



Update on PIANO

Alex Zheng

Beth McNeill

Why?

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

VALUE NOW, VALUE OVER TIME



Service Orientation, not 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
- ...

VALUE NOW, VALUE OVER TIME



PIANO Delivers

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
- ...

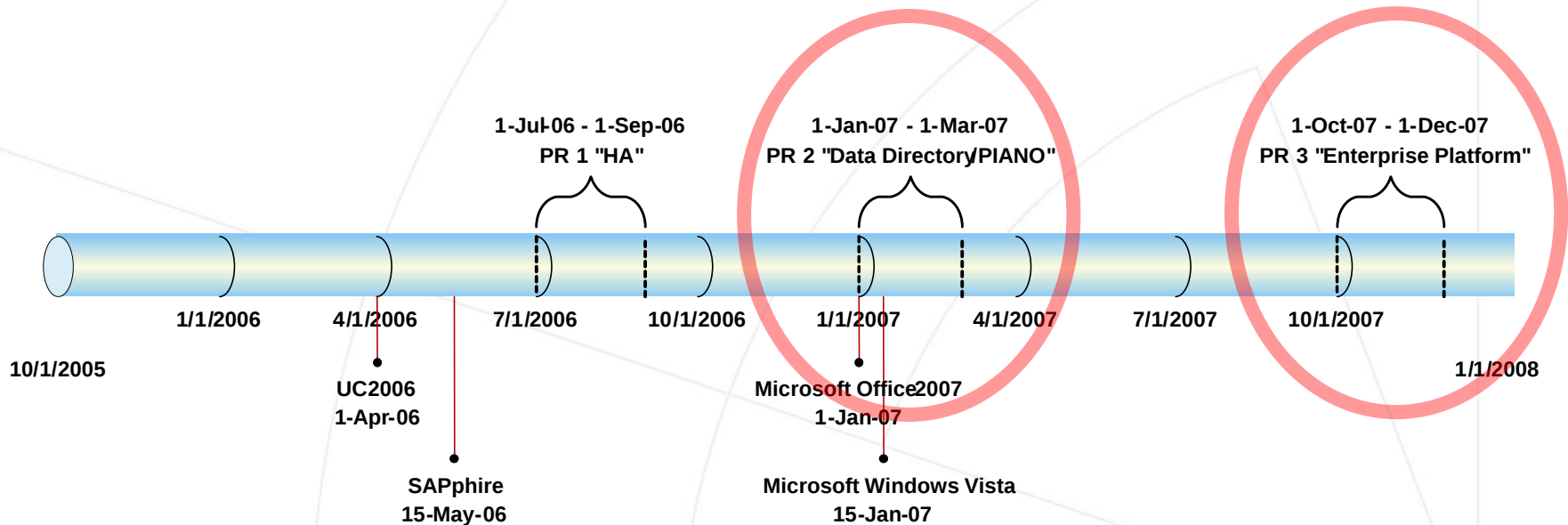
