

Analyzing the Software Measurements Domain, and Introducing to Software Measurement Ontologies

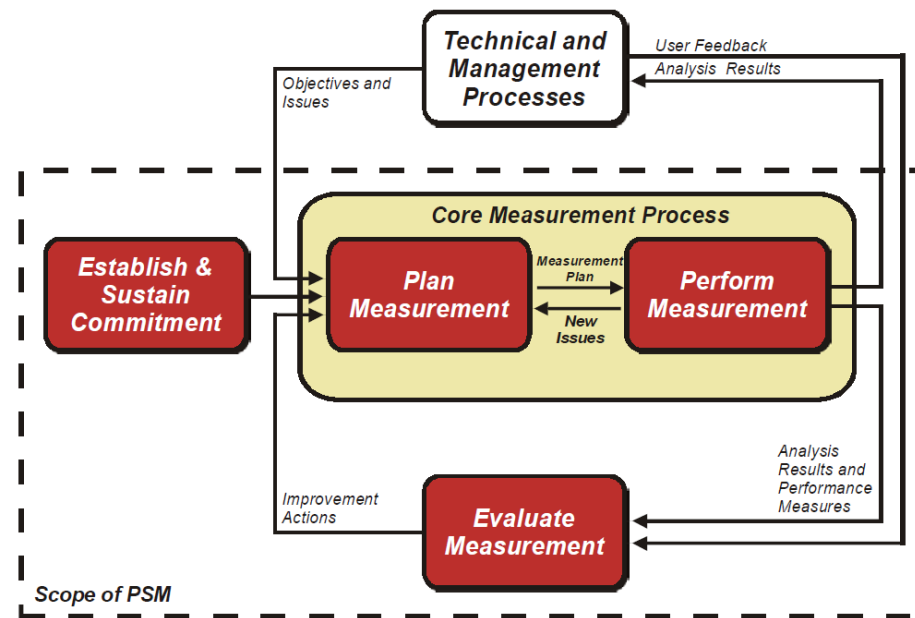
Outline

In order to both improve our communication, provide knowledge and promote common understanding, and to make the best possible description of the measurement domain in reality, with regard to a certain level of granularity and view point:

- Let us synthesize what we have been saying up to now about measurement and eventually expand on.
- Let us introduce to some reference ontologies.

Practical Software & System Measurement (PSP)

As already mentioned in a previous Section, PSM describes how to define and implement a measurement program to support the information needs of the software and system acquirer and supplier organizations.



PSM DOD Implementation Guidance.3-5-03

In the remaining we try to extend on, to go in deep, and to follow the evolutions on the related concepts.

Sw. Measurement Roles and Ontologies vs. Organization Maturity Levels

Depending on its maturity level, a software organization can perform measurement in different ways.

- At low – medium maturity levels, e. g., the Capability Maturity Model Integration (CMMI)'s levels *Initial*, *Managed* or *Defined*, the focus is on *supporting Management information needs*.
- At higher maturity levels, i.e., the CMMI levels *Quantitatively Managed* or *Optimizing*, measurement should be performed for the purpose of *Statistical process control* (SPC), in order to *understand the Process behavior* and to *support Process improvement efforts*.

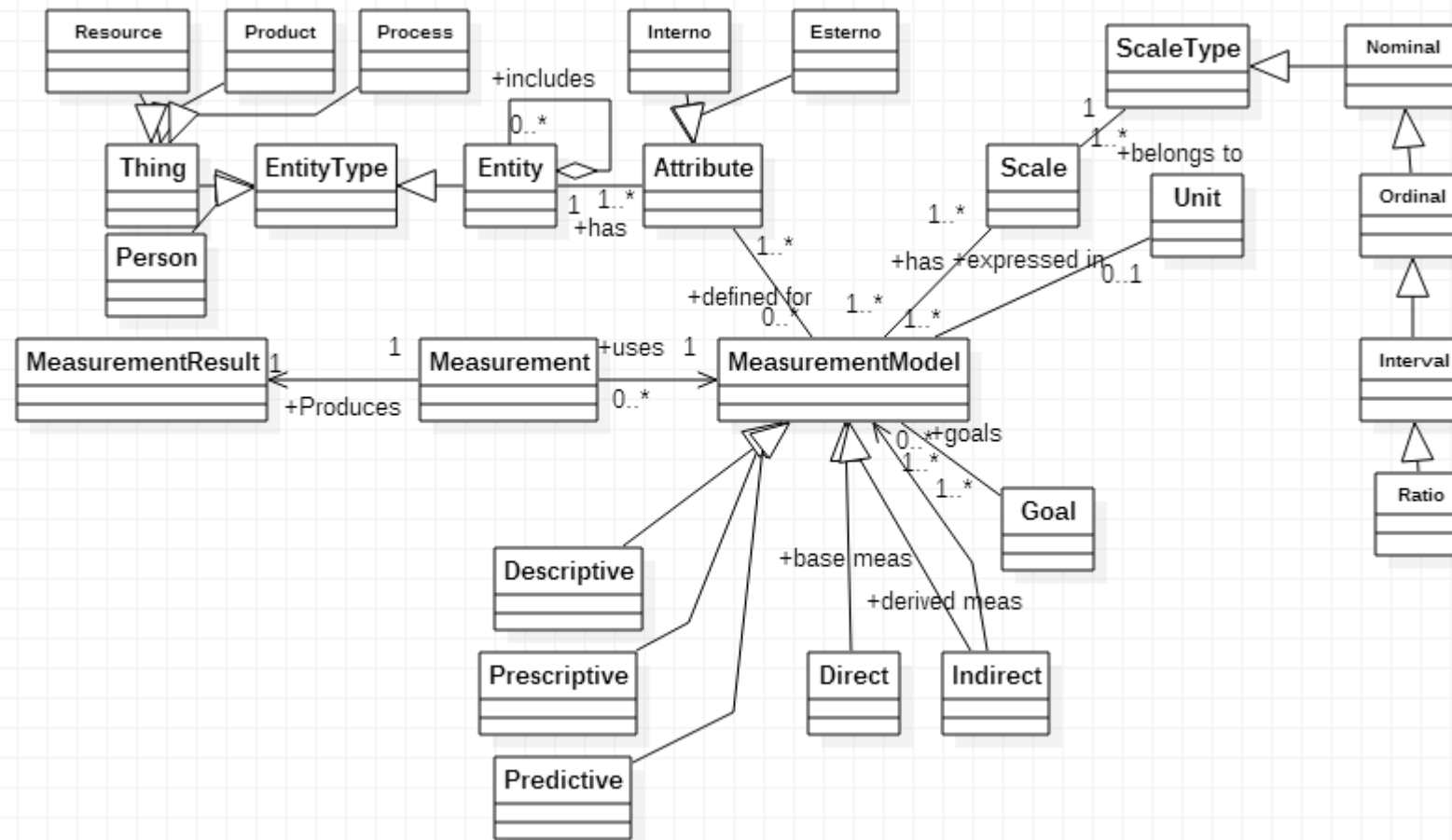
Measurement Model Ontologies (MMO)

Introducing to:

