Using TOGAF at Kynetia

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Local Application
Local Application

- Developed for a Multinational Insurance Company
Package Diagram
Component and Deployment
Using TOGAF to Create Enterprise Application
Framework and Principles
Business Drivers

- A Global platform covering the activities worldwide:
  - USA & Canada
  - Europe & Middle East
  - Australia and Eastern Asia
  - ... and soon South America and Africa
Business Goals

- Bring Local Application to Global Platform
- Integrate Several Corporate Services
- Simplify Workflow
- Create Common Application Framework
- Reuse Business Entities
- Optimize Business Processes
- Remove Current Constraints (localization, connectivity, scalability, flexibility, etc.)
- Allow Customized Services for Minor/Local needs
Architecture Principles

- Global Platform Architecture principles:
  - Unique and centralized database for business entities
  - SOA Approach for Global Applications:
    - Service layer to access the data
    - Global applications for core business functions
    - Service bus to expose & access functionality
- Unify Front-end components by using:
  - Common presentation tier technologies (XSL/AJAX/Etc)
  - Portlets, single sign-on
Architecture Vision
Statement of Architecture Work

Scope and constraints

- Re-platform and Re-design work is required
- Data access through common services
- Legacy technology (i.e. EJB 1.1) to be updated/replaced
- Replace home-grown MVC by industry standard components
- Front-end to be updated with Global presentation services
- Full integration with Global services (Document Storage, Document Generation, Email Input / Output, etc.)
- Ensure capacity, availability and performance for Worldwide usage
- Construct Global Platform within 2 years
Statement of Architecture Work

- Refined statements of Business Principles, Business Goals and Strategic Drivers
  - Automate work, collect information and analyze data to improve business processes and client services
  - Globalize business solutions and maximize company’s capacity, rather than optimizing local performance
  - Strategic Driver: use corporate knowledge and capacity to increase services qualities and capacities
Architecture Vision

- Provide a single platform for 25,000+ users
- Single-Sign-On
- Single database, with exhaustive reporting and mining
- Improved Scalability, Extensibility & Performance
- Reuse scalable solutions, adapting to the Global Architecture and Services
- Minimize risks by reusing working components, and transform them into Global services
**Business Scenario**

- **Users:** Company employees, Clients and third parties
- **Business Case:**
  - The Client submits a Claim into the system
  - The workflow activates an alert to Insurance Company
  - The Insurance Company notifies a supplier to repair the damage
  - The company tracks the activity, manages and report the client to ensure the service quality
  - The company gathers information and provides a risk study to the client based on the claims submitted in the last 3 years
Business Architecture
Business Goals, Drivers

- **Business Goals**
  - Covering worldwide business requirements
  - Flexibility to integrate with all global services
  - Service all corporation employees plus external users as clients and third parties
  - Generate new services for clients on top of new platform
  - Unify Business Data: Policy, Claims, Reports, Clients, Users, etc.
  - Unify Deliverables: Reports, Forms, Documents.
  - Reuse information and media
  - Facilitate Corporate reporting and cross-country processes

- **Strategic Drivers**
  - Move forward into a SOA Platform instead of hundreds of local systems, reducing maintenance costs and giving a complete governance view
Organization Structure
Business Functions

1. USER MANAGEMENT
   1.1. Create User
   1.2. Assign Profile, Clients, Products, etc.
   1.3. Change Profile (Language, Data Format, Preferences)

2. CLAIMS MANAGEMENT
   2.1. Create Claim
   2.2. Validate Claim
   2.3. Modify Claim
   2.4. List Claims
   2.5. Close Claim

3. DOCUMENT MANAGEMENT
   3.1. Create Notification Document
   3.2. Store Attachment
   3.3. Search / List Documents

2.6. Notify Third Parties
2.7. Calculate Cost / Indemnization
2.8. Create Check
2.9. Relate Policies & Claims Coverages, Limits, etc.
Business Services

- Claims system must expose Services for:
  - Create, modify, retrieve and close claims
  - Get reports from claims data stored in the system
  - Notifications & Alerts interaction
  - Submit events for Claim Management Workflow
Business Processes