VALUE NOW, VALUE OVER TIME



Platform Release Timeline

**Foundation/PIANO
(Notification)**

**PIANO
(Analysis)**

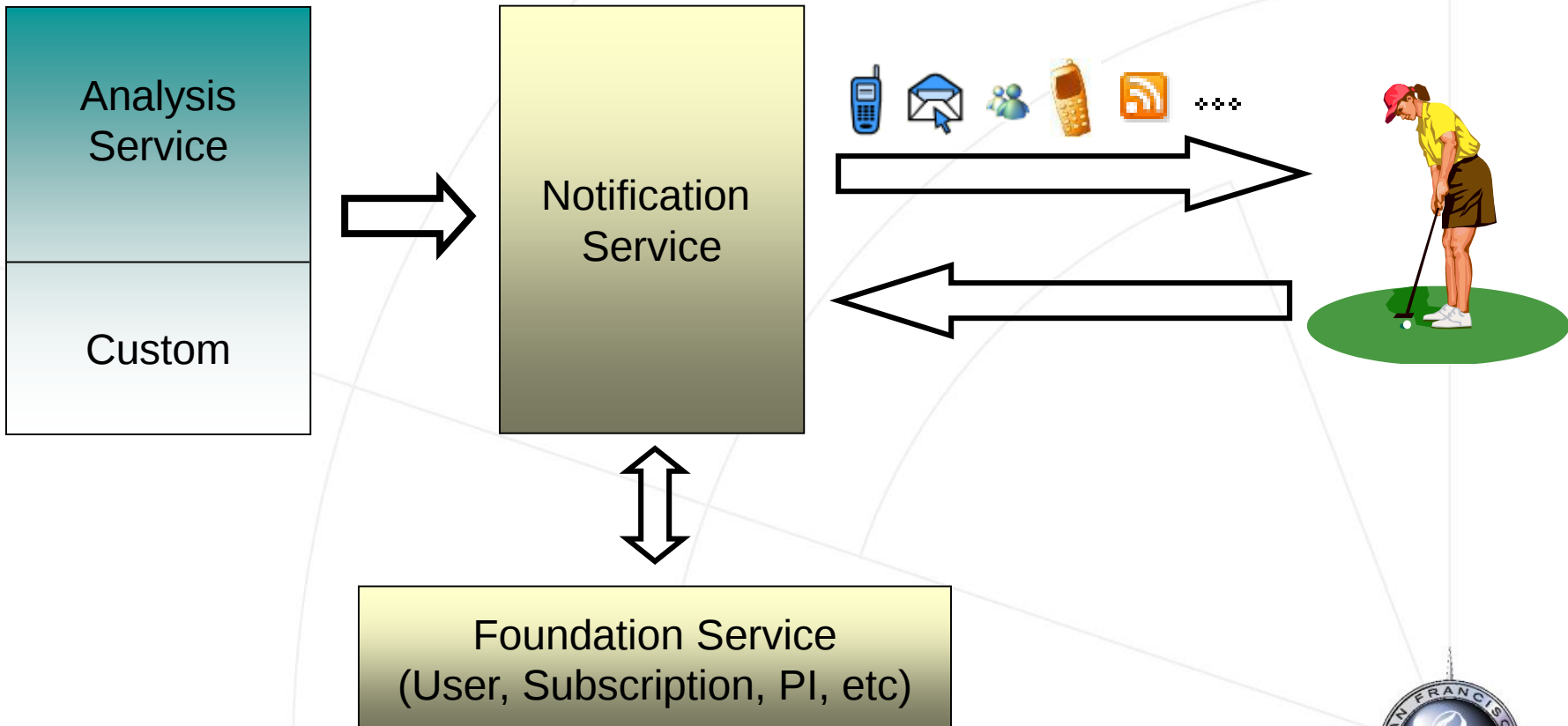


VALUE NOW, VALUE OVER TIME



Notification Service

Event Providers



VALUE NOW, VALUE OVER TIME



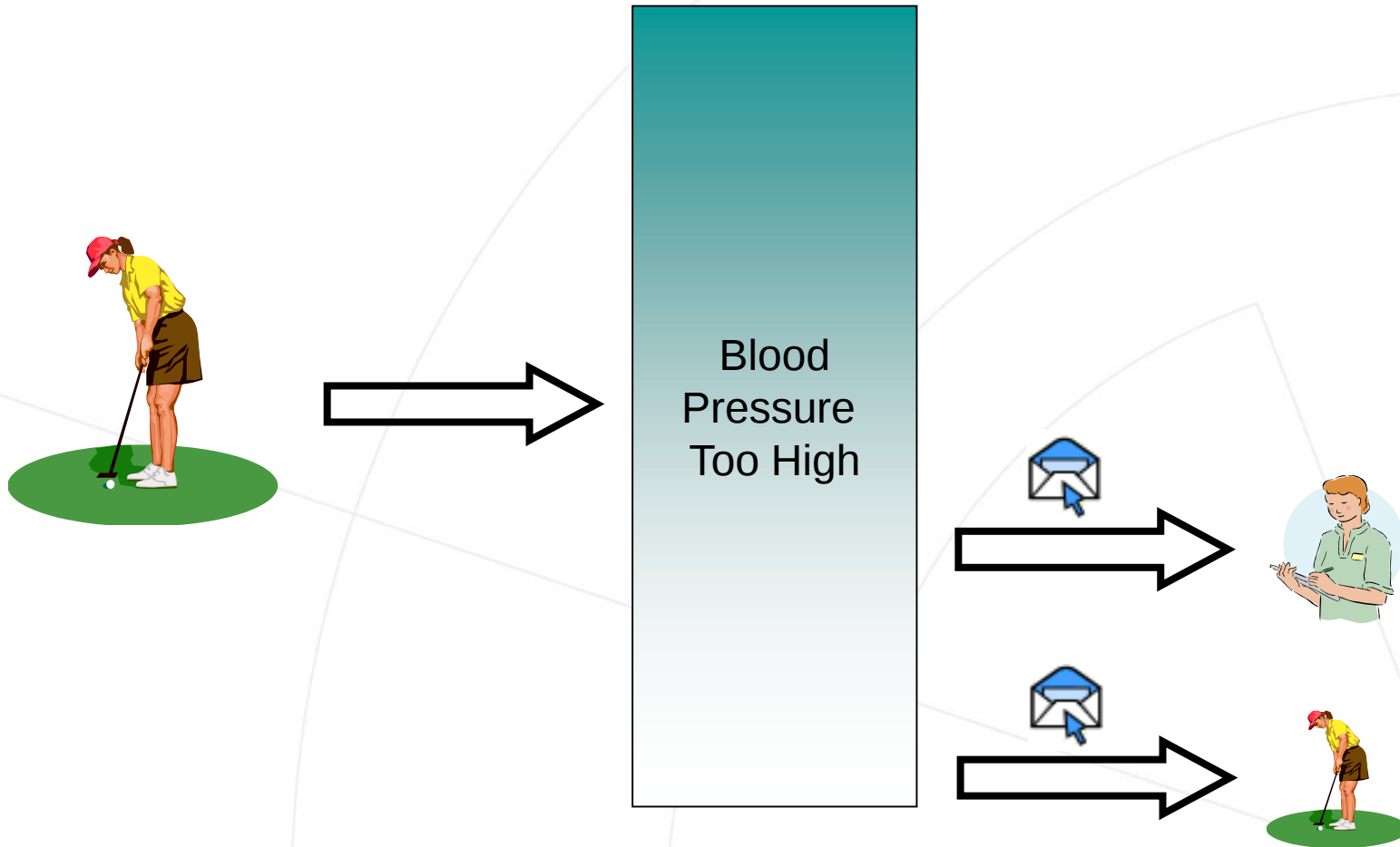
Configuring Notification

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