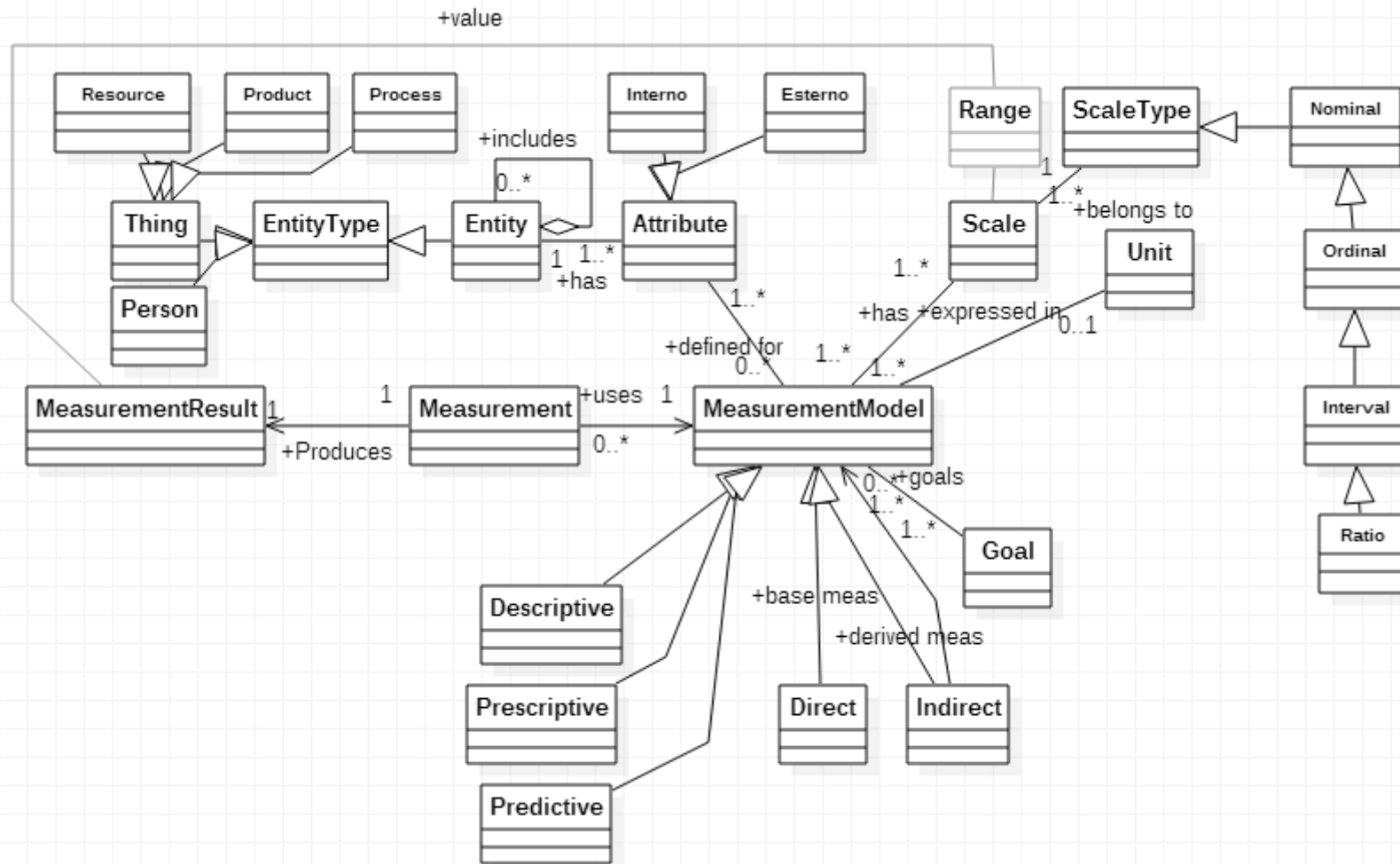
- the “basic MMO”, **bMMO**, and related evolutions,
- the “Software MMO”, **SMMO**,
- the “simplified MMO”, **sMMO**,
- a Reference Software Ontology, **RSO**, and related sub-ontologies and integrated ontologies.

Basic MMO ('90s)

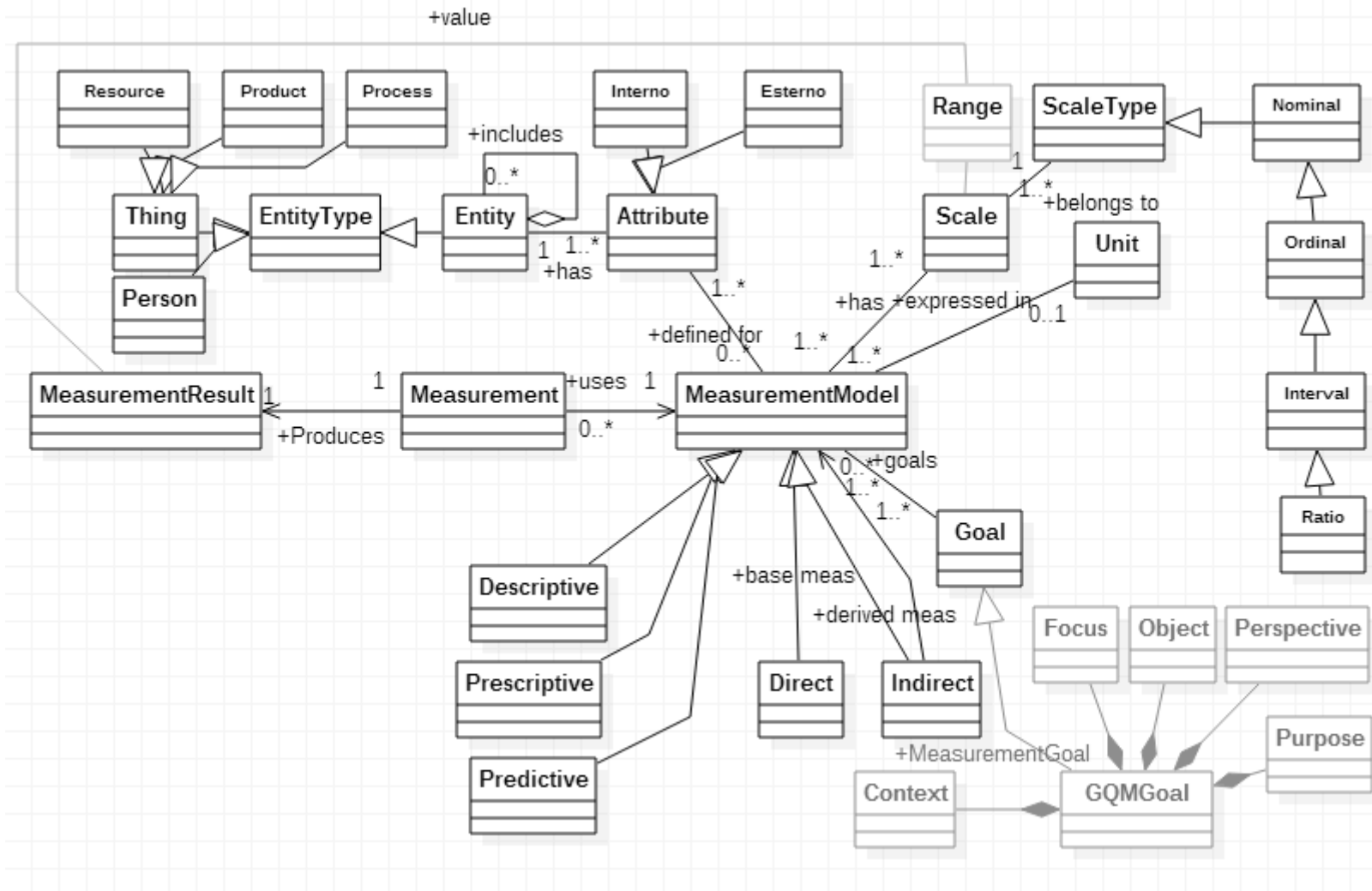
Based on: G. Cantone, P. Donzelli: *Fron the Concept of Measure to the Production of Models for Software Measurement*, (in Italian) ISERN TR 96-15 (1996). G. Cantone, P. Donzelli: *Production and Maintenance of Goal-Oriented Software Measurement Models*. Intl. Journal of Software Engineering and Knowledge Engineering 10(5): 605-626 (2000). G. Cantone, P. Donzelli, G. Pesce: *Misure software: teoria, modelli e ciclo di vita*. In *Metriche per il software*, F. Angeli (2006)



