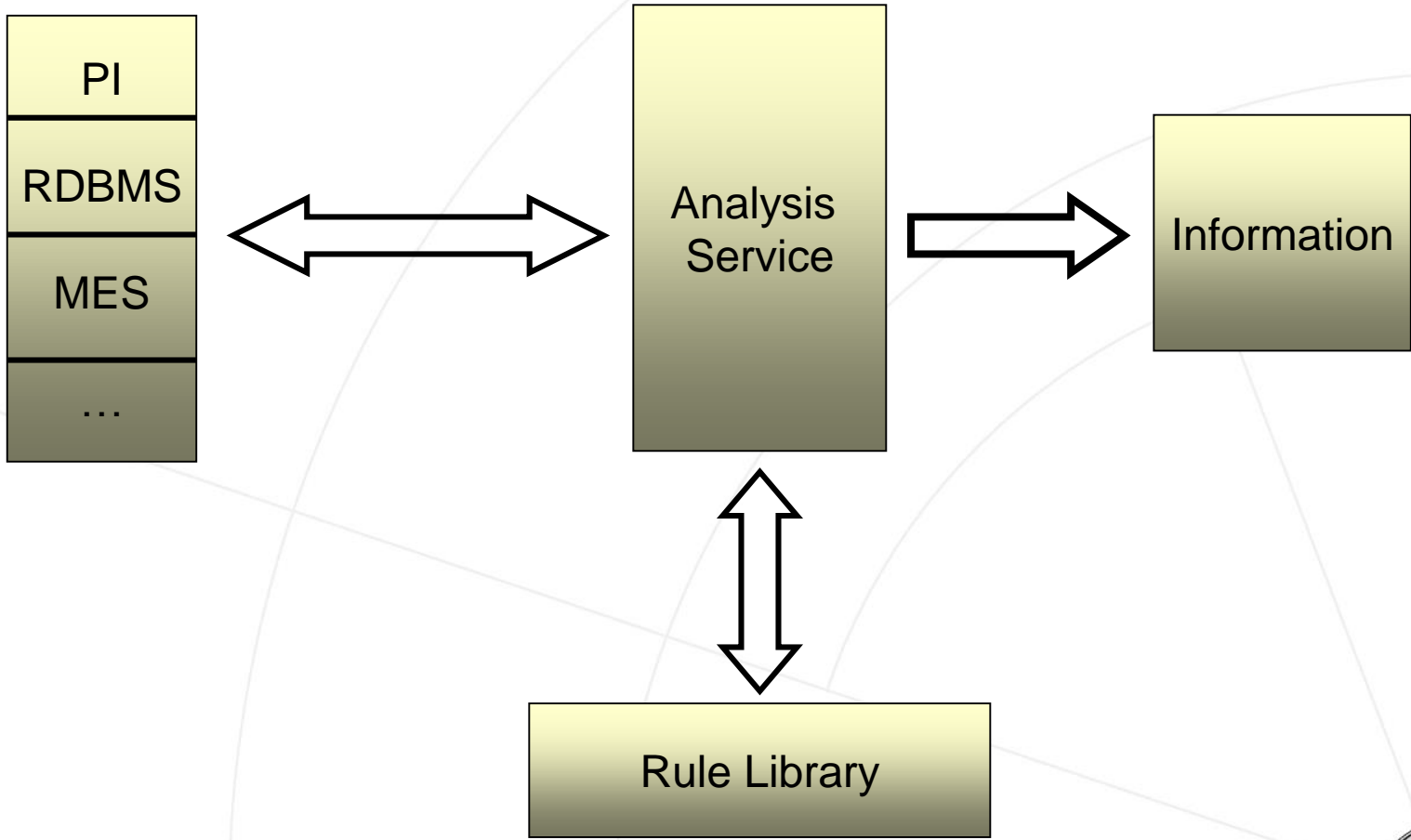
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- Time Series
- Data Directory
- Smart Connectors
- Data Access
- Update
- **Analytics**
- **Notification**
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- **Material & Products**
- Event Frame
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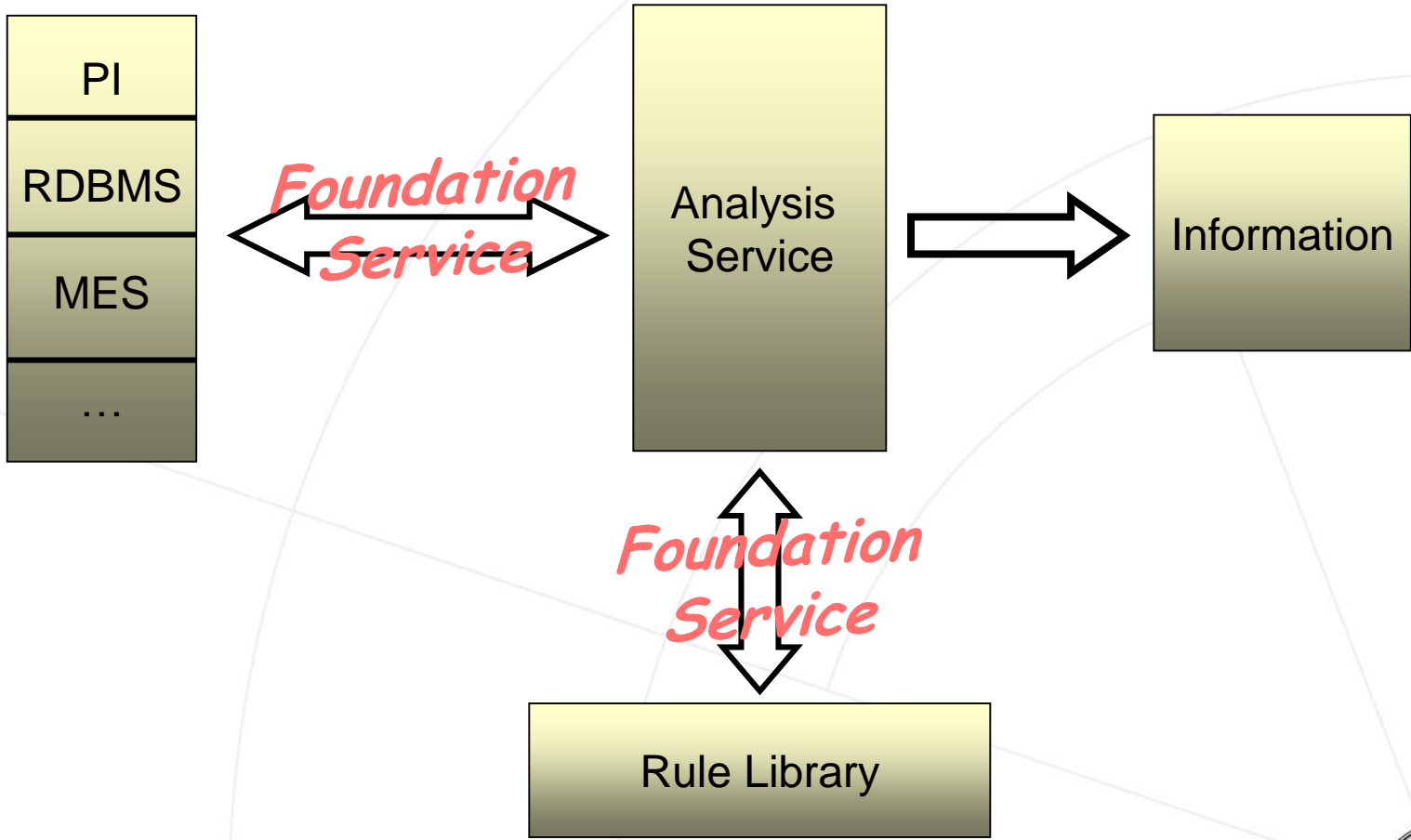
Analysis Service



