

Advanced software technologies for breakthrough applications



Ensemble and SOA

John Joseph, Director of Product Management
March 22, 2010

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Welcome



- Why are you here?
 - Our comprehensive SOA strategy is planned/approved and it's time to execute
 - We want to move to SOA – where do I start?
 - I'm doing XYZ – is that SOA?
 - I better learn what SOA really means
 - Determine if Buying Ensemble = Implementing SOA

Agenda



- What is SOA today?
- A practical approach to SOA
- Capabilities of InterSystems Ensemble
- Case studies
- Q&A

What Is SOA? SOA ≠ Web Services



	SOA	Web Services
Is an enabler for business and IT transformation?	Yes	Yes
Is an industry standard?	No	Yes
Is a technology platform?	No	Yes
Is a transport protocol?	No	Yes
Primary ownership is business-line owned?	Yes	No
Affects workflow and business processes?	Yes	No

SOA Is An Approach – Aided By Technology



Agreement to...

- Develop modular software elements
- Define the meaning of elements and interfaces
- Make the elements available – directory, bus

Leads to...

- Reuse
 - Lower development costs
 - Reduced defects
 - More consistent processes
- Agility
 - Assembly vs. development
 - Increased ability to change
 - Service improvements

SOA can be implemented using with various technologies!

I Thought SOA Was Dead



As An Approach, SOA Requires



Coordination

Policies

Constant enforcement

Discipline

Planning

Technology

Strategy

Measurement

Buy-in

Rewards/Penalties

SOA: In High Demand



In a recent survey by Gartner:

- 92% respondents in Europe have adopted SOA or plan to do so over the next 12 month
- 79% state the same for North America, and 57% in Asia
- 68% expect moderate to significant affect on their ability to support rapid change
- 60% expect a ROI from SOA in less than 24 month

***If you are developing applications for resale,
you have to fit into this environment***

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A Practical Approach To SOA



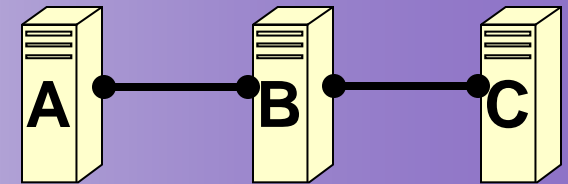
- Build SOA incrementally – one project at a time
- Develop a business case for each project - Don't sell SOA, tie SOA to business benefits
- Start small – choose low risk, high impact projects first

A Real-World Example: Point-to-Point vs. SOA Integration Approach

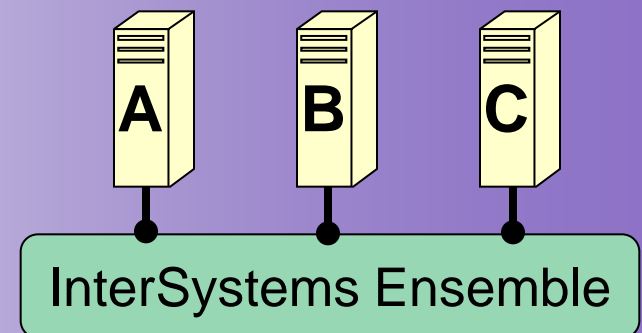


- Goal: integrate three systems
- Original point-to-point approach
 - Required serial integration
 - Change in first system extended integration time by several months
 - \$70K additional fees
 - Custom interface fees of \$109K
- SOA approach decoupled integrations
 - Impact of delay minimized – project back on time
 - Total savings of \$157K

Original: Point to Point



Actual: SOA



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Where Do I Start? Approaching Your First Project

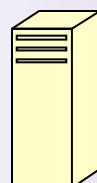
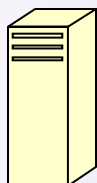
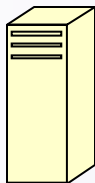
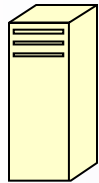
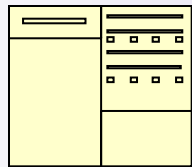
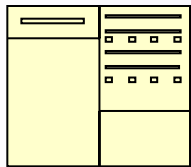
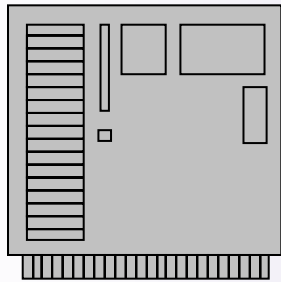


- Inventory of current assets, business functions
- Identify candidate services and which to do first
- Define the future state: policies, shared services, etc.
- Select a technology platform (plan for change)
 - HINT: Ensemble
- Select a project for success
- Implement and measure the impact