VALUE NOW, VALUE OVER TIME



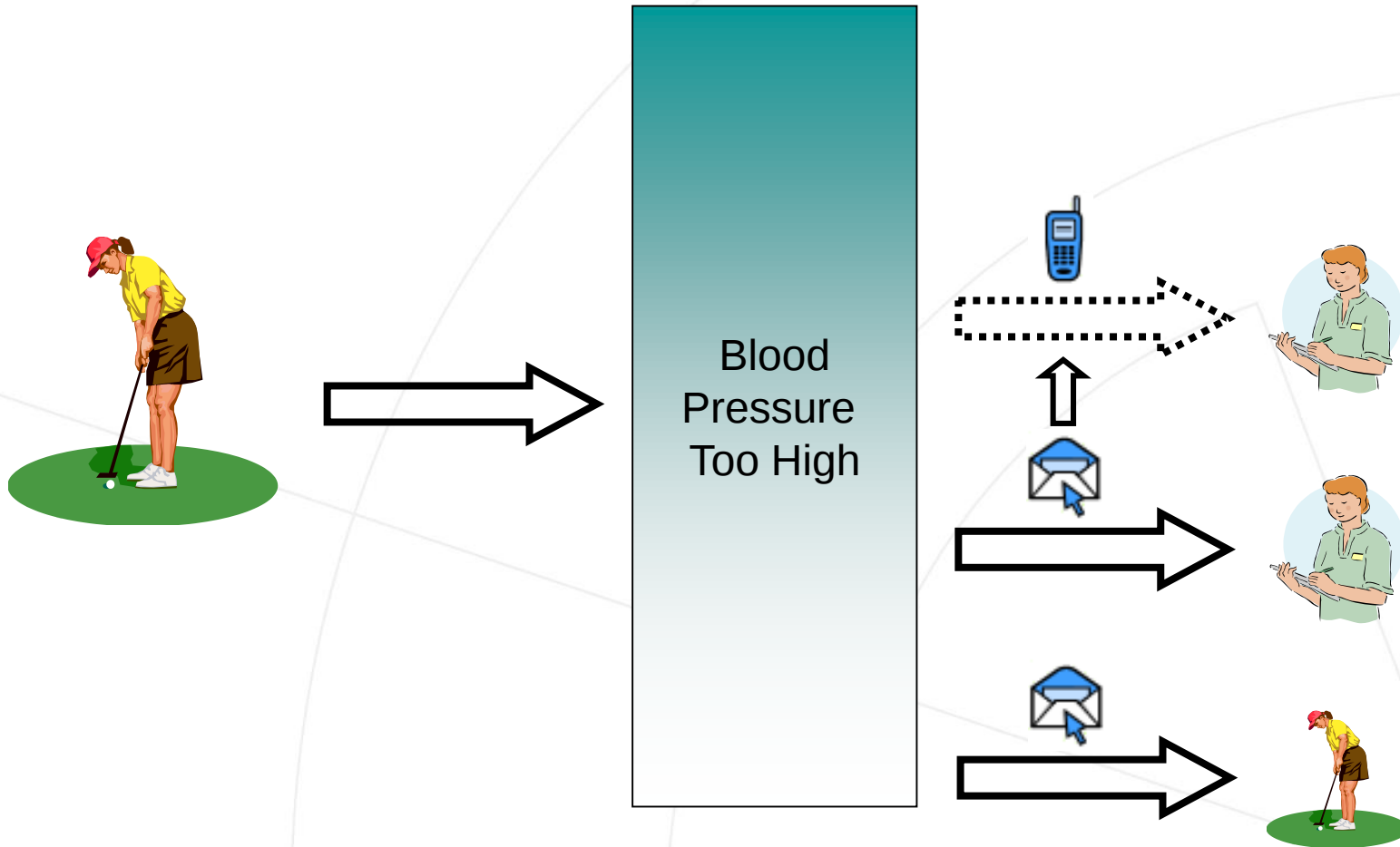
Demo Scenario



VALUE NOW, VALUE OVER TIME



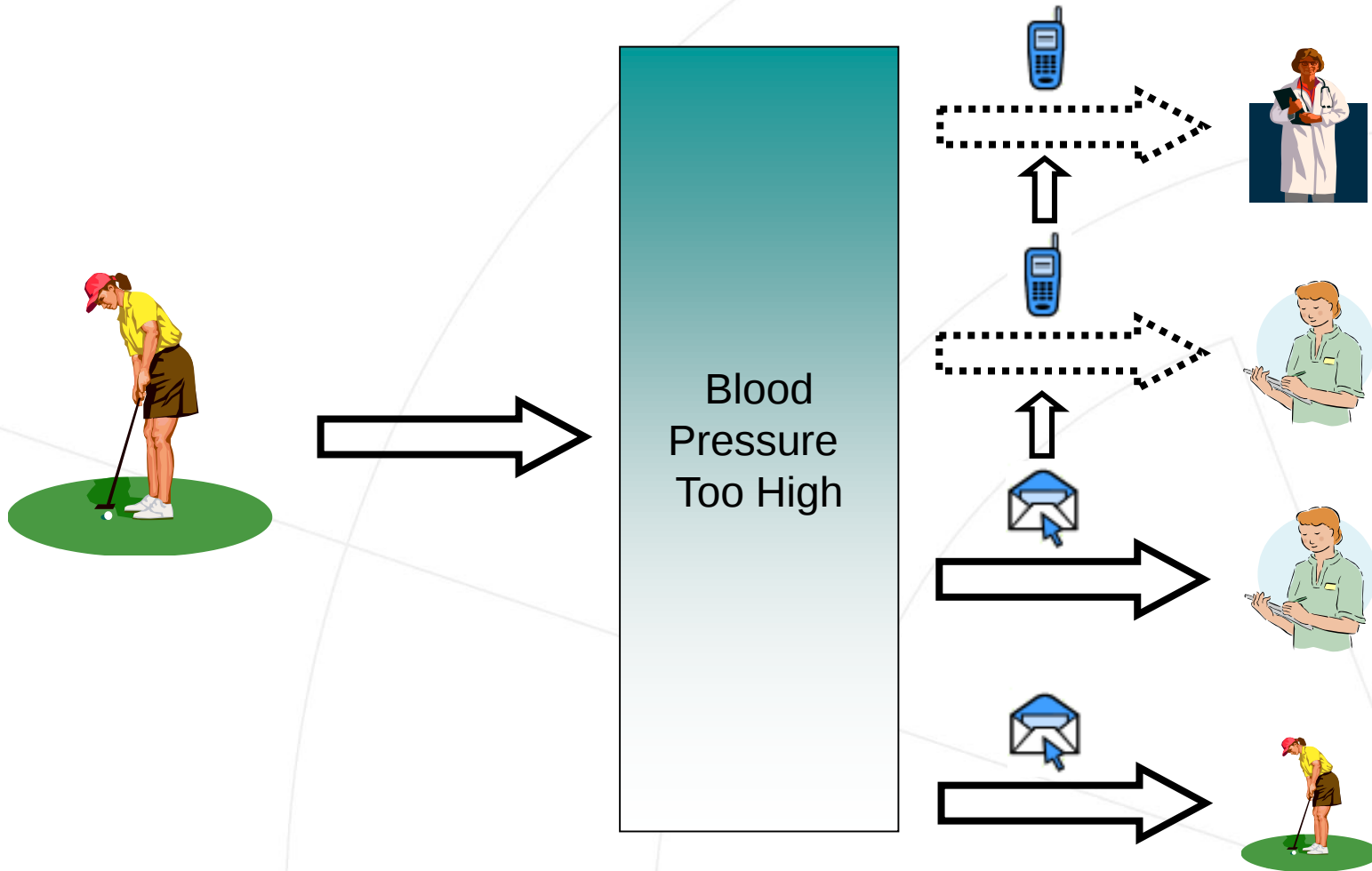
Demo Scenario



VALUE NOW, VALUE OVER TIME



Demo Scenario



VALUE NOW, VALUE OVER TIME



Demo

Notification



VALUE NOW, VALUE OVER TIME



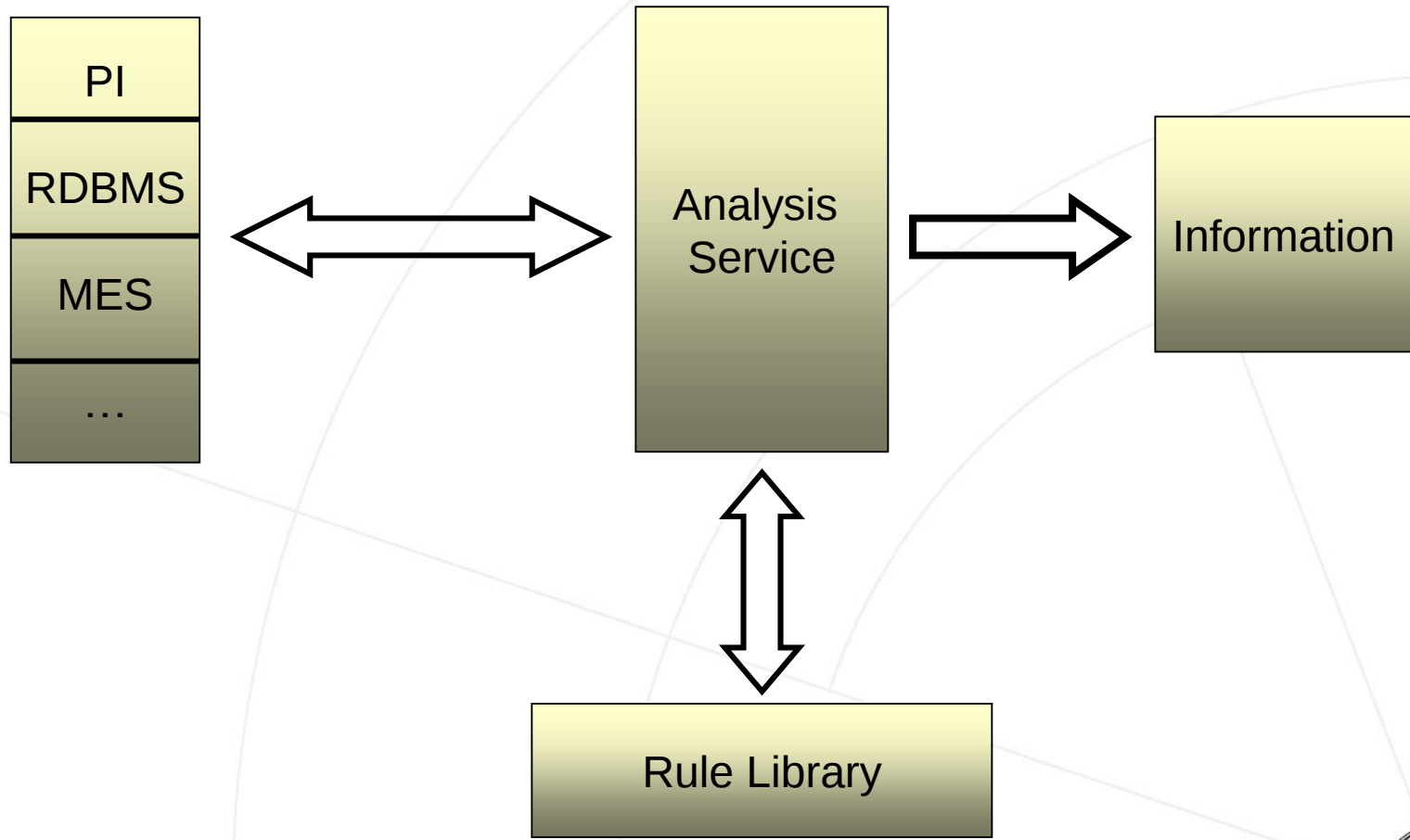