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Analysis Service



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Analysis – Example

Total('Meter4271', '1-Feb-06', '2-Feb-06')

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Analysis – Example

Total('Meter4271', '1-Feb-06', '2-Feb-06')

Total('Meter4271', '*-1d', '*')

+ Time

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Analysis – Example

Total('Meter4271', '1-Feb-06', '2-Feb-06')

Total('Meter4271', '*-1d', '*')

+ Time

Total('Meter', '*-1d', '*')

+ Time + Target

Analysis –Example

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+ Time + Target

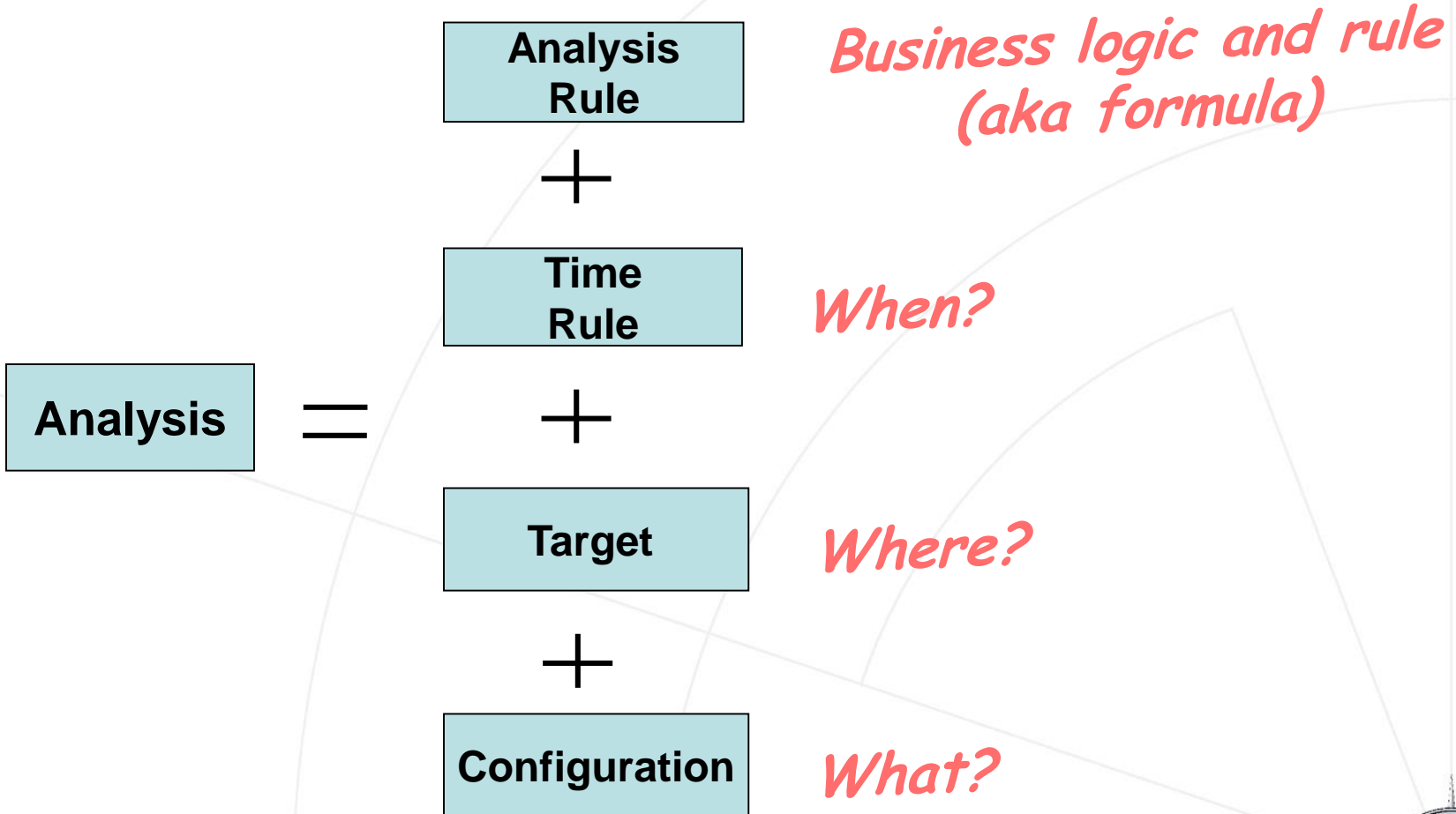
Total('Meter', '*', Period)

+ Time + Target + Configuration

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Analysis



Analysis Rule – Example

Total('Meter', '*', Period)

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Analysis Rule – Example

Total('Meter', '*', Period)

// Unit Conversion

If Unit = Barrel/Day Then

UnitCorrection = 1

Elseif Unit = GPM Then

UnitCorrection = 0.0292

...

Total('Meter', '*', Period) * UnitCorrection

Analysis Rule – Example

Total('Meter', '*', Period)

```
// Unit Conversion
If Unit = Barrel/Day Then
  UnitCorrection = 1
Elseif Unit = GPM Then
  UnitCorrection = 0.0292
...
// Handling Bad Value
If PctGood('Meter', '*', Period) = 100 Then
  TagTotal('Meter', '*', Period) * UnitCorrection
Else
  // Retrieve events for the period
  ...
  // Process each bad event according some criteria
  ...
  // Calculate the total
  ...
End If
```

Analysis Rule – Example

Total('Meter', '*', Period)

