

Telecommunications Service Creation: Towards Extensions for Enterprise Architecture Modeling Languages

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- What are Enterprise Architecture Modeling Language (EAML) Extensions?
- Why extend EAMLs?
- How extend EAMLS?
- Case study: an EAML extension for Telecom service creation
- Related work
- Conclusion



## What are Enterprise Architecture Modeling Language (EAML) Extensions?

- Enterprise Architecture (EA)
  - A set of models describing the structure and functions of an enterprise.



Enterprise meta-models at different levels of specificity, from [The Open Group, 2009].



# What are Enterprise Architecture Modeling Language (EAML) Extensions?

- Modeling Language (ML)
  - "A graphical language for visualizing, specifying, constructing, and documenting the artifacts of a software intensive system". [Booch et al., 2005]





### Language Extension

- A mechanism for customizing reference languages with constructs that are specific to particular domains, platforms. [Alhir, 2002]
- Allows refining the reference language in a *strictly* additive manner, so that they can't contradict standard semantics.





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## Why Entreprise Architecture (EA) ?

- An overall model of product/service creation taking in all business, management, and technical activities.
- An EA approach is beneficial for:
  - Management of system complexity,
  - Agile business alignment with technology platforms,
  - Interoperability and integration of constituting systems of an enterprise,
  - Promotion of common understanding across the entreprise.





### Why Modeling Languages (MLs) ?

- Usability graphic,
- Readability graphic,
- Standardization semantics agreed upon by a consortium,
- High abstraction generation towards a lower abstraction level (textual) language possible.
- An EAML offers the advantage of a unified language, capable of describing a wide range of domains.







### Why Language Extensions ?

- Reuse of tools for the base language,
- Easier interoperability between extensions facilitated by constructs common between each extension and the base language,
- No impact on tools for the base language strictly additive constraint.
- An EAML lacks semantic strength (i.e. the concepts present in the EAML are too abstract and they need refinement and specification). [Khoury, 2007]





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### The Meta-model approach for ML definition [Clark, 2001]







### Meta-model



The ArchiMate meta-model for technical view, from [The Open Group, 2009].





### Advantages of the Meta-modeling approach

- Use of meta-tools (i.e. tools that allow specification and generation of other tools):
  - Rapid ML tool (e.g., editor, 'engine') building/generation,
  - Low cost of ML tools,
  - Simple evolution process for ML tools updating only the configuration of the meta-tools (i.e. meta-model).





# Language extension with the Meta-modeling approach







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# Case study: an EAML extension for Telecom service creation

### The EAML



The ArchiMate meta-model for technical view, from [The Open Group, 2009].



# Case study: an EAML extension for Telecom service creation

### The EAML Telecom extension



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**Towards EAML Extensions** 



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## On Enterprise Architecture (EA)

- MEGAF [Hilliard et al., 2010]
  - Infrastructure for realizing architecture frameworks,
  - Extensible repository of viewpoints, views, model kinds, architecture models, system concerns, stakeholders.
- BUT
  - Generic infrastructure, in which specific architecture frameworks and languages have to be defined before they can be used;
  - Our approach starts from existing frameworks, languages and tools, and extends them.





### On EAML extensions

- ArchiMate proposed extensions
  - A Goal-Oriented Requirements Modelling Language for Enterprise Architecture [Quartel et al., 2009]
  - ArchiMate Extension for Modeling the TOGAF Implementation and Migration Phases [Jonkers et al., 2010]
- BUT
  - They propose adding concepts and relations in a non strictly additive manner;
  - Our approach is intended for strictly additive extensions (i.e. profiles).





### On Telecom service creation

- A Service Creation Environment [Blum et al., 2009]
  - based on MDE,
  - intended for orchestrated real-time communications services, through a service broker, on top of Next Generation Networks.
- BUT
  - Their approach is focused on composition of services;
  - Our proposal, being based on EA frameworks and languages, offers an overall representation of service creation.





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- Advocate the need of Enterprise Architecture Modeling Languages (EAMLs) for more specificity and higher degree of detail at lower levels of abstraction.
- Hope to raise awareness among EAML tool providers about this need, so that they support extension mechanisms.





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