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DoDAF in a nutshell

DRAFT v0.1

Part two: Terms and Concepts

- ▶ An attempt to distil DoDAF into c100 slides
 - Part one: DoDAF as applied system theory
 - **Part two: DoDAF terms and concepts**
 - Part three: DoDAF viewpoints and models
- ▶ DoDAF is verbose and elaborate, making it hard to work out whether it is consistent or not.
- ▶ However, it does seem that
 - the meta model is questionable in places not explored here
 - a “capability”, being a logical system, can be scoped as either
 - a persistent resource, performer or system, or
 - a transient process or project.

The concepts are related in a (questionable) class hierarchy

Domain Class Hierarchy

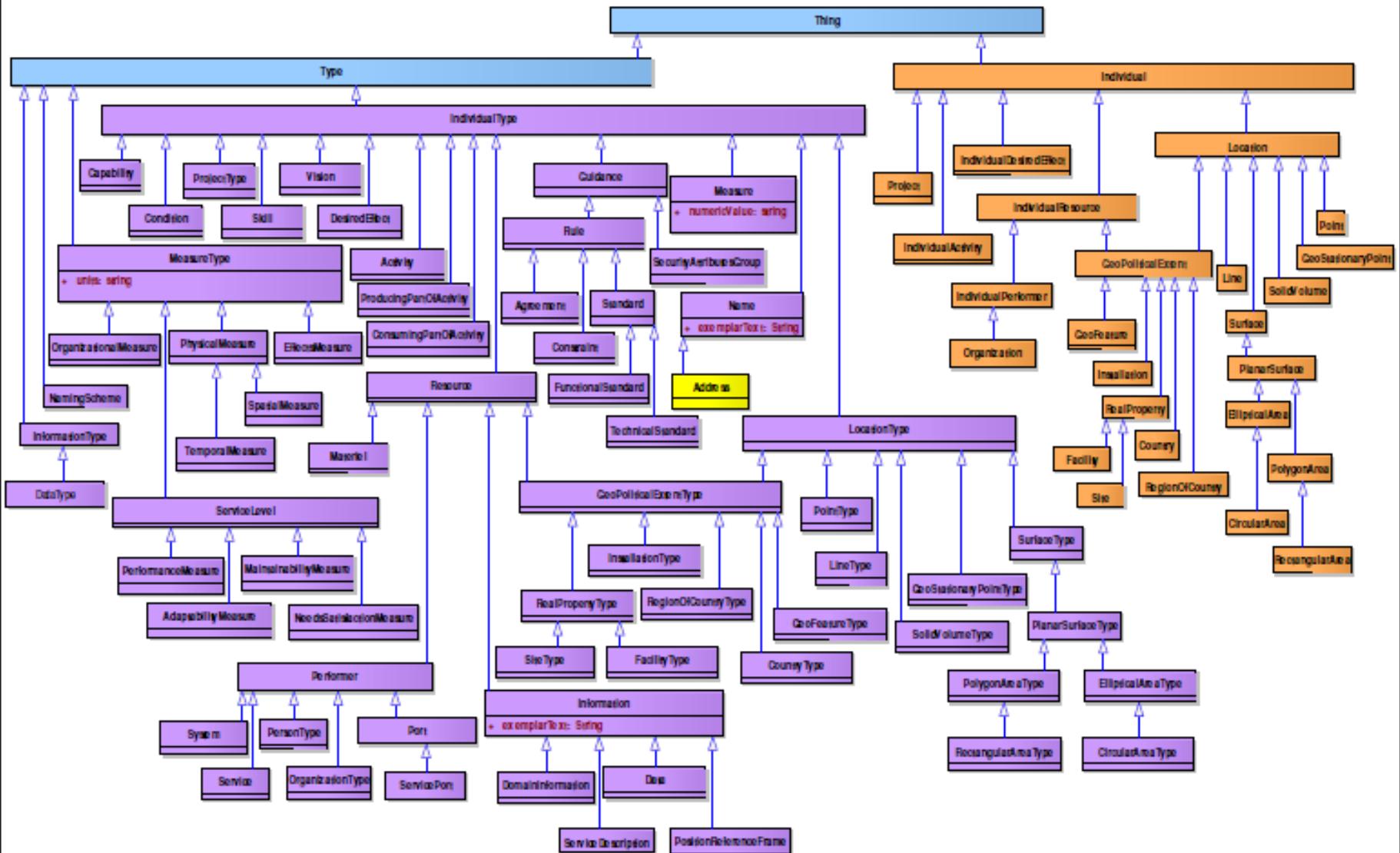


Figure 2-4: DM2 Domain Class Hierarchy

DoDAF terms and concepts

- ▶ Aims and projects
- ▶ Resources
 - ▶ Active structure
 - ▶ Interfaces and components
 - ▶ Services and systems
 - ▶ Passive structure: objects acted on by processes
- ▶ Processes: behaviour
- ▶ Things that are measurable
- ▶ Capabilities – persistent or transient?