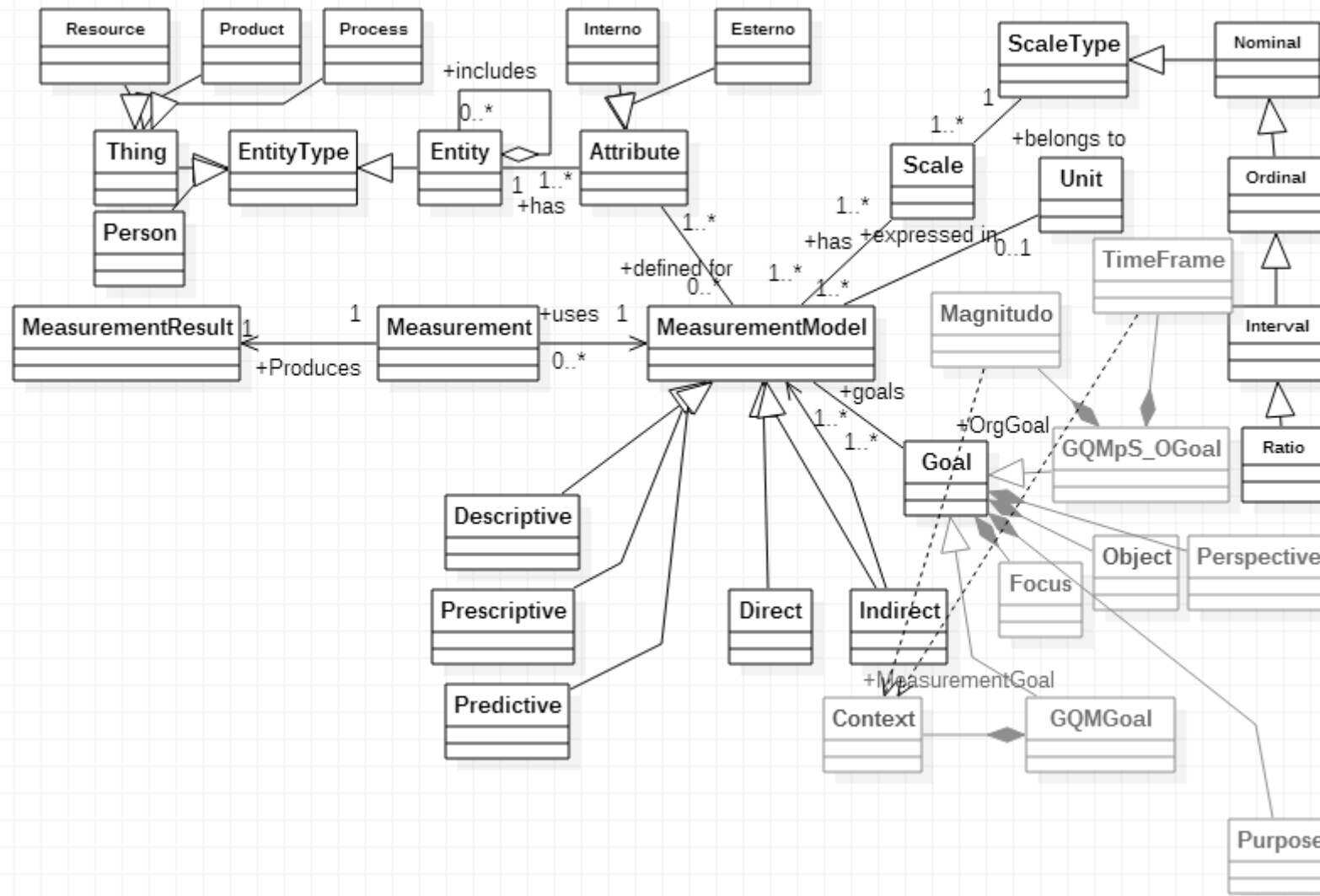
Detailing on the Basic MMO: an Instance 1/2



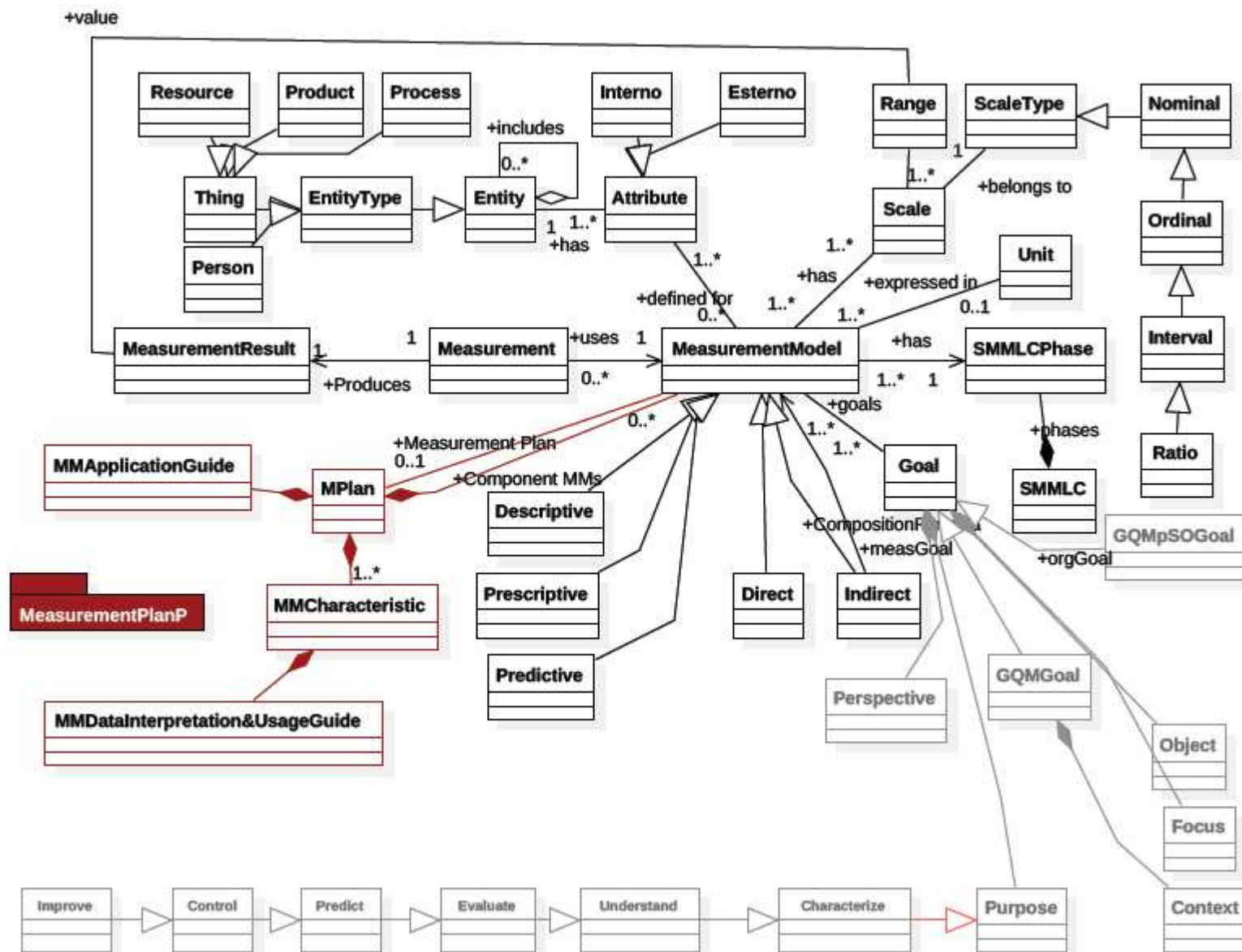
Detailing on the Basic MMO: an Instance 2/2