Key Notification Features

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

VALUE NOW, VALUE OVER TIME



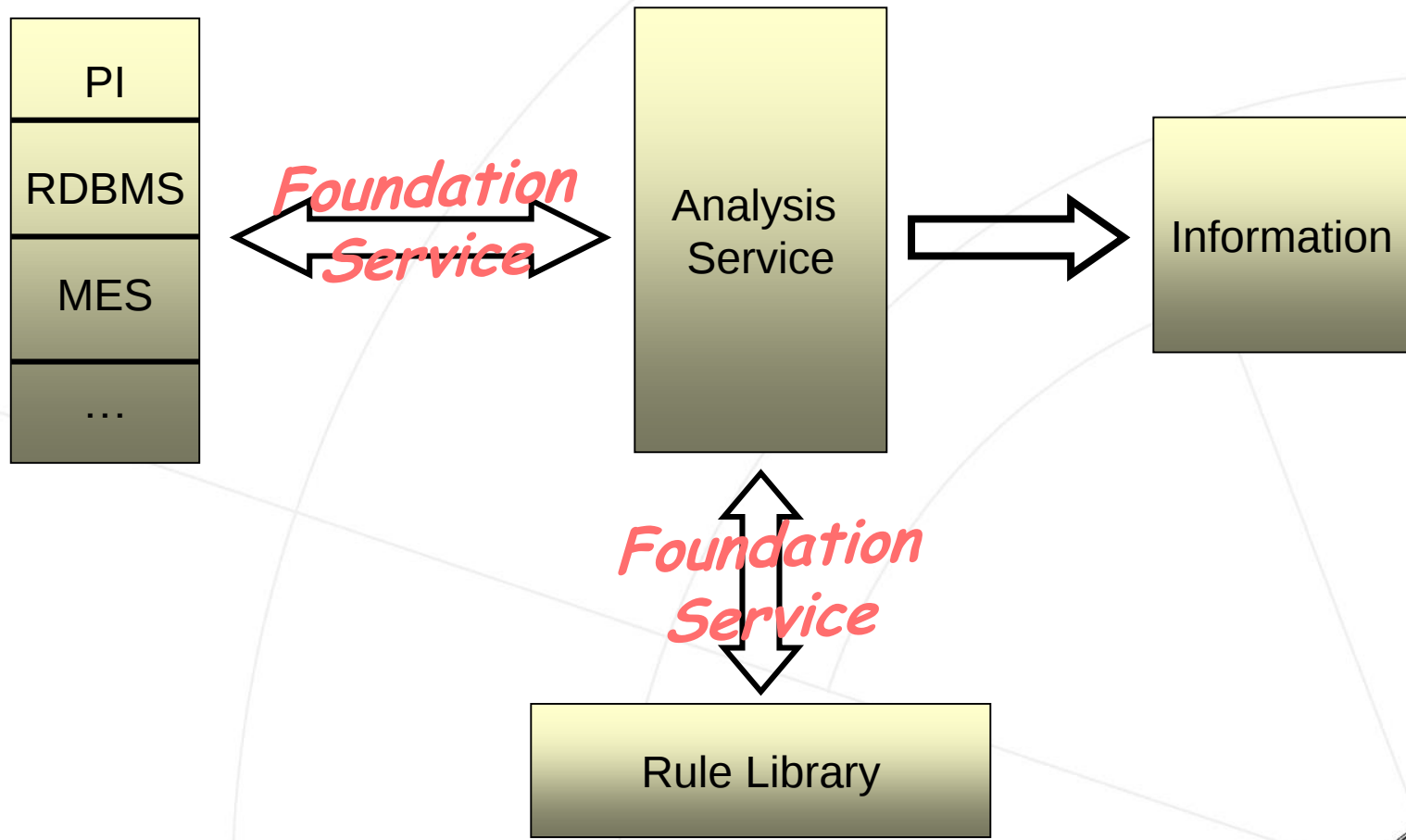
Analysis Service



VALUE NOW, VALUE OVER TIME



Analysis Service



VALUE NOW, VALUE OVER TIME



Analysis – Illustrating Example

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

VALUE NOW, VALUE OVER TIME