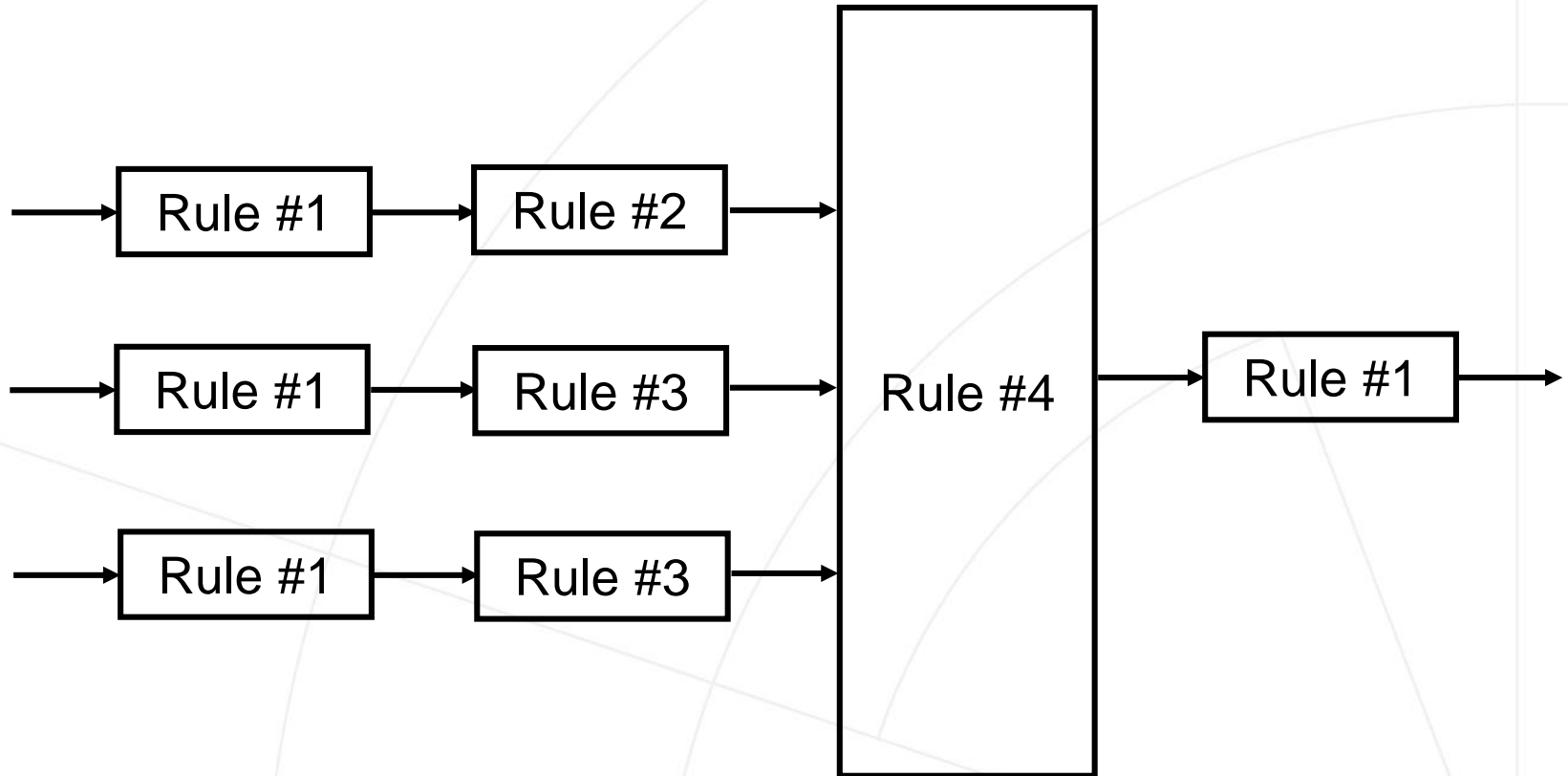
```
// Unit Conversion
If UnitConversionFactor < 1 Then
    // PPM Then
    UnitCorrection = 0.0292
Else
    // Bad Value
    Total('Meter', '*', Period) = 100 Then
        Total('Meter', '*', Period) * UnitCorrection
Else
    // Retrieve data for the period
    ...
    // Process each reading according some criteria
    ...
