

System Engineering in Astronomical Instrumentation with sysml (by sys-ml Ignorant)

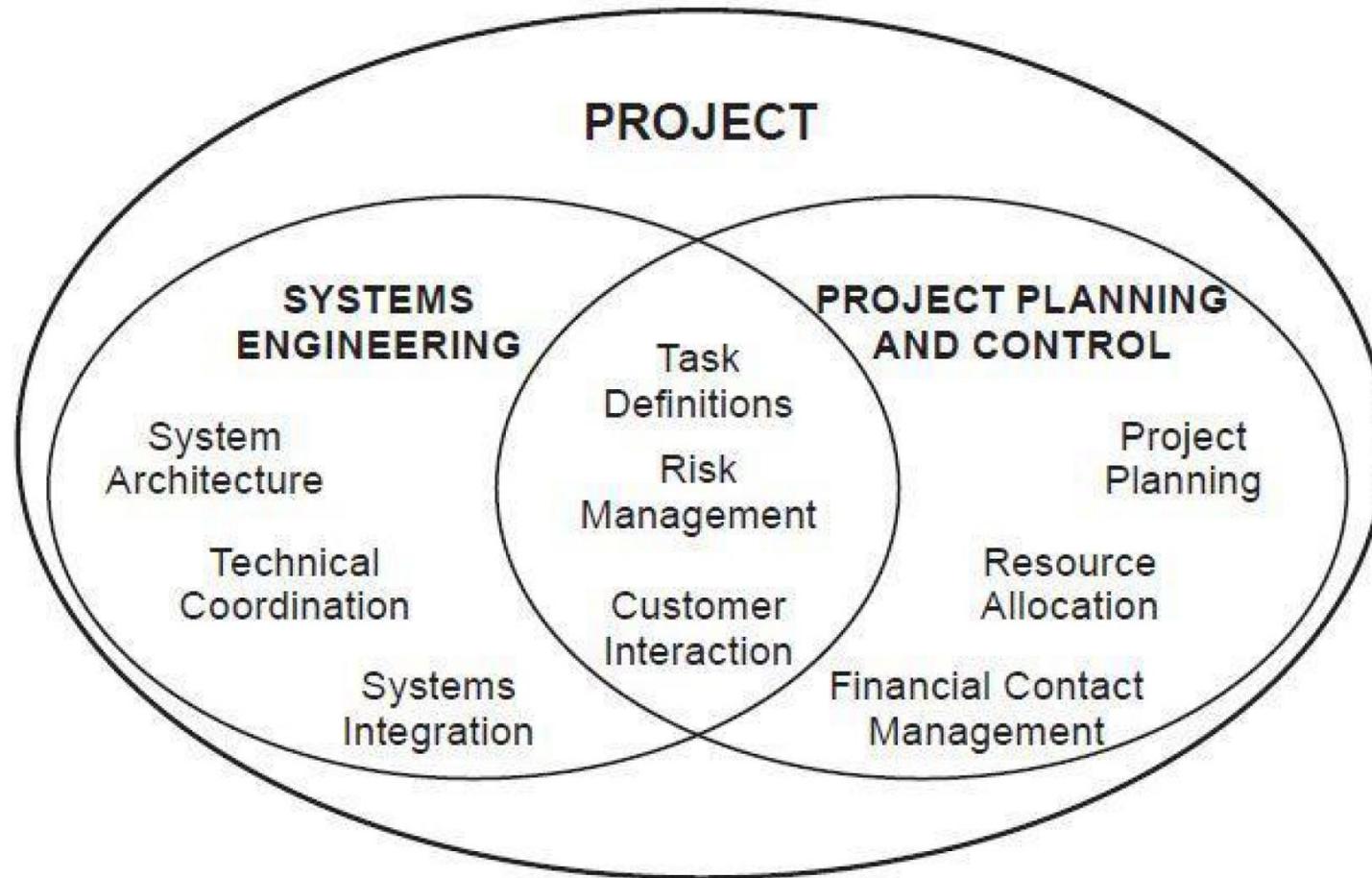
Trieste 17-11-2016

M.Riva

Outline

- Background
- Perché sysml?
- Come è stato implementato?
- Il futuro?

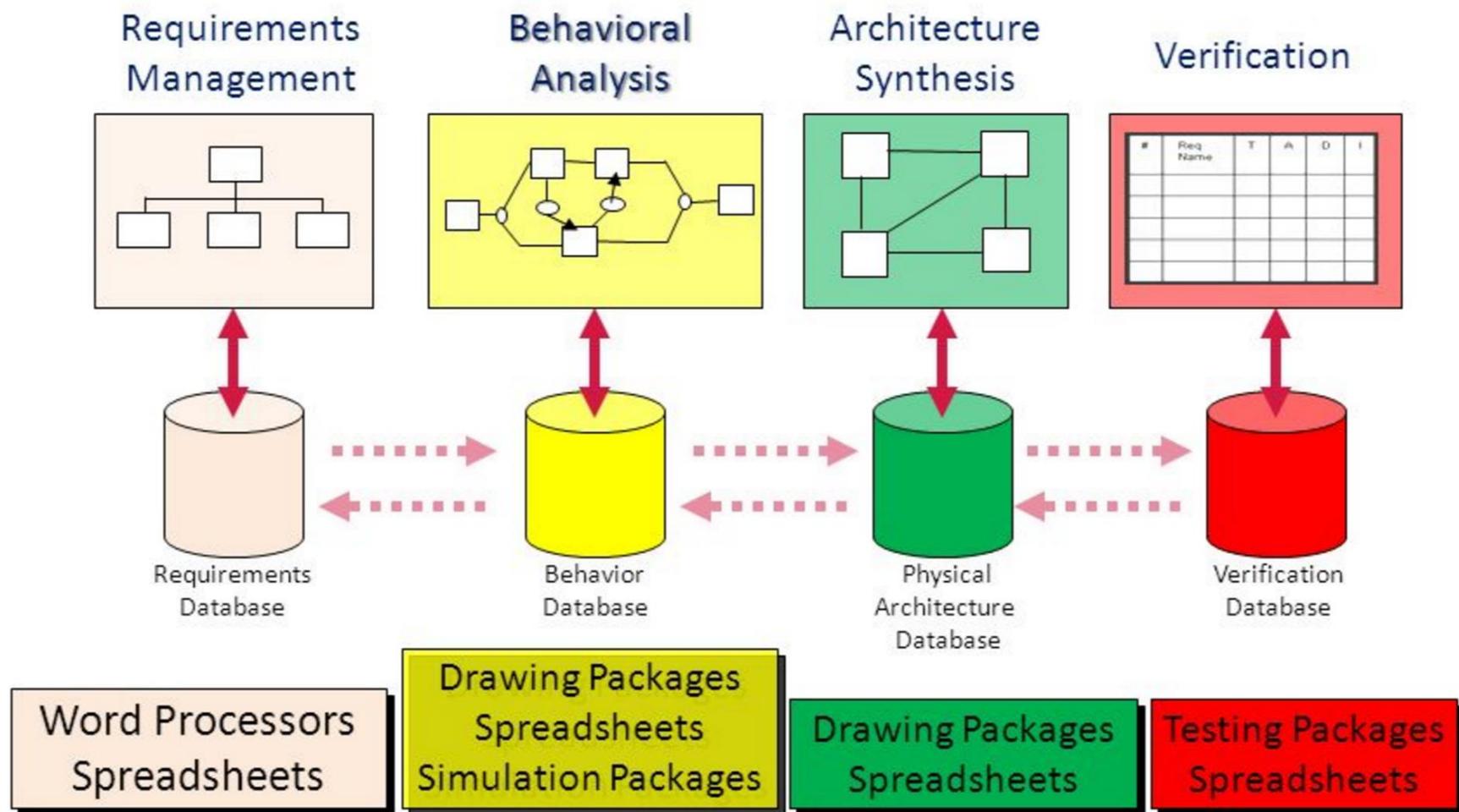
Project Manager o System Engineer?



Come affrontare progetti sempre più complessi?

- Sistemi di gestione più
 - Efficaci
 - Semplici
 - Espressivi
 - Interattivi ed adattivi
- Formazione
- Tecniche moderne

Document Based Engineering



Stovepiped efforts utilizing independent representations hides context, requires extraordinary data management, and complicates the SE effort

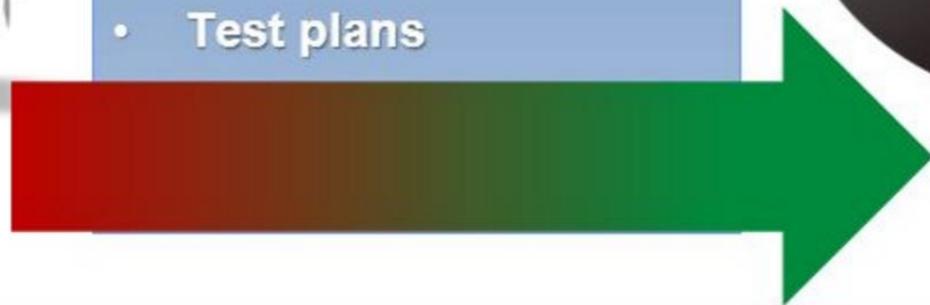
Document Management

Past



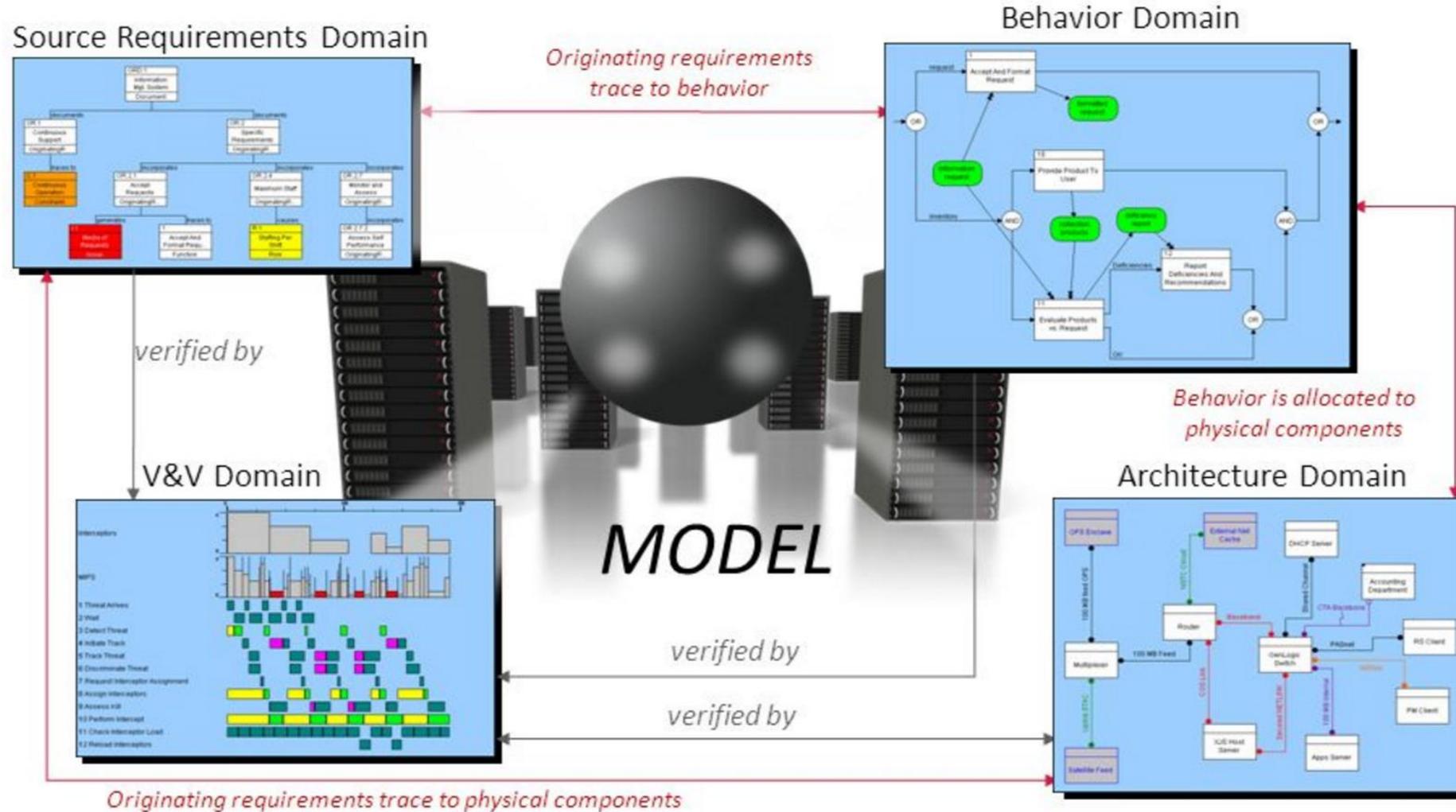
- Specifications
- Interface requirements
- System design
- Analysis & Trade-off
- Test plans