Aims and Projects

Vision An end that describes the future state of the enterprise, without regard to how it is to be achieved; a mental image of what the future will or could be like

► Visions are realized by Desired Effects (e.g., objectives).

Desired Effect The result, outcome, or consequence of an action (activity)

► A Project has Desired Effects (e.g., goals).

Project A temporary endeavor undertaken to create Resources or Desired Effects

► A Project consists of several or many Activities (e.g., Tasks).

Activity Work, not specific to a single organization, weapon system or individual that transforms inputs (Resources) into outputs (Resources) or changes their state

► Desired Effects (e.g., goals) guide/drive Activities

Resources: active and passive structure

| | |
|-----------------|---|
| Resource | Data, Information, Performers, Materiel, or Personnel Types that are produced or consumed |
|-----------------|---|

- ▶ In DoDAF terms
 - Performer
 - Organisation
 - Person
 - System
 - Service
 - Port
 - Information
 - Data
 - Materiel
 - Geopolitical extent
- ▶ In our system theory terms
 - Active structure
 - Human
 - Computer
 - Biological entity
 - Other technology
 - Interfaces to the above
 - Passive structure
 - Information/ Data
 - Material
 - Location

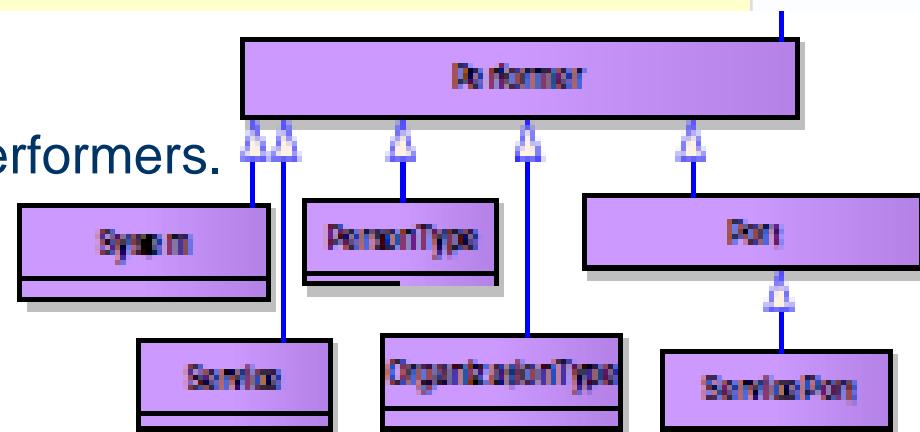
Active structure: interfaces and components

| | |
|--------------------|---|
| Performer | Any entity - human, automated, or any aggregation of human and/or automated - that performs an activity and provides a capability |
| Person Type | A category of persons defined by the role or roles they share that are relevant to an architecture |

- ▶ Performers perform Activities.
 - This distinguishes Performers from their superclass, Resources.
- ▶ Performers perform at Locations.
- ▶ A Person Type (e.g. a radar operator) can be part of a System
- ▶ Person Types have Skills.

| | |
|----------------|---|
| Service | A mechanism to enable access to a set of one or more capabilities, where the access is provided using a prescribed interface and is exercised consistent with constraints and policies as specified by the service description; the mechanism is a Performer; the capabilities accessed are Resources |
|----------------|---|

- ▶ A Service provides access to Performers.



Active structure: service and systems

- ▶ **In an abstract model, Services and Systems look the same**
- ▶ A system is a persistent structural element – an encapsulated group of components that cooperate in processes

System A functionally, physically, and/or behaviorally related group of regularly interacting or interdependent elements

- ▶ A service is also a persistent structural element – an interface that provides access to functions – available for repeated use.

Service A mechanism to enable access to a set of one or more capabilities, where the access is provided using a prescribed interface and is exercised consistent with constraints and policies as specified by the service description; the mechanism is a Performer; the capabilities accessed are Resources -- Information, Data, Materiel, Performers, and Geopolitical Extents

- ▶ A service is NOT a transient behaviour – not the response to a request or event – as TOGAF, ArchiMate and BCS reference model suggest.

Passive structure: objects acted on by processes

Information The state of a something of interest that is materialized -- in any medium or form -- and communicated or received

- ▶ Information describes a thing.
- ▶ Information Pedigree:
 - a type of Information that describes the production of Information (resources) by Activities, their Performers, and the Rules, Conditions, and Measures that apply to that information production.