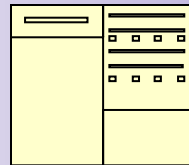
Getting Started: Identify Assets



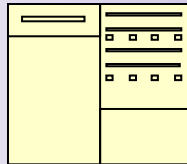
Legacy Applications (packaged/custom)



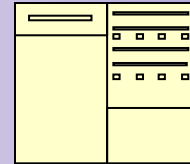
SOA Applications (packaged/custom)



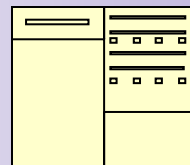
CRM



ERP

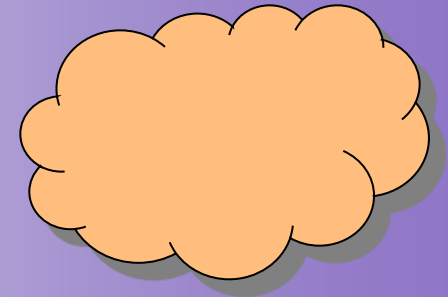


Services &
Composites

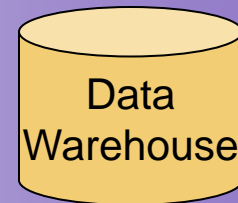


Portals /
Dashboards

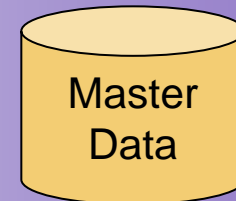
SaaS/Cloud Applications



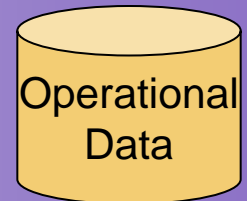
Enterprise Data



Data
Warehouse



Master
Data



Operational
Data

Getting Started: Identify Service Candidates With Functional Mapping



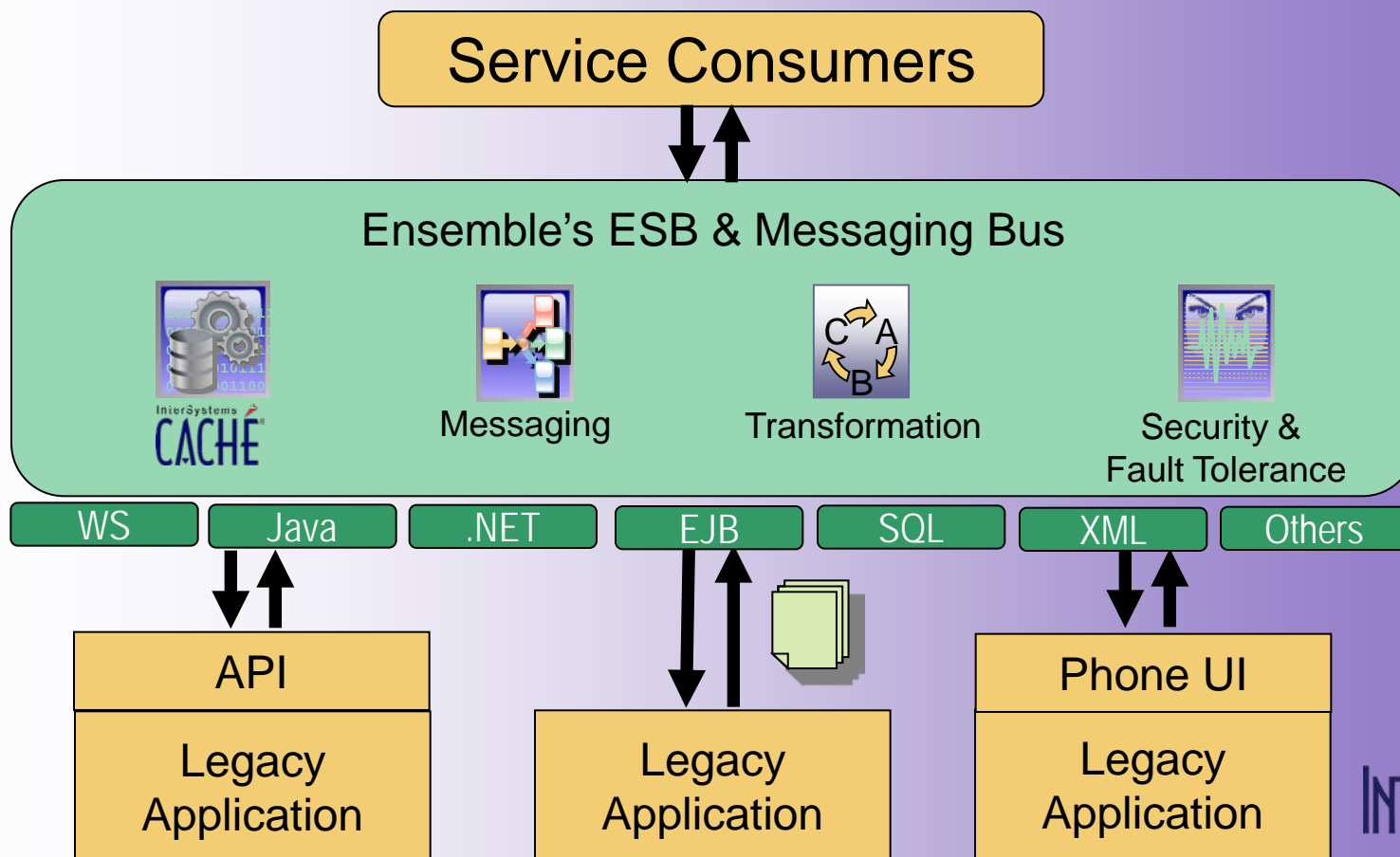
Table 3. SampleHealth Business Function Map