Evolutions of the Basic MMO 1/2



Evolutions of the Basic MMO 2/2



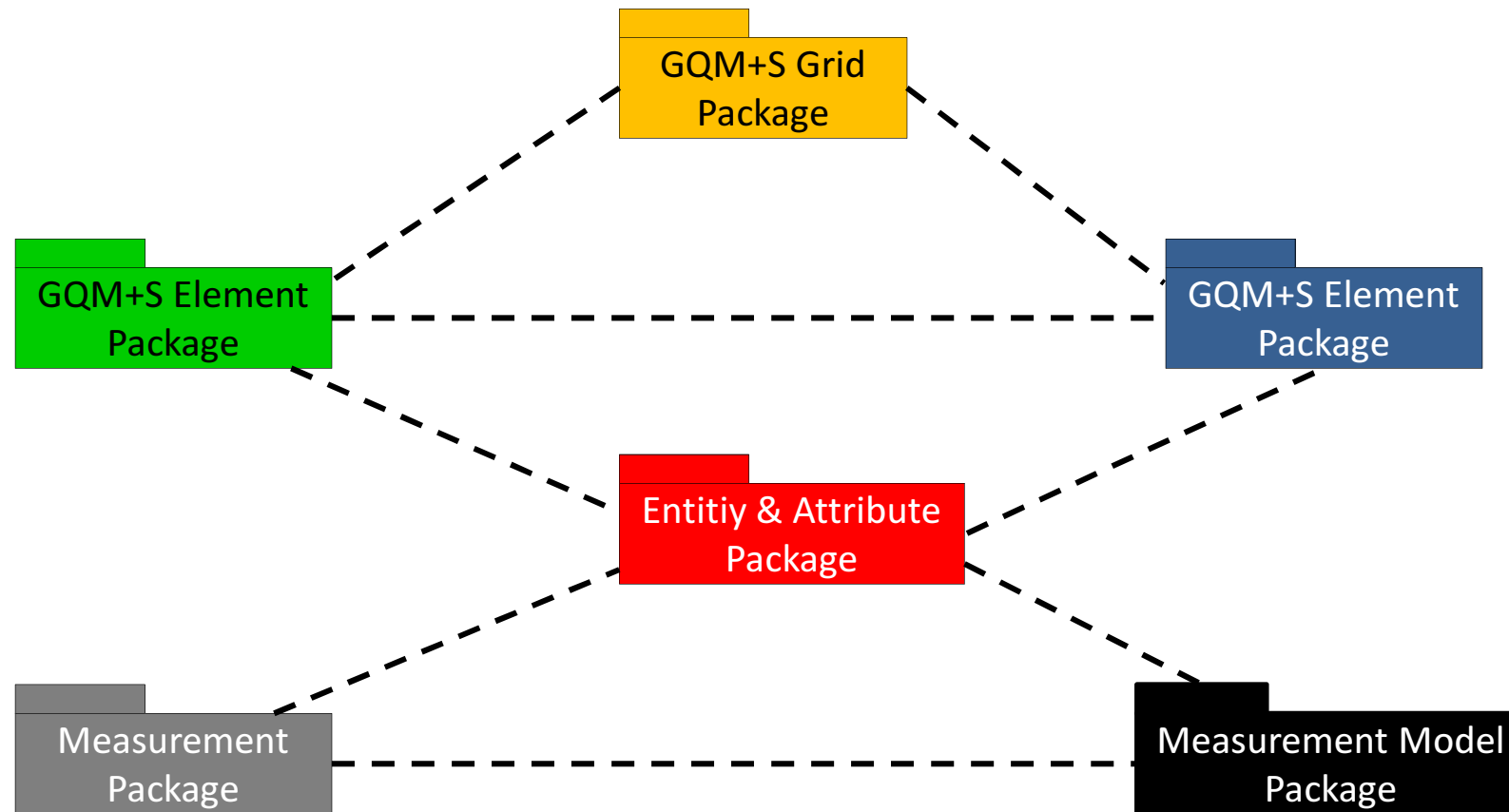
Materiale a circolazione interna al corso
ISSR – G. Cantone

Based on Cantone-Donzelli 1996, ISERN TR
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Basili et. al. GQM+Strategies, 2014, Springer

Based on Garsia, Piattini et al., 2006

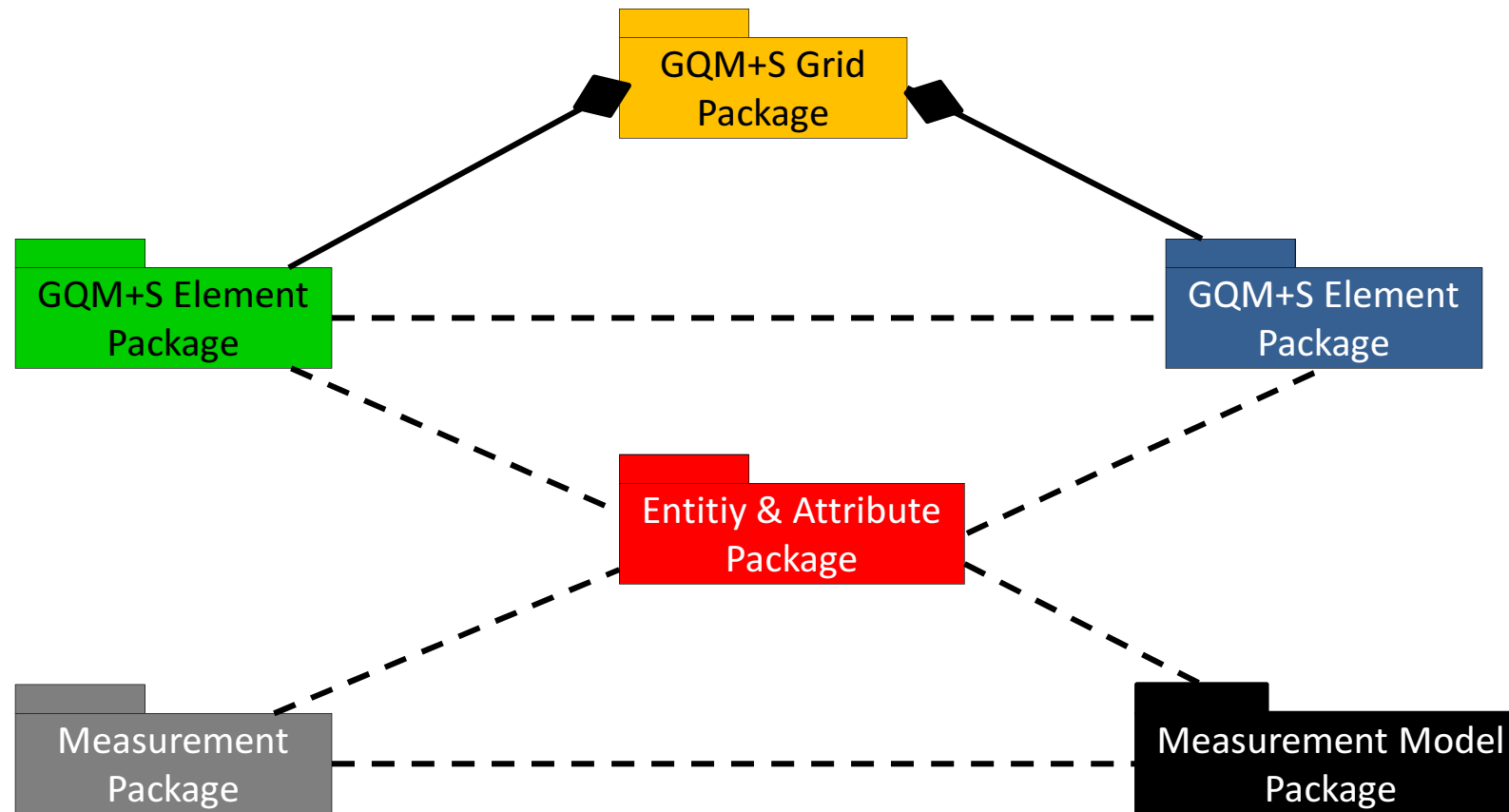


sMMO Organization: Top Level (2000 .. 2016)



