TOGAF diagrams mapped to ArchiMate 2.1 and 3.0 Viewpoints

Explanatory comments

Challenging comments

Including diagrams and definitions edited from the TOGAF 9.1 and ArchiMate 2.1 and 3 standards.
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## TOGAF diagrams mapped ArchiMate viewpoints

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The purpose of a Goal/Objective/Service diagram is to define the ways in which a service contributes to the achievement of a business vision or strategy.

Services are associated with the drivers, goals, objectives, and measures that they support, allowing the enterprise to understand which services contribute to similar aspects of business performance.

The Goal/Objective/Service diagram also provides qualitative input on what constitutes high performance for a particular service.
Goal realization viewpoint (goals to requirements)

The focuses on refining the initial, high-level goals into more concrete (sub-)goals using the aggregation relationship, and finally into requirements and constraints using the realization relationship.

**Goal:** A high-level statement of intent, direction, or desired end state for an organization and its stakeholders.

**Outcome:** An end result that has been achieved.

**Principle:** A qualitative statement of intent that should be met by the architecture.

**Requirement:** A statement of need that must be met by the architecture.

**Constraint:** A factor that prevents or obstructs the realization of goals.

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TOGAF: Business Footprint Diagram

- describes the links between business goals, organizational units, business functions, and services,
- maps these functions to the technical components delivering the required capability.
- provides a clear traceability between a technical component and the business goal that it satisfies
- demonstrates ownership of the services identified.
- demonstrates only the key facts linking organization unit functions to delivery services and is utilized as a communication platform for senior-level (CxO) stakeholders.

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Layered viewpoint v3

- This example is by no means intended to be prescriptive.
- The main goal of the layered viewpoint is to provide an overview in one diagram.

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Layered viewpoint v2.1

- Stakeholders: Enterprise, process, application, infrastructure, and domain architects
- Concerns: Consistency, reduction of complexity, impact of change, flexibility

Look like application services rather than platform services

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Archimate 2.1: Landscape Map Viewpoint

- Stakeholders: Enterprise architects, top managers: CEO, CIO
- Concerns: Readability, management and reduction of complexity, comparison of alternatives

No corresponding definition in TOGAF?
ArchiMate FULL framework

- Strategy
- Business
- Application
- Technology
- Physical
- Implementation & Migration

Layers:
- Passive structure
- Behavior
- Active structure
- Motivation

Aspects:

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to show on a single page the capabilities of an organization that are relevant to the consideration of an architecture.

By examining the capabilities of an organization from a functional perspective, it is possible to quickly develop models of what the organization does without being dragged into extended debate on how the organization does it.

Once a basic Functional Decomposition diagram has been developed, it becomes possible to layer heat-maps on top of this diagram to show scope and decisions.

For example, the capabilities to be implemented in different phases of a change program.
Capability map viewpoint

Provides an overview of the capabilities of the enterprise.

Can show goods and service flows between logical business functions.
describes the links between actor, roles, and location within an organization tree.

should provide a chain of command of owners and decision-makers in the organization.

Although it is not the intent to link goal to organization, it should be possible to intuitively link the goals to the stakeholders from the Organization Decomposition diagram.
Organization Viewpoint

- focuses on the (internal) organization of a company, department, network of companies, or of another organizational entity.
Organization Viewpoint (Actor Cooperation in 2.1)

focuses on the (internal) organization of a company, department, network of companies, or of another organizational entity.

Can show goods and service flows between physical org units
Organization viewpoint – actors and roles

- focuses on the (internal) organization of a company, department, network of companies, or of another organizational entity.
TOGAF: Business Use-case Diagram

- Displays the relationships between consumers and providers of business services.
- Business services are consumed by actors or other business services.
- The diagram provides added richness in describing business capability by illustrating how and when that capability is used.
- The purpose is to help to describe and validate the interaction between actors and their roles to processes and functions.
- As architecture progresses, use-cases can evolve from the business level to include data, application, and technology details.
- Architectural business use-cases can also be re-used in systems design work.
Service realization viewpoint

- shows how one or more business services are realized by the underlying processes (and sometimes by application components).
- Bridges between the business products and process views.
- a “view from the outside” on one or more business processes.

Akin to TOGAF Business Use Case diagram
Product Viewpoint 2.1

- Shows the value that products offer to the customers or other external parties involved, and shows the composition of one or more products in terms of the constituting (business, application, or technology) services, and the associated contract(s) or other agreements.