Future



Moving from document-centric to model-centric

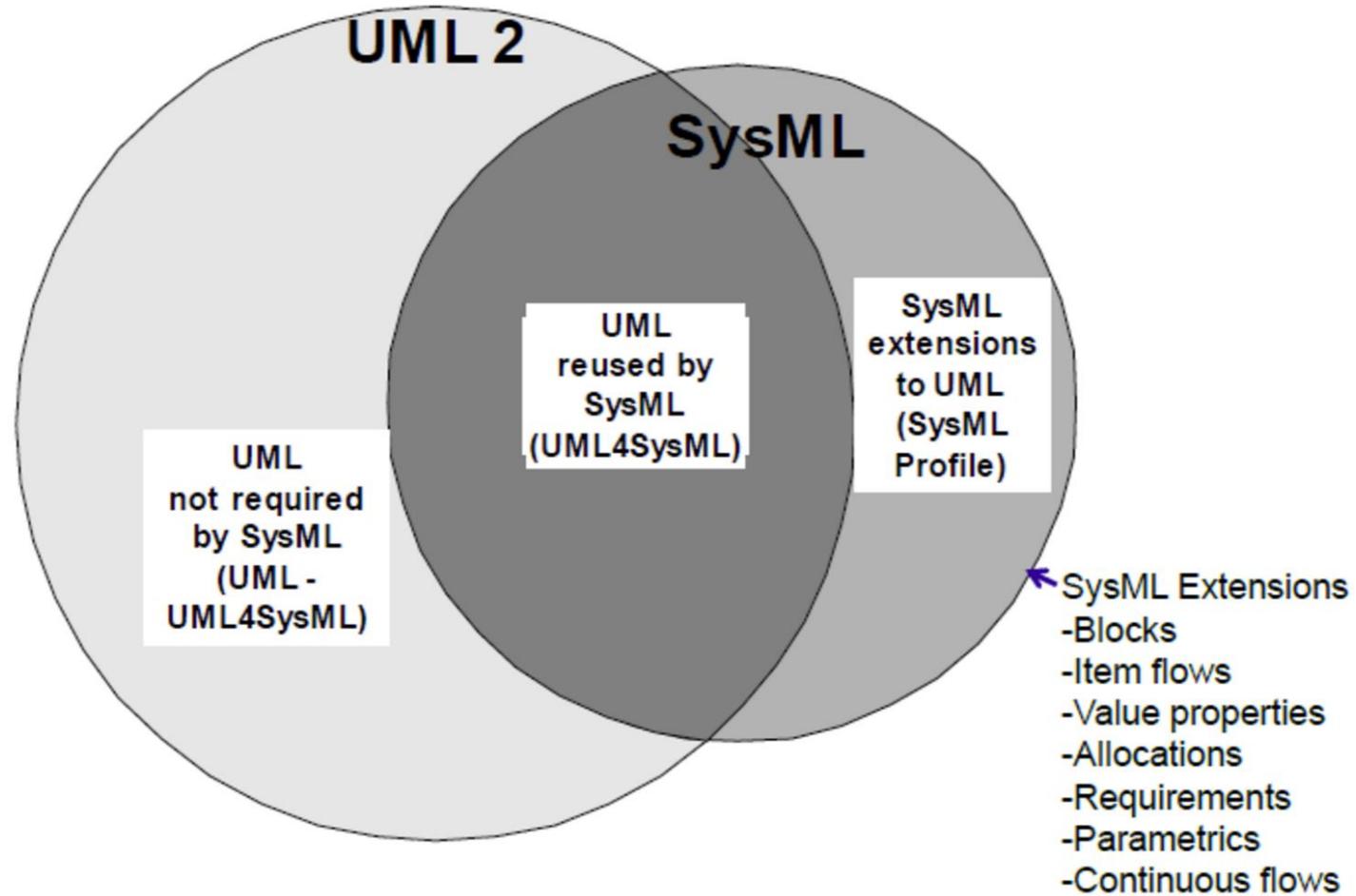
Model Based Systems Engineering





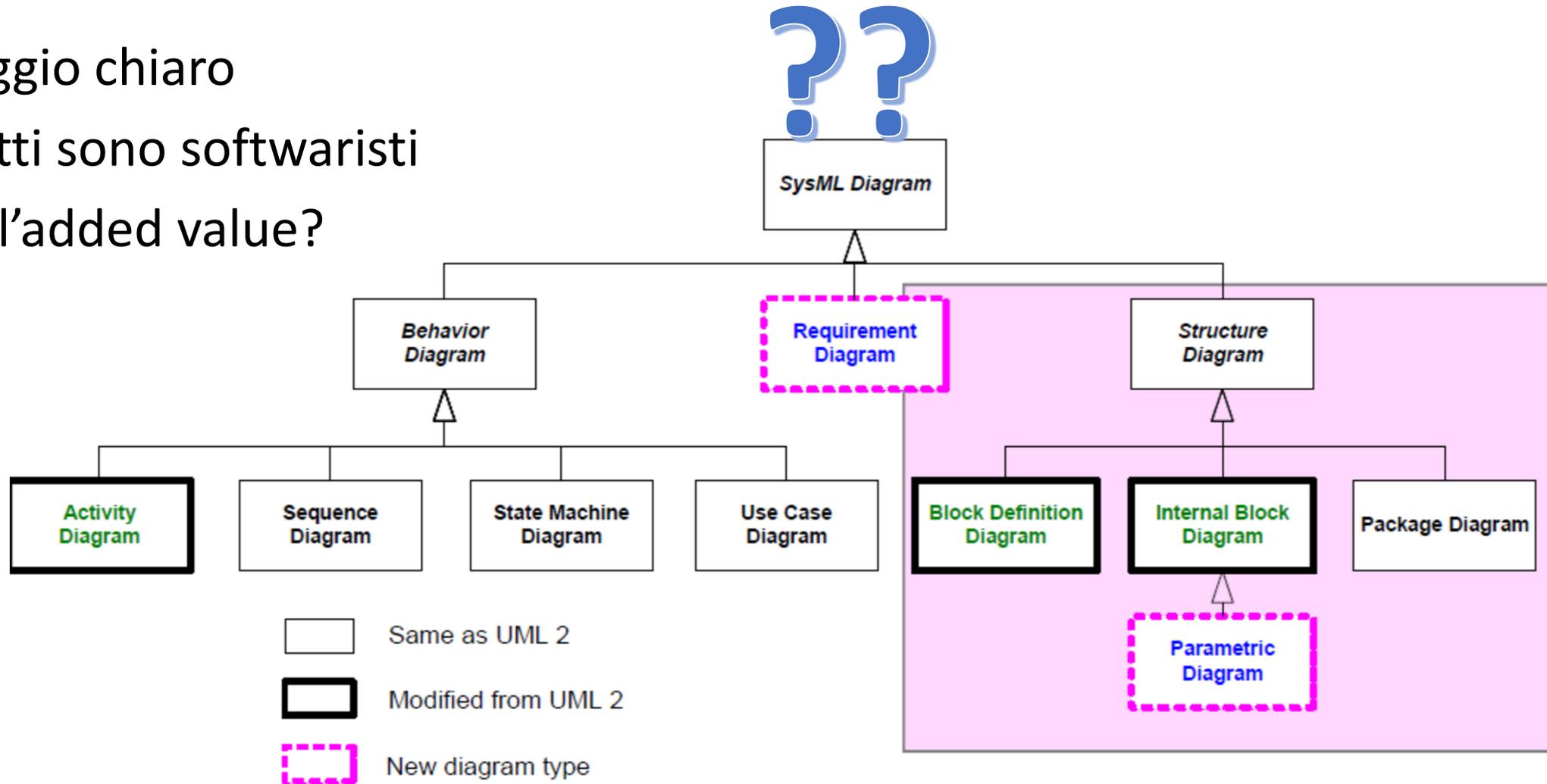
E' la sola e unica risposta?

Cos'è sysml

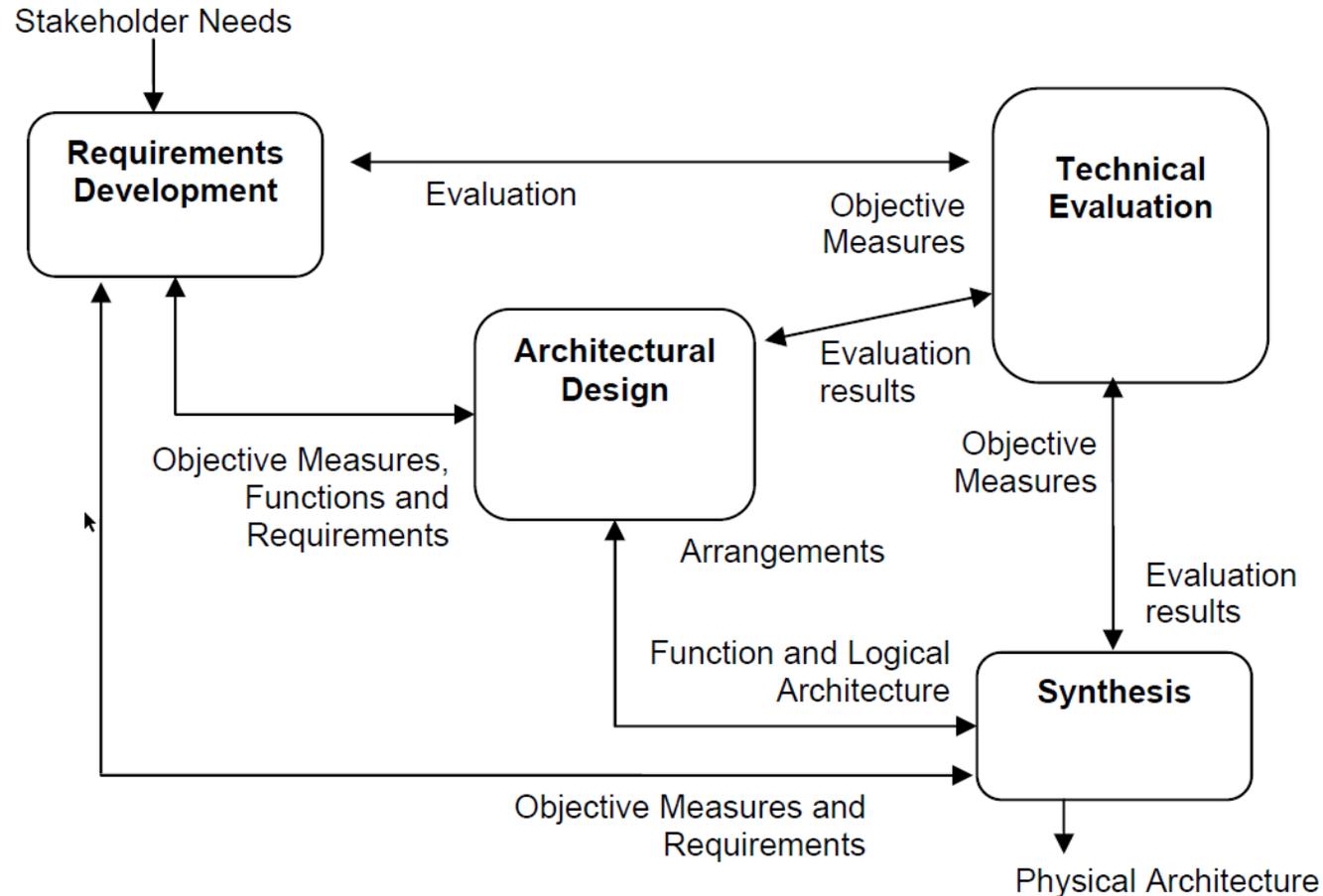


Come implementarlo?

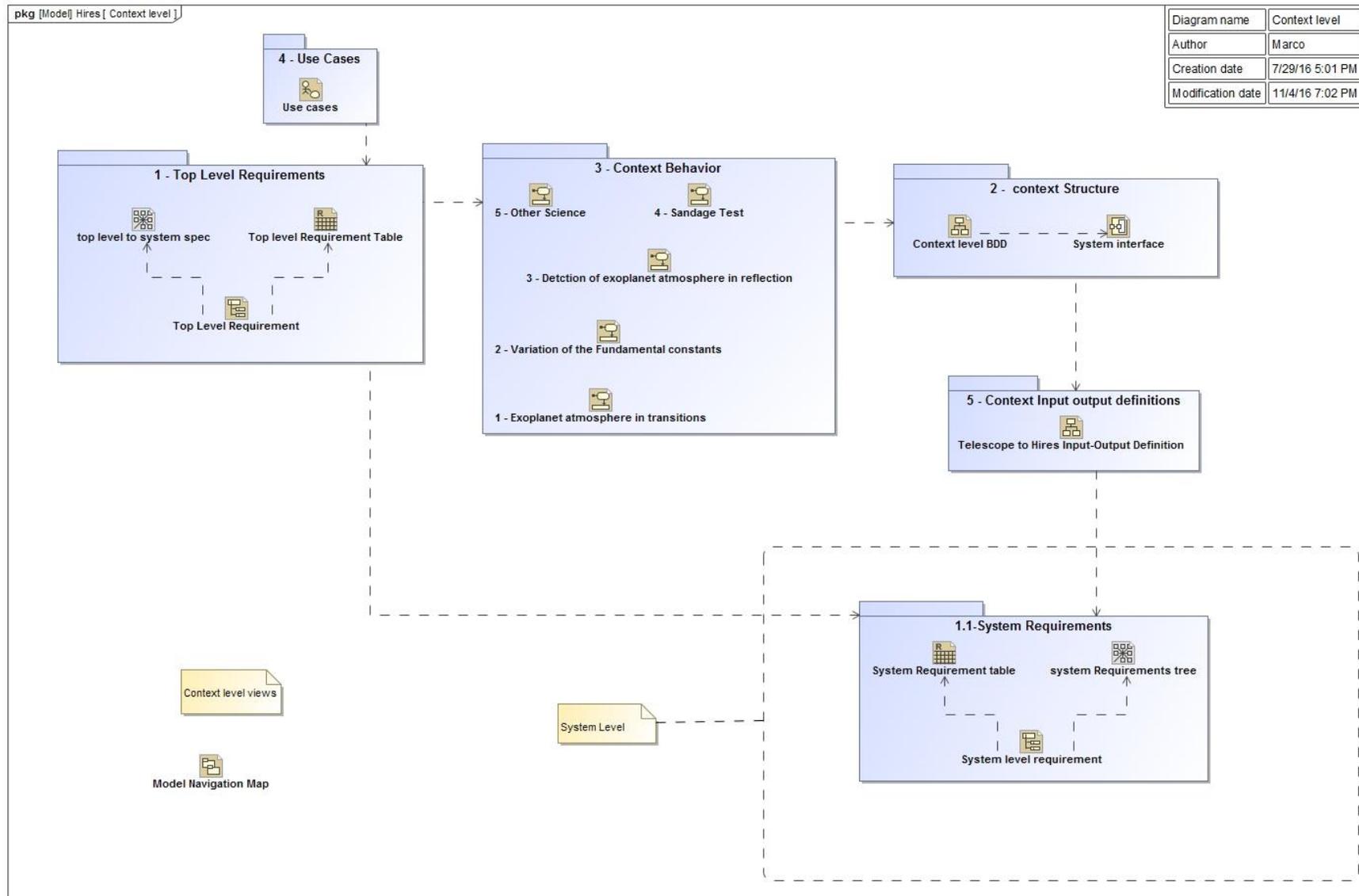
- Linguaggio chiaro
- Non tutti sono softwaristi
- Qual è l'added value?



