Delivering Enterprise Architecture with TOGAF® and ArchiMate®

Enterprise Architecture using open standards

Harmen van den Berg, BiZZdesign

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BiZZdesign in one slide...

**Tools**
- Design tools for EA and BPM
- Monitoring tools for Governance
- Publication via InSite Portal

**Consultancy**
- Architecture, Business and IT
- Project Management
- Design / modeling

**Best practices**
- ArchiMate®
- TOGAF™
- Reference models

**Training**
- Foundation
- Practitioner
- Certification
- Accredited by The Open Group

**BiZZdesign now in Leaders Quadrant of Gartner MQ EA Tools!**

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Let’s get to know each other!

Raise your hand:

- Who is TOGAF9 certified?
- Who is TOGAF8 certified?
- Who has ever attended a TOGAF training course?
- Who is using ArchiMate?
- Who has heard of ArchiMate before this seminar?
- Who is a business or IT architect?
- Who just discovered he or she is in the wrong room?....
What are we talking about?

Archimate
TOGAF
Architecture

Created with Wordle.net
Proposed schedule

- Introduction
- Enterprise Architecture
- ArchiMate
  - Core language
  - Extensions
- TOGAF
  - ADM
- TOGAF and ArchiMate
  - Case example
- Conclusions
Building strong organizations

Enterprise Architecture

Remco Koolhaas - Seattle Public Library

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Why Enterprise Architecture?

- Managing change and complexity:
  - Aligning business and IT
  - Outsourcing
  - Impact analysis
  - Project support (project start architectures)
  - Portfolio management
  - Communication with stakeholders
  - ...

- Obtaining insight in current situation (as-is)

TOGAF is an instrument for producing and using Enterprise Architecture

Flickr by neil nathanson

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What is Enterprise Architecture?

- A discipline, with the objective of steering changes

- A product
  - A design that shows the coherence between products, processes, organisation, information supply and infrastructure, based on a vision and certain explicit starting points, principles and preferences

- A process
  - Way of working
  - Aimed at the development and use of enterprise architectures within an enterprise
  - With people and resources
Ingredients of an EA Approach

TOGAF

ArchiMate

Process

Viewpoints

Language

Enterprise Continuum, Repository, Reference Models

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How to cook an egg?

Number of steps
Way of describing
Start of process
End of process
Eieren
Je kunt alle soorten eieren koken. Hele eieren zet je op met koud water. Als de temperatuur te sterk wisselt, kunnen de eierschalen barsten. Je kunt azijn en zout aan het kookwater toevoegen om het uitlopen van eiwit tegen te gaan. De kooktijd is afhankelijk van de gewenste gaarheid. De gehele eier of het ei beter kunt pellen?

Zachtgekoekte en hardgekoekte eieren
Een ei koken, precies zoals u het heeft gekozen.

Bereiding
Om te voorkomen dat eieren tijdens het koken in een pannetje met koude water te koelen, houdt de kooktijd in acht. Zachtgekoekt eitje, 5 à 6 minuut hardgekoekt eitje. Dompel het ei na de kooktijd in ijskoude water.

Wijzigingen
- Omdat de dooier en het ei dan het geel, zoals in het centrum, kan je eieren ook zachtgekookt of hardgekookt koken.
- Door het ei na de kooktijd in ijskoude water te dompelen, kan je eieren ook zachtgekookt of hardgekookt koken.

How to boil and egg

Choose eggs based on the desired result. Fresh eggs are more prone to cracking because they have a low pH in the white, causing it to adhere to the inner shell membrane. Essentially "sealing" it together. But this also makes fresh eggs more difficult to peel. Eggs which have been refrigerated for several days have higher pH and are more likely to crack, but they're easier to peel. Instead of boiling fresh eggs to get old, you can add a teaspoon of baking soda to a quart of water when cooking (which raises the pH and reduces adhesion) but it might make the eggs taste a little more and allow the white to firm up in fridge for eggs in half, you might want to use these for a more centered yolk and less likelihood of

Ghee Pure Vegetable Cooking Vanaspati

Sources recommend making a shallow hole with a knife in the yolk for easier peeling. Adding salt will make the eggs more tender and the proteins in the white coagulate faster so any

Put the eggs in the water and be able to monitor the temperature, the general consensus among most trainers to a boil, and remove from heat as soon as the water remains at slightly below boiling, you risk overcooking the eggs, which is
Why one process and language?