1. Create Incident
2. Fulfil Data
3. Validate Data
4. Submit Claim

Manage Claim

- Common Workflow
- Generate Notifications
- Close Claim

- Customized Workflow
- Generate Reports
## Gap Analysis

<table>
<thead>
<tr>
<th>Target Architecture → Current Architecture</th>
<th>Data Access based on Service Layer</th>
<th>Clustered supporting High availability</th>
<th>Front-end Integrated with corporate Framework</th>
<th>Business logic driven by standard BPEL Workflow</th>
<th>Eliminated services ↓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Access based on direct Database querying</td>
<td>Potential Match</td>
<td></td>
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<tr>
<td>Clustered supporting High availability</td>
<td>Included</td>
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<tr>
<td>Ad-hoc MVC &amp; JSP Generation</td>
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<tr>
<td>Ad-hoc Alert system</td>
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<tr>
<td>New</td>
<td>Gap to be procured</td>
<td>Gap to be procured</td>
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<tr>
<td></td>
<td>To be replaced</td>
<td>Gap in Target Architecture</td>
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</tbody>
</table>

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Potential Sources of Gaps

- People gaps
  - Training Required

- Process gaps
  - Forms Definition & Workflow Needs Improvements

- Information gaps
  - New Information Must be Captured
  - Processes and Sources Must be Validated

- Facilities gaps
  - Several New Facilities Required
Gap Analysis Results

- Front-end and Middleware must be refactored to meet target requirements
- Database access method should be modified
- Scalability and availability need to be improved
- Alerts & Notification system is not fully covered in target architecture
- Global solution does not contain an email / Fax alert engine
Technical Requirements

- SOA approach in Integration
- Use BPEL for defining Business Processes
- Re-engineer Solution to Match Target Platform
- Re-design System
- Provide Unified Front-end by Creating a Portal
Updated Business Requirements

- Form data capture functionality is reduced as the global service has restricted functionality
  - Local application allows data capture from dynamic forms, enabling an easy way to create Line of business and process the data fulfilled in the forms
  - Global application limits the flexibility of dynamic forms, so data capture functions are reduced
- Response time of system functions and services (i.e. Document Rendering or email alerts) will be increased due to Global Architecture complexity
Enterprise Architecture

1. Business Vision
   - Business Strategy & Objectives
   - Business Goals

2. Business Architecture
   - Policy Management
   - Claims Management
   - Doc. Management & Data importation
   - Reporting

3. IT Architecture
   - Development
   - Quality Assurance
   - Architecture
     - Security
     - Application
     - Integration
     - Services
     - Information
     - Data
     - NW.
     - NW. Security
     - Infrastructure
     - Apps
     - O.S.
Information System Architecture
Data Architecture

1. External Data Acquisition
   - Email / Fax Input Services
   - User File / Data Upload & Feeders
   - Legacy Systems (AS400, 360)

2. Data Preparation
   - Data Consistency Check
   - Format Adaptation
   - Constraints Appliance
   - ETL Processor

3. SOA Data Access Layer
   - Policy Entity Services
   - Claims Entity Services
   - User Entity Services
   - Other Entity Services

4. Transactional DB
   - Centralized Database
   - Store Procedures

5. Internal Data Usage
   - XML Request
   - XML Request
   - XML Request
   - Claims Creation / Modification / Listing
   - Policy Search / Details
   - Document Management

6. Data Services
   - Batch Jobs
   - 6.1. Reporting
     - Claims Reporting & Querying
   - 6.2. Data Mining
     - Emissary & Risk Management Research
     - Document Search
   - 6.3. Document Storage
     - Document Generation
Data Management Process Model

- New Processes to Manage Data:
  - Data Migration from Legacy Systems (previous Back Office systems & Local systems) to Common Database
  - ETL for exported Data. Data is exported from Local systems in different formats (i.e. FIX, XML, TAB) and then imported into new Common Database via ETL processes (SQL, Java or other platforms)
  - Documents and Events from email & fax will be processed though Common Services:
  - Main Entities (Policy, Claims, Clients, etc.) will be processed by dedicated Global Services
# Data entity / business function matrix

## Database Entities

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<tr>
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<th>DOCUMENT ENTITY</th>
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<td>FINANCIAL ENTITIES</td>
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Data Interoperability Requirements

- Claims data is required to be used by other applications/systems:
  - Financial Systems
  - Risk Management analyst tools
  - Coverage and Claims Report
  - Client Information Applications

- All applications should use:
  - Common Services for plain data
  - Reporting Services for BI
  - Claims Services for interactive functions
Key Stakeholder Concerns

- Addressing key stakeholder concerns:

- Data Architecture enables the Services for Application Architecture
Data Lifecycle View

- **Lifespan:**
  - Data lifecycle is determined by Business Requirements
  - Most of Entities must be stored and accessible for 10 years

- **Updation:**
  - Depends on final applications (i.e. Claims Management, Policy Renewal, Risk Management, etc)
  - Data is updated always via Web Service Layer
  - Frequency: for most entities update is daily during creation and renewal, which happens once a year

