

# Human Factors Integration – A Model-Based Approach

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MBDA

## Overview

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- Model-Based Systems Engineering
- HFI and Systems Engineering
- Using a SysML approach to manage HFI activities
- Summary

# Model-Based Systems Engineering

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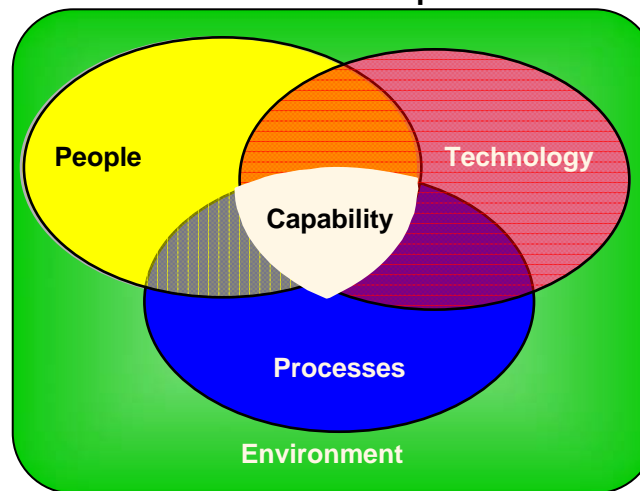
- Model-based systems engineering (MBSE) is formalised application of modelling to support :
  - System requirements
  - System design
  - System analysis
  - System verification and validation.
- MBSE should support these activities from the Concept phase and continue throughout Development and later life cycle phases.

(INCOSE)

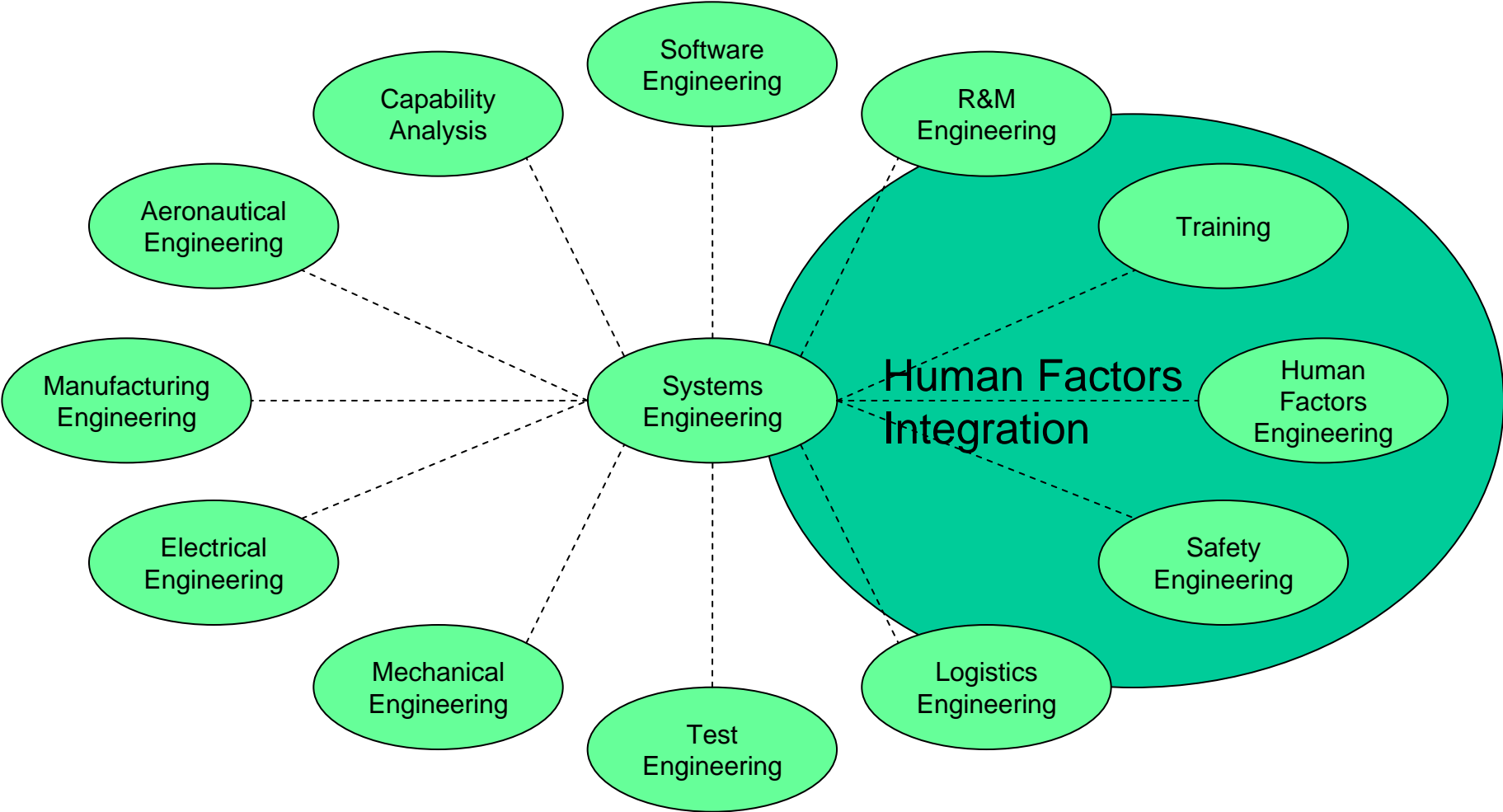
# HFI & Systems Engineering

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- HFI is concerned with mitigating risk, managing safety, improving performance and ensuring satisfaction and well-being of personnel
- HFI can be implemented as part of a robust Systems Engineering process
- HFI is split into Management and Technical Activities, which run in parallel and can be tailored to suit a specific project requirement
  - Management Activities ensure that relevant HFI questions are asked
  - Technical Activities ensure that these questions are answered



