Aligning the TOGAF ADM with Sasol’s project methodology: A case study

Gerhard Botha
05 June 2008
Agenda

- Introduction to Sasol
- Introduction to EA in Sasol
- The Sasol Project Methodology
- Projects & TOGAF ADM
- Template Overview
- Prerequisites for Templates
- Summary
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- Conclusion
Sasol’s Value Chain

- Open market purchases
- Crude Oil
- FT Technology (LT or HT)
- Fuel Components
- Co-products
- Refining and Blending
- Chemical Technologies (own or licensed)
- Chemical Feedstock
- Marketing
- Wholesale
- Commercial
- Consumer

- E&P of Feedstock
  - Coal
  - Gas
  - Oil
- Biomass
- Third Party Producer
- New energy sources
- Bio-diesel
- Fuel cells
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The Architecture Framework

Business Strategy

Business Processes

Information

Applications

Infrastructure

IT Resources Deployed

We lead the enterprise to continuously unlock inconceivable value through pro-active Exceptional Alignment of strategy, business processes and the underlying IT.
EA & Project Involvement

Project Execution

EA CoE
(Strategy, Roadmaps, Domain Architecture)

Consulting

Energy Cluster

Consulting

Chemical Cluster

Consulting

Group IM
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- Introduction to Sasol
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## Sasol BD&I

### Business Definition

**Idea Generation**
- **Pre-feasibility**
  - Strategic alignment
    - Opportunity scanning
    - Brainstorming
    - R&D Stage Gate Model
    - Business enquiries
  - Idea Packaging
    - Identify & assess opportunity
    - Assess business alternatives, uncertainties & risks
    - Company Strategy Alignment
    - Accuracy ± 60%
    - Identify products

**Front End Loading**
- Feasibility
  - Business Planning
  - Facility Planning
  - Develop & select best alternatives
  - Select Technology
  - Execution & Design philosophies
  - Develop Business opportunity
  - Accuracy ± 30%
  - Product development & specification

**Basic Development**
- Project Planning
  - Optimised & fully defined scope
  - Authority Engineering & Execution Plan
  - Accuracy (± 10% to ± 20%) depending on contracting strategy
  - Product acceptance by market

**Focus**
- Business Establishment
  - Provide assets according to Business Plan
  - Implement with minimum changes
  - Facility & business systems ready for start-up
  - Owner quality assurance
  - Product quality assurance systems in place

**Operate Business**
- Safe start-up of the assets and business systems
- End-of-job documentation
- Steady operation
- In specification product
- SBU acceptance

**Continuous Improvement**
- Evaluation to ensure project meets objectives
- Performance test
- Start business support
- Post project audit
- Product accepted in market

### Track Deliverables

- **Business/Operations**
  - Business Case
  - Final Business Plan
  - The Business
  - The Business

- **Engineering/Technical**
  - Preliminary Eng. Proposals
  - Conceptual Eng. Proposal
  - Basic Eng. Package
  - Technical Integrity
  - Start-up Assistance

- **Project Management**
  - Project Execution Assessment
  - Project Execution Philosophy
  - Project Execution Plan
  - Project as per Execution Plan
  - Project Close-out & Review Report

- **Sponsor**
  - Feasibility Charter
  - Basic Development Charter
  - Project Charter
  - Governance

### Probability of Business Development proceeding

- 30%
- 50%
- 70%
- 95%
- 100%

### Criteria
- Strategy fit
- Continue /
- Right business opportunity?
- Right business solution?
- Project authorisation
- RFD
- Approve start-up
- Beneficial operation
- All objectives met
- Business management

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Optimise operation, maintenance & products
- Product Quality assurance
- Legal & governance compliance
- Opportunity identification
- Technology support
- Technical support
- Asset management
- End-user support
EA in the Sasol BD&I

Project Team

Sasol Enterprise Architecture Team
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TOGAF ADM

- Prelim: Framework and Principles
- Architecture Vision
- Architecture Change Management
- Implementation Governance
- Migration Planning
- Requirements Management

Source: The Open Group Architecture Framework v8.1
Source: The Open Group Architecture Framework v8.1
Templates & ADM

Source: The Open Group Architecture Framework v8.1
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TOGAF Aligned Templates

Conceptual Design Statement

Stakeholders

Business Architecture
- Business Architecture Principles
- As-Is Business Architecture (If Appropriate)
- To-Be Business Architecture v2

Information Architecture
- Information Architecture Principles
- As-Is Information Architecture (If Appropriate)
- To-Be Information Architecture v2

Application Architecture
- Application Architecture Principles
- As-Is Application Environment
- To-Be Applications Architecture

Technology Architecture
- Technology Architecture Principles
- As-Is Technology Architecture
- To-Be Technology Architecture

Gap Analysis
Solution Evaluation
Solution Components & Cost Estimates
Quality Management & Version Control
## TOGAF Aligned Templates

**Requirement ID** | **Requirement** | **Requirement Type** *(Mandatory, Key, Optional)* | **Requirement Weight** *(1 - 10)* *(Key and Optional)* | **Addressed in Document** | **Document Section**  
--- | --- | --- | --- | --- | ---  
R001 |  |  | 1 - 10 |  | 

![Diagram](image.png)
3 Business Architecture

3.1 Business Architecture Principles

*Purpose:* To list the business architecture principles that will guide the design of the business architecture.