- **Archive / Deletion**
  - Old data will not be deleted: deletion shouldn’t happen
  - Archived data with 10 years or more: policy is not fully defined
Data Security View

- **Layers:**
  - Security at Application Level (i.e. JAAS at EJB or POJO elements)
  - Oracle realms / schemas security: different views for different access profiles
  - Service Layer security: possible application of Windows WSE

- **SOA:**
  - Services require authentication at connection level
  - Data access is authenticated using credentials
Data Management View

- Data is managed fully through the Service Layer, which interacts with a set of store procedures in Database:
  - Create and Update are driven by common services
  - Deletion is not allowed except for cleaning processes
- Reference:
  - Common services for structural information such as users and clients
  - These services provide referential ids to be used in the rest of entities
Gap Analysis Results

- Security: Services will require authentication, DAL should implement a validation mechanism
- Performance: To develop querying cache to avoid massive WS/XML process
- Extensibility: Services must be for common usage: custom functionality must be redesigned using common services
- Availability: Global platform must be clusterizable, using persistent middleware (i.e. MOM) and fault tolerance
Impact Analysis

- Business Architecture: Minor local functionality should be unified into the Global system and, consequently, for some cases will be removed.
- Application Architecture: Security requirements implies application changes and improvements to assign data access profiles.
- Technology Architecture: DAL technology changes from Dynamic SQL to SOA Approach using Web Services.
Applications Architecture

- Target
- Applications Architecture
Applications Architecture

- Validated Applications Principles:
  - Reduce Integration complexity
  - Maximize Data Usage and Performance
  - Avoid Data Duplication
  - Security and Simplicity (on Data Access)
  - Provide Corporate Governance
Applications Architecture

- Place System Models: Centralized Infrastructure
Applications Interoperability Requirements

- View of Applications Interoperability
  - Defines a service based interface for all systems
  - Specific Data Services provide entities data
  - Specific App. Services provide entities functionality
  - End Applications use previous services

- Low coupling between applications: Functionality & Data is built from common services
Applications Interoperability Requirements

- View of Applications Interoperability
  - Usage of Enterprise Bus for Service Access
  - In first phases, direct WS clients are allowed
Applications Architecture (contd.)

- Viewpoints addressing key stakeholder concerns:
  - Performance: System should perform as Real Time Web Application, but MOM Middleware for Enterprise bus is slow. Cache and dedicated Message Queues.
  - Security: Business Components should be deployed as secured application blocks. Usage of JAAS.
  - Governance and flexibility: Usage of BPEL / BPMN to design workflow between app. blocks.
  - Serviceability: SOA for middle, back and front ends.
Common Applications
Services View

- Services Exposed:
  - Presentation
    - Dynamic Forms
    - Ajax Support
    - Common Front
  - Data Services
    - Entity FindBy...
    - Listing
    - CRUD
  - Functionality
    - Workflow
    - Reporting
    - BI
    - Documents
    - I/O Comms

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Applications / Information View

Applications

2.2. SECURITY MANAGEMENT
2.3. CLAIMS
2.4. POLICY
2.5. REPORT
2.6. OTHER FUNCTIONS

Information Supplied

USER VALIDATION
USER PROFILE AND ACCESS RIGHTS
VALIDATES EVERY ACCESS TO FUNCTIONALITY / DATA

CLAIMS ENTITIES (INDIVIDUALS)
LISTING CLAIMS AND QUERYING
CRUD FOR CLAIMS

POLICY ENTITIES (INDIVIDUALS)
LISTING POLICY AND QUERYING
CRUD FOR POLICY

B.I. ON PREVIOUS ENTITIES
REPORTING ON USERS ACTIVITIES
REPORTING ON LINE OF BUSINESS DATA

DOCUMENTS IN THE SYSTEM
WORKFLOW STATUS: TASKS AND PLANNING
FINANCIAL INFORMATION, ETC.
Applications / User Location View

- Local Applications User Location View
Applications / User Location View

- Target Application User Location View
Gap analysis results

- Application blocks should be adapted into a security framework (JAAS, ITIM, etc.)
- Original workflow (ad-hoc, stored in database) must be replaced by Commercial Workflow Engine, based on BPEL for further customization
- Performance and scalability must be addressed by implementing MOM and redundancy
Applications Architecture (contd.)