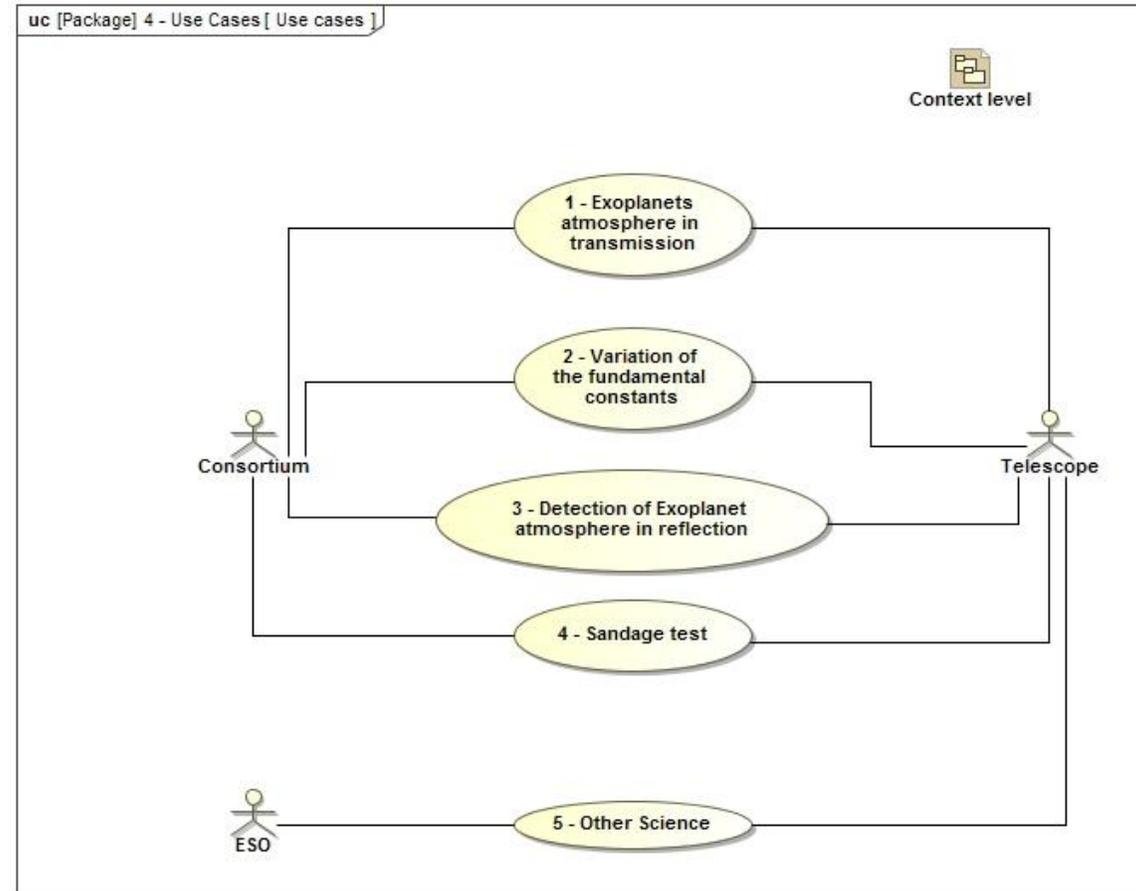
Typical Systems Engineering Process



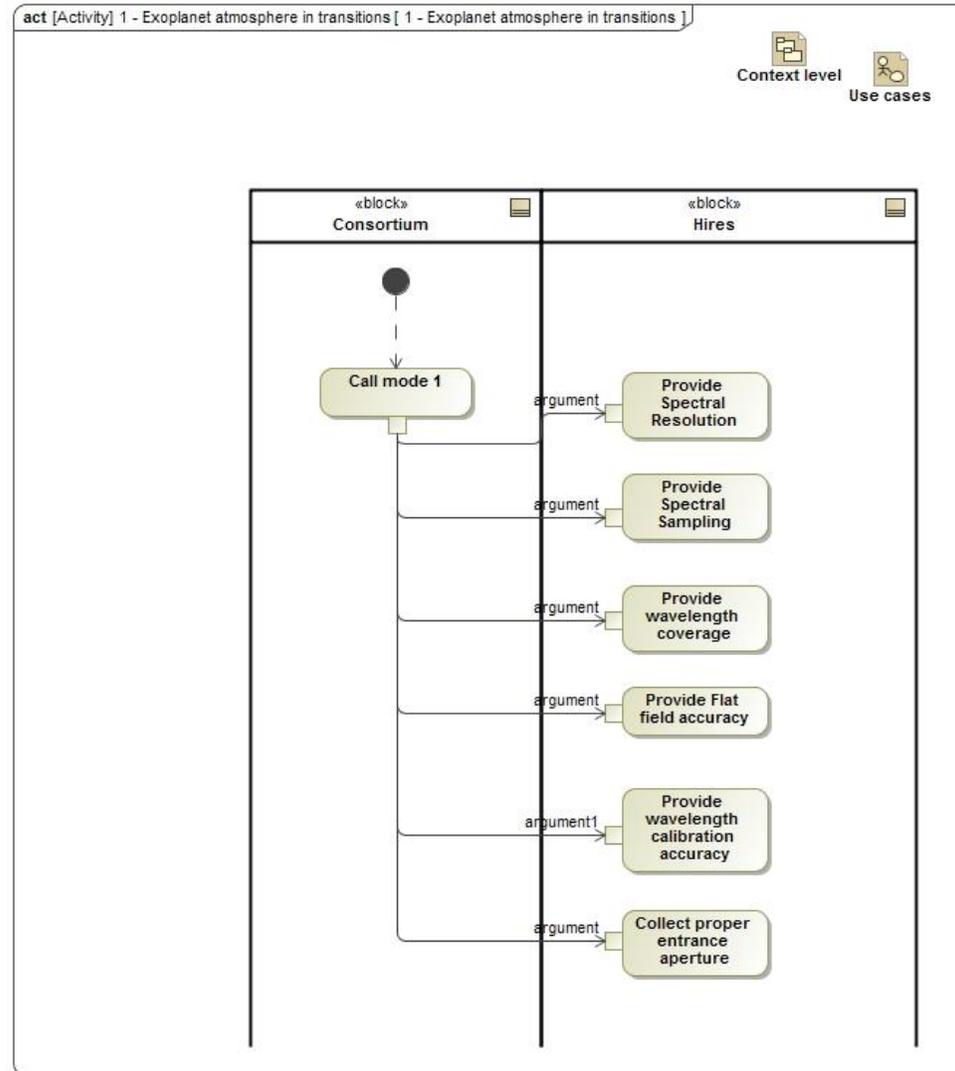
Processo di alto livello



Definire Use case



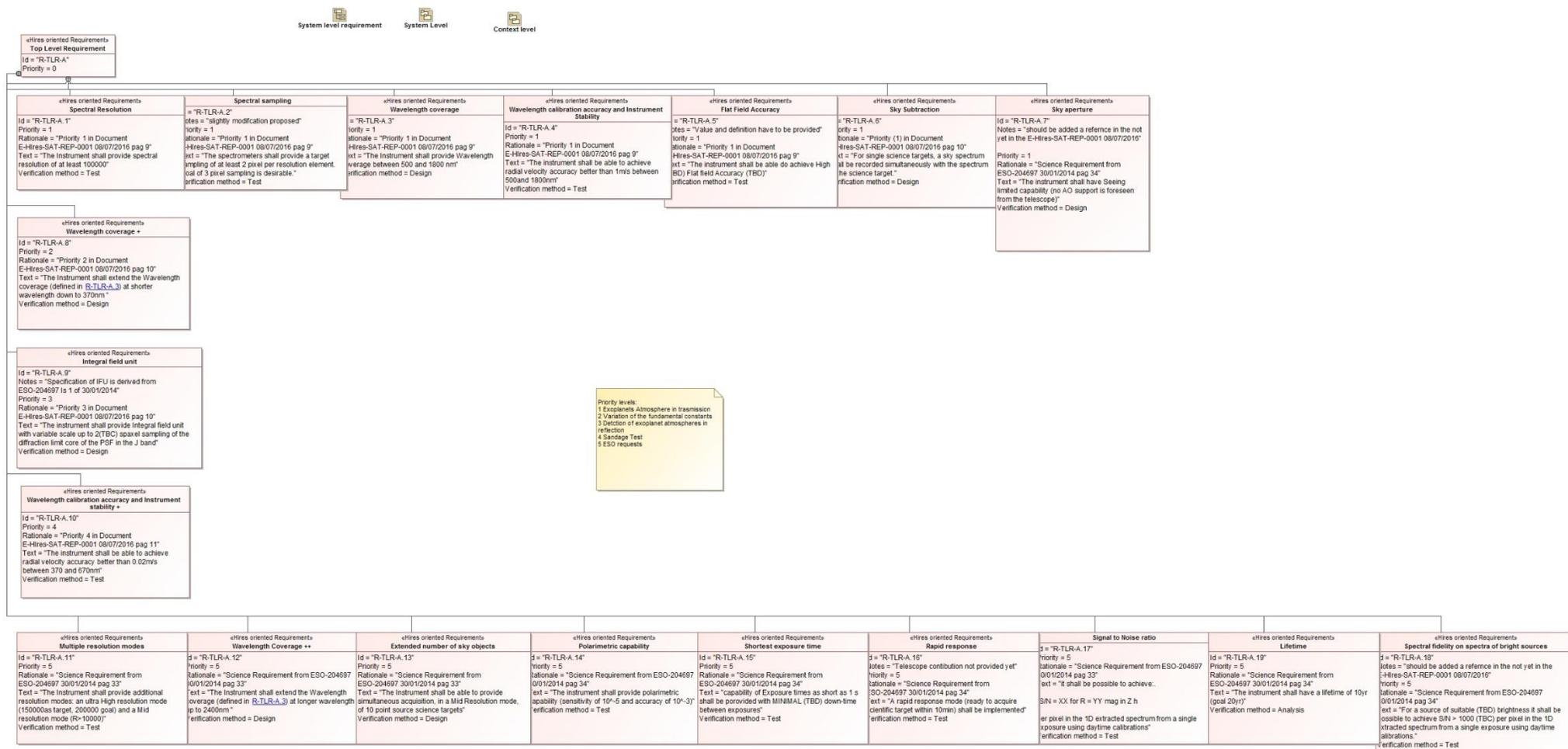
Caratteristiche degli use case



Top Level requirement

req [Package] 1 - Top Level Requirements [Top Level Requirement]

Diagram name	Top Level Requirement
Author	Marco
Creation date	7/29/16 5:04 PM
Modification date	11/4/16 7:02 PM