    // Calculate the total
    ...
End If
// Handle Sampling Frequency
...
// Handle Special Filtering Algorithms
...
// Handle Clamping
...
// Handle Temperature Correction
...
// Handle Pressure Correction
...
// Handle Correction Factor
...
// Handle
...
```



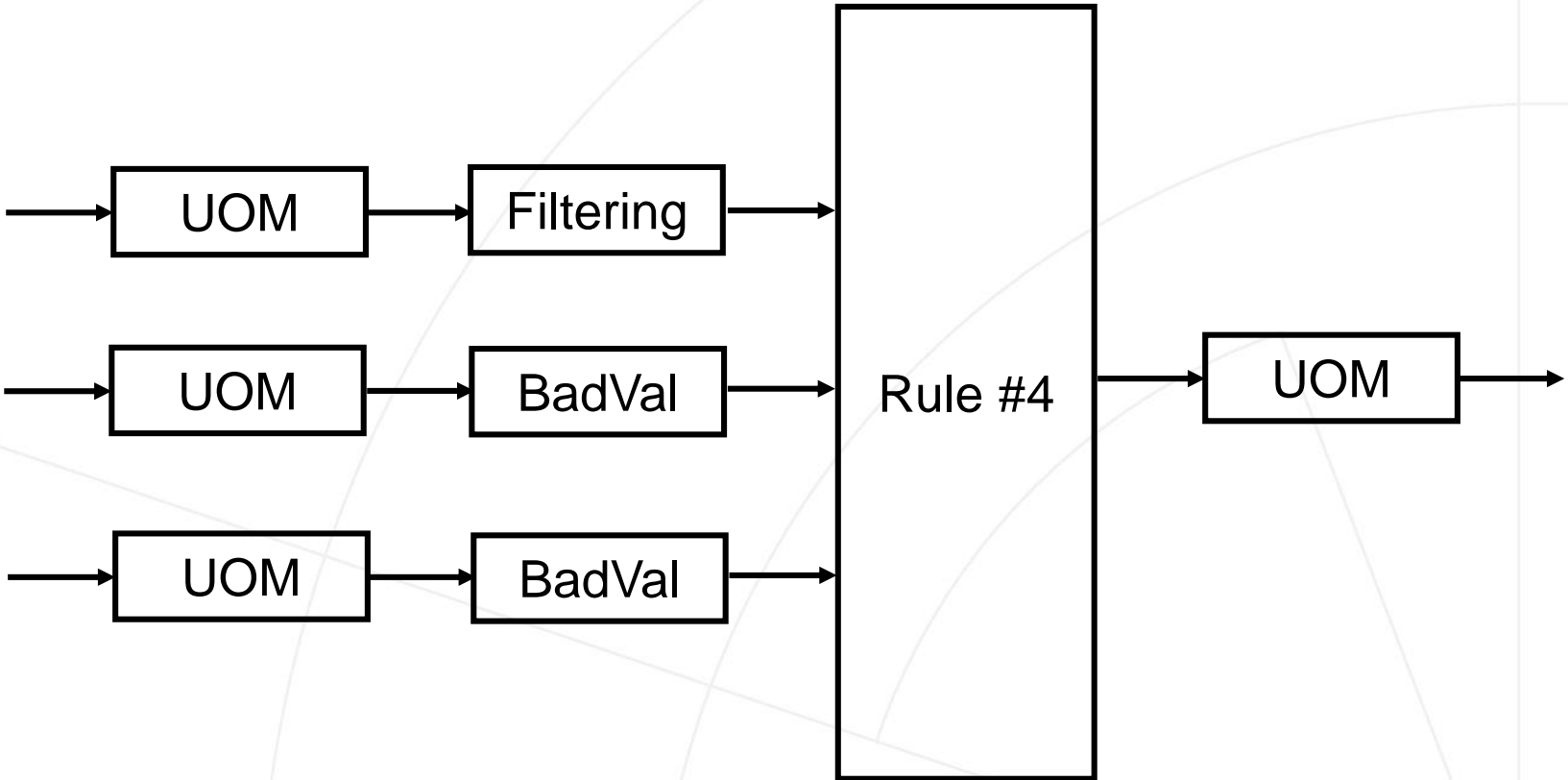
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Analysis Rule