Business Line	Healthcare-Unique Services						Business Svcs					SOA Infrastructure Svcs					
	Order Entry	Order Fulfillment	Patient Evaluation (DSS)	Laboratory Data Retrieval	Pharmacy Data Retrieval	EHR	Alert/Event Mgmt	Master Person Index	Terminology Service	Demographics	Billing	Scheduling	Auditing Service	Exception Mgmt	Business Process Mgmt (BPM)	Authentication	Services Directory	Access Control
Pharmacy	X	X	X	.	X	X	X	X	X	X	.	X	X	X	X	.	X
Laboratory	X	X	X	X	.	X	X	X	X	X	X	X	X	X	X	.	X
Patient Administration	.	.	.	.	.	.	X	X	.	X	X	.	X	X	.	X	X
Order Entry/Mgmt	X	X	.	.	.	X	X	X	X	X	X	X	X	X	X	X	X
Scheduling	.	.	.	.	.	.	X	X	.	X	.	X	X	X	X	X	X
Registration	.	.	.	.	.	.	X	X	.	X	X	X	X	X	X	.	X
Care Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Referrals/Referral Mgmt	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nursing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Emergency Department	X	X	X	X	X	X	X	X	X	X	X	X	X	.	X	X	X
Patient Billing	.	X	.	X	X	X	X	X	X	X	.	X	X	X	X	.	X
Imaging/Radiology	.	X	.	.	.	X	X	X	X	X	X	X	X	X	X	X	X
Clinical Decision Support	.	.	X	X	X	X	X	X	X	.	.	X	X	.	X	.	X
Facilities Management	.	.	.	.	.	.	X	.	.	.	X	X	X	.	X	X	X
Nutrition Mgmt (Dietetics)	X	X	.	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Using Ensemble For SOA: Encapsulating Legacy Applications with Ensemble



- Ensemble's adapters, data transformation, mediation layer and orchestration can expose legacy applications as services



Ensemble Productions Are Built And Managed With Graphical Interfaces



Ensemble Configuration Editor - Windows Internet Explorer

http://localhost:57782/csp/ensemble/CSPX.EnsConfigFrame.cls?ID1=Rush.POC

Creating a New Production Ensemble Configuration E...

INTERSYSTEMS Ensemble Configuration
Licensed to: Bill

[Ensemble] > [Productions]

Rush.POC

Business Services | Business Processes

EnsLib.File.InboundAdapter → HL7FileService → MsgRouter

Business Service: **EnsLib.HL7.Service.FileService**

Apply Cancel Copy Remove Change Class

General Settings

Name: HL7FileService

Comment: This is a default HL7 File Service.

Schedule:

Category:

Class: EnsLib.HL7.Service.FileService

Description: N/A

Enabled:

Foreground:

Log Trace Events:

Specific Settings

Adapter Class: EnsLib.File.InboundAdapter

Ack Target Config Names:

Framing: Flexible

Target Config Names: MsgRouter

Search Table Class: EnsLib.HL7.SearchTable

Local Facility Application: ISC:EnsembleHL7

Ack Mode: Never

Use Ack Commit Codes: True

Ensemble System Monitor - Windows Internet Explorer

https://localhost:57781/csp/ensdemo/CSPX.Portal.Monitor.cls?NAMESPACE=

Ensemble System Monitor

INTERSYSTEMS System Monitor
Licensed to: Bill
Server: khumbyX60
Instance: ENSEMBLE20081
User: SYSTEM

[Ensemble] > [System Monitor]