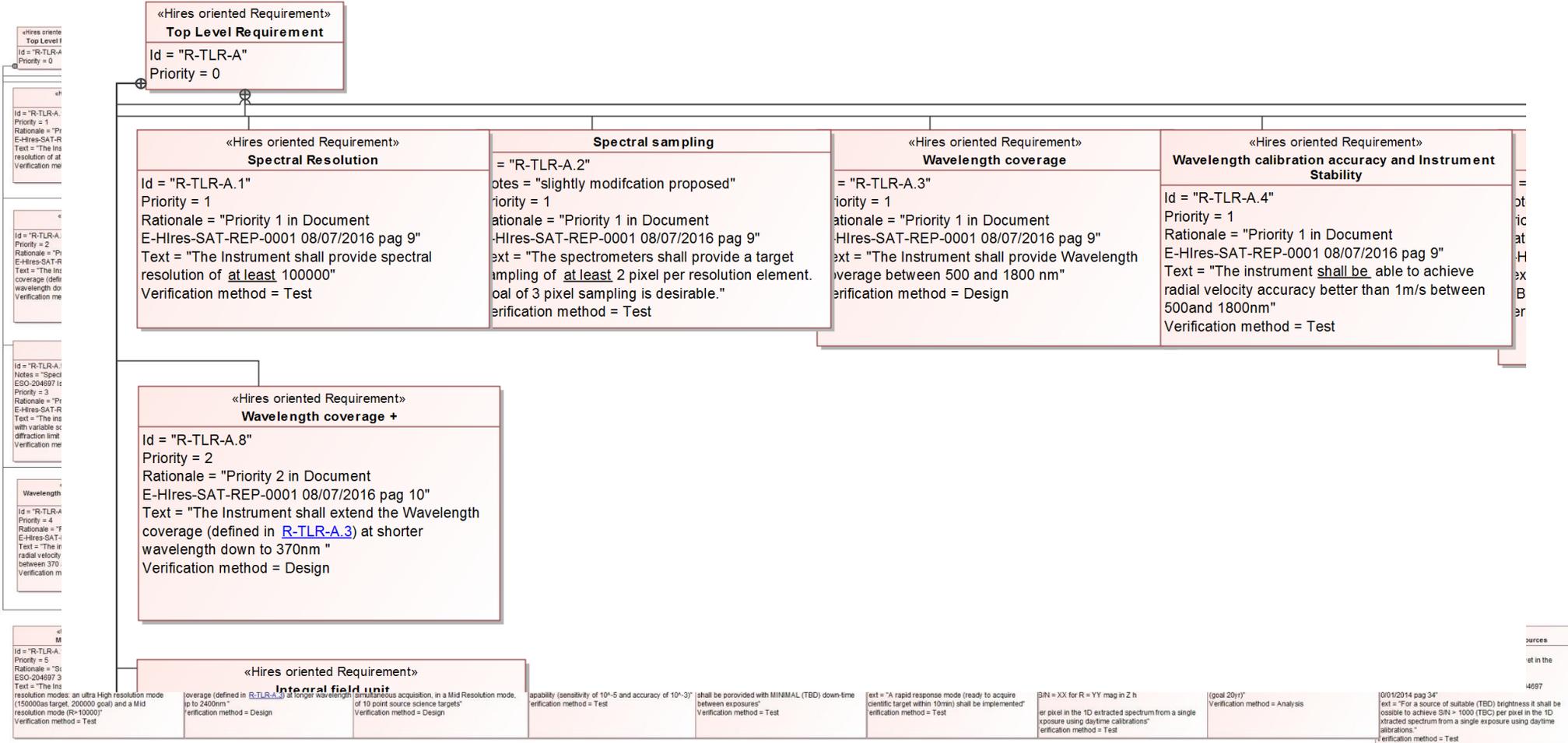


Top Level requirement

req [Package] 1 - Top Level Requirements | T

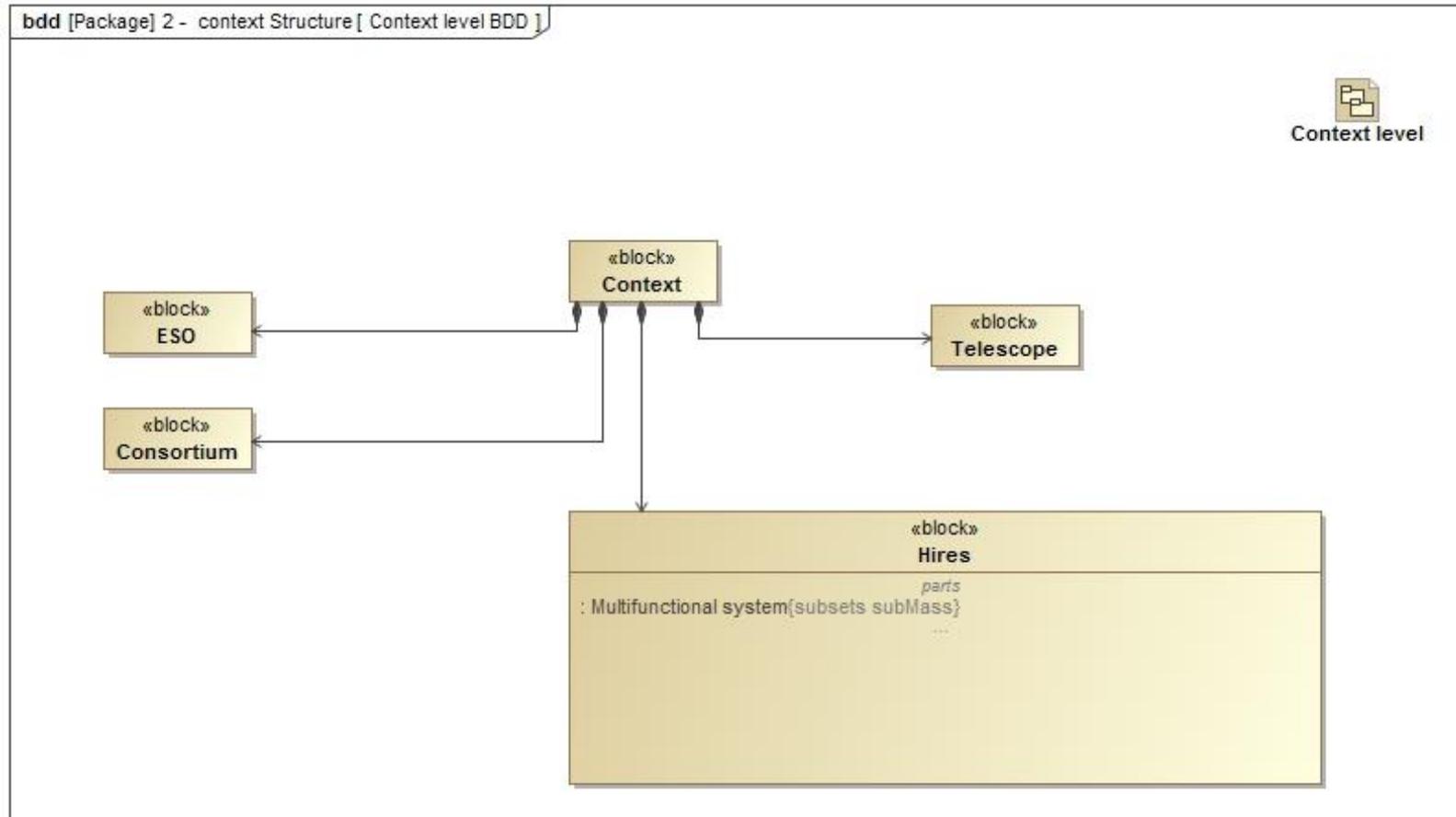
System level requirement System Level Context level

Diagram name	Top Level Requirement
Author	Marco
Creation date	7/29/16 5:04 PM
Modification date	11/4/16 7:02 PM