- Communication
- No ambiguity
- Coherence
- Consistency
- Visualization
- Analysis
- …
Building strong organizations

ArchiMate®

The open standard for modeling enterprise architecture

ARCHIMATE®

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Do you recognize this?
The ArchiMate Language

ArchiMate language

- High-level modelling within a domain
- Modelling relations between domains
- Relate to standards

Basis for visualisations
Basis for analyses
Archimate

- A *language* for describing architectures
- Covers business, application and technology layers
  - With relations between these layers
- Graphical language with formal semantics, enabling analysis and tool support
- Techniques for *visualization* and *analysis*, aimed at various stakeholders
- Open standard maintained by The Open Group
- See [www.opengroup.org/archimate](http://www.opengroup.org/archimate) or [www.archimate.org](http://www.archimate.org)
Layers, Aspects, and Domains

- **Environment**
  - Business
    - Product domain
      - Information domain
    - Process domain
    - Organization domain
  - Application
    - Data domain
    - Application domain
  - Technology
    - Technical infrastructure domain

**Passive**
- “object”

**Behaviour**
- “verb”

**Active**
- “subject”

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ArchiMate Core Summary

- Business
  - Business object
  - Business process
  - Business interface
  - Business role
  - Business actor

- Application
  - Data object
  - Application function
  - Application service
  - Application interface
  - Application component

- Technology
  - Artifact
  - System software
  - Infrastructure service
  - Infrastructure interface
  - Device
  - Network

Information | Behaviour | Structure
ArchiMate core and extensions

- ArchiMate ‘core’ (= ArchiMate 1.0)
  - Business
  - Applications
  - Technology
- Two extensions in ArchiMate 2.0
  - Implementation & migration extension
    - Programs and projects
    - Periods
  - Motivation extension
    - Stakeholders, concerns and goals
    - Principles
    - Requirements
Some examples of the ArchiMate language for “educational purposes”

Examples created using BiZZdesign Architect

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Products and services

Contract

Product

Value

Role

Insurance Policy

Damage insurance

Being insured

Customer

Policy mutation Service

Payment Service

Policy Service

Premium Service

Declaration Service

Business services

Aggregation

Association
Processes and roles

Event
- Damage notification
- Accept and Register claim
- Assess claim
- Pay claim
- :-) customer

Process
- Administrative employee
- Taxateur
- Employee Finance
- Specialist Car damage

Role

Triggering Assignment

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Business functions

Composition (by nesting)

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Business objects

Aggregation
Specialization
Realization

Business object

Representation
Applications and application services

Accept and Register claim

Assess claim

Register Service

Acceptation Service

Assessment service

Registration system

Acceptation system

Assessment system

Customer administration system

Payment system

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### Motivation extension

<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder</td>
<td>An individual, team, or organization with an interest in the outcome of the architecture</td>
</tr>
<tr>
<td>Driver</td>
<td>Something that creates, motivates, and fuels the change in an organization (<em>earlier called “concern”</em>)</td>
</tr>
<tr>
<td>Assessment</td>
<td>The outcome of the analysis of some concern, revealing the strengths, weaknesses, opportunities, or threats that may trigger a change to the enterprise architecture</td>
</tr>
<tr>
<td>Goal</td>
<td>Some end that a stakeholder wants to achieve</td>
</tr>
<tr>
<td>Principle</td>
<td>A general desired property that guides the design and evolution of systems in a given context</td>
</tr>
<tr>
<td>Requirement</td>
<td>A desired property that must be realized by a system</td>
</tr>
</tbody>
</table>
ArchiMate Motivation Extension

- Stakeholder
- Concern
- Assessment
- Goal
- Principle
- Requirement / Constraint
- Core Element
Motivation extension

**Stakeholder**

- Board
- Customer satisfaction
- Lack of insight
- Increase insight in portfolio

**Driver**

- Stakeholder Driver

**Assessment**

- Claim
- Service registration
- System

**Goal**

- Registration service
- Website

**Requirement**

- Improve overview of current insurances
- Support online insurance mutations
- Better overview claim status
- Support online claim handling
- Keep digital records of claims
- Support claim registration