*Action Item:* List the business architecture and related sub-domain principles that will guide the design of the business architecture.

*Reference:* TOGAF – Section 5.4, Steps, point 3, page 38

TOGAF – Section 29.5, Applying Architecture Principles, page 260 - 261
SIM-STD-15 – Sasol Governing Principles of EA
SIM-STD-30 – Enterprise Architecture Domain Principles
Technology Sub-Domain Architects and Responsible Forums

*Notes:* Take great care in selecting the principles from both SIM-STD documents, as these principles will be used to design the solution. Use the Technology Sub Domain Architects document to determine which sub-domain principles to place under which architecture.

The following business architecture and sub-domain principles are applicable to the design:

<Principle number>:  <Principle>
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Domains & Sub-Domains

Business Architecture
- Business Process

Information Architecture
- Information Security
- Enterprise Content Management
- Business Intelligence

Application Architecture
- Software Engineering
- Collaboration
- Industrial IT
- Enterprise Resource Planning
- Manufacturing Execution Systems

Technology Architecture
- Platform
- Operating Systems
- Connectivity
- Communications
PRINCIPLES OF ENTERPRISE ARCHITECTURE (PEAs)

The following generic principles govern all domains of EA:

PEA1: Business requirements define architecture solutions
PEA2: Technology creates business opportunities
PEA3: Minimise architecture complexity
PEA4: Reuse before buying before building
PEA5: Holistic integration of all architecture domains
PEA6: Unified management of architecture

PEA1: Business requirements define architecture solutions

Rationale:
- Sasol is a fuel and chemical business. EA within Sasol exists to support the Sasol business strategy

Implications:
- EA should be optimized to provide the greatest benefit to Sasol as a whole and must be aligned with Sasol business strategy
- Architecture should be optimised for total return on investment and not just for application delivery, operations or support
- Architecture solutions must reflect the business model and risk
Domain Architecture

Enterprise Architecture
Body of Knowledge

Enterprise Architecture Principles

Domain Architecture Principles

Sub-Domain Architecture Principles

International Standards

Product Standards

BUSINESS ARCHITECTURE PRINCIPLES (BAPs)

INFORMATION ARCHITECTURE PRINCIPLES (IAPs)

APPLICATION ARCHITECTURE PRINCIPLES (AAPs)

INFRASTRUCTURE ARCHITECTURE PRINCIPLES (TAPs)

TAP1: Consolidate and optimise infrastructure as far as possible
Rationale:
- Reduction in support cost
- Improved efficiency

TAP2: Standardize on currently used, best practice technologies, aligned with enterprise requirements

TAP3: Design for optimum maintenance levels over the life cycle of the hardware

TAP4: Evaluate emerging and unexplored technologies

TAP5: Compliance to governance

TAP6: Synchronize hardware replacement with application lifecycles

TAP7: Valuable information should be classified, accurate, complete, relevant, and current
Rationale:
- Security and privacy
- Reliability and accuracy
- Usability and accessibility

IAP1: Align with industry best practices
IAP2: Ensure that the system is scalable and maintainable
IAP3: Implement a robust disaster recovery plan
IAP4: Optimize the system for performance and efficiency
IAP5: Ensure data integrity and security
IAP6: Implement a comprehensive maintenance plan
IAP7: Ensure the system is cost-effective
Domain Architecture

Enterprise Architecture
Body of Knowledge

Enterprise Architecture Principles

Domain Architecture Principles

Sub-Domain Architecture Principles

International Standards

Product Standards

Information Security Sub-domain principles

<table>
<thead>
<tr>
<th>Principle:</th>
<th>Sasol’s Data will be protected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationale:</td>
<td>Data is an asset that has value to the enterprise and must be protected accordingly. It is a valuable corporate resource which contains the Intellectual Property of Sasol. In simple terms, the purpose of data is to aid decision-making. Accurate, timely data is critical to accurate, timely decisions. Corporate assets are carefully managed, and data is no exception.</td>
</tr>
<tr>
<td>Implications:</td>
<td>While protection of IP assets is everybody’s business, much of the actual protection is implemented in the IT domain. Even trust in non-IT processes can be managed by IT processes (email, mandatory notes, etc.). A security policy, governing human and IT/IM resources, will be required that can substantially improve protection of IP. This must be capable of both avoiding compromises and reducing liabilities.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Principle:</th>
<th>Security will be Designed into environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationale:</td>
<td>Security should not be an after thought or add-on. Security considerations should begin with the requirements phase of development and be treated as an integral part of the overall system design. Security is not optional.</td>
</tr>
<tr>
<td>Implications:</td>
<td>Projects to consider to what extent and how requirements management will be done in line the nature and scope of the project.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Principle:</th>
<th>Reduce Risk to acceptable level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationale:</td>
<td>Risk and security counter-measures should be balanced according to business objectives. Identify potential trade-offs between reducing risk and increasing cost, including negative impacts on other aspects of operational effectiveness, if any.</td>
</tr>
<tr>
<td>•</td>
<td>Reduce risk to an acceptable level.</td>
</tr>
</tbody>
</table>
Domain Architecture