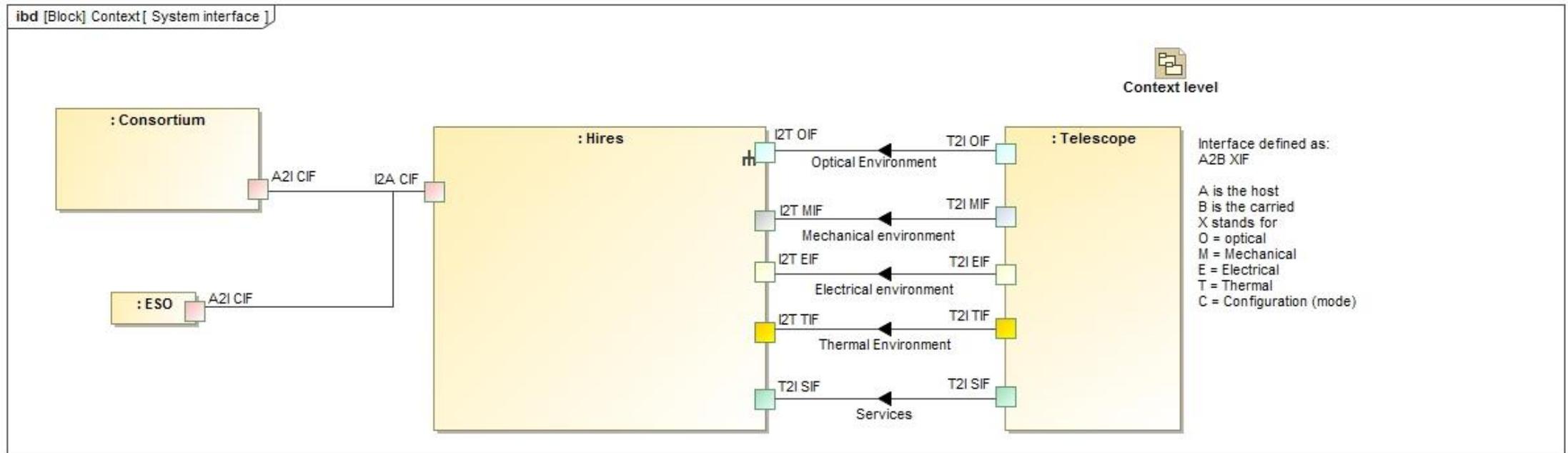


sources
et in the
4697

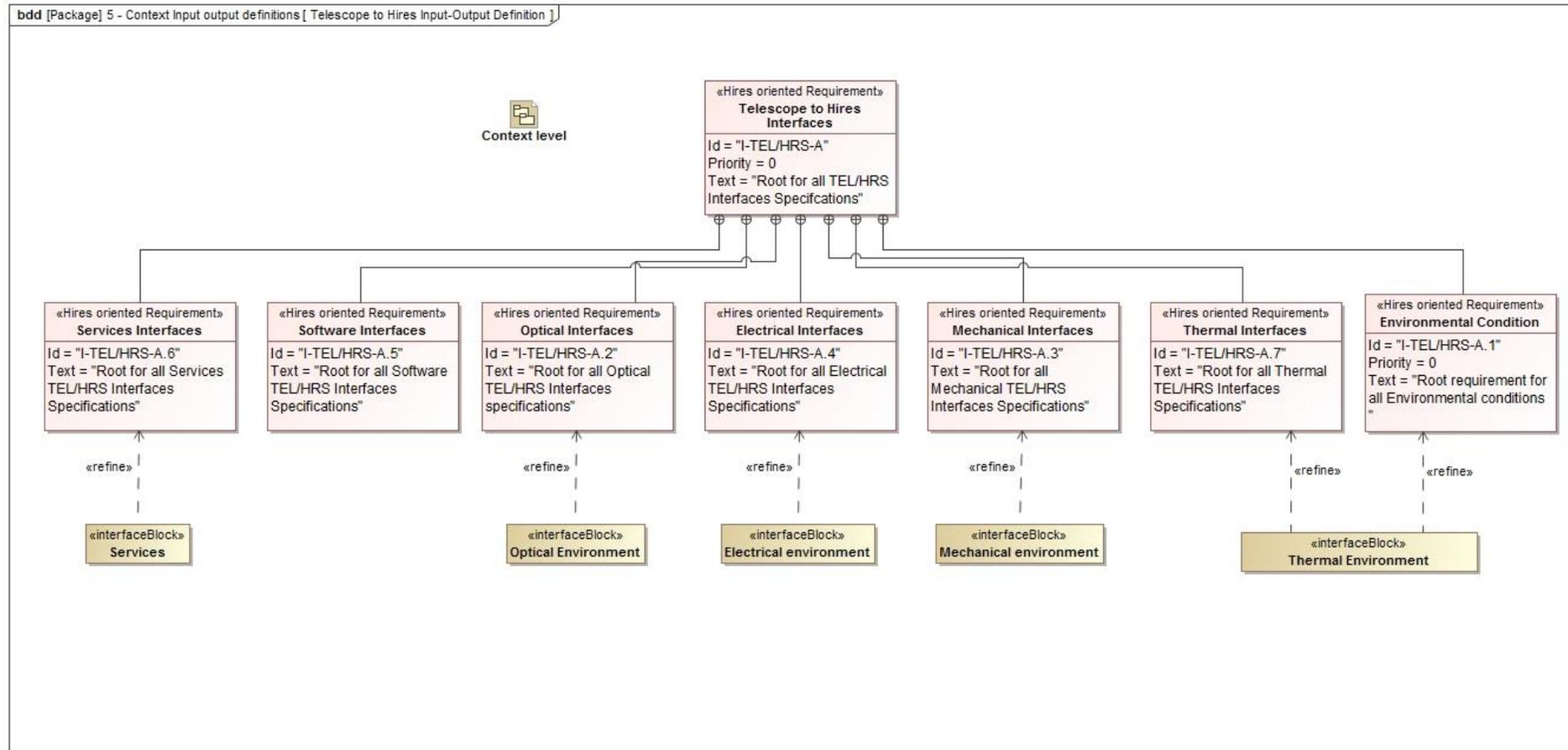
Definire un contesto



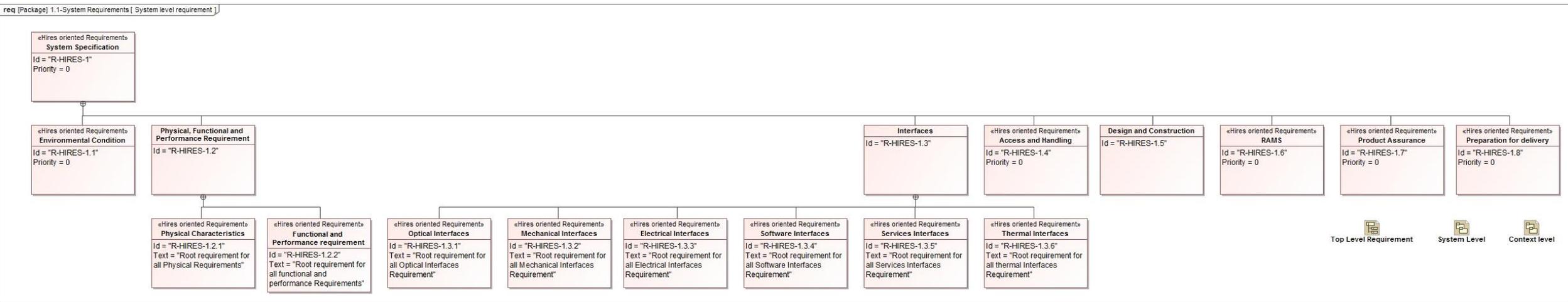
Identificazione delle interfacce



Definizione interfacce

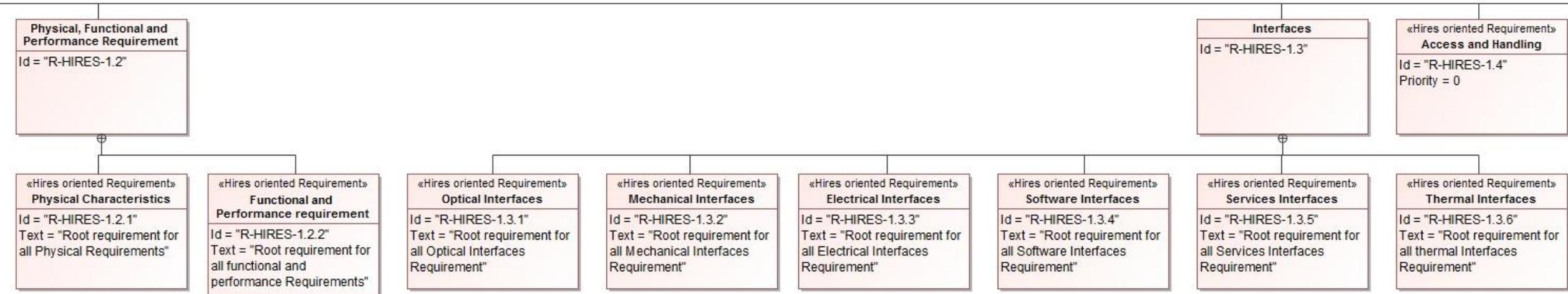


Requisiti di sistema

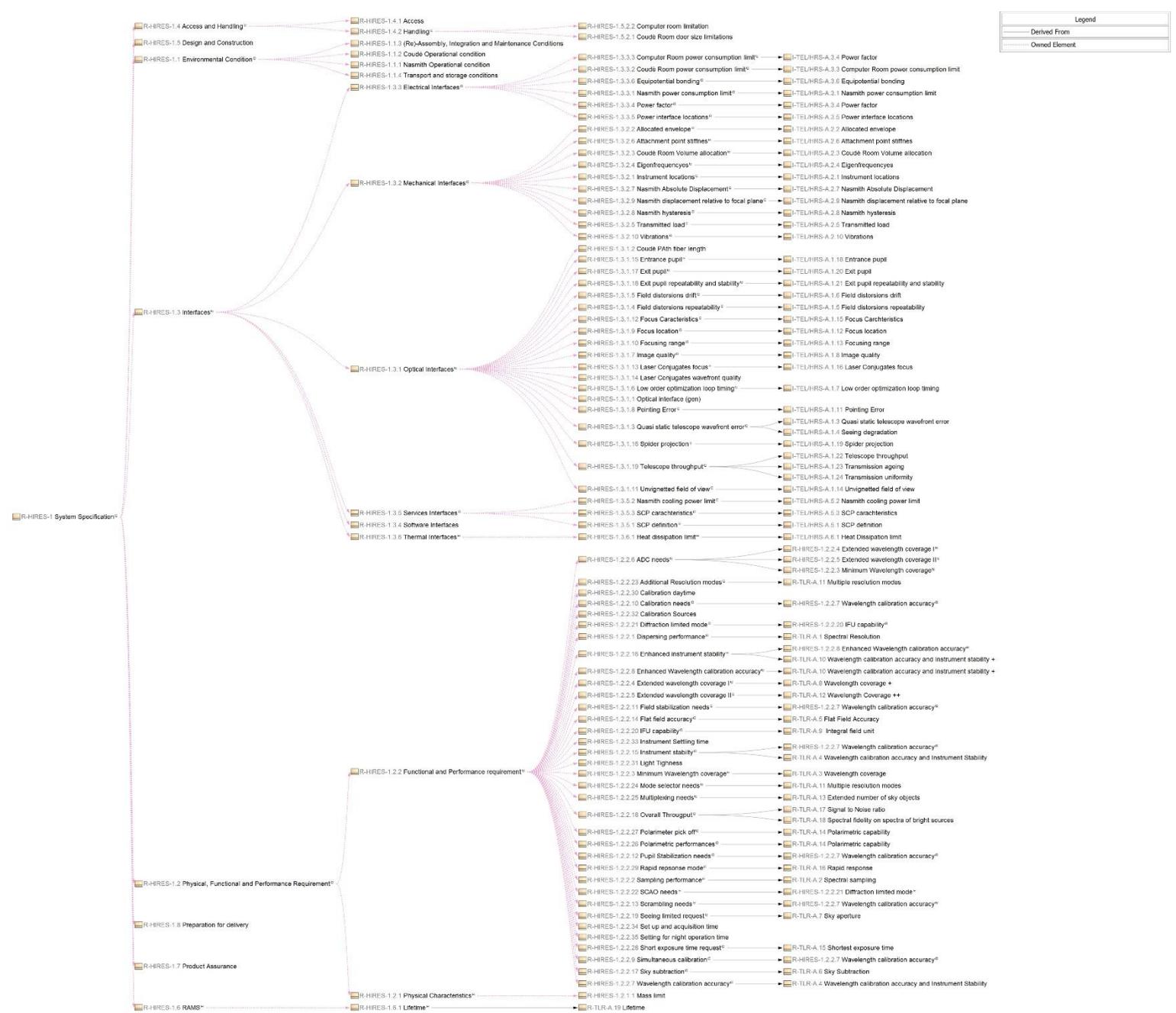


Requisiti di sistema

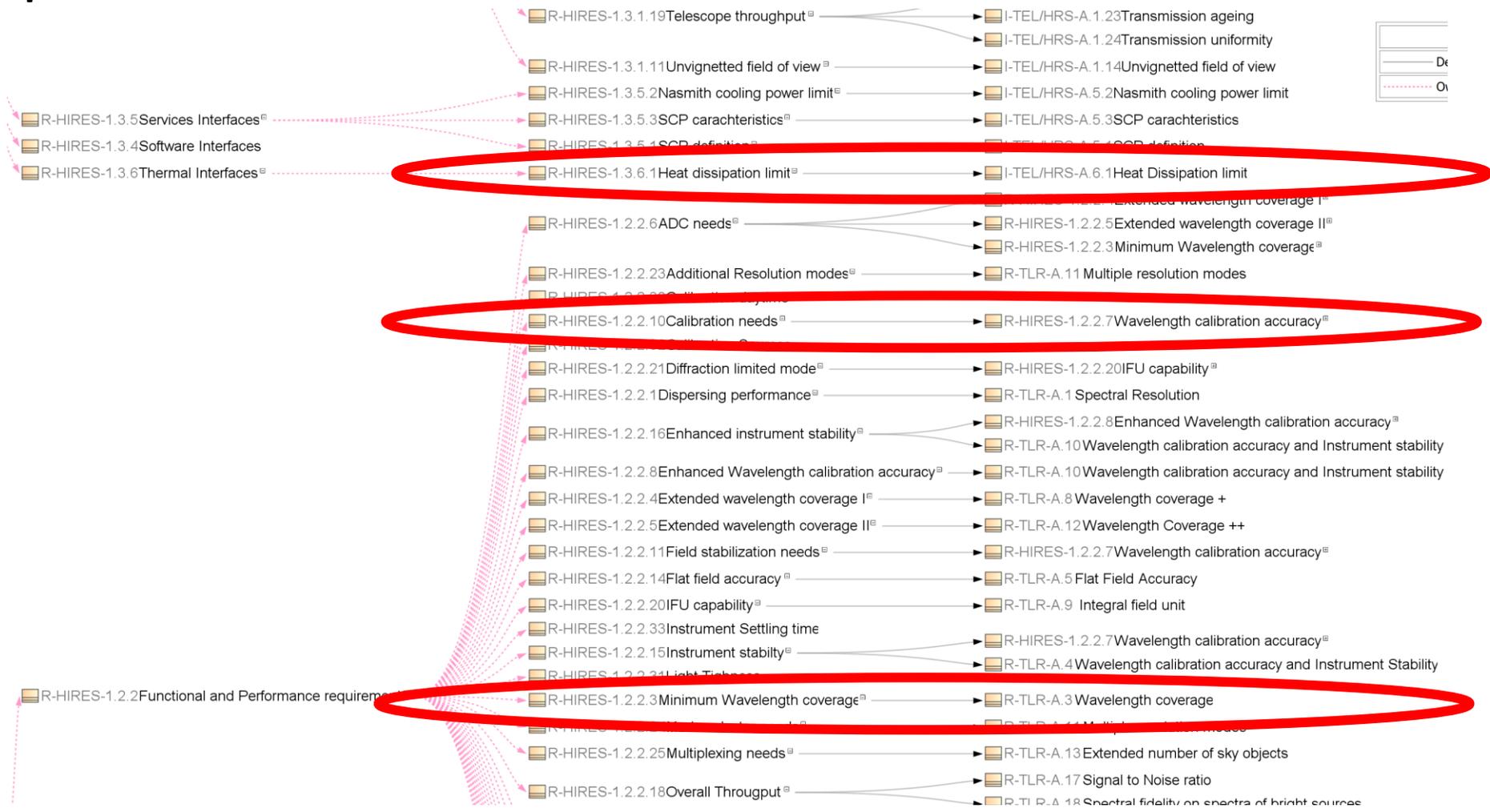
System level requirement



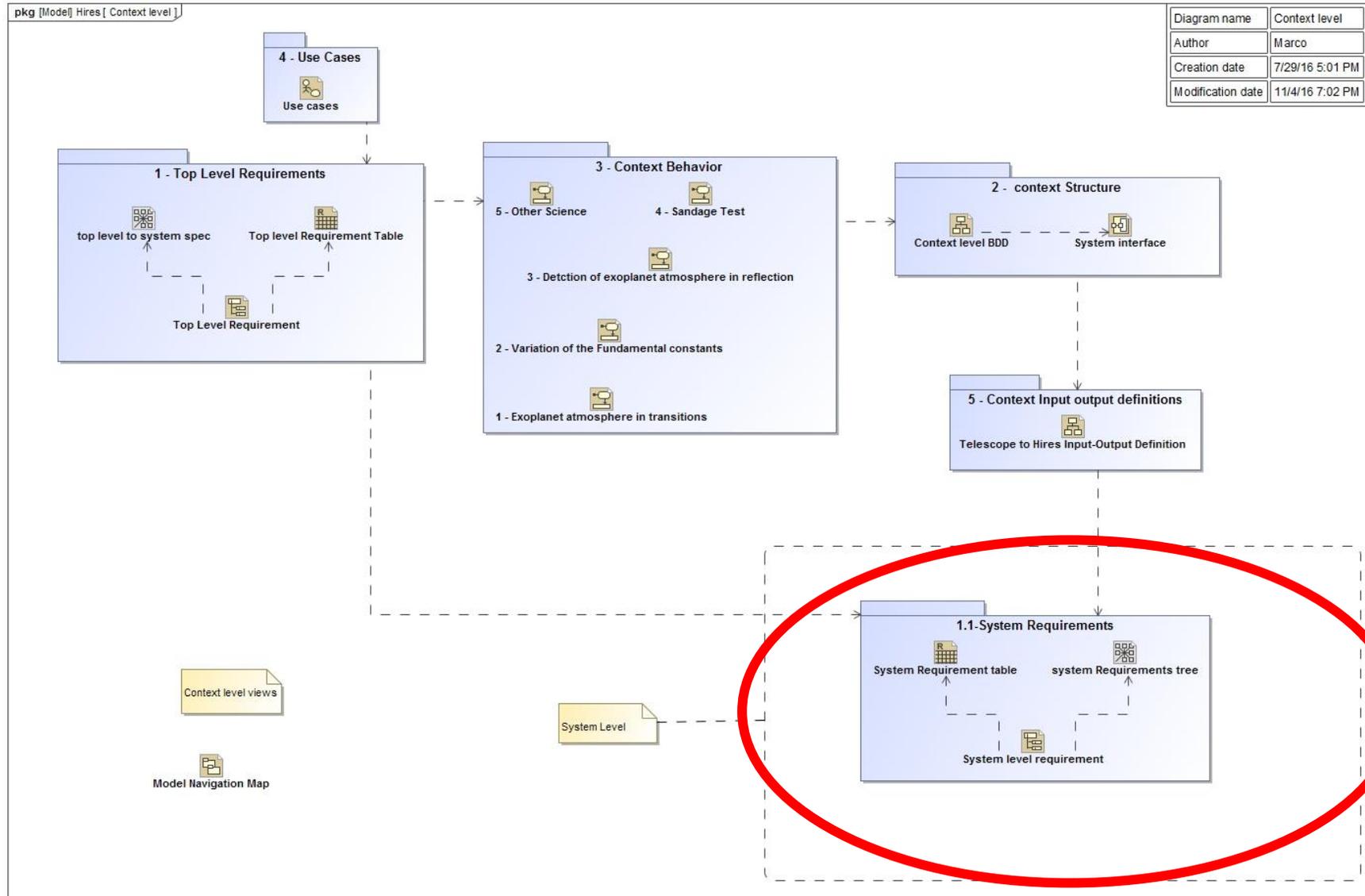
Dipendenze



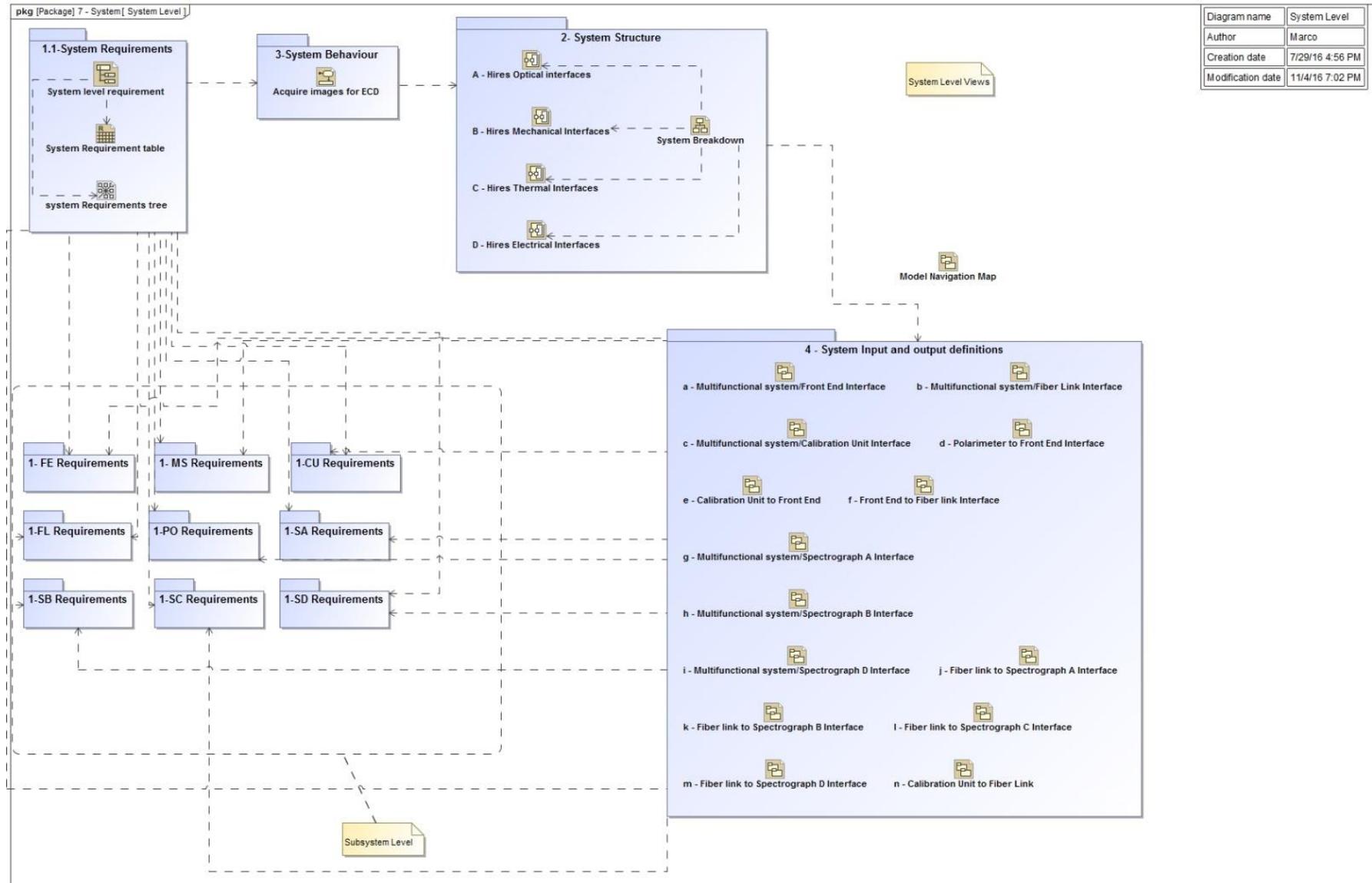