**Akin to TOGAF Business Use Case diagram**

**Product used by Actor**

- Customer

**Better Role than Actor**

**Product defined as a group of services, supported by business (information) object**

- Insurance
  - Insurance application
  - Premium payment
  - Customer information
  - Customer data modification
  - Claim registration
  - Claim payment

**Subtype product extends super type**

- Car insurance
  - Damage assessment

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Product viewpoint

- Shows the value that products offer to the customers or other external parties involved, and shows the composition of one or more products in terms of the constituting (business, application, or technology) services, and the associated contract(s) or other agreements.
to depict all models and mappings related to the process metamodel entity.

- show sequential flow of control between activities

- may utilize swimlane techniques to represent ownership and realization of process steps. can be used to detail the
  - controls that apply to a process,
  - events that trigger or result from of a process
  - products generated from process execution.

- useful in elaborating the architecture with subject specialists, as they allow the specialist to describe “how the job is done” for a particular function.

- each process step can become a more fine-grained function and can then in turn be elaborated as a process.
Business Process Co-operation Viewpoint 2.1

- show the relationships of one or more business processes with each other and/or with their environment.

TOGAF Process flow diagram

Role uses Service

Service realised by Process

Service used by Process
Business Process Cooperation Viewpoint

- show the relationships of one or more business processes with each other and/or with their environment.

TOGAF Process flow diagram
shows the information needed to support one or more business services.

shows what data is consumed by or produced by a business service and may also show the source of information.

shows an initial representation of the information present within the architecture and therefore forms a basis for elaboration and refinement within Phase C (Data Architecture).
2.1 Business Process Viewpoint

► Stakeholders: Process and domain architects, operational managers
► Concerns: Structure of business processes, consistency and completeness, responsibilities

This access arrow shows direction of flow (not access)

Cf. Business Service/Information Diagram

Transition arrow

Note: process rather than function symbol

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TOGAF: Conceptual Data Diagram (aka business data model)

- to depict the relationships between critical data entities within the enterprise.
- developed to address the concerns of business stakeholders.

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Information structure viewpoint – conceptual level

- shows the structure of the information used in the enterprise or in a specific business process or application, in terms of data types or (object-oriented) class structures.
Information structure viewpoint – logical level

- shows how the information at the business level is represented at the application level in the form of the data structures used there

- Composition – 1 of source type contains 1 or more of target type
- Aggregation – N of source type groups N of target type
A strange kind of Business Data Model

Naive use of aggregation

Data object realises abstract business object

Redundant relationship?

Abstraction of paper form

Application data object

Business object
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TOGAF: Application Communication Diagram

- to depict all models and mappings related to communication between applications in the metamodel entity.
- shows application components and interfaces between components.
- Interfaces may be associated with data entities where appropriate.
- Applications may be associated with business services where appropriate.
- Communication should be logical and should only show intermediary technology where it is architecturally relevant.

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describes the relationships between applications components in terms of the **information flows** between them, or in terms of the **services** they offer and use

- typically used to create an overview of the application landscape of an organization
- also used to express the (internal) cooperation or orchestration of services that together support the execution of a business process.
TOGAF: Application Use Case Diagram

- displays the relationships between consumers and providers of application services.
- Application services are consumed by actors or other application services and the Application Use-Case diagram provides added richness in describing application functionality by illustrating how and when that functionality is used.

- to help to describe and validate the interaction between actors and their roles with applications.
- As the architecture progresses, the use-case can evolve from functional information to include technical realization detail.
- Application use-cases can also be re-used in more detailed systems design work.
Application Usage Viewpoint

- describes the relationships between applications components in terms of the information flows between them, or in terms of the services they offer and use - typically used to create an overview of the application landscape of an organization - also used to express the (internal) cooperation or orchestration of services that together support the execution of a business process.
to clearly depict the sequence of events when multiple applications are involved in executing a business process.

- enhances the Application Communication diagram by augmenting it with any sequencing constraints, and hand-off points between batch and real-time processing.

- It would identify complex sequences that could be simplified, and identify possible rationalization points in the architecture in order to provide more timely information to business users. It may

- also identify process efficiency improvements that may reduce interaction traffic between applications.
2.1 Application Behavior Viewpoint

- Stakeholders: Enterprise, process, application, and domain architects
- Concerns: Structure, relationships and dependencies between applications, consistency and completeness, reduction of complexity

In the application domain, process step shown using function symbol

A kin to a use case header

Service realised by Process

Function accesses data

Transition arrow

Cf. Process/Application Realization diagram?
Software Engineering Diagram

► breaks applications into packages, modules, services, and operations from a development perspective.

