Avancier Methods (AM)
EA-level Business Architecture

The structured approach to business architecture that underpins TOGAF and its artefacts

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TOGAF suggests 3 approaches to Business Architecture

"The level and rigor of decomposition needed varies from enterprise to enterprise"

**Process Modelling**
Define high-level Processes/Scenarios
Decompose Processes to activities
Map activities to Roles & Functions

**Structured Analysis**
"Identifies the key business Functions within the scope of the architecture, and maps those Functions onto the Org units within the business."

**Use-case Analysis**
Identifies where Roles use Applications in performing Process steps, and defines the required App/IS Services

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What Structured Analysis means

Principles that underpin TOGAF and its artefacts, and relate Functions to Capabilities

1. Functions are independent of Organisation structure (8.4.1, 8.5).
2. Functions impose a structure on Activities sequenceable in Processes (34.2.1).
3. Functions/Capabilities are defined by Services provided (35.6.3)
4. Functions are used to describe Capabilities (34.2.1).
1. Form an Organisation view

- Classical Structured Analysis starts from the Organisation chart - in the area of interest.
- This management structure may show the people employed in each Org unit.

- (Target design may leave the Organisation structure until last.)

“Organization Unit:
A self-contained unit of resources with goals, objectives, and measures.”
TOGAF 34.2.1
List Atomic Activities performed in each Organisation Unit

- Focus on the essential activities and services.
- People come and go; what they do is what matters.
- List the major activities that each Org unit (in the area of interest) performs

<table>
<thead>
<tr>
<th>Organisation Activities</th>
<th>Unit A</th>
<th>Unit B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity A</td>
<td>Performed in</td>
<td>Performed in</td>
</tr>
<tr>
<td>Activity B</td>
<td></td>
<td>Performed in</td>
</tr>
</tbody>
</table>
A trouble is: human social structures evolve continually

- Org units, managers and employees are frequently shuffled.
- It would be impractical to maintain an EA repository in which many entities are mapped to today’s Organisation chart.

- Q) how to insure the bulk of the EA repository against reorganisations that redistribute and perhaps duplicate activities between Org units?

- A) Buy or build a *logical* Organisation structure over activities of interest
2. Form a Capability overview

- **Buy or build** a *logical* Organisation structure over Atomic Activities
- “The level and rigor of decomposition needed varies from enterprise to enterprise” TOGAF

**Archisurance: Function Hierarchy / Capability Map**

- **Customer Relations**
  - Open Policy
  - Record Claim
  - Email Approval

- **Claim Handling**
  - Assess Claim

- **Finance**
  - Pay Claim
  - Bank Premium

- **Product Management**
  - Policy Definition
  - Legal Compliance
  - Maintain client records

A strict (non-redundant) hierarchy.
Buy and adapt a reference model to suit your business?

- APQC – for a commercial enterprise (below)
- BIAN – for a bank (next slide)
- SCOR – for a supply chain business
- Proact – for a retail business

Core
1.0 Develop Vision and Strategy
2.0 Design and Develop Products and Services
3.0 Market and Sell Products and Services
4.0 Deliver Products and Services
5.0 Manage Customer Service

4.0 Deliver Products and Services
  4.1 Plan for and acquire resources (Supply Chain Planning)
  4.2 Procure Technology and services
  4.3 Produce/Manufacture/Deliver product
  4.4 Deliver product service to customer
  4.5 Manage logistics and warehousing
Buy one? E.g. a business Function/Capability hierarchy for a bank
Build one? Cluster activities into business Functions

- Group Atomic Activities into logical Functions using some affinity criterion.
- Group lower level Functions into higher level Functions
- So each Function a logical subdivision an enterprise’s capability
  - Definable externally by the services it provides
  - Definable internally by the activities required to deliver those services

“Business Functions — a detailed, recursive step involving successive decomposition of major Functional areas into sub-Functions.”
TOGAF 8.5
Capabilities as Functions

- Function describes units of business Capability at all levels of granularity (TOGAF 34.2.1)
- Capabilities are typically expressed in general and high-level terms and typically require a combination of Organization, people, Processes, and technology to achieve. For example, marketing, customer contact, or outbound telemarketing. [cf. Function Names] (TOGAF 3.26)
- This Functional decomposition can be used to identify new Capabilities required to support business change.
- The purpose of the Functional Decomposition diagram is to show on a single page the Capabilities of an Organization…. (TOGAF 35.6.3)
- Implication: Functions have all the attributes Capabilities have - including target qualities
Chapter 32 on Capability-Based Planning has 10 (ten!) references to Capabilities being cross-organisational.