Analysis Rule



Analysis Rule – Reusability

- Separate logic from
 - Target
 - Time
 - Configuration
- Build composite rules

Building Analysis Rules

- How
 - PE Builder
 - VS.NET
 - Foundation Explorer
 - Custom Builders
- Built-in Analysis Rules
 - [Unit of measure]
 - Bad Value Substitution
 - Clamping
 - Totalization
 - SQC
 - ...

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Time Rule – Scheduler Service

- Built-in
 - Calendar
 - Event
 - Natural
 - Analysis
- Multiple time rules through AND and OR operations
 - PumpEff < 50% AND Temperature > 20 deg C
 - PumpEff < 50% OR MaxInspectionDueDate
 - (PumpEff < 50% OR MaxInspectionDueDate) AND Weekday AND 8am-5pm
- Custom

Key Analysis and Scheduler Features

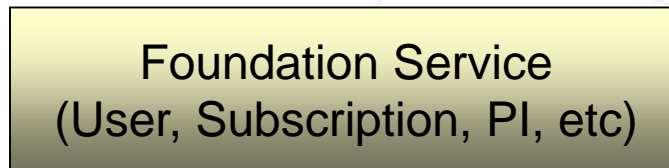
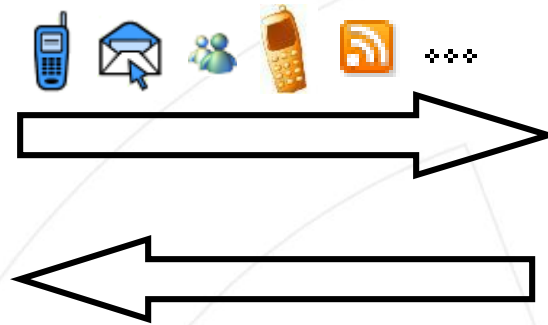
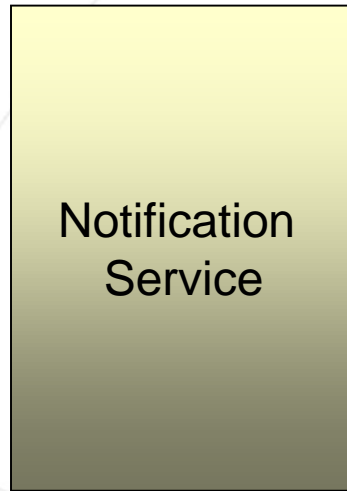
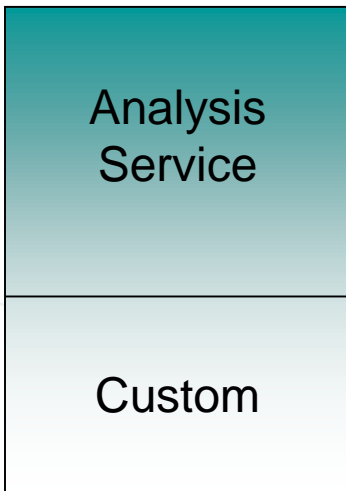
- Simplicity
- Flexibility
- Reusability
- Enterprise
- High Availability
- Leveraging and Used by Foundation Service