► enables more detailed impact analysis when planning migration stages, and analyzing opportunities and solutions.

► ideal for application development teams and application management teams when managing complex development environments.
2.1 Application Structure Viewpoint

- Stakeholders: Enterprise, process, application, and domain architects
- Concerns: Application structure, consistency and completeness, reduction of complexity
Archimate FULL framework

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Training at [http://avancier.website](http://avancier.website)
to show the "as deployed" logical view of logical application components in a distributed network computing environment.

The diagram is useful for the following reasons:

- Enable understanding of which application is deployed where
- Establishing authorization, security, and access to these technology components
- Understand the Technology Architecture that support the applications during problem resolution and troubleshooting
- Isolate performance problems encountered and perform necessary upgrade to specific physical technology components
- Identify areas of optimization
- Enable application/technology auditing and prove compliance
- Serve as an important tool supporting effective change management
TOGAF: Processing Diagram

- focuses on **deployable units of code/configuration** and how these are deployed onto the technology platform.

- addresses the following:
  - Which set of application components need to be grouped to form a deployment unit
  - How one deployment unit connects/interacts with another (LAN, WAN, and the applicable protocols)
  - How application configuration and usage patterns generate load or capacity requirements for different technology components

- The organization of deployment units depends on separation concerns of the presentation, business logic, and data store layers and service-level requirements of the components.

Training at http://avancier.website
Implementation and Deployment viewpoint

► shows how one or more applications are realized on the infrastructure - mapping of applications and components onto artifacts - mapping of the information used by these applications and components onto the underlying storage infrastructure

Dodgy v 2.1 diagram
Technology Usage Viewpoint

shows how applications are supported by the software and hardware technology: the technology services are delivered by the devices; system software and networks are provided to the applications - plays an important role in the analysis of performance and scalability, since it relates the physical infrastructure to the logical world of applications - very useful in determining the performance and quality requirements on the infrastructure based on the demands of the various applications that use it.
TOGAF: Platform Decomposition Diagram

depicts the technology platform that supports the operations of the IS Architecture.
covers all aspects of the infrastructure platform
an overview of the enterprise’s technology platform
can be expanded to map the technology platform to appropriate application components within a specific functional or process area.
may show details such as product versions, number of CPUs, etc.
or simply an informal “eye-chart” - an overview of the technical environment.
TOGAF: Communication Engineering Diagram
contains the software and hardware technology elements supporting the Application Layer, such as physical devices, networks, or system software (e.g., operating systems, databases, and middleware).
Technology Viewpoint

- contains the software and hardware technology elements supporting the Application Layer,
- such as physical devices, networks, or system software (e.g., operating systems, databases, and middleware).
Technology Viewpoint 2.1

- Stakeholders: Infrastructure architects, operational managers
- Concerns: Stability, security, dependencies, costs of the infrastructure

Better Interface? Or Function? Or Communication path?

System Software (Platform App)

Training at http://avancier.website
Technology Viewpoint

**Stores (100+)**
- Shop Floor
  - IBM 4680
  - IBM 4690
  - Store loop
- Back Office
  - Windows XP
  - Windows XP
  - Switch
  - Server
  - Unix
  - Cisco

**Depots (5)**
- Office
  - Windows XP
  - Windows XP
  - Server
  - Unix
  - Switch
  - Server
  - Unix
  - Cisco
- Warehouse
  - Handheld
  - Handheld
  - RF

Private network (TCP/IP over ISDN)

Appl. servers

IBM Mainframe

Gateways

Suppliers etc.

Some unreadable agency

IBM 4680

IBM 4690

Windows XP

Unix

Servers

Switch
## More ArchiMate viewpoints

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Training at http://avancier.website
ArchiMate FULL framework

Training at http://avancier.website
2 Motivation Viewpoints

► Stakeholder Viewpoint >
► Goal Realization Viewpoint >
► Requirements realization viewpoint: focuses on modeling the realization of requirements and constraints by means of core elements, such as actors, services, processes, application components, etc.
► Motivation viewpoint: covers the entire motivational aspect and allows use of all motivational elements.

Also
► Goal contribution viewpoint: focuses on modeling and analyzing the influence relationships between goals (and requirements).
► Principles viewpoint: focuses on modeling the relevant principles and the goals that motivate these principles.
► Capability map viewpoint: provides an overview of the capabilities of the enterprise.
Stakeholder viewpoint

focuses on modeling the stakeholders, drivers, the assessments of these drivers, and the initial goals to address these drivers and assessments.