Last update: 2008-07-17 22:35:33.946
 Auto update

Current production: Demo.HL7.HsgRouter.Product

Details for selected item
Category: Business Service
Name: XYZ_HL7FileService

Event Log
Queue Contents

Input Connections		Output Connections	
Last Activity: 2008-07-17 22:34:45.539 Completed: 6			
XYZ_HL7FileService	ABC_HL7FileService	Admin_Helen	Admin_F
XYZ_HL7FileService	XYZ_HL7FileService22	Priority_FileOperation	ADT_A0
XYZ_HL7FileService222		ADT_A31_FileOperation	Admin_E
		Admin_Dons	BadMes
		Batch_FileOperation	Extra_O
		ORM_001_FileOperation	Other_F
		Regular_FileOperation	

Queues	
Total Queued Messages: 77	
Priority_FileOperation	73
Admin_richard	1
ADT_A08_FileOperation	0
ADT_A31_FileOperation	0
Admin_Bergsvend	0
Admin_Dons	0
Alarm	0
Batch_FileOperabon	0
Extra_Observatons	0
ORM_001_FileOperation	0
ScheduleHandler	0
XYZ_Router	0
Suspended Messages	0

Event Log	
Errors Since Last Start: 29 Last Error: 2008	
239: (18) FailureTimeout of 15 seconds exceeded	
238: FailureTimeout of 15 seconds exceeded in i	
237: FailureTimeout of 15 seconds exceeded in i	
236: (17) FailureTimeout of 15 seconds exceeded	
235: FailureTimeout of 15 seconds exceeded in i	
234: (16) Cannot open file 'C:\Practice\out\2235_Pri	
233: Cannot open file 'C:\Practice\out\2235_Pri	
232: Unable to open TCP/IP connection.	
231: (15) Unable to open TCP/IP connection.	
230: Unable to open TCP/IP connection.	

Visual Data Transformations



The screenshot shows the VDT tool interface with the following components:

- Source:** EnsLib.HL7.Message (Demo.HL7.MsgRouter.Schema:ADT_A01)
- Target:** EnsLib.HL7.Message (2.3.1:ADT_A01)
- Mapping:** Lines connect source elements to target elements. A pink box highlights the MSH element mapping.
- Code Editor:** Contains XSLT transformation code for mapping source to target.
- Inspector:** Shows details for the selected 'assign' step.

```
<?xml version="1.0" ?>
<transform targetClass='EnsLib.HL7.Message' targetDocType='2.3.1:ADT_A01' sourceClass='EnsLib.HL7.Message' sourceDocType='
<assign property='target.{MSH}' value='source.{MSH}' action='set'/>
<assign property='target.{MSH:9.1}' value='ADT' action='set'/>
<assign property='target.{MSH:9.2}' value='A01' action='set'/>
<assign property='target.{MSH:ReceivingApplication}' value='TEST' action='set'/>
<assign property='target.{EVN}' value='source.{EVN}' action='set'/>
<assign property='target.{PID}' value='source.{PID}' action='set'/>
<assign property='target.{PID:5.1}' value='NEWNAME' action='set'/>
```

Name	Value
Name	assign
Property	target.{MSH:9.2}
Value	"A01"
Action	set

The message structure of source and target is established based on their metadata

The mapping between source and target is defined by drawing line between elements

If source and target have identical groups of data, they can be mapped in one go

Beside simple mapping, transformations can apply many transformation functions, do lookups, delete values, use branching logic (if/then/else), do loops,...

Each step can be defined or modified using a convenient transformation "inspector"

Management Of Bus Traffic Made Possible By Unique Visual Message Trace



INTERSYSTEMS Ensemble Message Browser
 Licensed to: InterSystems Sales Engineering
 Server: beD610caudron
 Instance: ENSEMBLE20082
 User: _SYSTEM

[Ensemble] > [Messages] Namespace: ENSDEMO Go to:

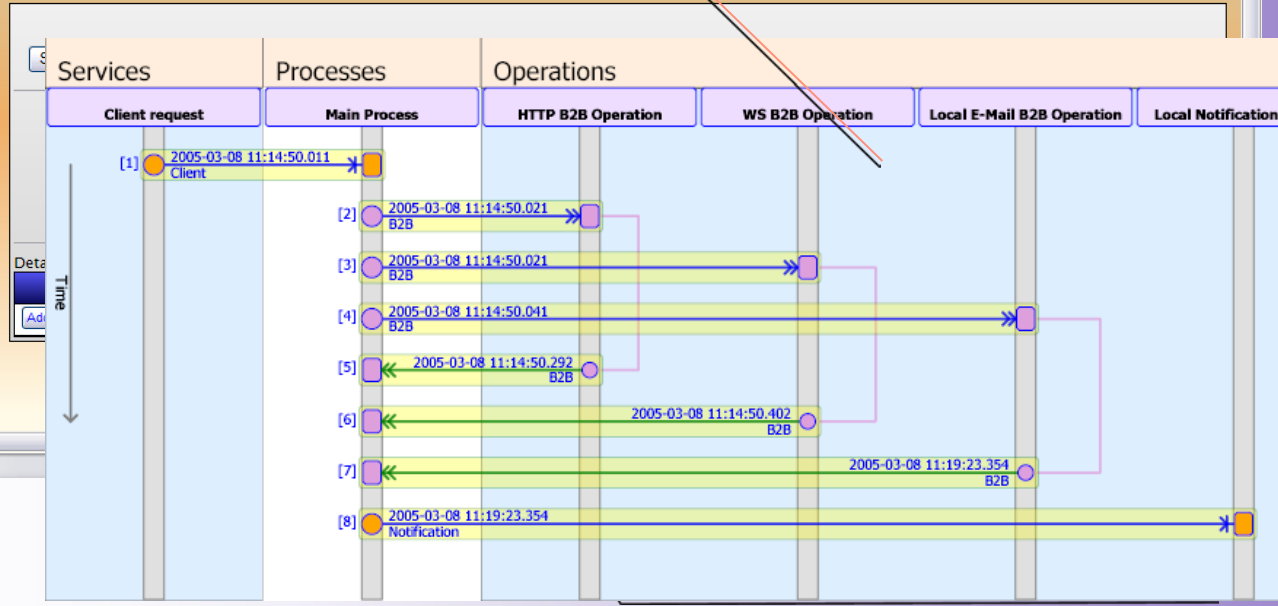
Compare Messages | Resend Messages

The following Message objects were found in the message store: Last update: 2008-10-12 14:32:24.927

#	ID	Time Created	Session	Status	Error	Source	Details	Contents	Trace	Report
1	49	16:18:01.706	49	Completed	OK	Ens.ScheduleService	Details	Contents	Trace	Report
2	48	17:20:15.020	48	Completed	OK	HL7FileService	Details	Contents	Trace	Report
3	47	17:20:00.004	47	Completed	OK	Ens.ScheduleService	Details	Contents	Trace	Report
4	46	17:19:37.223	46	Completed	OK	Ens.ScheduleService	Details	Contents	Trace <td Report	

Complete list of messages:
 All messages are persistently logged unless the system is configured otherwise. Purges can be manual or automated.

Process lifecycle view:
 Displays all interactions between business elements involved in the process. Uses a convenient UML sequence diagram notation



Visual Trace Legend - M...

Visual Trace Legend

- Synchronous request: Time Message Type
- Asynchronous request with response: Time Message Type
- Asynchronous request; no response: Time Message Type
- Synchronous response: Time Message Type
- Asynchronous response: Time Message Type
- Discarded response: Time Message Type

Highlights Of Web Services Support

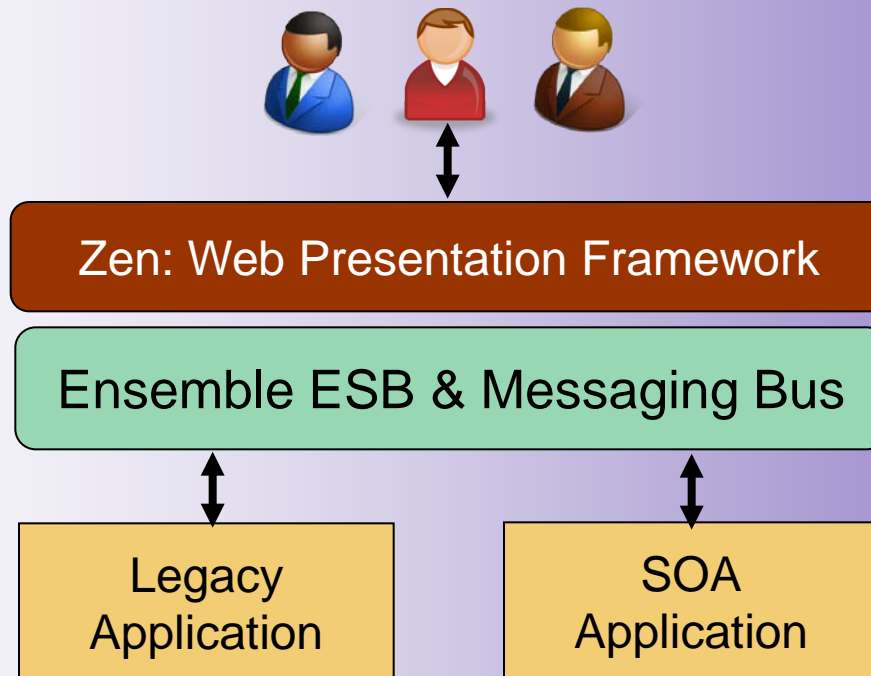


- Service creation and transport
 - SOAP creation wizard
 - SOAP 1.2, 1.1
 - Transport via HTTP 1.1, 1.0
 - MTOM (Message Transmission Optimization Mechanism) 1.0 – for attachments in SOAP messages
- Directories
 - WSDL 1.1 – generation, use
 - UDDI version 1.0 – client only
- Performance
 - Binary SOAP – performance enhancement for large messages
- Security
 - WS-Security 1.1 – XML encryption of SOAP messages
 - WS-Policy 1.5, 1.2