Enterprise Architecture Body of Knowledge

- Enterprise Architecture Principles
- Domain Architecture Principles
- Sub-Domain Architecture Principles
- International Standards
- Product Standards

3.6 Platform Product Standards

<table>
<thead>
<tr>
<th>Technology Group</th>
<th>Technology Functions</th>
<th>Applicable Standards/ Products</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servers</td>
<td>Large rack mounted (&gt;4 CPU)</td>
<td>IBM x3950 M2, HP rx8640, HP Superdome</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Medium rack mounted (4 CPU)</td>
<td>HP DL580 G4, IBM x3850 M2, Dell 6850</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Small rack mounted (2 CPU)</td>
<td>HP DL380 G4, IBM x3650 M2, Dell 1950</td>
<td>M</td>
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<tr>
<td></td>
<td>Blade Servers</td>
<td>HP BL10 Blade, IBM HS21 Blade, Dell 1955 Blade</td>
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<td></td>
<td>Blade Chassis</td>
<td>IBM Blade Centre H, HP C-Chassis</td>
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<tr>
<td></td>
<td>Small towers</td>
<td>HP ML350 G3, IBM x236</td>
<td>M</td>
</tr>
<tr>
<td>Desktop/ Client Workstations</td>
<td>Large Desktop</td>
<td>HP DC7800, HP DC7700, Dell GX620</td>
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<tr>
<td></td>
<td>Medium Desktop</td>
<td>HP DC5000, Dell GX520</td>
<td>M</td>
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<tr>
<td></td>
<td>Small Workstations</td>
<td>Dell Precision 390</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Large Workstations</td>
<td>Dell Precision 690</td>
<td>M</td>
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</table>
# Solution Building Blocks

## Platform

<table>
<thead>
<tr>
<th>Backup Devices</th>
<th>Desktops</th>
<th>Mobile Devices</th>
<th>Peripheral Hardware</th>
<th>Servers</th>
<th>Storage Area Networks</th>
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<tbody>
<tr>
<td>Archiving</td>
<td>Large Desktop</td>
<td>Large Notebook</td>
<td>Black &amp; White Printer</td>
<td>Blade Servers</td>
<td>Blade Server Chassis Switch</td>
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<td>IBM DR550</td>
<td>HP DC7700</td>
<td>Dell D620</td>
<td>Networked</td>
<td>HP BL10</td>
<td>Brocade 4Gb/s</td>
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<td>HP RIS3</td>
<td>Dell GX620</td>
<td>HP NW8440</td>
<td>Colour Printer</td>
<td>IBM HS21</td>
<td>Host Bus Adapters</td>
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<td>Backup Drives</td>
<td>Large Workstation</td>
<td>Large PDA</td>
<td>Networked</td>
<td>Dell 1995</td>
<td>Emulex 4Gb/s</td>
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<td>IBM 3592</td>
<td>Dell 690</td>
<td>HP IPAQ hx2700</td>
<td>Controlroom Monitor</td>
<td>IBM x3950</td>
<td>Qlogic 4Gb/s</td>
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<td>HP 3646</td>
<td>Dell DC5000</td>
<td>Dell D620</td>
<td>Large Rack Mounted</td>
<td>HP rx 8640</td>
<td>Switch Blades</td>
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<td>Backup-to-Disk</td>
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<td>Dell NC6440</td>
<td>HP L2106</td>
<td>HP Superdome</td>
<td>Brocade 4Gb/s</td>
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<td>HP DCX520</td>
<td>PDA Phones</td>
<td>Flash Drives</td>
<td>Brocade 4Gb/s</td>
<td>Brocade M48</td>
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<td>HP VLS</td>
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<td>USB 2.0</td>
<td>Switches</td>
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<td>Storage Devices</td>
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### Legend
- **Emerging**
- **Mainstream**
- **Retirement**
- **Tolerated**
- **No Specific Standard**
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Role of An Architect in Projects

- **Enterprise Architecture Principles**
- **Domain Architectures**
- **Consult & Advise**
- **Project Scope**
- **Solution Architecture**
- **As-Built Architecture**