- Better overview in portfolio
Conflict and Contribution

- Reduce interaction with customer
- Assign personal assistant
- Provide on-line portfolio service
- Improve portfolio management

- Increase customer satisfaction:
  - ++
- Systems should be customer facing:
  - --
  - ++
# Implementation and migration extension

<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Package</td>
<td>A series of actions designed to accomplish a unique goal within a specified time.</td>
<td><img src="image1" alt="Work package" /></td>
</tr>
<tr>
<td>Deliverable</td>
<td>A precisely defined outcome of a work package.</td>
<td><img src="image2" alt="Deliverable" /></td>
</tr>
<tr>
<td>Plateau</td>
<td>A relatively stable state of the architecture that exists during a limited period of time.</td>
<td><img src="image3" alt="Plateau" /></td>
</tr>
<tr>
<td>Gap</td>
<td>An outcome of a gap analysis between two plateaus.</td>
<td><img src="image4" alt="Gap" /></td>
</tr>
</tbody>
</table>
ArchiMate Implementation & Migration Extension

Program
Application Portfolio Rationalization

Project
Back-office system integration

Project
CRM system integration

Reduction Applications (RA)

Acceptation system

SLA Management

Assessment system

Registration system
ArchiMate Implementation & Migration Extension

Baseline Architecture

Project A: Integration of CRM systems

Transition Architecture A

Project B: Integration of back-office systems

Target Architecture

Legend:
- Blue: both in 2011 - current state and 2015 - future state
- Orange: only in plateau 2011 - current state
- Green: only in plateau 2015 - future state

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ArchiMate and support

- Low entrée level
  - Free format in Visio/OmniGraffle stencils
  - Archi
- ArchiMate is commercially supported
  - By certified tool vendors
    - BiZZdesign: Architect
    - Casewise: Corporate Modeler
    - IDS Scheer: Aris ArchiMate Modeler
    - Telelogic: System Architect
    - Troux: Metis
  - By a large number of service providers like Atos Origin, BiZZdesign, Capgemini, Getronics, Logica, Sogeti, Ordina,…
- Certification for individual architects and training is in progress
ArchiMate and other languages

► ArchiMate: perfect starting point for MDA and software development
  ► ArchiMate incorporates the service paradigm
  ► ArchiMate has implementation relationships to process modelling languages (BPNM, BPEL)
  ► ArchiMate has implementation relationships to software engineering design languages (UML)

► ArchiMate connects architectural domains
  ► It has a broader scope, but less detail than UML and BPMN
  ► It does not replace specialized languages for different architectural domains, such as UML, BPMN and others
Refer detailed models to your ArchiMate models.

**Activity diagram**

- **Request insurance**
  - Receive request
  - Process request
  - Collect premium

**Component diagram**

**Detailled models in UML, BPMN, also pay attention to the relation to less formal modelling in Powerpoint and Visio**
Why not dive straight into UML?

- Business people just don’t understand it!
- Not designed for enterprise architecture
- Lack of integration of business, application and technical infrastructure aspects
- Too many details
- No explicit service paradigm
- Many diagrams = many models
  - ArchiMate works with views on one model
Summary ArchiMate

- **Language** for describing enterprise architecture
- Covers business, application and technology
  - With relations between these layers
- Extensions for
  - Motivation
  - Migration and implementation
- Graphical language with formal semantics, enabling analysis and tool support
- Techniques for **visualization** and **analysis**, aimed at various stakeholders
- Open standard maintained by The Open Group
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TOGAF

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What is TOGAF?

TOGAF is an **architecture framework**:

- A framework that structures EA descriptions by
  - Describing the process leading to the architecture.
  - Discerning relevant viewpoints and modelling techniques;
  - Indicating which elements should be part of an architecture model (this part is limited in TOGAF)
What else is TOGAF?

- A vendor- and technology-independent framework
- Best practices and knowledge gathered from experienced experts worldwide
- The result of almost 15 years of development
- The description of a systematic series of steps and processes for the creation and description of IT architectures
- A collection of checklists at different levels – from business requirements to infrastructure components
- Information freely available through the web site of The Open Group
- Free use within your own organisation
- For commercial use, a “commercial license” is required (included in the membership of the Architecture Forum of The Open Group)
Why TOGAF as an architecture framework?