Dipendenze



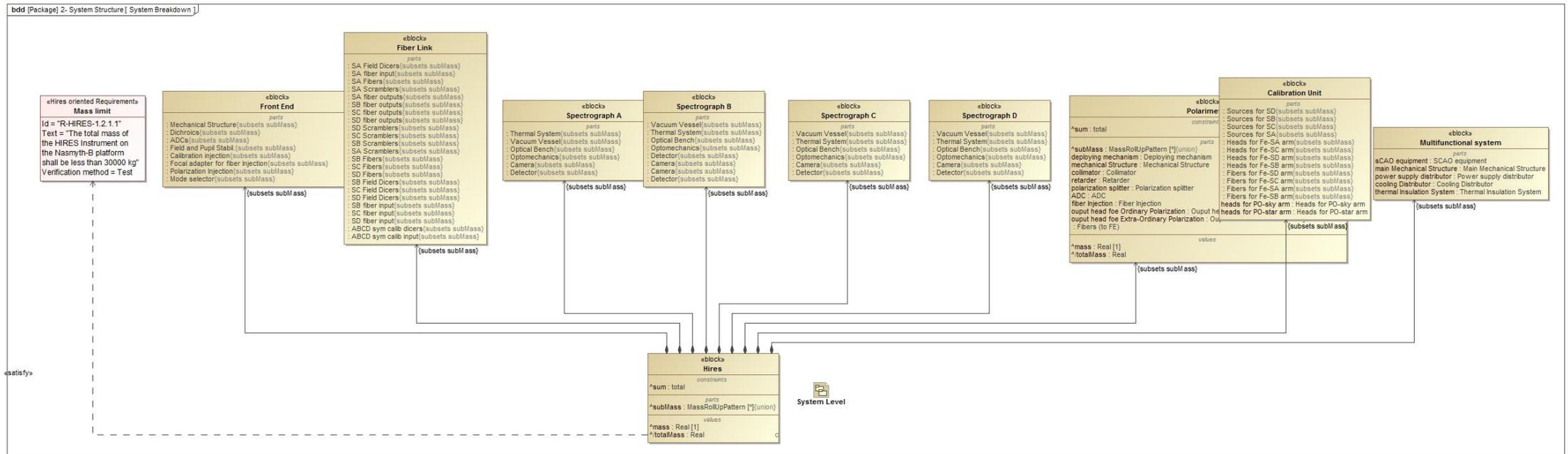
Processo di alto livello



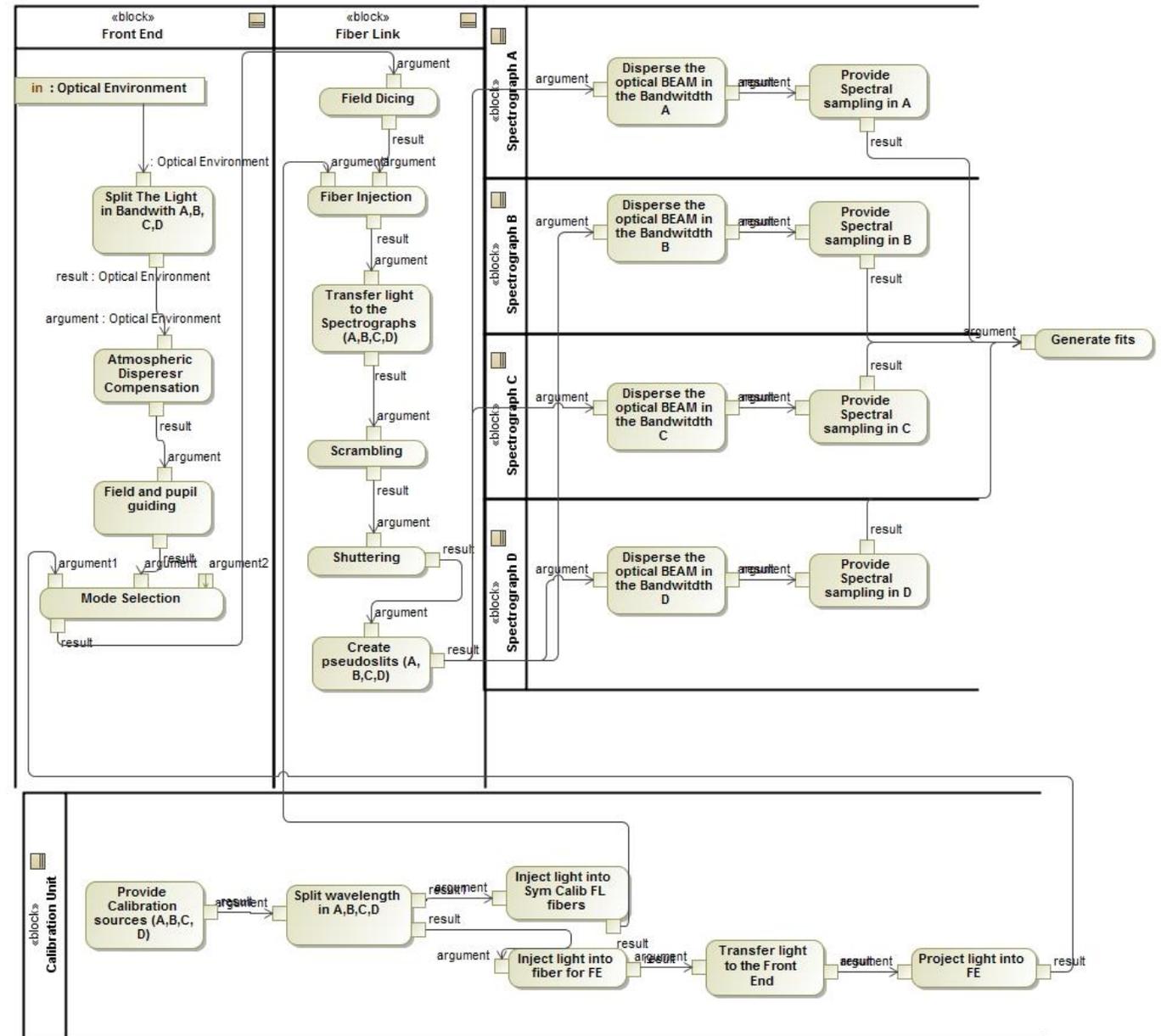
Livello di sistema



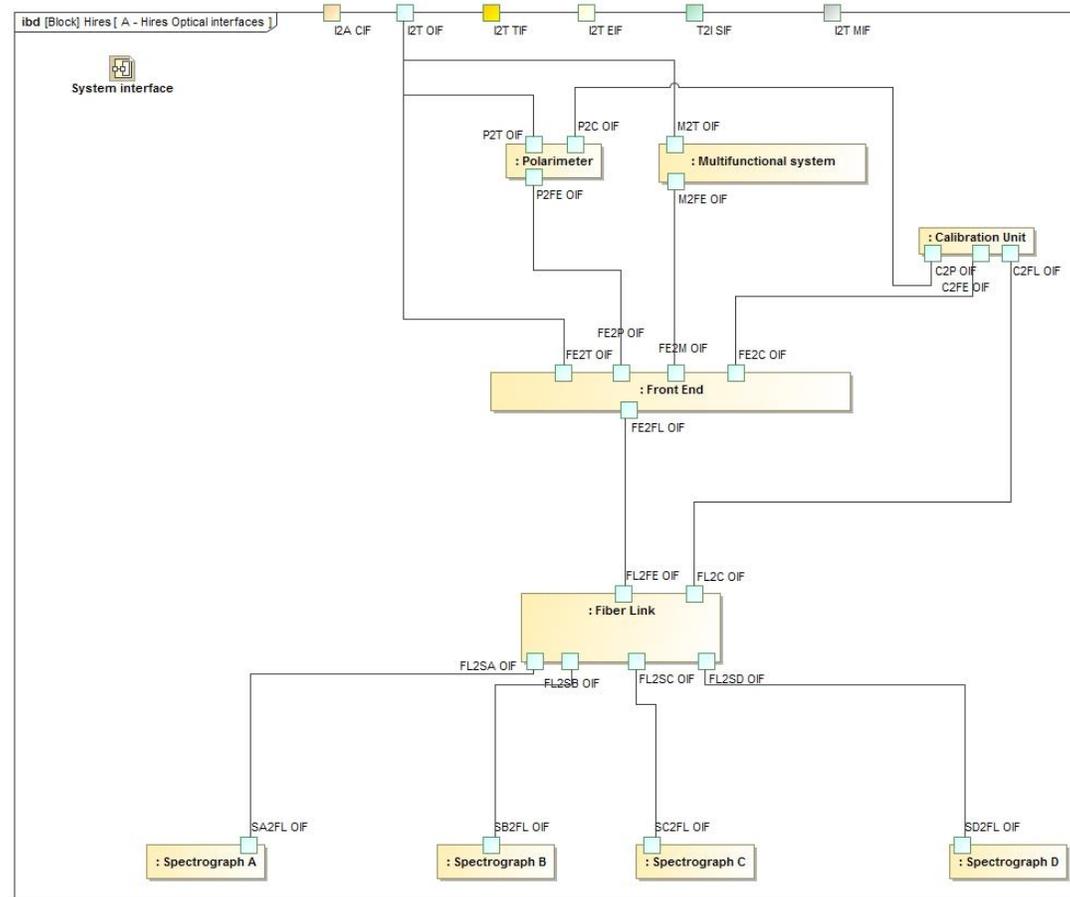
Identificare I componenti



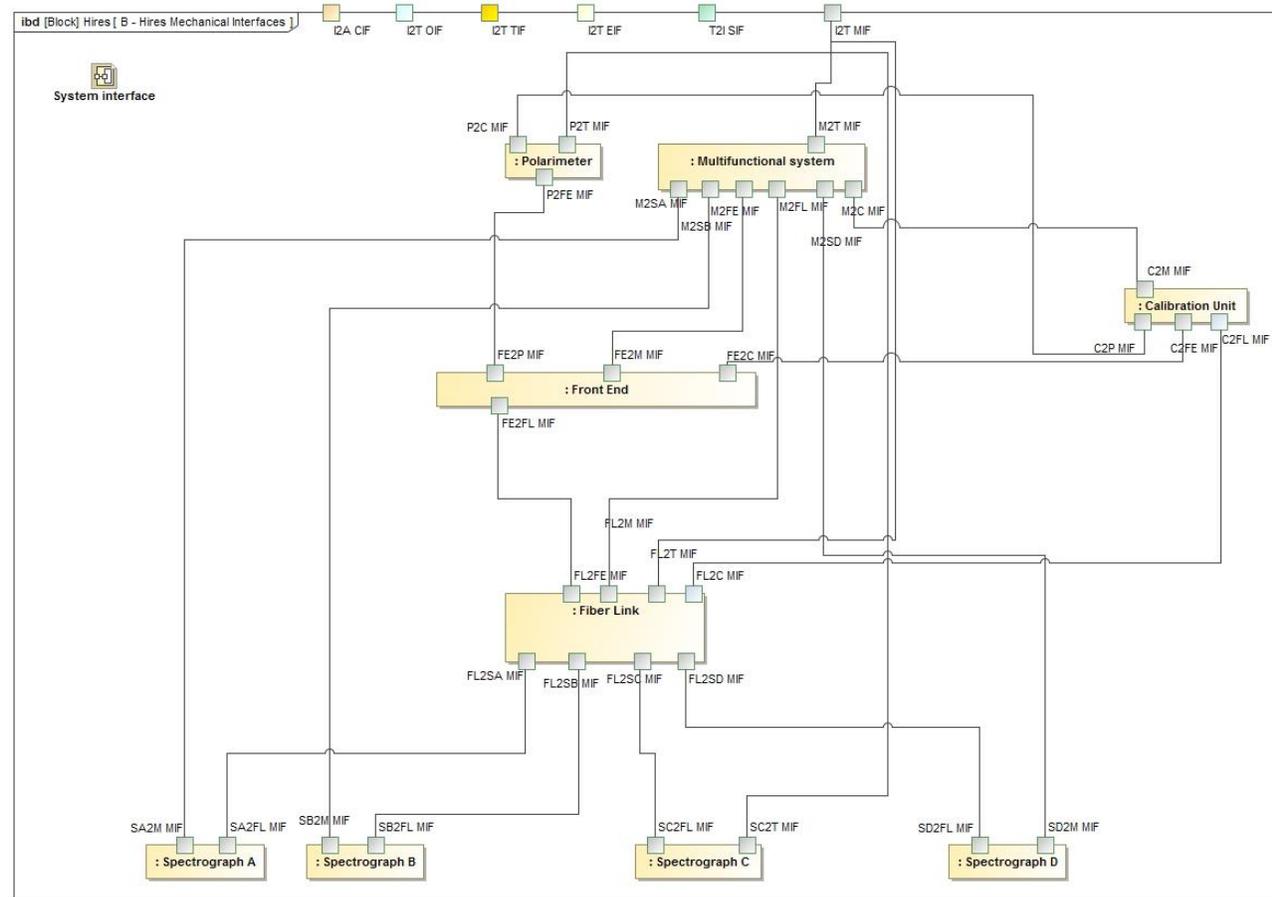
Identificare le funzionalità



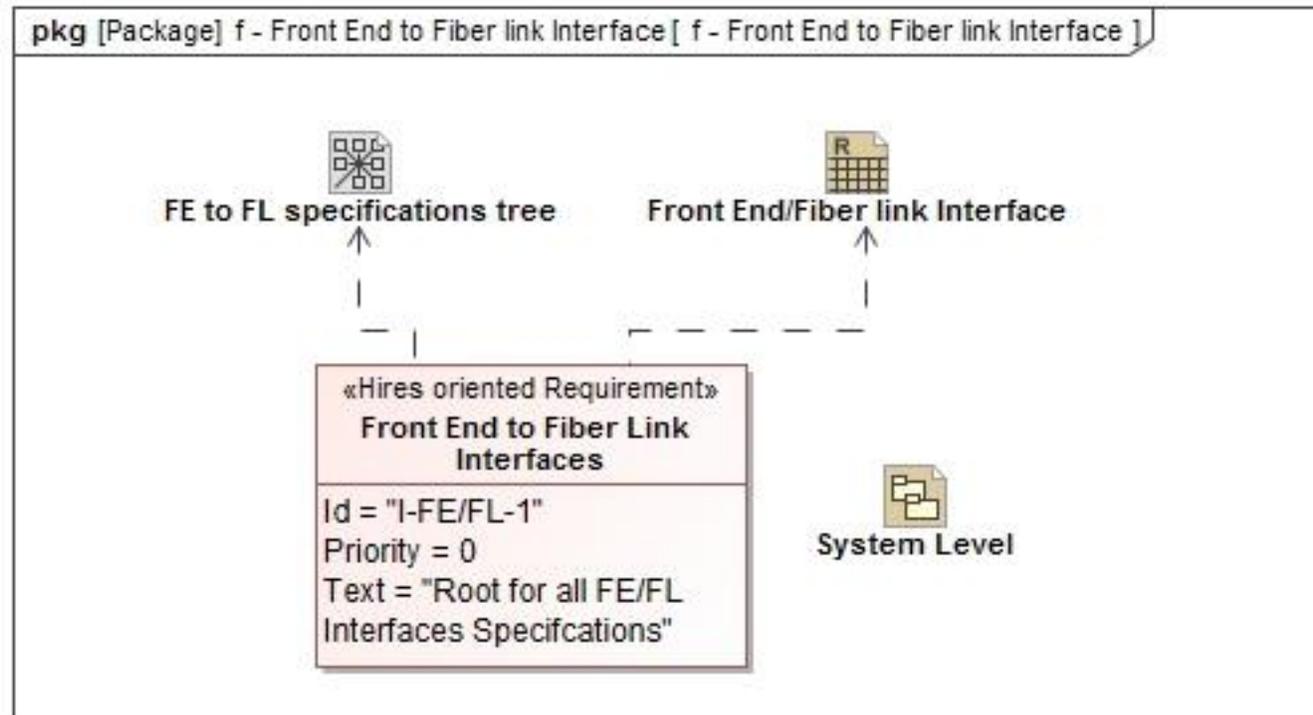
Identificare le interfacce



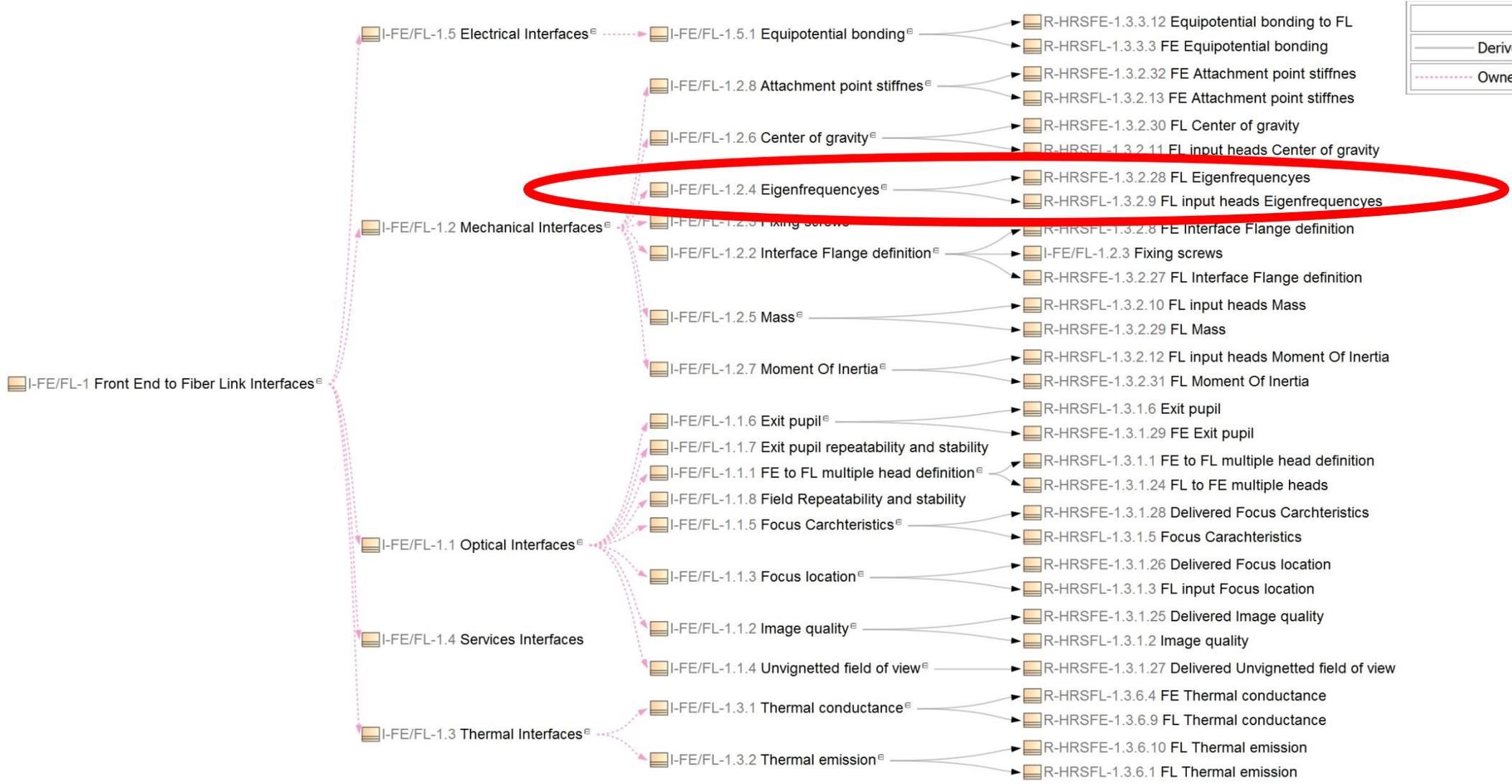
Identificare le interfacce



Specificare le interfacce

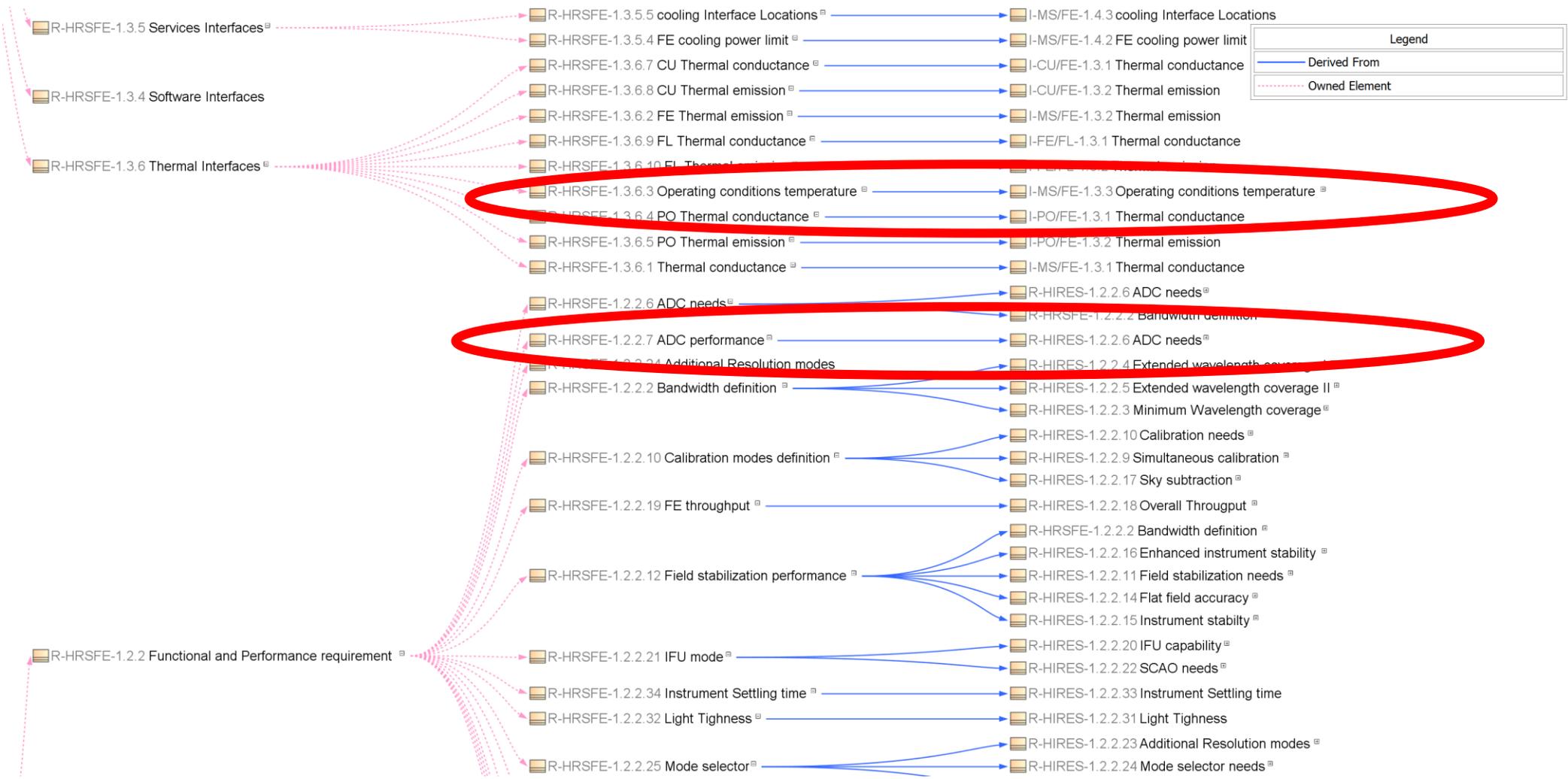