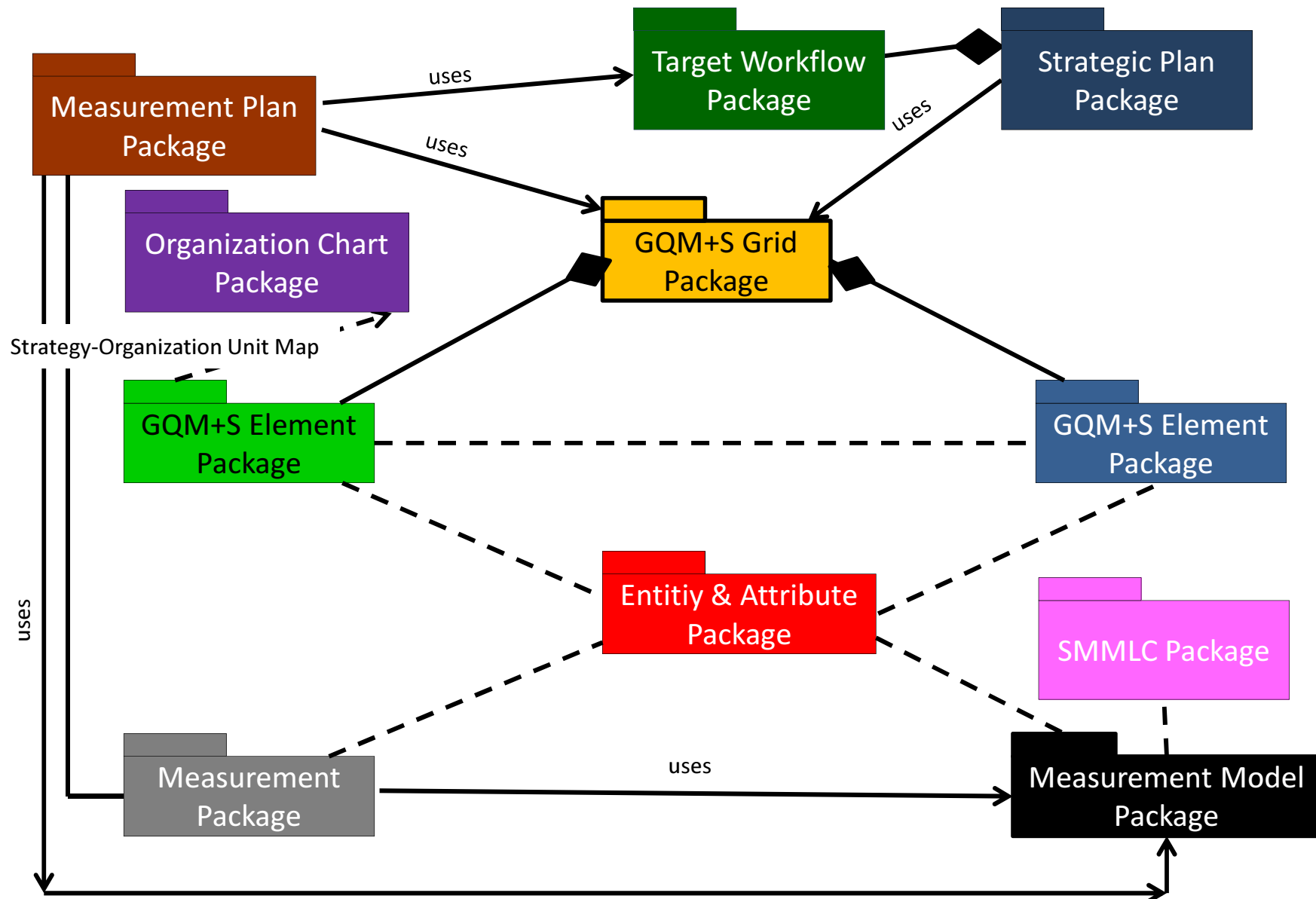
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sMMO Organization: Top Level (2000 .. 2016)



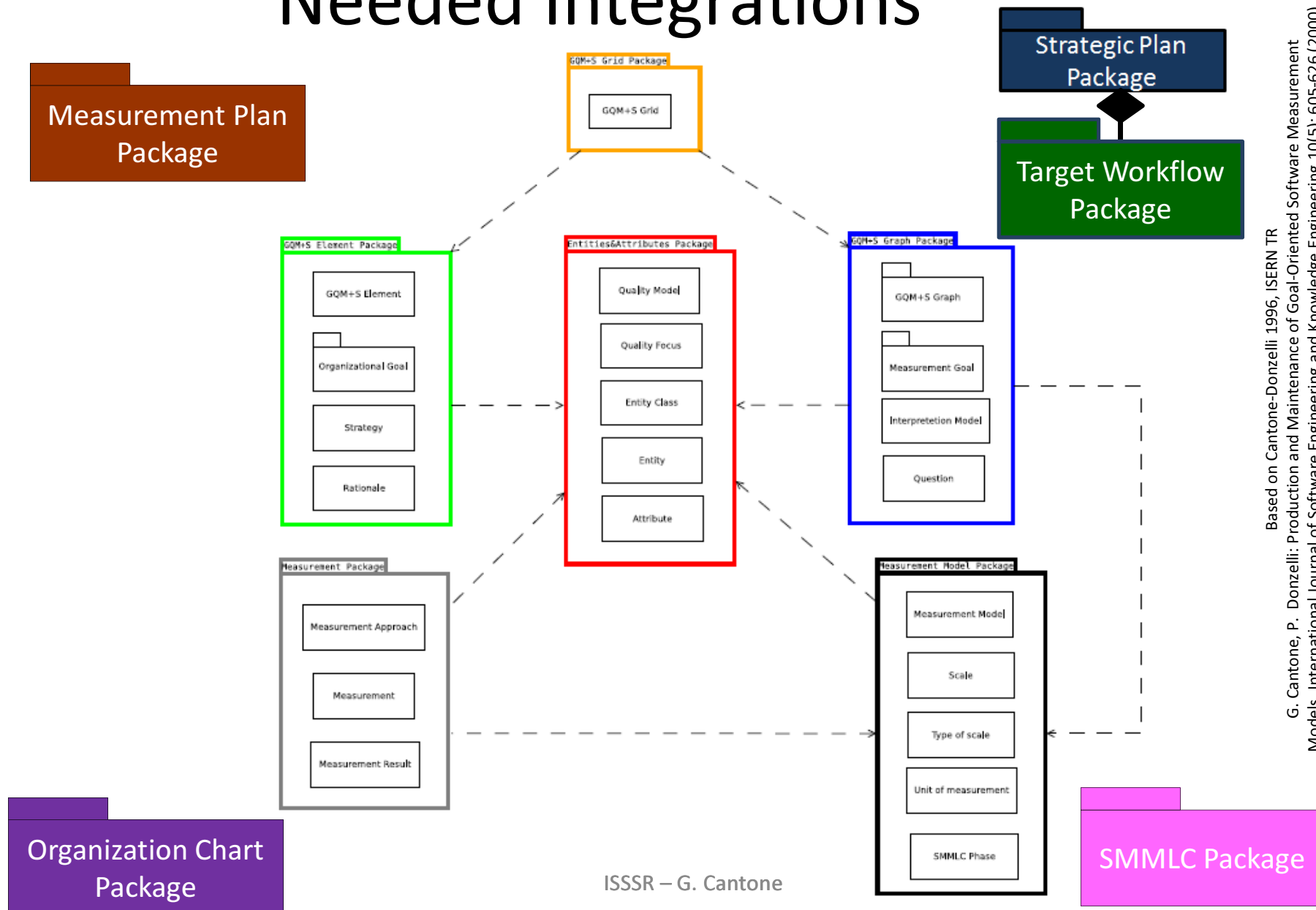
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sMMO Integrated Organization: Top Level (2000 .. 2016)



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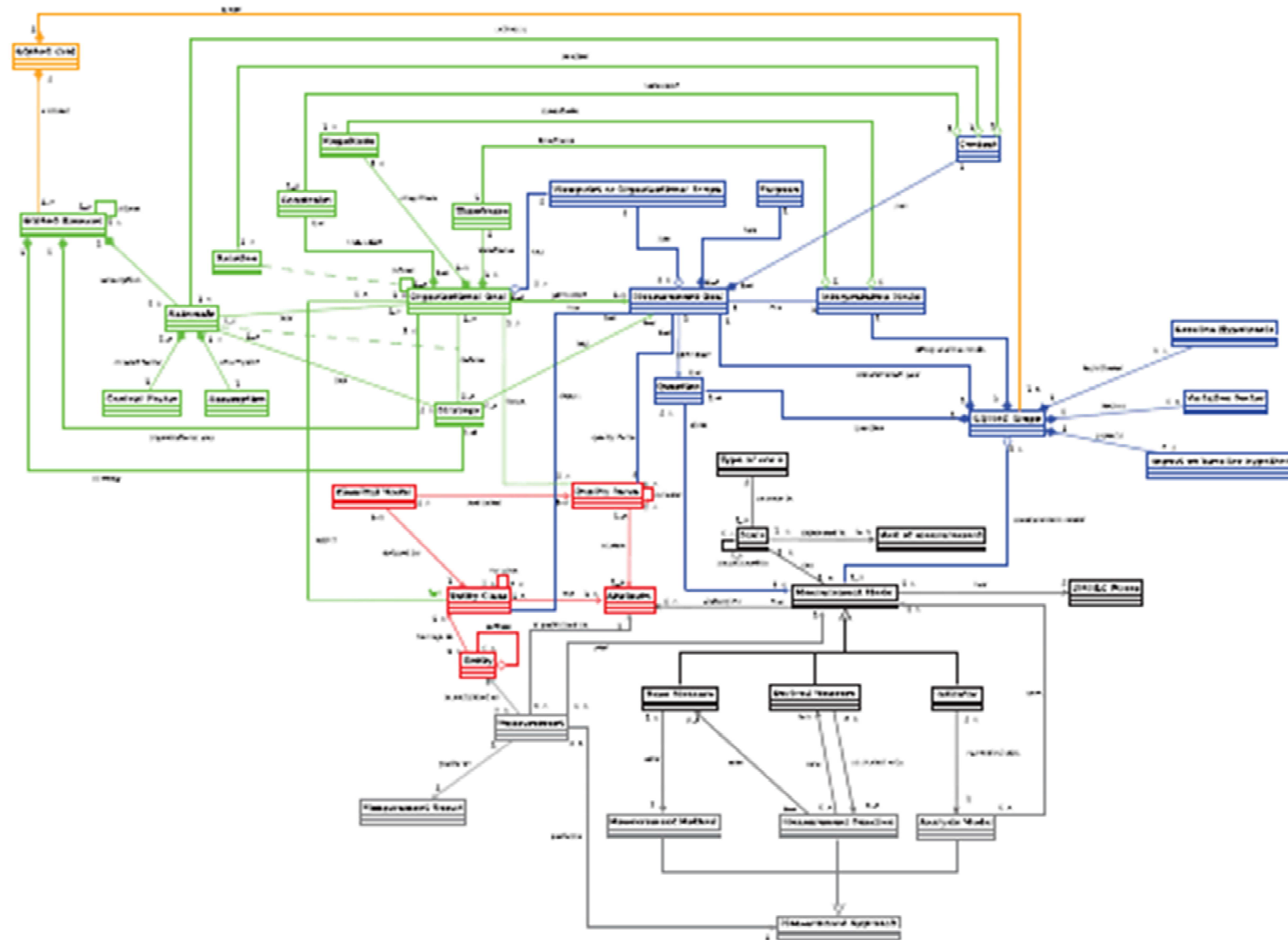
sMMMO - Packages Diagram: Needed Integrations