- Impact Analysis
  - Business Architecture: Usage of BPEL Choreographer limits the functionality. Customized functions at business lines workflow requires now specific development at Workflow Engine
  - Data Architecture: No impacts, as Database Access Layer abstracts the applications details
  - Technology Architecture: Considering Commercial Software for applications architecture impacts on technology to use and general implementation
Information Architecture

1. Policy Management
   - Policy
   - Limits
   - Segment / LoB
   - Coverages
   - Premiums

2. Claims Management
   - Claim
   - Situations
   - Payments
   - Reinsurance
   - Tasking / Workflow

3. Security Items
   - Roles
   - Granted Lists
   - User Profile

4. Reporting & Documents
   - Templates
   - Rendered Document
   - Document Repository

5. Shared Items
   - People
   - Clients
   - Users
Baseline

Technology Architecture Version 0.1:

Technology Architecture – Constraints
- Local Application platform is not compliant with Corporate platform (App Server, Database, Java Technologies ...)
- Local Database Access and Structure must be replaced
- Scalability: Local capacity is far below desired capacity
- Serviceability: Application must expose services
- Security: Data and Functionality access to be secured
- Application must be integrated with Global Services
Baseline

- Technology Architecture Version 0.1:
  - Deployment / Packages

![Diagram of Technology Architecture Version 0.1: Deployment / Packages]
Baseline

- Technology Architecture Version 0.1:
Viewpoints

- Technology Architecture Version 0.2
  - Networked Computing/Hardware View
Viewpoints

- Technology Architecture Version 0.2
- Processing View

Diagram showing the interactions between Legacy Systems, ETL Applications, Front Applications, Common Services, Global Data Access Services, Global Database, and their respective data flows and functionalities.
Viewpoints

- Technology Architecture Version 0.2
- Cost View

**Diagram:**
- **Construction:**
  - Re-Architecture
  - Integration
  - Rollout
  - Documentation
- **Configuration:**
  - Add forms & insurance products
  - Customize reports
  - Create documents
- **Maintenance:**
  - Production support
  - Hardware/software maintenance

**Keys:**
- Light green: Cost finance by corporate (+50%)
- Pink: Cost finance by countries using the system (users)
Viewpoints

- Technology Architecture Version 0.2
  - Standards View: Central Servers:
    - Unified Platform based on J2EE / Oracle / XML
    - Low coupling between applications
    - High redundancy and availability
    - Easy monitoring & maintenance
  - Standards View: Local Clients (Countries):
    - RIA Approaches, based on Web systems
    - Low response time
    - No client side component to be deployed (W32)
Business goals and objectives

- Technology Architecture Version 0.5
  - Technology Architecture - Requirements Traceability
    - Claims accessible and unified
    - Able to generate reports and documents
    - Dynamic definition of insurance products
    - Complete functionality not available
      - Unified products for Policy & Other Insurance products
      - Advanced reporting
Criteria for specification selection

- Technology Architecture Version 0.6
  - Technology Architecture - Requirements Traceability
    - Client side: Performance is downgraded due to Service invocation and response times
    - Server side: Ad-hoc solutions are not 100% compliant with corporate technical standards
Gap analysis

- Technology Architecture Version 1

- Technology Architecture - gap report
  - Some services are still to be integrated in Claims system
  - Existing Functionality GAP will require modifications on current version
  - Overall Performance to be revised after integrating with Common Services (Web Service overhead and XML process)
  - Extensibility to be tested and probably improved
Infrastructure Architecture

1. Client
   - AJAX Libraries
   - XSL Libraries
   - Javascript Runtime
   - Email Client
   - Thin Client Browser
   - PDF Reader
   - File Storage System

2. Application
   - Web Services
   - Security Roles
   - Applications Deployed
   - Components Deployed
   - JEE Environment
   - Configuration
   - Common Services: JMS, JDBC, JNDI
   - Packages JAR, WAR, EAR
   - Network Services
   - SMTP Proxy
   - Remote File Proxy

3. Server
   - JEE Environment
   - MQ Queues
   - Message Factories
   - MQ Config
   - MQ Environ.
   - JAAS
   - JMS Connector
   - JDBC Conn. Pool
   - JCA
   - JDBC Conn
   - JMS Mess

4. Operations
   - Config
   - DDL / DML
   - Stored Proced.
   - Optimizer
   - Access Roles
   - Oracle Env.
   - Balanced IP
   - Virtual Environments
   - NAS F.S.
   - Configuration
   - Tivoli Framework
   - Operating System
   - Clustering, Mirroring
Infrastructure Architecture – Network
Security Architecture

1. Internet
   - Public Web Applications
   - Public Portals
   - HTTPS / VPN Access
   - User Validation (AD / LDAP)
   - FIREWALL