Monitorare le interfacce

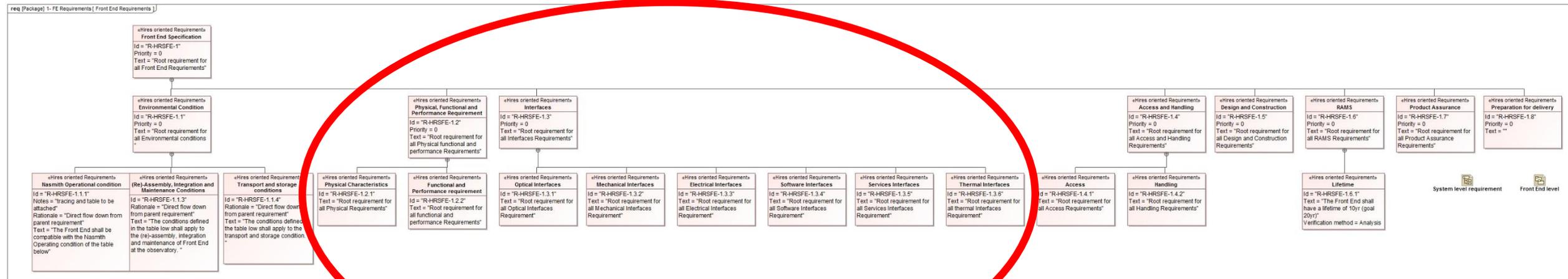


Legend	
	Derived
	Owned Element

Dipendenze



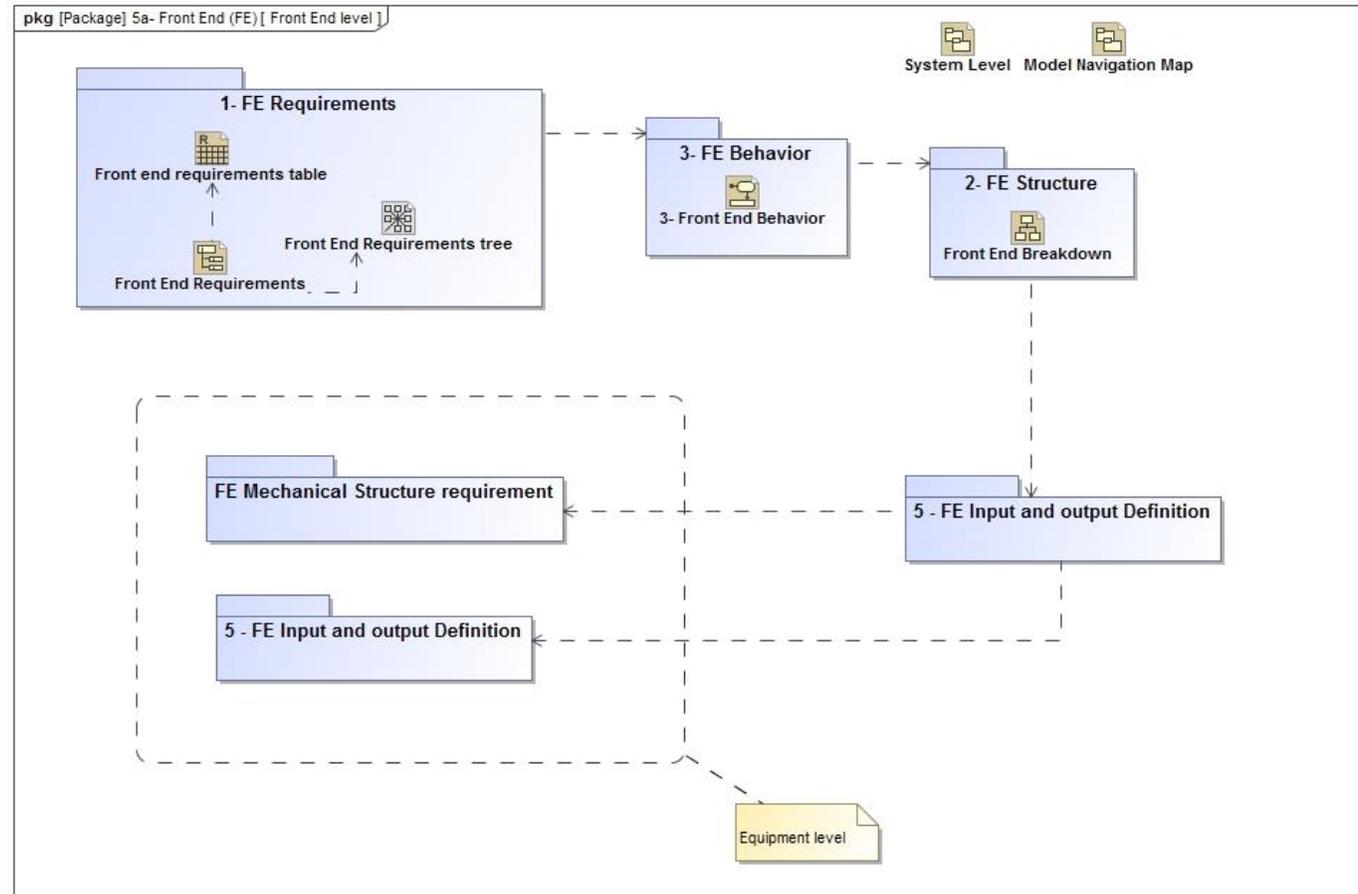
Requisiti di sottosistema



Livello di sistema



Livello di sottosistema



Quali sono i pro e i contro?

- PRO

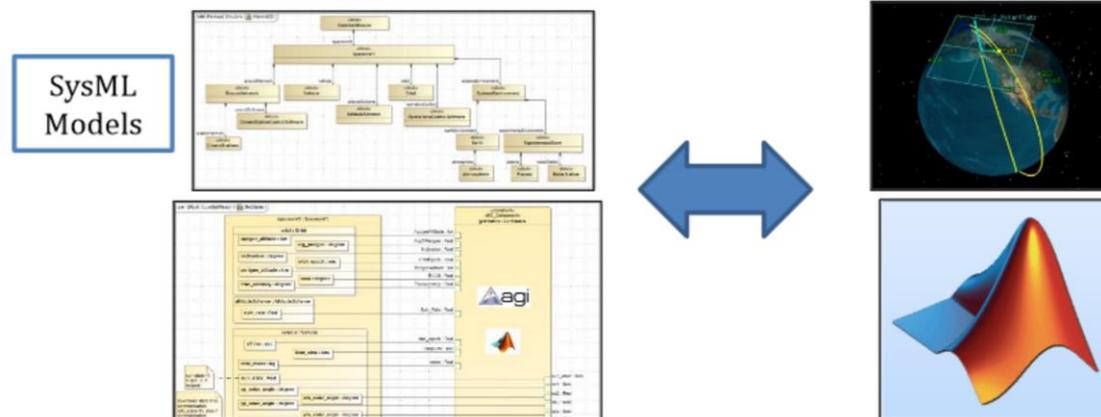
- Informazioni semplici e chiare
- Informazioni immediate
- Dipendenza rigorosa permette di non perdersi pezzi di progetto

- Contro

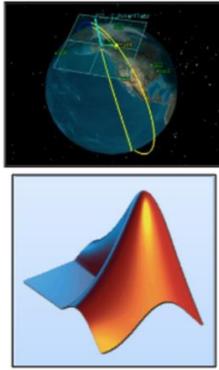