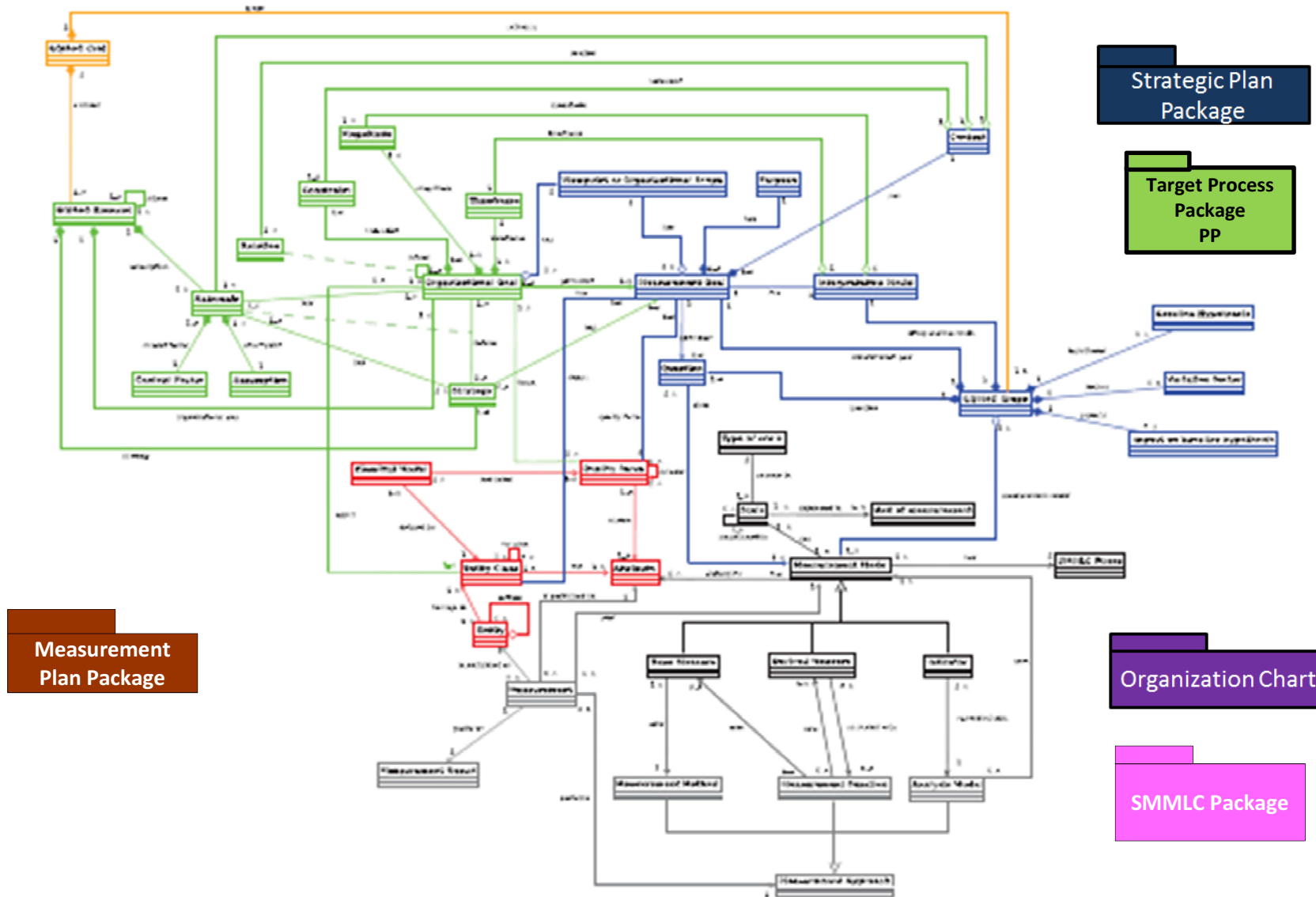
ISSSR – G. Cantone

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sMMO as a Whole (2016)

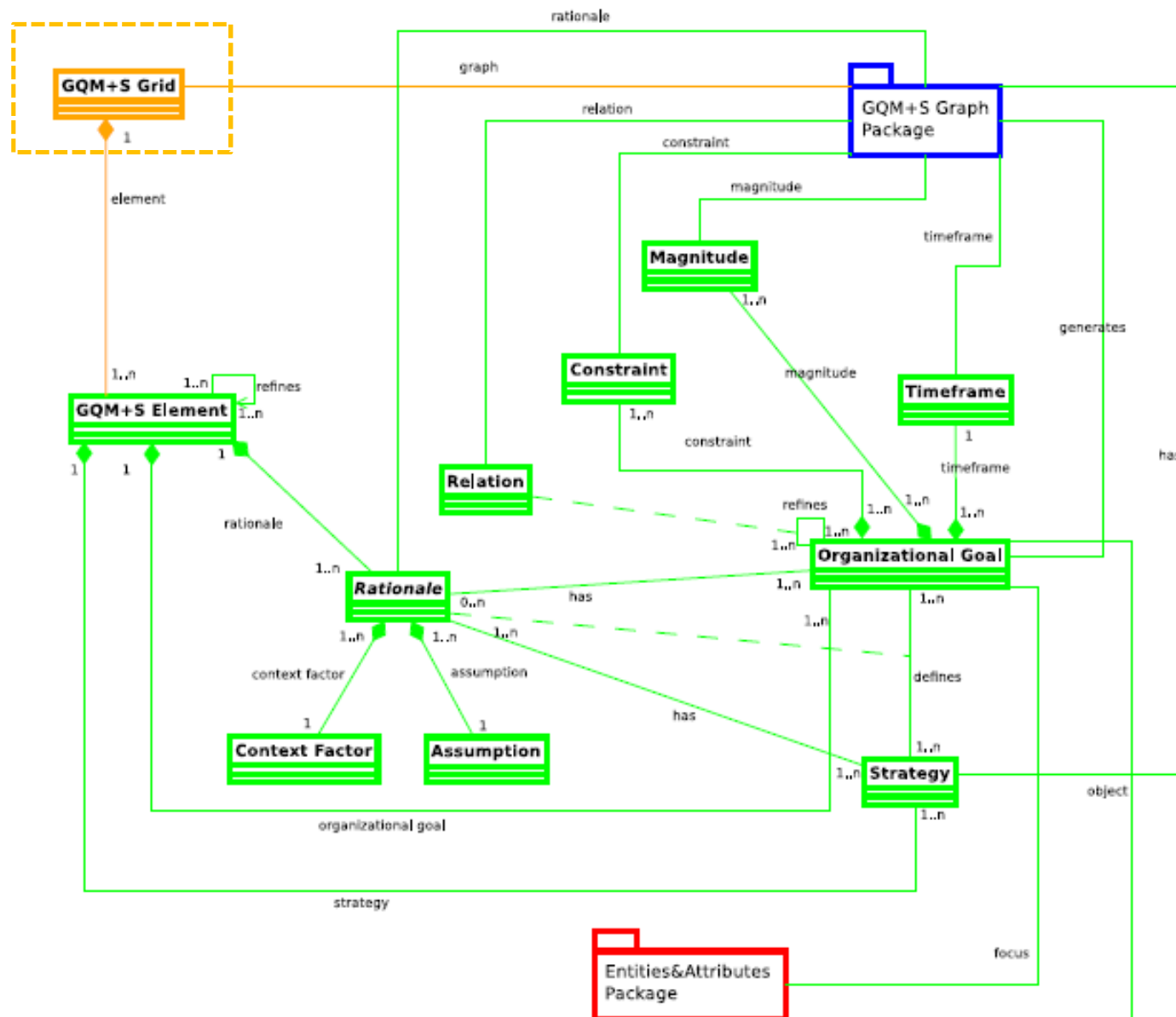


iMMO as a Whole (June 2017)