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Notification Service

Event Providers



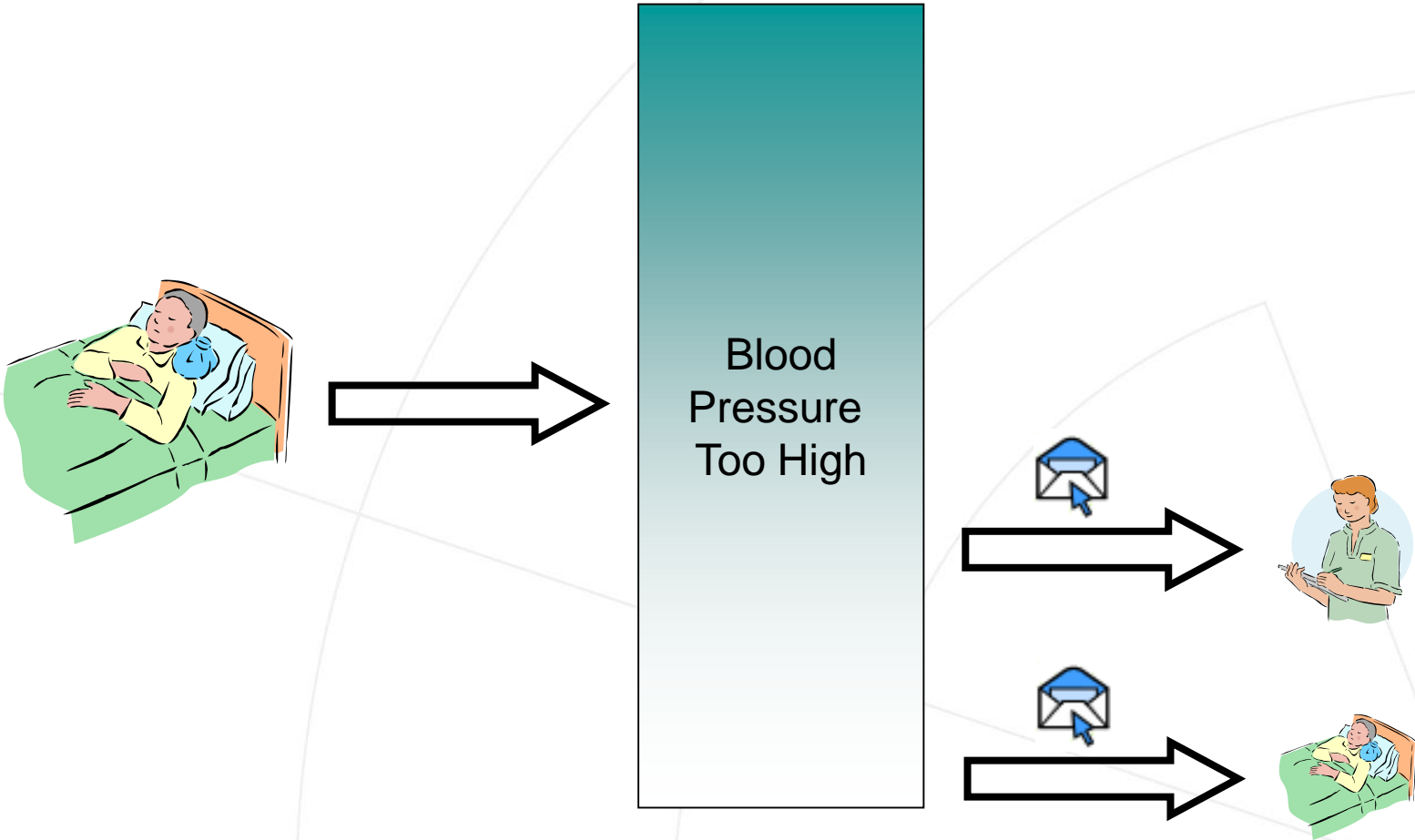
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Configuring Notification

- Event Provider
- Contents
 - Predefined
 - Custom
- Subscriptions
- Security Attributes