- A common process for developing and using architecture
- Represents best practice in architecture development
- By using TOGAF, architectures are developed that:
  - Are consistent
  - Reflect the needs of stakeholders
  - Employ best practice
  - Give consideration both to current requirements and to likely future needs of the business
- Combines well with ArchiMate
- Developed through a collaborative effort of >300 Architecture Forum members
Building strong organizations

The Structure of TOGAF

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The TOGAF Components

ADM
- Architecture Vision
- Business Strategy
- Information Systems Architecture
- Solution Architecture
- Technology Architecture
- Implementation Governance
- Requirements Management
- Preliminary Planning

Architecture Content Framework

Reference Models

ADM Guidelines & Techniques

Enterprise Continuum

Architecture Capability Framework

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ArchiSurence

A case for applying the ADM

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ArchiSurance

ArchiSurance Home & Travel insurances

PRO-FIT Car insurances

LegallyYours Legal Aid insurances

The “new” ArchiSurance

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Structure of the New Company

Front-office

Home & Away back-office

Car back-office

Legal Aid back-office
Proposed Change

- Migrate to a single back-office system for the three back-offices.
- This system will replace:
  - The Policy administration system and Financial application of the Home & Away back-office
  - The Car insurance application of the Car back-office
  - The Legal aid back-office system
- Migrate to a shared CRM system
Building strong organizations

The ADM
Summary of the ADM process

1. “Getting the organisation committed & involved”

2. “Getting the architecture right”

3. “Making the architecture work”

4. “Keep the process running”
Activities in the Preliminary Phase include:

- Scope the enterprise
- Define enterprise architecture team and organisation
- Identify architecture principles
- Select and tailor architecture framework
- Implement architecture tools
Architecture Principles

**Business principles**
- Primony of principles
- Maximize benefit to the enterprise
- Information management is everybody’s business
- Common use of applications
- Compliance with law
- Business continuity
- IT responsibility
- Protection of intellectual property

**Data principles**
- Data is shared
- Data is an asset
- Data is accessible
- Data trustee
- Common vocabulary and data definition
- Data security
- Control technical diversity

**Technology principles**
- Requirements-based change
- Responsive change management
- Interoperability

**Application principles**
- Technology independence
- Ease of use

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Phase A: Architecture Vision

Activities in the Preliminary Phase include:

- Establish the architecture project / define scope
- Identify stakeholders, concerns, and business requirements
- Confirm/elaborate business goals, drivers and constraints
- Develop Architecture Vision
Stakeholder Analysis

- Operations
  - Portfolio management
  - Claim handling
  - Customer support

- Sales
  - Sales target
  - Customer satisfaction
  - Product portfolio
  - Reputation

Diagram:

- A (Prelim)
- B
- C
- D
- E
- F
- G (Reqs. Mgt.)

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Business Goals and Initial Requirements

CIO

Provide support for business functions

Support claim registration
- Claim submission and tracing

Support premium payment
- Online premium payment

Support insurance selling
- Online product buying

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Architecture Vision
Phases B, C, D: “Getting the Architecture Right”

Activities in Phases B, C and D include:

- Select reference models, viewpoints and tools
- Develop Baseline Architecture
- Develop Target Architecture
- Perform gap analysis
- Conduct formal stakeholder review
Realisation of Requirements

- Revise claim handling process
  - Reduce cost of claim handling
  - Improve reliability of information
    - An employee must check the information

Claim acceptance service

- Claim submission ➔ Claim acceptance ➔ Claim evaluation ➔ Claim payment

Claim handling

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Target Application Architecture

Call center application

Web portal

ArchiSurance CRM system

Policy data mgt.

Claim data mgt.

Risk assessment

Premium collection

Claim payment

ArchiSurance back-office system

Document management system

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Application Architecture Gap Analysis

Call center application

Archisurance
CRM system

Web portal

Archisurance back-office system

Home & Away
fin. application

Legal aid
back-office system

Car insurance
application

Document management system

Legend:
- Only in Baseline
- Only in Target
- Both in Baseline and Target

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Data Dissemination Diagram

Customer File

Damage Claim

Insurance Policy

Customer

Customer data

Customer Data Access Component

Policy Data Management Component

Claim data

Policy data

Home & Away Policy Administration

Prelim

A

B

C

D

E

F

G

H

Reqs. Mgt.
Technology Architecture Gap Analysis

Unintentional omission

Legend
- Only in Baseline
- Only in Target
- Both in Baseline and Target

Diagram showing various application servers and servers connected through LANs.
Phases E, F, G: “Making the Architecture Work”