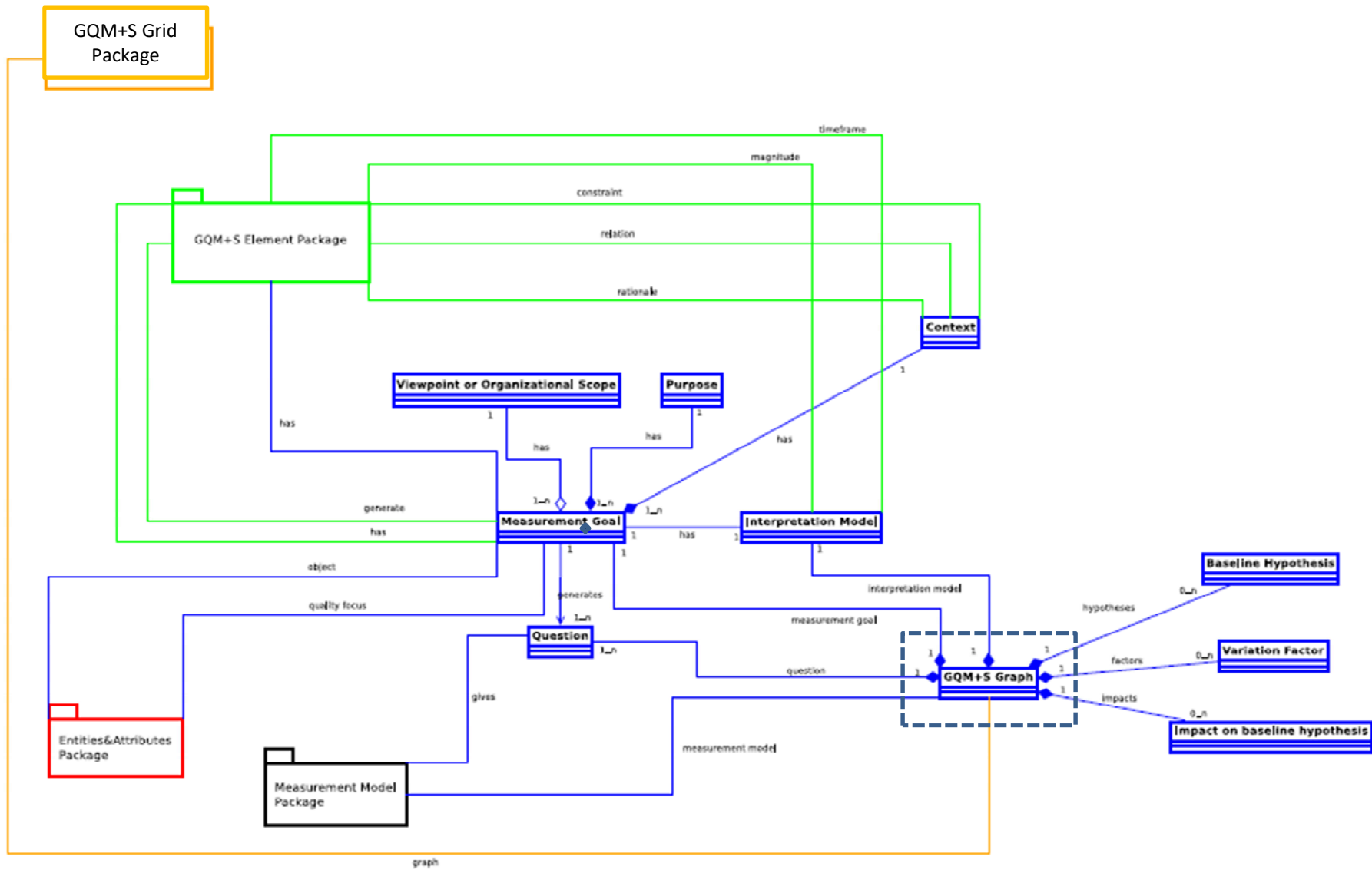
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sMMO – GQM Element Pkg.



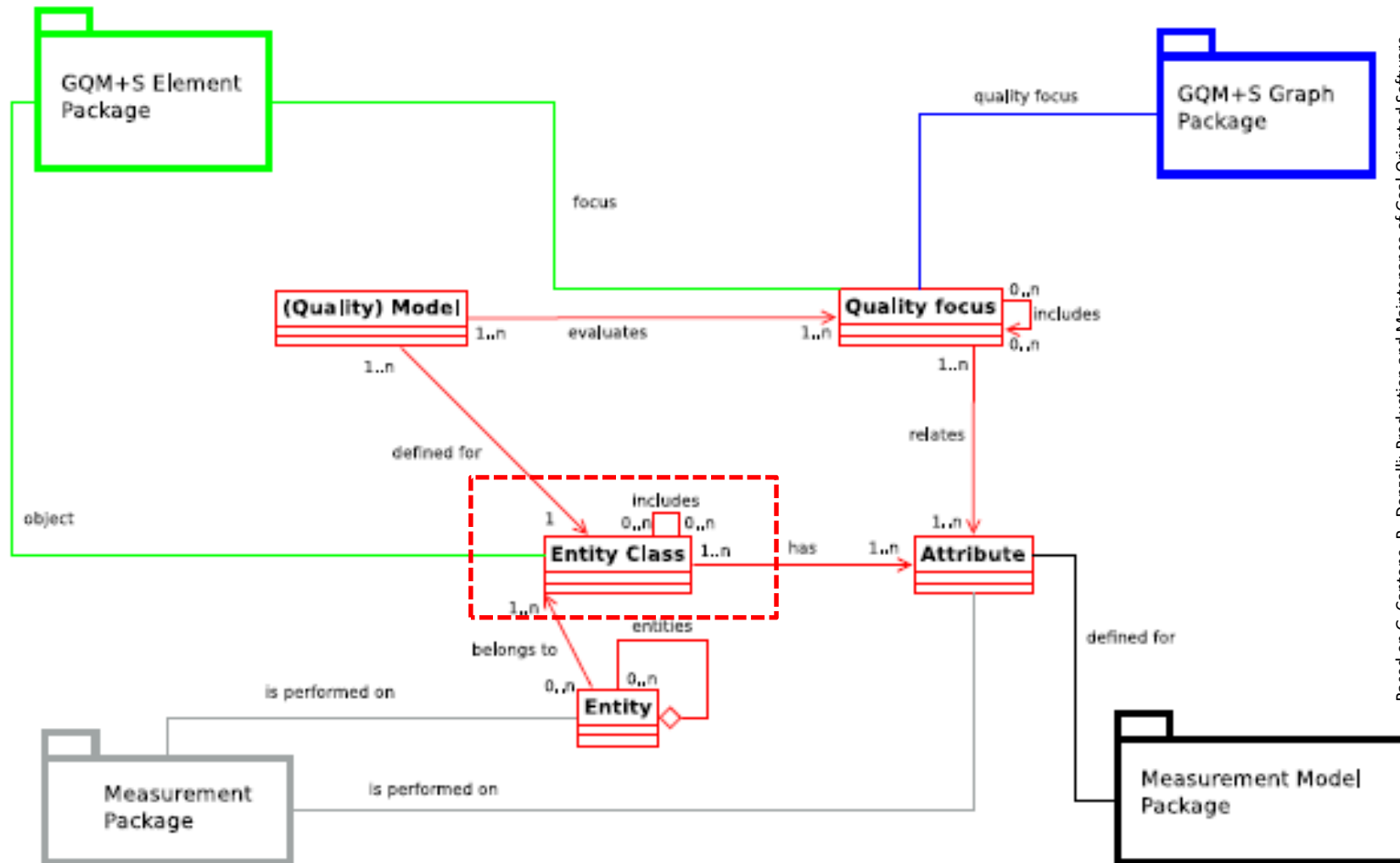
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sMMO – GQM Graph Pkg.