It is not about improving an Organisation Unit

It is about improving a named Function (say, HR) regardless of where it is carried out in the Organisation

Both Structured Analysis and CBP encourage architects to

- discuss Functions/Capabilities independently of Org Units.
- examine business objectives, services and processes *before* mapping those to Organisation Units.

"Function describes units of business Capability at all levels of granularity"

TOGAF 34.2.1

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Capability/Function

Functional Decomposition

Organisation Unit

Organisation Decomposition

Organization/Actor catalogue

Actor (human)
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Structured Analysis: “Identifies the key business Functions within the scope of the architecture, and maps those Functions onto the Org units within the business.” TOGAF 8.4.1

<table>
<thead>
<tr>
<th>Function Organisation</th>
<th>Cust. Relations</th>
<th>Claims</th>
<th>Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>Activity</td>
<td></td>
<td>Activity</td>
</tr>
<tr>
<td>Delivery</td>
<td>Activity</td>
<td>Activity</td>
<td>Activity</td>
</tr>
</tbody>
</table>

“Business architecture outputs include Correlation of Organization and Functions - relate business Functions to Organizational units in the form of a matrix report” TOGAF 8.5
3. Form a Process view

Swim lanes show Structure
- Actor
- Role or Function

Arrows show Behaviour
- Event
- Trigger
- Activity

Example after ArchiMate guru Marc Lankhorst
Map atomic process steps to business functions

Atomic Business Processes

Handle Claim Process Flow

- Record Claim
- Assess Claim
- Email Approval
- Pay Claim

May be placed under a Functional Decomposition as Atomic Business Functions

ArchiSurance: Functional Decomposition

Customer Relations
- Open Policy
- Record Claim
- Email Approval

Finance
- Pay Claim
- Bank Premium

Claim Handling
- Assess Claim

Product Management
- Policy Definition
- Legal Compliance
- Maintain client records
Complete correspondence is a theoretical possibility

- Each atomic Process could be placed as an atomic Function
- **But almost nobody gets complete their models.**
- The Function hierarchy usually stops at a high (3rd or 4th) level
- Some Process models descend to a lower (5th or 6th) level.
  - one-person, one place, one time (OPOPOT) activities.
  - can be mapped to the data created and used

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<table>
<thead>
<tr>
<th>Function</th>
<th>Process</th>
<th>Cust. Relat’ns</th>
<th>Claims</th>
<th>Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Policy</td>
<td>Open Policy</td>
<td></td>
<td></td>
<td>Bank Premium</td>
</tr>
<tr>
<td>Handle Claim</td>
<td>Receive Claim</td>
<td>Assess Claim</td>
<td></td>
<td>Pay Claim</td>
</tr>
</tbody>
</table>

"Processes are flows of activities; Functions group the same activities under a structure.” TOGAF 34.2.1
4. Form a people view

A Role is a group of activities that is performable by one Actor - by virtue of the abilities required.

<table>
<thead>
<tr>
<th>Role Process</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td></td>
<td>Accountable</td>
</tr>
<tr>
<td>Activity</td>
<td>Responsible</td>
<td>Consulted</td>
</tr>
<tr>
<td>Activity</td>
<td></td>
<td>Involved</td>
</tr>
</tbody>
</table>

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Aside: modelling Roles rather than Actors

► EA usually records Roles rather than individual human Actors.
► Except where a Role is performed by only one Actor
► Of course, a human Actor can do more than any Role they are asked to play.
► But what each individual human might do outside the system (in addition to or in conflict with Role definitions) is not documented.
5. Form a data view

- EA is concerned with Processes that **create and use data**
- Atomic activities can be mapped to data entity types. E.g.
  - Product Type (SKU, Description, Unit Price, Warranty Period, Delivery Fee)
  - Product Instance (SKU, Instance Number, Supplier Id, Purchaser Id, Delivery Date).
A raison d'être of a business is to provide services.