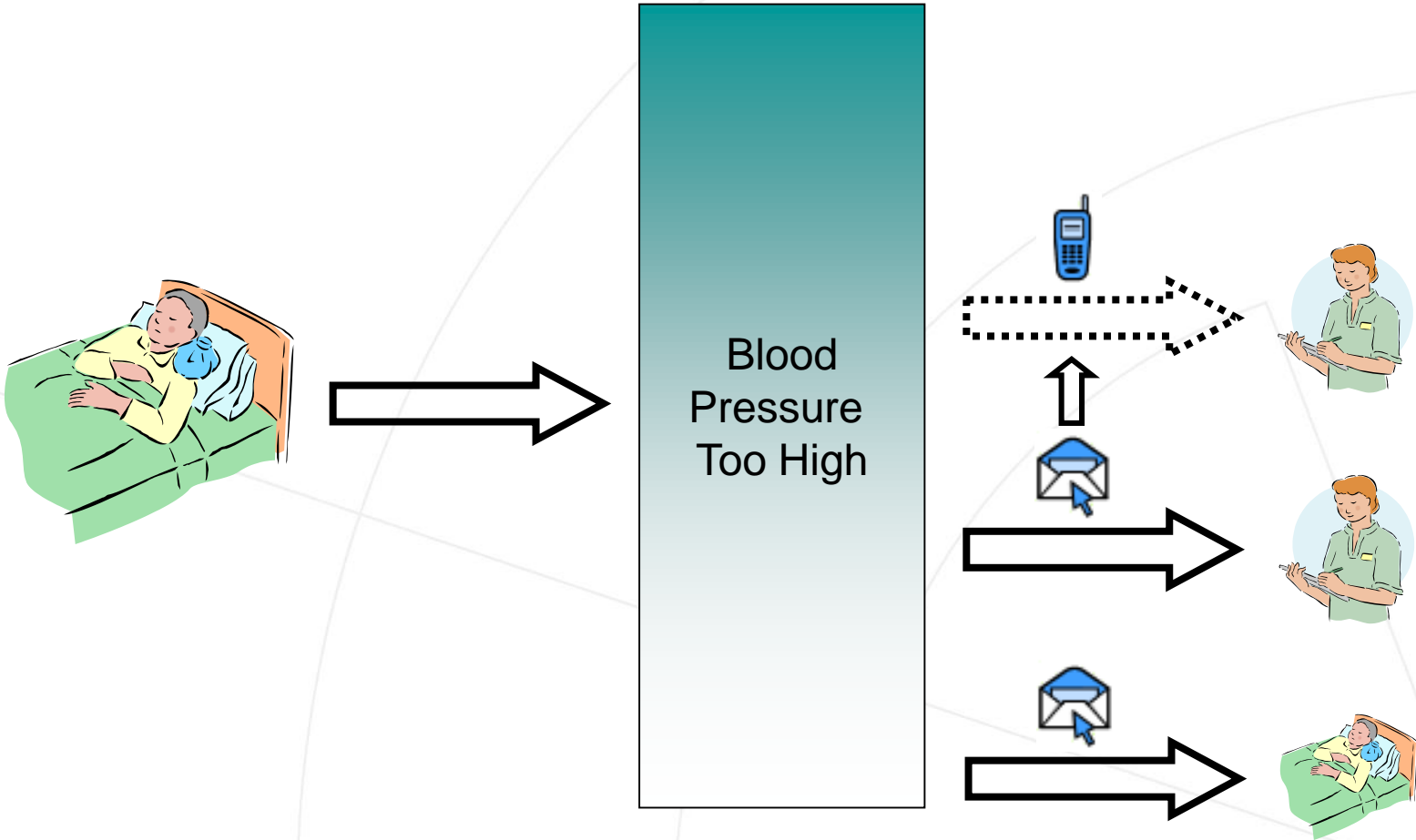
Demo Scenario



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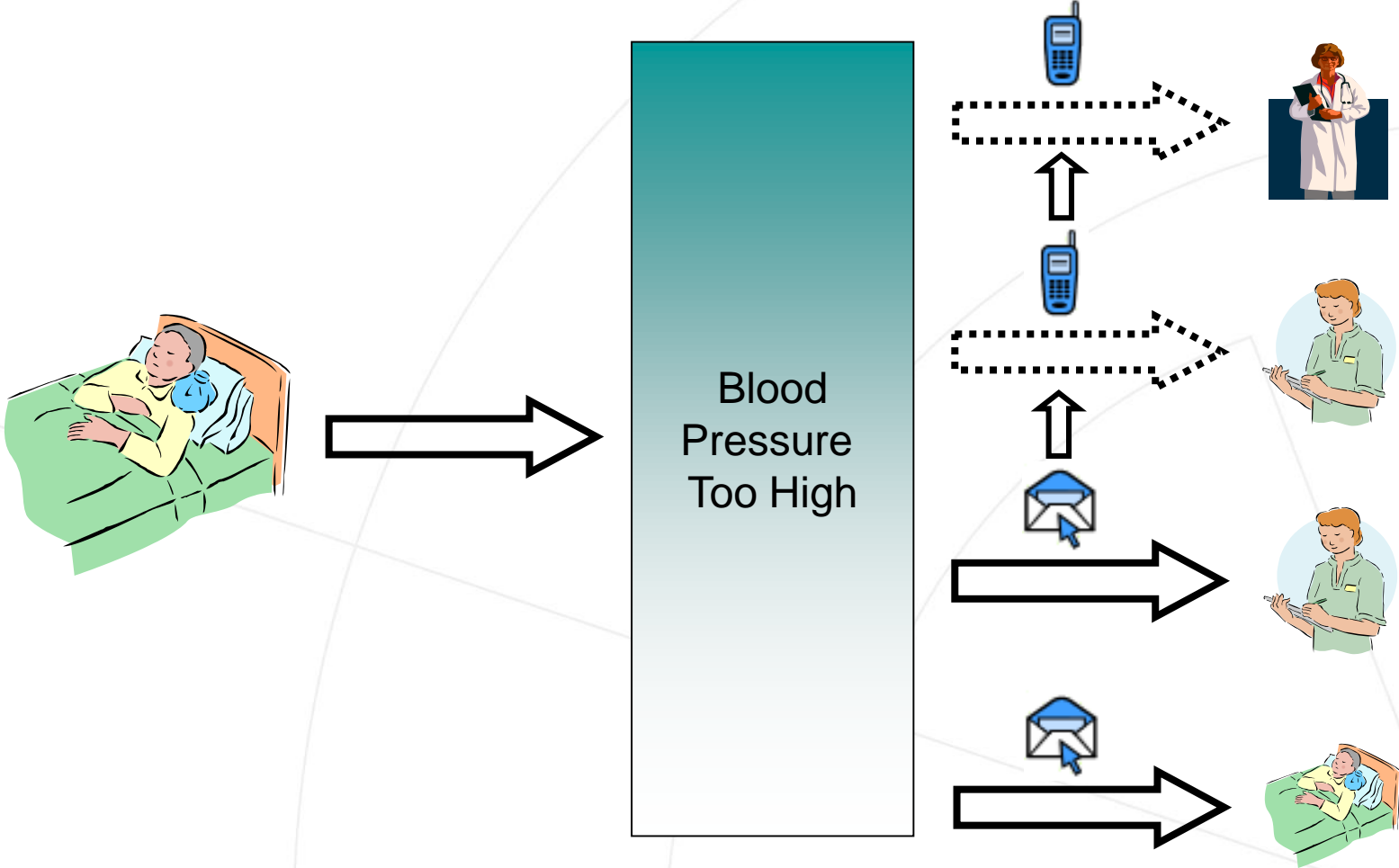
Demo Scenario