**Stakeholder**: The role of an individual, team, or organization (or classes thereof) that represents their interests in the outcome of the architecture.

**Driver**: An external or internal condition that motivates an organization to define its goals and implement the changes necessary to achieve them.

**Assessment**: The result of an analysis of the state of affairs of the enterprise with respect to some driver.

Example 18: Stakeholder, Driver, and Assessment
Motivation

Value: The relative worth, utility, or importance of a core element or an outcome.

Meaning: The knowledge or expertise present in, or the interpretation given to, a core element in a particular context.

Example 20: Meaning and Value
ArchiMate FULL framework

- **Passive structure**
- **Behavior**
- **Active structure**
- **Motivation**

- **Layers**

- **Aspects**

**Strategy**

**Business**

**Application**

**Technology**

**Physical**

**Implementation & Migration**

Training at http://avancier.website
3 Strategy Viewpoints

► **Strategy Viewpoint:** allows the business architect to model a high-level, strategic overview of the strategies (courses of action) of the enterprise, the capabilities and resources supporting those, and the envisaged outcomes.

► **Capability map viewpoint:** provides an overview of the capabilities of the enterprise.

► **Outcome realization viewpoint:** describes how high-level, business-oriented results are produced by the capabilities and resources of the enterprise.

► **Resource Map Viewpoint** >

Training at http://avancier.website
Resource map viewpoint

► a structured overview of the resources of the enterprise.
► typically shows two or three levels of resources across the entire enterprise.
► may also show relationships between resources and the capabilities they are assigned to

► **Resource**: An asset owned or controlled by an individual or organization.
► **Capability**: An ability that an active structure element, such as an organization, person, or system, possesses.
► **Course of action**: An approach or plan for configuring some capabilities and resources of the enterprise, undertaken to achieve
Archimate FULL framework

- Strategy
- Business
- Application
- Technology
- Physical
- Implementation & Migration

Aspects

Layers
A Project Context diagram shows the scope of a work package to be implemented as a part of a broader transformation roadmap.

The Project Context diagram links a work package to the organizations, functions, services, processes, applications, data, and technology that will be added, removed, or impacted by the project.

The Project Context diagram is also a valuable tool for project portfolio management and project mobilization.
4 Implementation and Migration Viewpoints

► **Project viewpoint:** primarily used to model the management of architecture change.

► **Migration viewpoint:** used to model the transition from an existing architecture to a target architecture.

► **Implementation and Migration Viewpoint >**
Implementation and migration viewpoint

► relate programs and projects to parts of the architecture they implement.
► allows modeling of the scope of programs, projects, project activities in terms of plateaus realized or architecture elements affected
► how elements are affected may be indicated by annotations
ArchiMate FULL framework

Layers

Aspects

Passive structure | Behavior | Active structure | Motivation

Strategy | | | |
Business | | | |
Application | | | |
Technology | | | |
Physical | | | |
Implementation & Migration | | | |

Training at http://avancier.website
Physical elements

- **Equipment**: One or more physical machines, tools, or instruments that can create, use, store, move, or transform materials.

- **Facility**: A physical structure or environment.

- **Distribution network**: A physical network used to transport materials or energy.

- **Material**: Tangible physical matter or physical elements.
Physical viewpoint

- contains equipment (one or more physical machines, tools, or instruments) that can create, use, store, move, or transform materials, how the equipment is connected via the distribution network, and what other active elements are assigned to the equipment.
Three more ArchiMate v3 diagrams
Example 26: Application Active Structure Elements

Training at http://avancier.website
Example 27: Application Behavior Elements
Technology Behaviour Elements

Example 30: Technology Behavior Elements

Training at http://avancier.website
Where to find more example diagrams

► All TOGAF diagram types
► Almost all ArchiMate v3 diagram types

► Go to http://avancier.website
► Click on “AM Products and Techniques”
► Look at the slide shows marked (T&A)

- We not recommend any particular diagram type.
- Some ArchiMate diagrams could be replaced by alternatives
- E.g.
  - BPMN for process flow
  - UML sequence diagrams for process-application realisation
  - Any proper data modelling notation for data model structures
  - Any regular expression notation for data flow structures
You can find more in Avancier Methods

- **Avancier Methods** are useful with all architecture frameworks that share similar domains and entities

- http://avancier.website