Services can be defined at any level of Process or Function definition.

- Barber Services
  - Hair cut – £20
  - Shave - £5
  - Manicure - £10

- Logistics Services
  - Delivery
    - Express delivery
    - Recorded delivery

Service view

The purpose of the Business Service/Function catalog is to provide a Functional decomposition. The Business Service/Function catalog can be used to identify Capabilities of an Organization.
Mapping Services to Motivations

TOGAF relates Services to Requirements
Level 0: Define external services

- Identify your customers and what services they want.
- Identify your suppliers
Level 1: Define internal services

- Link nodes - differentiating material and information flows.
- What flows between nodes within the system and to/from external entities?

Elements of this diagram can be Logical (Functions and Roles) and/or Physical (Organisation Units and Actors)
Clasical top-down decomposition

- Decompose level 0 into level 1 capabilities/functions
- Define inter-function services and flows
- Decompose level 1 capabilities/functions into level 2
- Define inter-function services
- Etc.


NOTE: Node numbers shown here indicate that the box has been detailed. The C-number or page number of the child diagram could have been used instead of the node number.
7. Form a “technology” view

- Relate Business elements to IS Services (App Use cases) and Applications
- TOGAF offers several artefacts (the App/Function matrix could list atomic activities included also in Process flow diagrams).
What might you find already documented?

► A company directory, identity management or access control system may already record and relate some of the entities below.
Taking different views of a human activity system

Different Views are related via the Atomic Activities
Skills Framework for the Information Age suggests 7 views

The 7 views can be centered on the Atomic Activities

- Environment
  - External environs
  - Requirement
- Business
  - Service view
  - Process view
- Data
  - Data/Info view
- Apps & Technology
  - Technology view
- People view
  - Org Unit
  - Role
  - Actor
- Organisation view
  - Function
  - Org Unit
- Process view
  - Process
  - IS Service
  - Applicat’n
  - Technol’gy
- Requirement
  - Business
  - Service
How TOGAF’s artifacts document a Business Architecture

1. Principles catalogue
2. Business Service/Product catalogue
3. Process/Event/Control/Product catalogue
4. Process flow diagram
5. Data Entity catalogue
6. Data Entity/Business Function matrix
7. Driver/goal/objective catalogue
8. Business Function/Service catalogue
9. Functional decomposition
10. Org. Function matrix
11. Business Interaction matrix
12. Organisation decomposition
13. Organization/Actor catalogue
14. Role catalogue
15. Actor/Role matrix
Avancier Methods (AM)
Heat mapping

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A 2-dimensional Business Function/Capability Model

The activities within a Function may be mapped to (for example) levels of management

<table>
<thead>
<tr>
<th>Level</th>
<th>Function</th>
<th>Sales</th>
<th>Delivery</th>
<th>Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>Activity</td>
<td>Activity</td>
<td>Activity</td>
<td></td>
</tr>
<tr>
<td>Manage</td>
<td>Activity</td>
<td>Activity</td>
<td>Activity</td>
<td></td>
</tr>
<tr>
<td>Perform</td>
<td>Activity</td>
<td>Activity</td>
<td>Activity</td>
<td></td>
</tr>
</tbody>
</table>

Any Business Function/Capability hierarchy or matrix may be used as a heat map, to highlight areas of concern

<table>
<thead>
<tr>
<th>Level</th>
<th>Function</th>
<th>Sales</th>
<th>Delivery</th>
<th>Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>Activity</td>
<td>Activity</td>
<td>Activity</td>
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<tr>
<td>Manage</td>
<td>Activity</td>
<td>Activity</td>
<td>Activity</td>
<td></td>
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<tr>
<td>Perform</td>
<td>Activity</td>
<td>Activity</td>
<td>Activity</td>
<td></td>
</tr>
</tbody>
</table>
You can grow a "Function forest", a number of parallel Function hierarchies that group the same activities in different ways.