Now That Everything's A Service, Let's Build Composite Applications



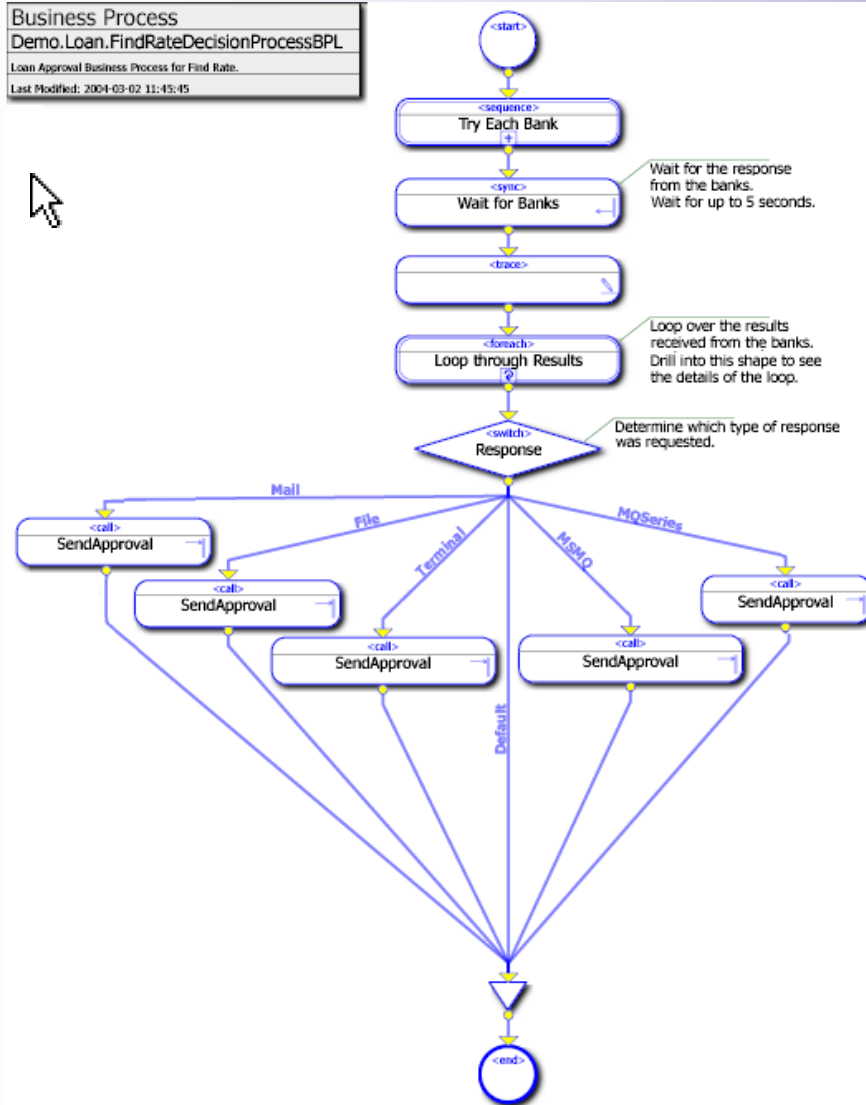
- Built-in web page authoring (CSP, ZEN)
- New face for applications, fills information gaps
- Rapid solutions for business units