2. Intranet
   - Identification Management
   - Authentication Management
   - Profile Based Access Control
   - Applications
   - Services
   - Tivoli Identification Manager
   - Tivoli Authentication Manager
   - User Profiling Manager
   - Oracle DBMS
   - Tivoli Config. & Admin

3. Security Policies
   - Access Request Process
   - Quality Requirements
   - Configuration Management

4. Security Management
   - Access / Profiling Requests
   - Security Committee
   - Security Services Support Team
   - Certification
   - Deployment
Service Architecture

1. Messaging Security

2. JASS Security

3. Asynchronous Messaging

4. Policies

Privileged Credentials
Role based
Token based

Public Credentials
Public Services & Domains

Trusted Applications

Authentication Service

Token Request

Application

Authorization Services (TAM)

Secure Service

MDE.JB

Token Verifier

Service

Message Queue

RMI/IIOP Transport

Web Services Access Policy

Authorization Services (TAM)

JAAS

Spring Framework

Service Consumer

Session Token

Browser
Active Dir.

HTTP Session
Identification

Service API

Token Verifier

Secured Service Implementation

Service Box

Application Box

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Opportunities and Solutions
Outputs

- Opportunities
  - Share business information between countries, to improve performance and costs
  - Global Platform allows to create tons of reports, analysis, statistics and extract information from business activities:
    - New Information services
    - Improvement helped by Data Mining
    - B2B opportunities
**Outputs**

- High-level implementation plan
Outputs

- Impact Analysis - Project list
  - This Project impacts on every Global Operations
    - Corporate services
    - Local services
    - Authentication services
    - Document & Data Storage
  - Requires synchronization with current Local Version
  - Data Migration impacts all legacy systems
Steps

- Prioritize projects
- Estimate resource requirements and availability
- Perform cost / benefit assessment of the various migration projects
- Perform risk assessment
- Generate implementation roadmap (time-lined)
- Document the Migration Plan
Prioritize projects
Resource Requirements and Availability

CASE STUDY PROJECT RESOURCES

- 10 TECHNICAL RESOURCES 100%
- 3 QUALITY ASSURANCE RESOURCES 100%
- 1 MANAGEMENT RESOURCE 100%
- 6 TECHNICAL RESOURCES 100%
- 2 QA RESOURCES 100%
- 1 MANAGEMENT RESOURCE 100%

Timeline:
- 01/01/2006: Analysis
- 01/07/2006: Replatform
- 01/10/2006: Migration
- 01/01/2007: Integration
- 01/06/2007: Implementation
- 01/01/2008: Rollout
Cost/Benefit Assessment

- Investment per country is returned in 2 years (average) due to efficiency improvement.
- Common cost for global infrastructure is returned in 5 years:
  - Provides reduction of maintenance & infrastructure cost (IT systems reduced in more than 50%).
  - Increases new business opportunities (global data and potential cross-country services).
Risk Assessment

- Main risk to cover is the feasibility and efficiency of global platform:
  - Delivery dates could be delayed. Financial impact
  - Technical solution can’t satisfy business requirements (performance, reliability, etc). Time and Financial impact, due re-work on solution
- Under extreme circumstances, the previous systems can provide service to business needs (No operational risks)
- Iterative deployments & validations are required to minimize previous risks
Implementation Roadmap

CASE-STUDY PROJECT

01/01/2006 ANALYSIS
01/07/2006 REPLATFORM
01/10/2006 MIGRATION
01/01/2007 INTEGRATION
01/06/2007 IMPLEMENTATION
02/06/2007 - 01/01/2008 COUNTRY IMPLEMENTATION
01/01/2008 ROLLOUT

01/01/2006
01/04/2006
01/07/2005
01/10/2006
01/01/2007
01/04/2007
01/07/2007
01/10/2007
01/01/2008

20/01/2006 LOCAL VERSION
11/09/2006 VERSION 0.1 REPLATFORMED
10/12/2006 VERSION 0.2 MIGRATED
08/03/2007 VERSION 0.4 INTEGRATION 2
13/06/2007 VERSION 1.0 INTEGRATION X
19/04/2007 VERSION 0.5 INTEGRATION 3
19/12/2007 GLOBAL VERSION
Migration Plan

- Analyse Project Approach
- Replatform Local System (Corporate IT policies)
- Migrate Database, from Local to Global
- Iterative Integration Project
  - Migrate Local Database access to Global Services client
  - Load Data and Test Iterations
- Configure Country based data & Requirements
- Deploy Version