(E.g. I gather the UK national police body EA have 9 parallel Function hierarchies.)
Used as a “Heat map”

Figure 7. Heat maps identify “hot” areas to exploit business value.

<table>
<thead>
<tr>
<th>Business competencies</th>
<th>Direct</th>
<th>Control</th>
<th>Execute</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business administration</strong></td>
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<tr>
<td>Logistics</td>
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<tr>
<td>Network design</td>
<td></td>
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<tr>
<td>Corporate strategy</td>
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<tr>
<td>Corporate planning</td>
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<tr>
<td>Financial planning</td>
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<tr>
<td>Corporate governance</td>
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<tr>
<td><strong>Channels</strong></td>
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<tr>
<td>Channel strategy</td>
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<tr>
<td>Store design</td>
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<tr>
<td>Real estate strategy</td>
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<tr>
<td>Internet design</td>
<td></td>
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<tr>
<td>Catalog/call center design</td>
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<tr>
<td><strong>Products/services</strong></td>
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<td></td>
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<tr>
<td>Merchandise planning</td>
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<tr>
<td>Channel planning</td>
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<tr>
<td>Assortment planning</td>
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<tr>
<td>Space planning</td>
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<tr>
<td>Promotion planning</td>
<td></td>
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<tr>
<td><strong>Customers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market strategy</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Customer service strategy</td>
<td></td>
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<tr>
<td><strong>Accountability level</strong></td>
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<tr>
<td><strong>Control</strong></td>
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</tr>
<tr>
<td>Customer service</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Customer communications</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Execute</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Marketing</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Advertising</td>
<td></td>
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<tr>
<td>Public relations</td>
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</tbody>
</table>

Source: IBM Business Consulting Services.

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Business Capability = Function ++

Capability = Function + Target Qualities + Resources Needed

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EA is about human and computer activity systems in which Actors/components achieve desired effects by playing Roles in Processes.

A required **Capability** (say Sales, or Disaster Recovery) can be specified as a group of
- required products or **Services** resulting from **Processes** performed by **Actors/components**

A required **Function** (say Sales, or Disaster Recovery) can be specified as a group of
- required products or **Services** resulting from **Processes** performed by **Actors/components**
A Capability is a **view** rooted in a Function (at whatever level of granularity is chosen).

It can encompass as many of the remaining entities as you choose.
So, Capability = Function ++

- In business architecture documentation

- Capability (say Marketing) =

- Function (Marketing) + quality targets + resources needed
Reader’s challenge 1: What makes Disaster Handling a Capability?

► An enterprise may not formalise disaster handling
  ■ It may rely on the ad hoc responses of intelligent human Actors when a disaster happens.
  ■ It may do little or nothing other than encourage Actors to think about disasters and what they can do about them.

► Or, it may set out to develop a disaster handling Capability
► Which is to formalise and systemise
  ■ Nominate a DR Function
  ■ Define what kinds of disaster are to be anticipated
  ■ Define targets for recovery from those disasters
  ■ Define Roles and Processes needed to achieve DR
  ■ Acquire resources (Actors, components etc.) needed to perform DR Roles and Processes
  ■ Testing
  ■ Etc.
Reader’s challenge 2: What makes Innovation a Capability?

- You may perceive an enterprise as being innovative
- But so far, innovations have been down to human inspiration and motivation to follow them up.

- How to develop a tangible innovation “Capability”?
- The EA concept of Capability implies a degree of systemisation
  - Nominate an innovation Function
  - Define where innovation is sought
  - Define targets for innovation success (e.g. income from new products)
  - Define Roles (if not Processes) needed to achieve innovation
  - Acquire resources (Actors) needed perform the Roles and Processes
  - Etc.
Variations of "Capability" appear in “Capability maturity models” and “Capability based planning”, and in TOGAF (with various meanings)

DoDAF is built around Capability-based planning. It does not have the concept of a business Function, because Capability takes its place.