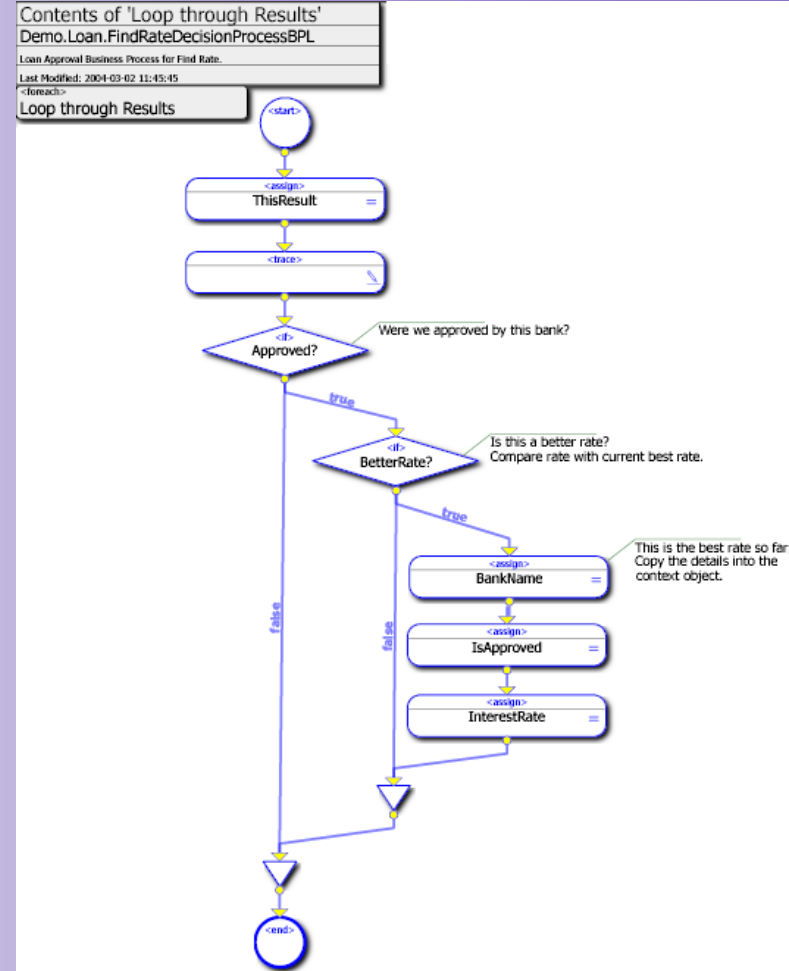
Orchestration Using InterSystems' BPL Editor



Business Process
 Demo.Loan.FindRateDecisionProcessBPL
 Loan Approval Business Process for Find Rate.
 Last Modified: 2004-03-02 11:45:45



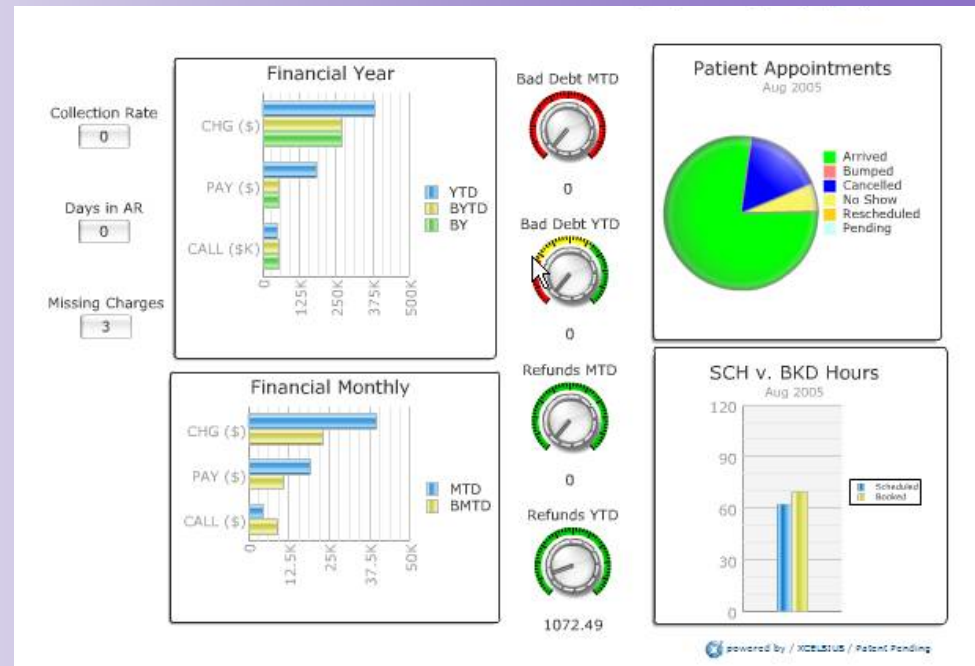
Contents of 'Loop through Results'
 Demo.Loan.FindRateDecisionProcessBPL
 Loan Approval Business Process for Find Rate.
 Last Modified: 2004-03-02 11:45:45
 <foreach>
 Loop through Results



Measurement & Governance Is Enabled Through Ensemble's Business Activity Monitoring Capability



- Display business metrics in dashboards
- Measurement of SOA
 - Development time
 - Reuse or cost of services, interfaces



Advanced SOA



- Event-driven architecture (EDA)
- Extreme transaction processing (XTP)
- Real-time BI
- Flow modeling/BPM
- Enterprise-wide SOA – SOA federations
- SaaS/Cloud
- More...