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Demo Scenario



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Demo

Notification



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Key Notification Features

- Simplicity
- Flexibility
- Historization
- Enterprise
- High Availability
- Leveraging Analysis and Foundation services

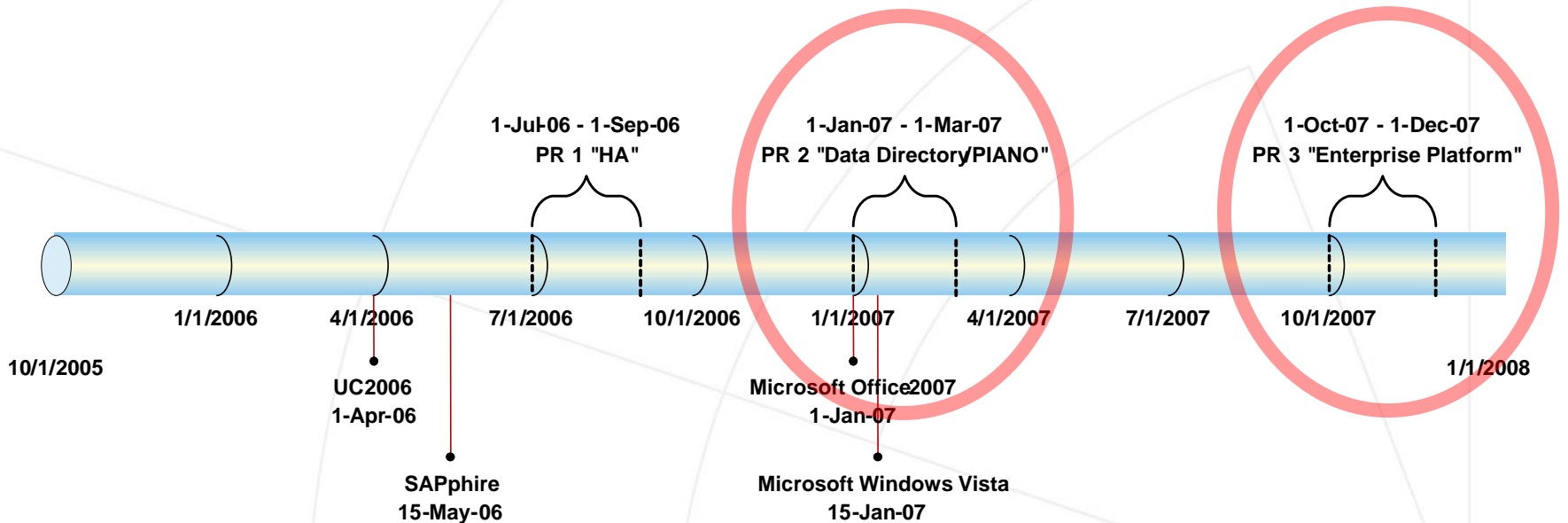
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Platform Release Timeline

**Foundation/PIANO
(Notification)**

**PIANO
(Analysis)**



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Conclusions

- When
 - Notification + Scheduler Services: 1Q 2007
 - Analysis Service: 4Q 2007
- Core Part of Our Platform
 - Analytics
 - Notification
 - Scheduler
- **SEA Change**
- Leveraging and Used by PI and Foundation Services

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Thank you!

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