Activities in Phases E, F and G include:
- Review/consolidate gap analysis results
- Formulate implementation & migration strategy
- Identify/group/prioritise main projects/work packages
- Identify Transition Architectures
- Generate Architecture Implementation Roadmap
Projects for the Transitions between Plateaus

Baseline Architecture → Transition Architecture → Target Architecture

Project A: Integration of CRM systems → Transition Architecture A → Integration of back-office systems

Project B: Integration of back-office systems

Work Package Software modification
Work Package Hardware
Work Package Legacy outphasing
Phases H & RM: “Keep the process running”

Activities in Phase H and the RM process:
- Baseline requirements and monitor them
- Identify changed requirements
- Assess impact of changed requirements
Summary of the ADM process

1. “Getting the organisation committed & involved”
2. “Getting the architecture right”
3. “Making the architecture work”
4. “Keep the process running”
Key points of the ADM

- The ADM is *iterative*:
  - Over the whole process
  - Between phases
  - Within each phase

- The ADM is a *generic* method
  - Intended to be used in a wide variety of enterprises in different sectors
  - The process can be adapted for specific situations, e.g., a specific sector
ArchiMate and TOGAF

A strong combination!
ADM and Extended ArchiMate Framework
ArchiMate with extensions provides a well-defined language, including graphical notation, covering most of the ACF.

With ArchiMate, relations between different architectural domains can also be modeled.

ArchiMate models form a basis for views, visualizations, and analysis.

ArchiMate with extensions is very suitable to represent the viewpoints that TOGAF defines, and thus supports the ADM.

Some minor modifications or extensions to the metamodels are recommended to complete the match.
ArchiMate: Adding Value to TOGAF

- Integrated, consistent and coherent modelling in various phases
- Specifically designed for enterprise architecture
- Full support for viewpoints (predefined and user-defined)
- Not just the ‘boxes’, but also their interrelationships
- Explicit support for the service paradigm
- Concrete, visible results for various stakeholders can be generated from a repository
- Analysis (e.g. impact-of-change and gap analysis) made easy
Conclusions and benefits experienced

AND SOME TIPS....
ArchiMate is more than drawing diagrams

- Consistent and integrated modelling…
  - Is a kind of knowledge management
  - Helps to integrate various (types of) models
  - Enables stakeholder specific view generation
  - Enables analyses
- Insight in the various domains and the relations between these
- Easy to use, low complexity, step-by-step growth in advanced use

Position ArchiMate as an umbrella language for integrated high level modelling and analyses over various domains
ArchiMate is a start - not an endpoint

- Open Standard is a “save choice”
- Think big, start small
  - There are many possible concepts and relations;
  - Select and learn;
- Training is required to fully benefit
  - 2 day training is a suitable start
- Implementing ArchiMate means a change in how architects work.
  - Takes time
  - Communication

Consider the implementation of ArchiMate as a project...
Include change management aspects

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Modelling efforts should be integrated

- With the EA process
  - TOGAF ADM or any other
- With EA governance
  - Validate the models
- With other modelling efforts
  - Process modelling
  - Software modelling
  - …

When embedding EA (and ArchiMate) in the organization, work from the perspective of products and deliverables!
ArchiMate is useful to...

- Bridge the gap between “free-format” strategy models and detailed solutions architecture models
- Enhance communication
- Makes models analyzable
- Have a common basis for more detailed modelling
- Well supported by tools and service-providers

Relate your ArchiMate models to your operating model or business model when communicating to C-level
More information...

- The Open Group
  www.opengroup.org

- ArchiMate
  www.opengroup.org/archimate
  www.archimate.org

- TOGAF 9
  http://www.opengroup.org/architecture/togaf9-doc/arch/

- ArchiMate 1.0
  http://www.opengroup.org/archimate/doc/ts_archimate/

- www.bizzdesign.com
Want to know more?

ArchiMate
► Participate in one of our ArchiMate training courses
► Foundation or Practitioner

TOGAF
► Participate in one of our TOGAF training courses
► Level 1 and/or level 2

Come to our booth today!
Thank you!

Harmen van den Berg
BiZZdesign

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