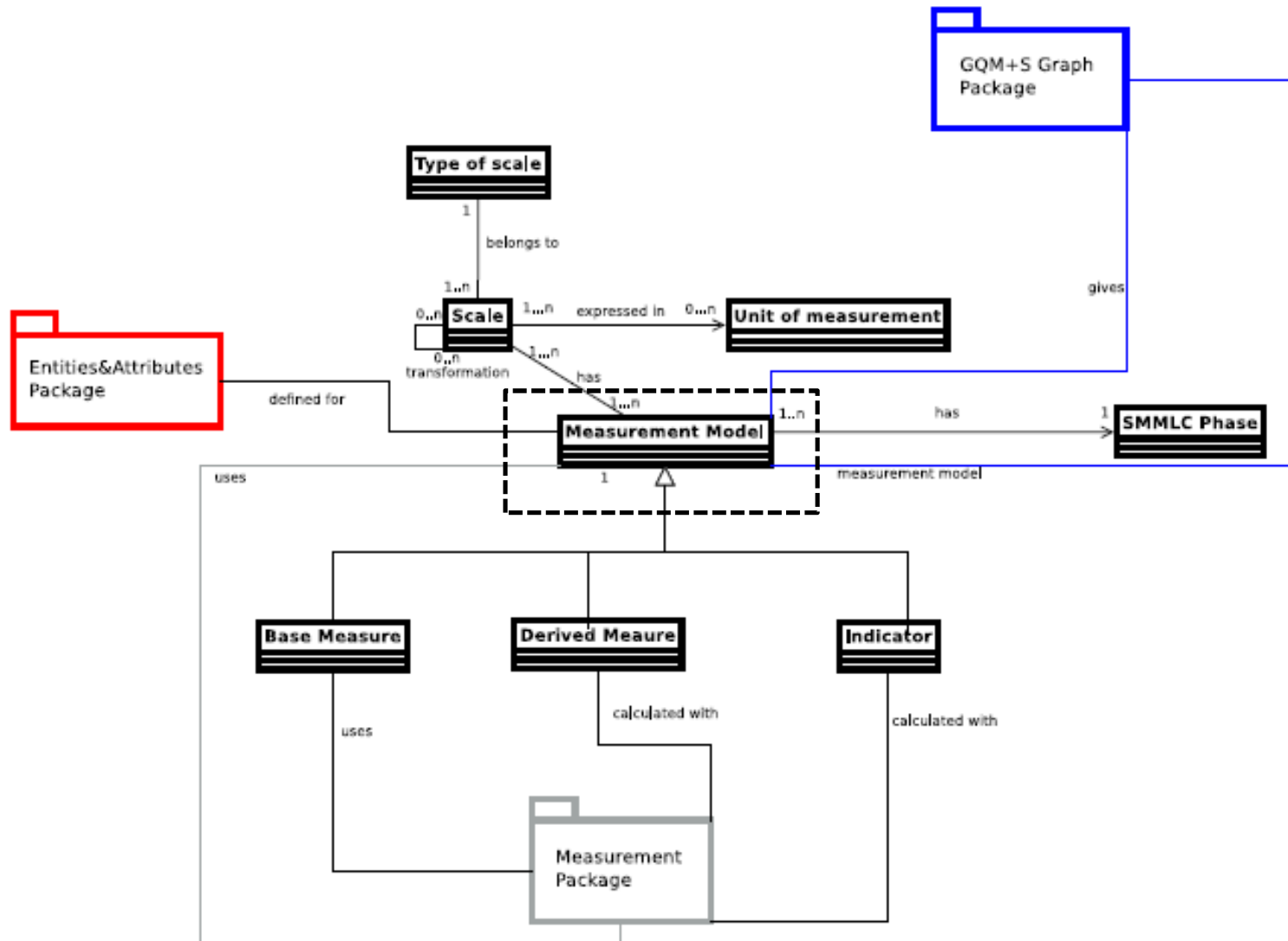
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sMMO – Attribute & Entity Pkg.



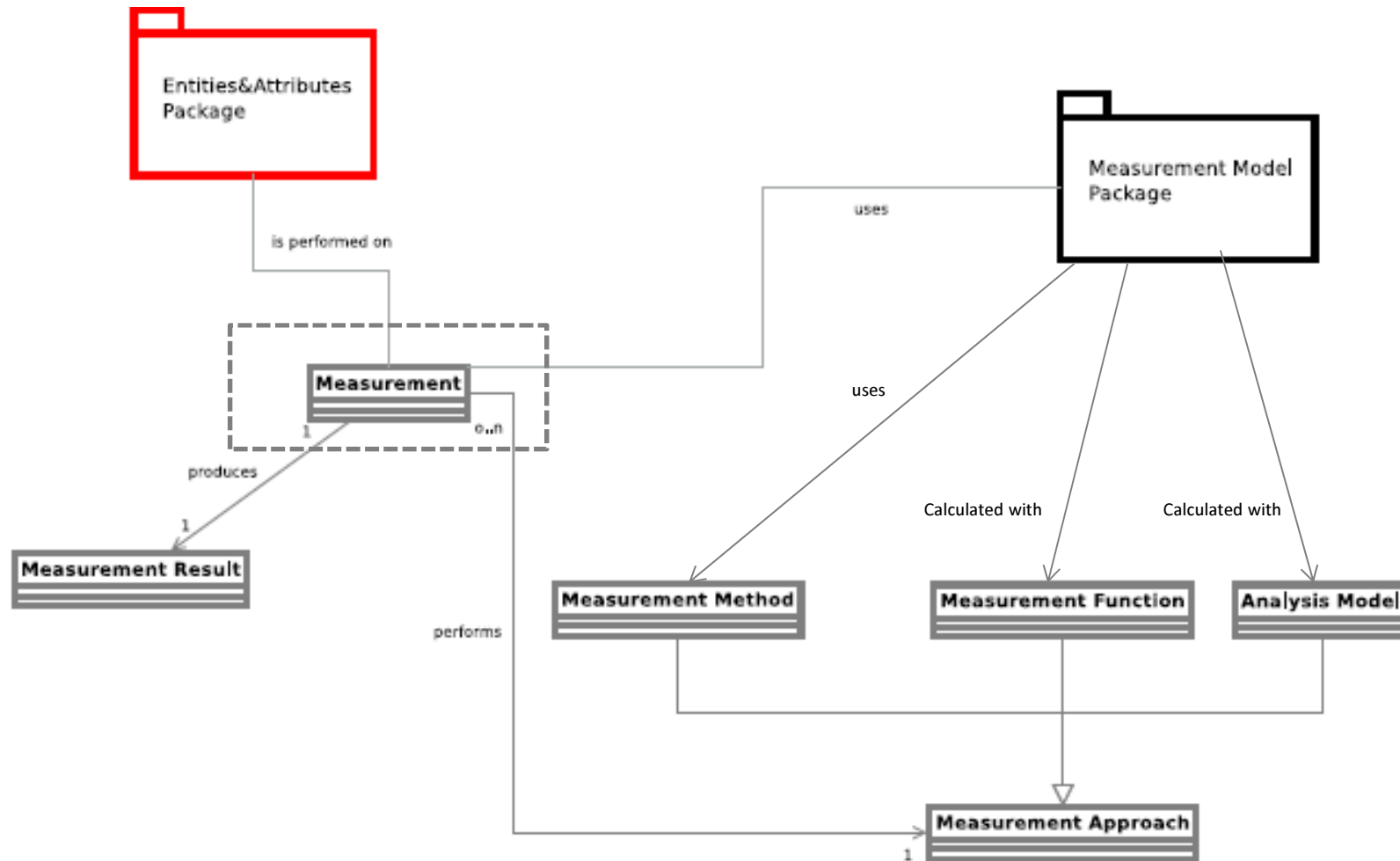
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sMMO – Measurement Model Pkg.



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sMMO – Measurement Pkg.



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