Analysis – Illustrating Example

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

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

+ Time

VALUE NOW, VALUE OVER TIME



Analysis – Illustrating Example

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

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

+ Time

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

+ Time + Target

VALUE NOW, VALUE OVER TIME



Analysis – Illustrating Example

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

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

+ Time

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

+ Time + Target

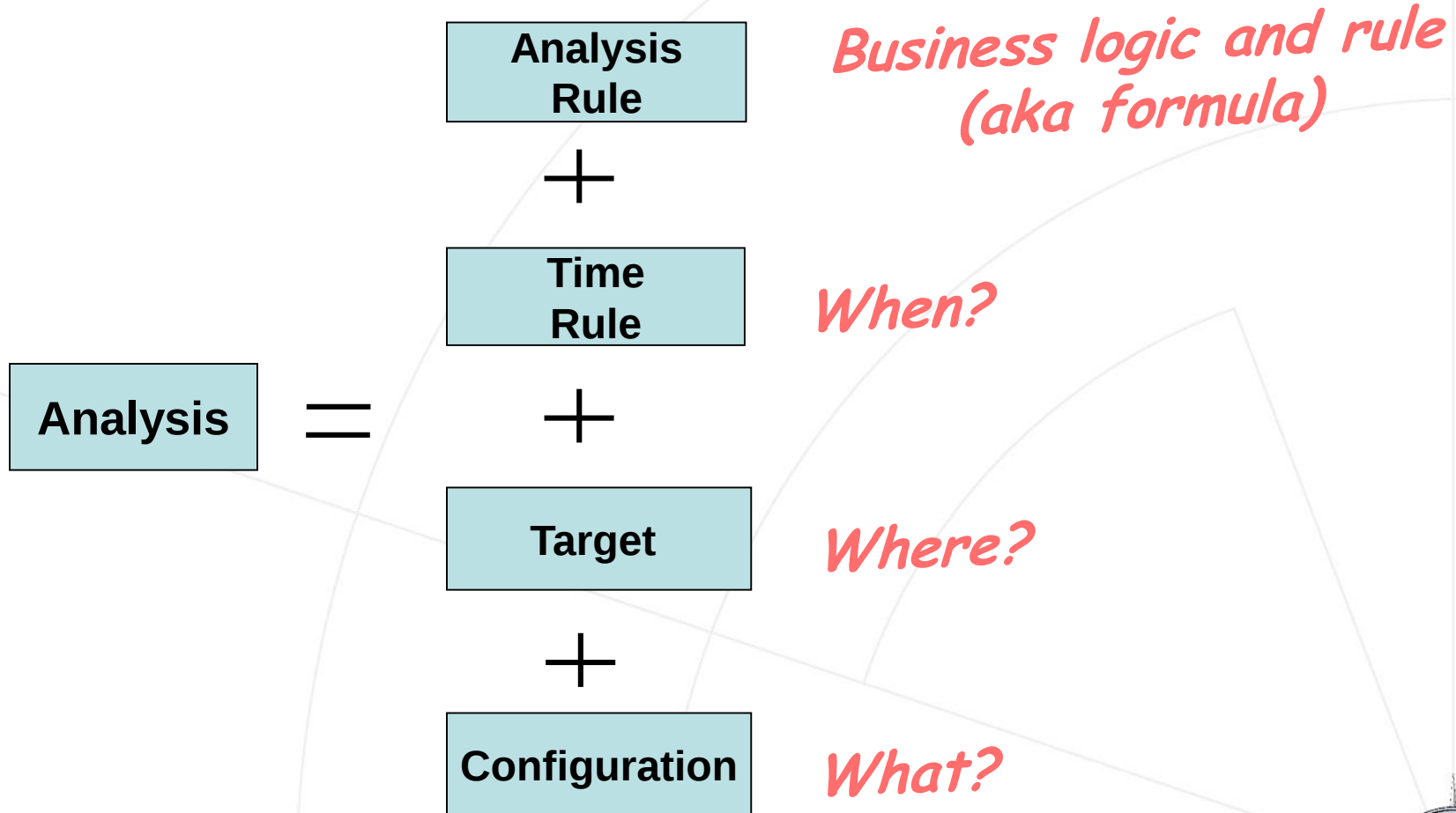
Total('Meter', '*', Period)