Data Representation of information in a formalized manner suitable for communication, interpretation, or processing by humans or by automatic means:
Examples could be whole models, packages, entities, attributes, classes, domain values, enumeration values, records, tables, rows, columns, and fields

Matériel Equipment, apparatus or supplies that are of interest, without distinction as to its application for administrative or combat purposes

- ▶ Matériel can be part of a System, the parts and equipment that are part of a System.

Processes: behaviour

Activity Work, not specific to a single organization, weapon system or individual that transforms inputs (Resources) into outputs (Resources) or changes their state

- ▶ Activities **result in effects** on Effect Objects (Resources), i.e., a cause-effect chain.
- ▶ An Activity **consumes or produces Resources**
 - (Materiel, Information, Data, Geo-Political, or other Performers).

Condition The state of an environment or situation in which a Performer performs

- ▶ An Activity is performable under certain **Conditions**
 - (e.g., the Conditions applicable to Tasks in the UJTL).
- ▶ An Activity is performed by a Performer under certain **Conditions**.
- ▶ The performance of Activities as part of a Capability is done under certain **Conditions**

Rule A principle or condition that governs behavior; a prescribed guide for conduct or action

- ▶ Activities are performed in accordance with **Rules**
 - (Controls in IDEF0).
- ▶ The consumption or production of Resources by Activities is subject to **Rules**,
 - (e.g., the Information Assurance Rules that are part of the OV-3).
- ▶ The performance of Activities by Performers is subject to **Rules**.
- ▶ A Rule applies to an Activity under certain **Conditions**,
 - (e.g., Rules of Engagement may vary dependent on threat Conditions).

Capabilities

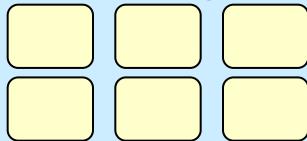
Capability The ability to achieve a Desired Effect under specified (performance) standards and conditions through combinations of ways and means (activities and resources) to perform a set of activities.

- ▶ A Capability entails performance of Activities (Tasks)
 - as so stated in the CJCSI 3170.
- ▶ A Capability is realized by one or more Performers
 - (including configurations of Performer)
- ▶ Capabilities have Desired Effects
 - as so stated in the CJCSI 3170.

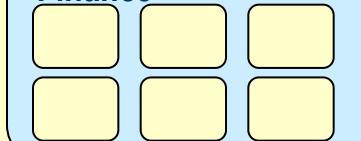
- ▶ *Hmm.. So what is the scope of capability?*
 - *The scope of a persistent resource, performer or system*
 - *The scope of a transient project*

Manage and support the business

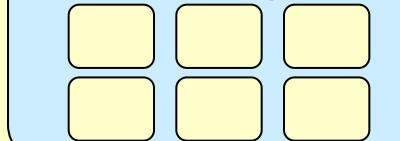
Vendor management



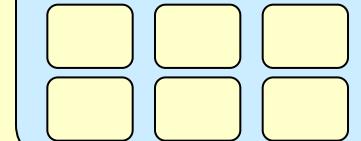
Finance



Business management



Business support



Product and service delivery

Proposition management



Distribution and sales

Channel strategy

Channel management

Panel management

Lead management

Quotes and agreements to buy

Sales performance management

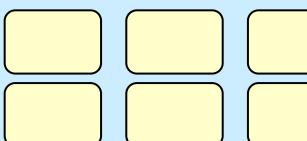
On sell and retention

Distribution support

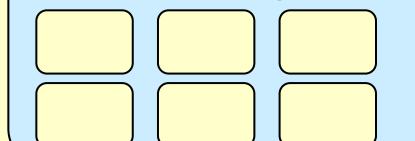
Functional decomposition

Service customers

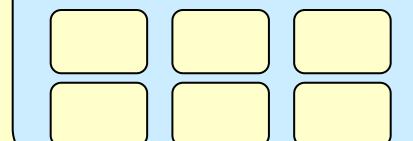
Policy administration



Customer management



Claims



| | | |
|--------------------------|---|---|
| CV-3: Capability Phasing | The planned achievement of capability at different points in time or during specific periods of time. Shows the capability phasing in terms of the activities, conditions, desired effects, rules complied with, resource consumption and production, and measures, without regard to the performer and location solutions. |  Avancier |
|--------------------------|---|---|

► *This view treats a capability as the scope of a transient project*

| Migration path | | | |
|----------------------|---|---------|---------|
| Capability increment | Phase 1 | Phase 2 | Phase 3 |
| A | V.1 activities, conditions, desired effects, rules complied with, resource consumption and production, and measures | V. 2 | |
| B | V. 1 | | |
| C | | V. 1 | V. 2 |
| D | | V. 1 | Retire |
| E | | | V. 1 |
| F | | | V. 1 |

Capabilities – persistent or transient?

| | |
|-------------------|--|
| Capability | The ability to achieve a Desired Effect under specified (performance) standards and conditions through combinations of ways and means (activities and resources) to perform a set of activities. |
|-------------------|--|

- ▶ *It can be persistent structural element – a collection of Resources (people and technologies) able to repeatedly perform Activities (processes) and achieve a Desired Effect.*
- ▶ *But, suppose the Desired Effect is the delivery of a new capability or a capability increment? Then the Capability could instead be the transient scope of a one-off project .*

| | |
|----------------|--|
| Project | A temporary endeavor undertaken to create Resources or Desired Effects |
|----------------|--|

Seems to me that a Capability is...