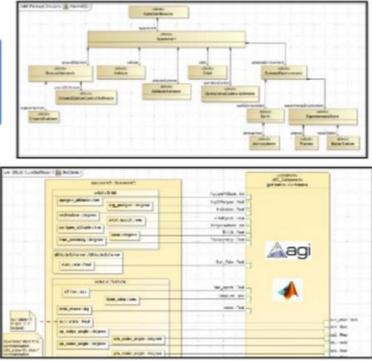
- Non tutti sono softwaristi
- Serve comunque un intermediario

What's next?

- Per transire ad un vero mbse manca l'implementazione di modelli fisici
- che però già esistono (e2e, zemax, nastran)



SysML Models



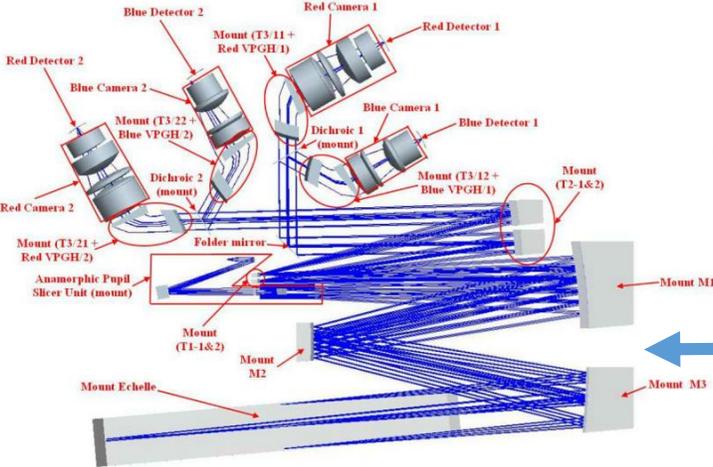
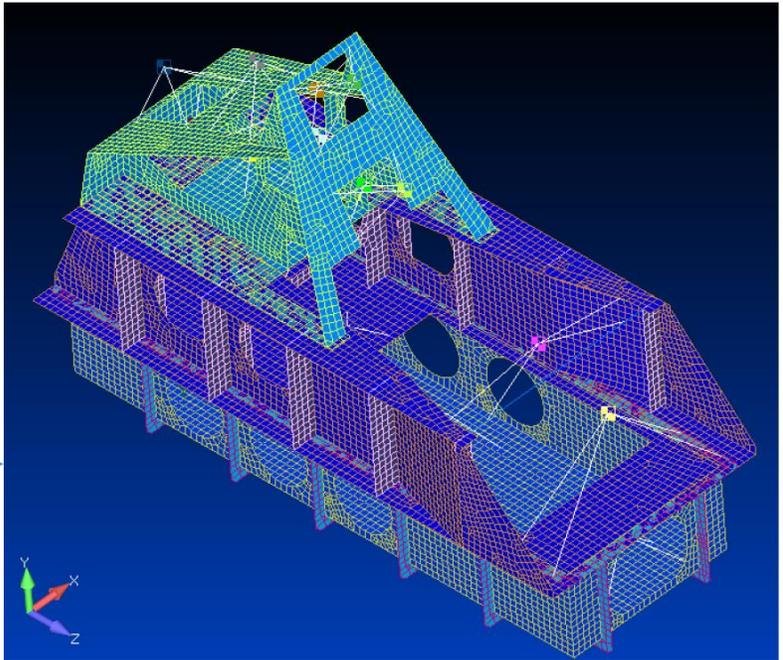
Matlab

Zemax

Nastran

Raytracing

FEA



INAF working group?

- Definire standard di lavoro
- Mettere a punto template
- Definire interfacce di comunicazione con il resto della comunità