+ Time + Target + Configuration

VALUE NOW, VALUE OVER TIME



Analysis



VALUE NOW, VALUE OVER TIME



Analysis Rule – Illustrating Example

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

VALUE NOW, VALUE OVER TIME



Analysis Rule – Illustrating 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 – Illustrating 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
```

VALUE NOW, VALUE OVER TIME



Analysis Rule – Illustrating Example

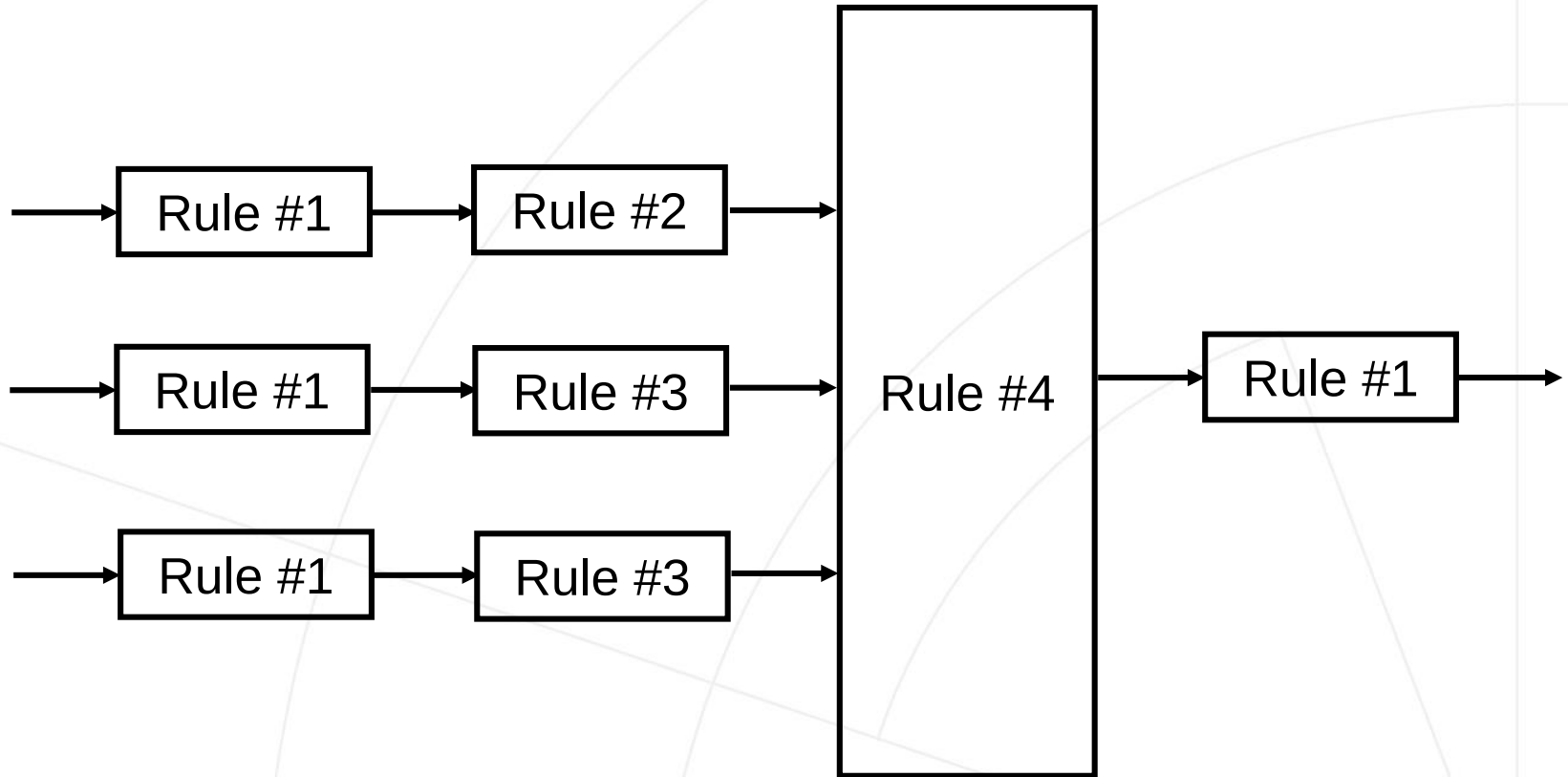
Total('Meter', '*', Period)