Some Capabilities may correspond to a Function in a primary business-as-usual Functional decomposition hierarchy (usually but not inevitably a high-level Function).

Other Capabilities (e.g. “Disaster Handling”) might not appear in the primary Function hierarchy. But you can define other Function hierarchies.

And you can define a Function independently of any hierarchical decomposition structure, as a free-standing structural component, a grouping of any activities you choose.

So, whether your Capability is named in a Function hierarchy or not, it is always representable as a Function + target qualities + resources needed.
Avancier Methods (AM)
Abstracting a meta from EA artefacts

Based on the structured approach to business architecture that underpins TOGAF and its artefacts

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Designing activity systems

- Define required Processes
- Assign activities in Processes to Functions and Roles
- Find Org units and Actors to perform the activities when required

Passive structure acted on

Required behaviour elements triggered by events, produce results

Logical active structure elements group activity types

Physical active structure elements perform activities

- Entity
- Artifact
- Business
- Data Entity
- Data Entity/Business Function matrix
- Activity sequence
- Process
- Process Flow diagram
- Activity I/O
- Business Service
- Business/Function Service cat.
- Business Activity
- Activity group
- Function
- Functional Decomposition
- Organisation/Function matrix
- Org Unit
- Organisation Structure
- Actor
- Role
- Role catalogue
- Actor/Role matrix
- IS Service
- IS Service catalogue
- Use Case diagram
- Application Interface
- Application
- Application Portfolio Cat
- Information Systems

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Function: externally, a group of service types; internally, a group of activity types
Role: externally, a group of service types; internally, a group of activity types

Nothing is really physical in EA, but when implemented, a physical element must be addressable.
**Core artifacts**: describe architectural entities and relations between them

<table>
<thead>
<tr>
<th>2 Context / Precursors</th>
<th>4 Business Architecture</th>
<th>5 Data Architecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver/Goal/Objectives cat.</td>
<td>Business Function/Service catalogue</td>
<td>Data Entity catalogue</td>
</tr>
<tr>
<td>Principles catalogue</td>
<td>Functional Decomposition diagram</td>
<td>Data Entity/Business Function matrix</td>
</tr>
<tr>
<td>Stakeholder catalogue</td>
<td>Organisation/Function matrix</td>
<td>Data Store catalogue</td>
</tr>
<tr>
<td>Requirements catalogue</td>
<td>Organization/Actor structure</td>
<td>Logical Data Model diagram</td>
</tr>
<tr>
<td>Business Scenario diagram</td>
<td>Actor/Role matrix</td>
<td>Data Dissemination diagram</td>
</tr>
<tr>
<td>Solution Vision diagram</td>
<td>Process catalogue</td>
<td>CRUD diagram</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7 Applications Architecture</th>
<th>9 Infrastructure (Tech) Architecture</th>
<th>10 Migration Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Services catalogue</td>
<td>Technical Reference Model</td>
<td>RAID catalogue</td>
</tr>
<tr>
<td>Application Portfolio catalogue</td>
<td>Technology Standards catalogue</td>
<td>Value/Cost/Risk Grid</td>
</tr>
<tr>
<td>Data Flow catalogue</td>
<td>Technology Portfolio catalogue</td>
<td>Migration Path</td>
</tr>
<tr>
<td>Application/Data Entity matrix</td>
<td>Application Technologies diagram</td>
<td>Road Map</td>
</tr>
<tr>
<td>Application/Function matrix</td>
<td>Deployment diagram</td>
<td></td>
</tr>
<tr>
<td>Application Communication diagram</td>
<td>Networked Computing Hardware diagram</td>
<td></td>
</tr>
<tr>
<td>Application Use Case diagram</td>
<td>Communications Engineering diagram</td>
<td></td>
</tr>
<tr>
<td>Application Platform Service catalogue</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Abstracting a meta model from the artifacts
As complete as seems reasonable
Avancier Methods are useful with all architecture frameworks that share similar ends and means.