Reuse Policies Applied To HL7 Interfaces



- 7 hospitals, 2,200 beds
- Mostly HL7, but some X12, XML, WS
- Ensemble supports strategic drive to SOA/ESB
- Policies around reuse enable development of new HL7 interfaces in hours

“If we expect to perform an action more than 2-3 times, then we create it as a service and we add it to our service catalog.”

Kim Gordon, manager of integration solutions

Northgate Selects Ensemble For SOA Support, Rapid Development And ROI



northgate "Let's make change work"
PUBLIC SERVICES

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PUBLIC SERVICES

- Services
 - Transformation Services
 - Business Services
 - Document Services
 - Managed Services
 - Energy Efficiency
- Markets
 - Local Government
 - Social Housing
- Criminal Justice**
 - Operational Policing
 - Control Rooms
 - Roads Policing and Notice Enforcement
 - Justice Agencies

Home > Markets > Criminal Justice > Public Safety Event and Incident Management System

Event and Incident Management

Over the last year we have seen a number of events that have challenged emergency services, including some that they are not directly responsible for managing. There have been spontaneous events like avian flu, flooding and foot & mouth disease, as well as planned major sporting events. There have also been terrorist incidents around airports and the underground as well as other potential incidents that have been stopped due to excellent intelligence work and therefore never met the public eye.

All public service organisations require event and incident management in this changing and challenging environment.

Our Event and Incident Management System provides support to the Gold and Silver command functions set-up for critical or major incidents and together all the information required to assist the decision making process in a single consolidated view, and provides an audit log of all actions and decisions taken throughout the incident.

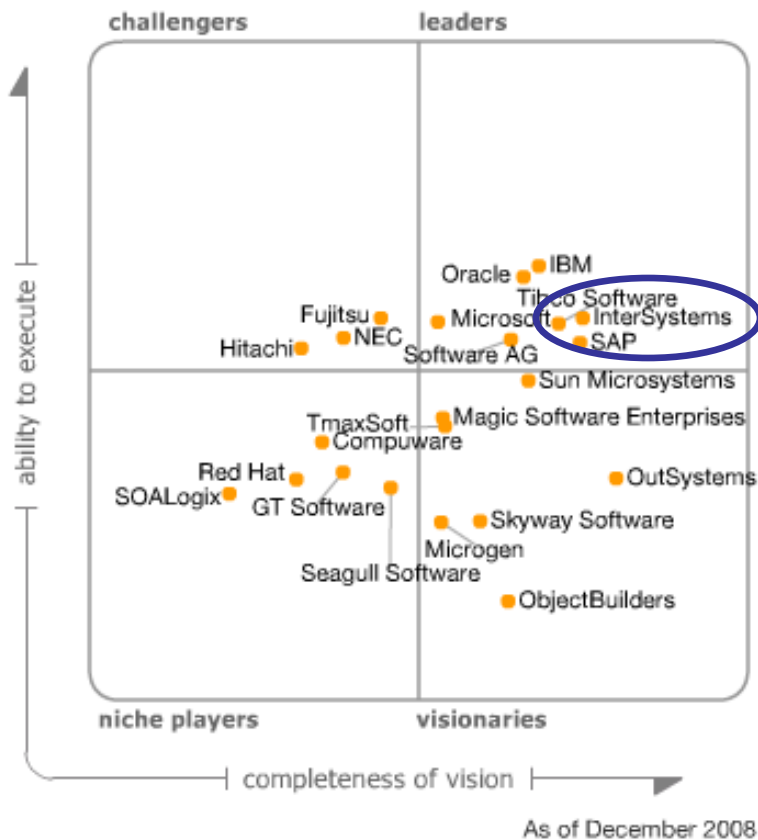
EIMS supports both pre-planned and unplanned events and incidents, providing you with a distribution mechanism for key information without constraining you by technology or overloading the officer receiving the information. Concise tailored content presented with the right information, at the right level, for the type of

- Integrated incident management (IIM) system
- Composite application
- Manages business processes (BPM)
- Extends life of legacy applications
- Ensemble's dashboards and ESB make Northgate strategic and unique

Ensemble Is Recognized As A Leading SOA Development Platform



InterSystems positioned in the Leaders Quadrant



“InterSystems has a leading position as an application infrastructure provider in the healthcare industry”

Gartner.

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Additional SOA Tools/Components That Enhance Ensemble



- Governance solutions
 - Sensedia
- Simulation tools - BPM
- Open source UDDI servers/repositories
 - openUDDI

Summary



- SOA is an approach – enabled by Ensemble
- A practical approach – build SOA incrementally with business justification
- Basic SOA enables reuse and agility
- Advanced SOA tends to optimize business processes
- Ensemble supports basic and advanced forms of SOA

Advanced software technologies for breakthrough applications



Ensemble and SOA

John Joseph, Director of Product Management
March 22, 2010

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