- ▶ A combination of processes, people and technologies that deliver required products or services.
- ▶ A logical encapsulation of the activities and resources an enterprise or system needs to deliver desired effects, to required measures or standards.
- ▶ It can provide an aim or focus of attention for a strategic project plan.
- ▶ It can take the place occupied by **Business Function or Role** in TOGAF and ArchiMate.

Not to forget: measurement of things that are measurable

- ▶ **Condition**
- ▶ **Resource** (e.g., mass, size).
- ▶ **Project** (e.g., time, cost).
- ▶ **Desired Effects**
- ▶ **Activity** (e.g., how long it takes.).
- ▶ **Effect** on Effect Objects by Activities.
- ▶ **Skills** of a Person Type (e.g., Skill level of a Person Type).

- ▶ The performance of Activities by Performers (Additional to Activities' Measures).
- ▶ The performance of Activities under certain Conditions
 - (e.g., the Measure Types applicable to Tasks [Activities] in the UJTL).
- ▶ The performance of Activities as part of a Capability (metrics) for their performance
 - as so stated in the CJCSI 3170.
- ▶ The consumption and production of Resources by Activities
 - (e.g., the Timeliness and Size measures that are part of the OV-3).

- ▶ **Measurements** are done in accordance with Rules, (e.g., Rules that specify how test measurement equipment must be calibrated before a test).
- ▶ Measures can be categorized into **Measure Types**.

Core concept summary (1 of 2)

| | |
|----------------------------------|--|
| Activity | Work, not specific to a single organization, weapon system or individual that transforms inputs (Resources) into outputs (Resources) or changes their state |
| Agreement | A consent among parties regarding the terms and conditions of activities that said parties participate in |
| Architectural Description | Information describing an architecture such as an OV-5b Operational Activity Model |
| Capability | The ability to achieve a Desired Effect under specified (performance) standards and conditions through combinations of ways and means (activities and resources) to perform a set of activities. |
| Condition | The state of an environment or situation in which a Performer performs |
| Constraint | The range of permissible states for an object |
| Data | Representation of information in a formalized manner suitable for communication, interpretation, or processing by humans or by automatic means: Examples could be whole models, packages, entities, attributes, classes, domain values, enumeration values, records, tables, rows, columns, and fields |
| Desired Effect | The result, outcome, or consequence of an action (activity) |
| Guidance | An authoritative statement intended to lead or steer the execution of actions |
| Information | The state of a something of interest that is materialized -- in any medium or form -- and communicated or received |
| Location | A point or extent in space that may be referred to physically or logically |

Core concept summary (2 of 2)

| | |
|---------------------|--|
| Materiel | Equipment, apparatus or supplies that are of interest, without distinction as to its application for administrative or combat purposes |
| Measure | The magnitude of some attribute of an individual |
| Measure Type | A category of Measures |
| Organization | A specific real-world assemblage of people and other resources organized for an on-going purpose |
| Performer | Any entity - human, automated, or any aggregation of human and/or automated - that performs an activity and provides a capability |
| Person Type | A category of persons defined by the role or roles they share that are relevant to an architecture |
| Project | A temporary endeavor undertaken to create Resources or Desired Effects |
| Resource | Data, Information, Performers, Materiel, or Personnel Types that are produced or consumed |
| Rule | A principle or condition that governs behavior; a prescribed guide for conduct or action |
| Service | A mechanism to enable access to a set of one or more capabilities, where the access is provided using a prescribed interface and is exercised consistent with constraints and policies as specified by the service description; the mechanism is a Performer; the capabilities accessed are Resources -- Information, Data, Materiel, Performers, and Geopolitical Extents |
| Skill | The ability, coming from one's knowledge, practice, aptitude, etc, to do something well |
| Standard | A formal agreement documenting generally accepted specifications or criteria for products, processes, procedures, policies, systems, and/or personnel |
| System | A functionally, physically, and/or behaviorally related group of regularly interacting or interdependent elements |
| Vision | An end that describes the future state of the enterprise, without regard to how it is to be achieved; a mental image of what the future will or could be like |