```
// 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
// Handle Sampling Frequency
...
// Handle Special Filtering Algorithms
...
// Handle Clamping
...
// Handle Temperature Correction
...
// Handle Pressure Correction
...
// Handle Meter Correction Factor
...
// Handle Other Custom Stuff
...
```

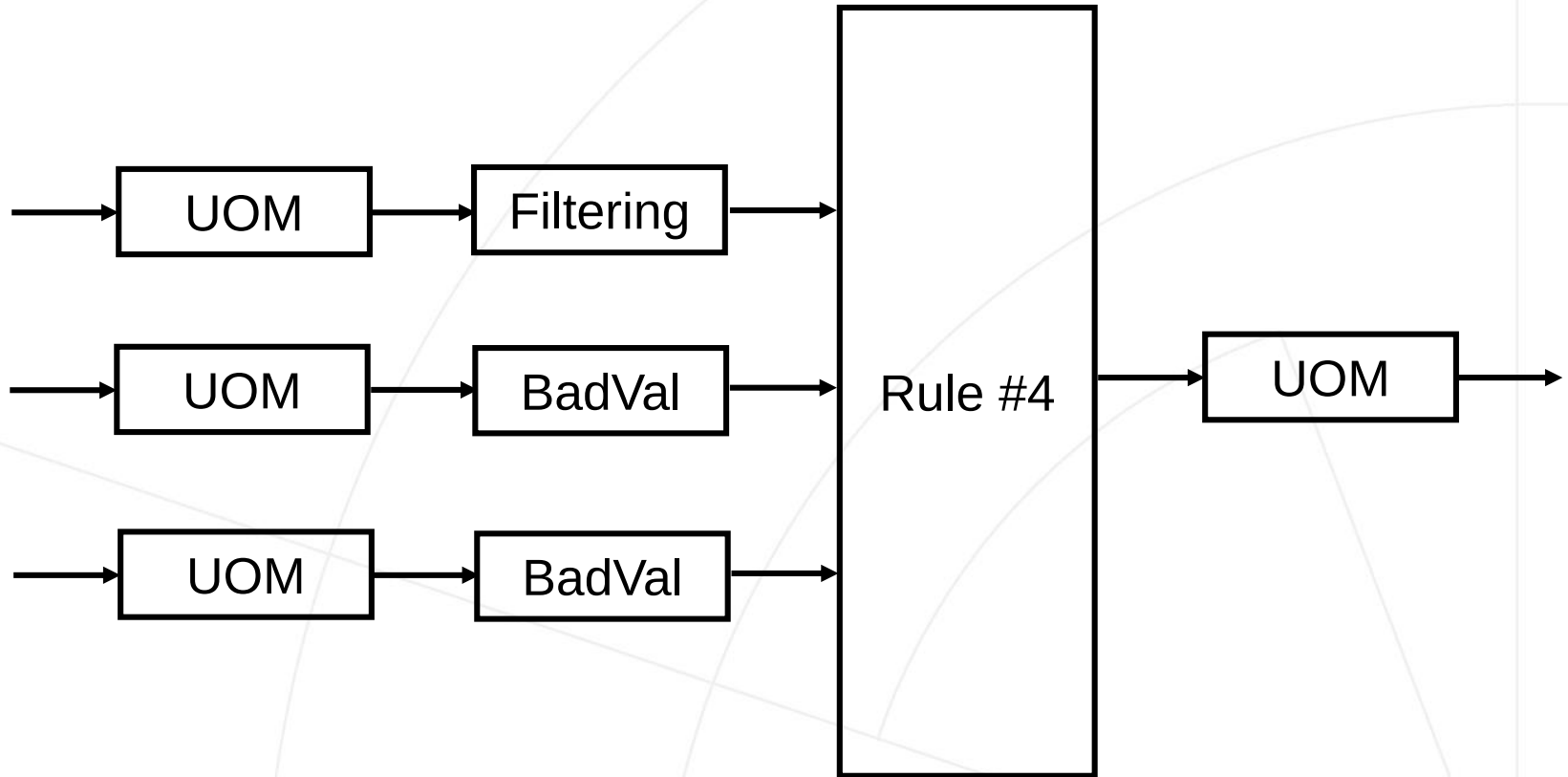
VALUE NOW, VALUE OVER TIME



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 (e.g., Process State Machine)
- Built-in Analysis Rules
 - [Unit of measure]
 - Bad Value Substitution
 - Clamping
 - Totalization
 - SQC
 - ...

VALUE NOW, VALUE OVER TIME



Time Rule – Scheduler Service

- Built-in
 - Calendar
 - Event
 - Natural
 - Analysis
- Multiple time rules through AND and OR operations
 - Faucet = Off AND Temperature < 0 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

VALUE NOW, VALUE OVER TIME



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

VALUE NOW, VALUE OVER TIME



THANK YOU!

Alex Zheng: azheng@osisoft.com

Beth McNeill: bmcneill@osisoft.com

VALUE NOW, VALUE OVER TIME