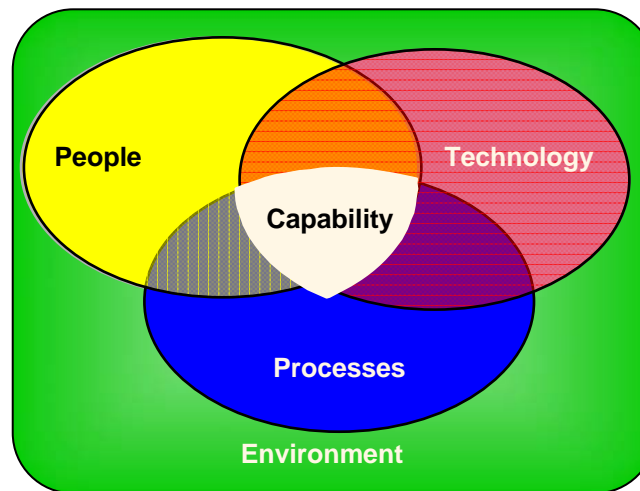
# HFI & Systems Engineering



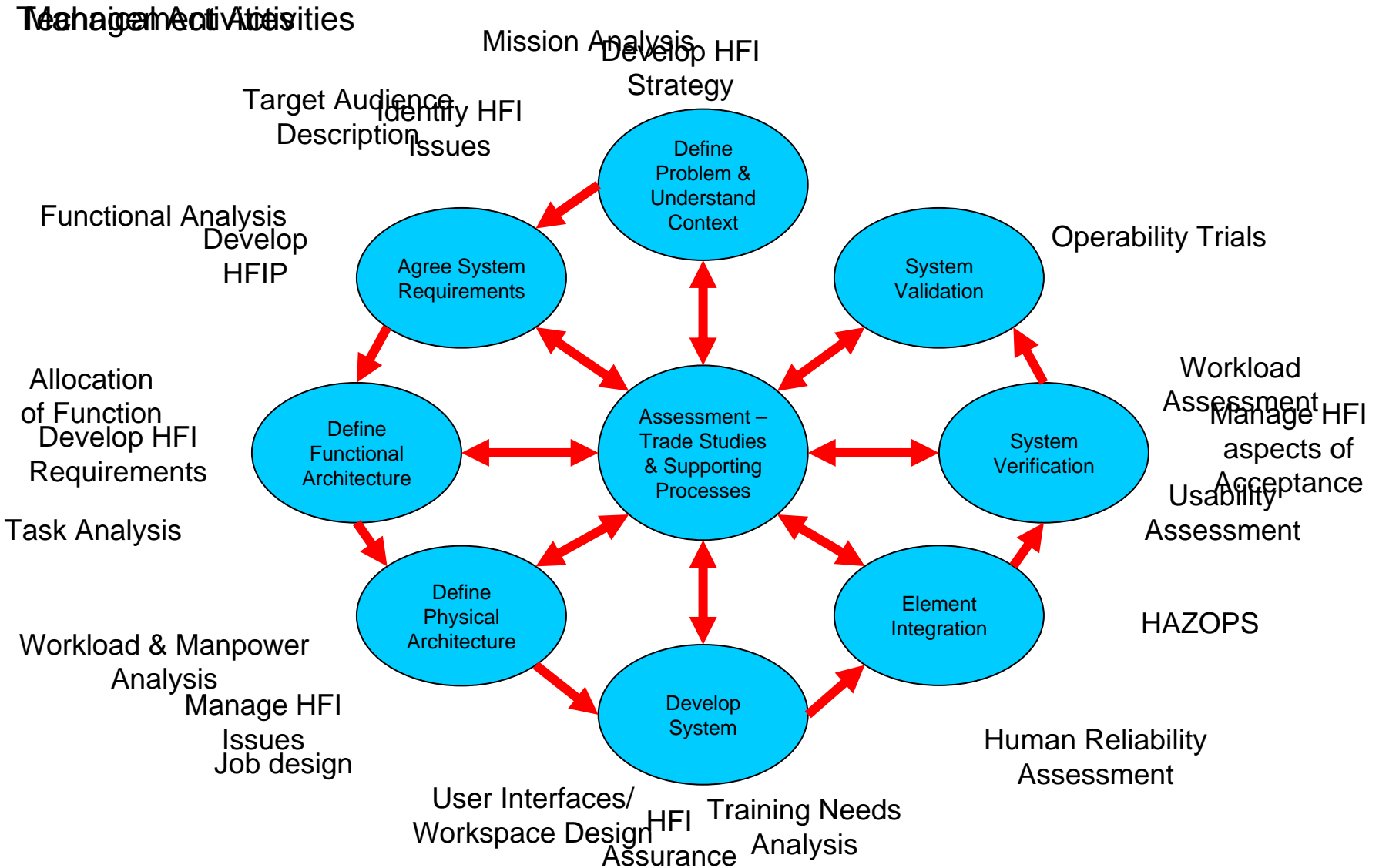
## The need for integration

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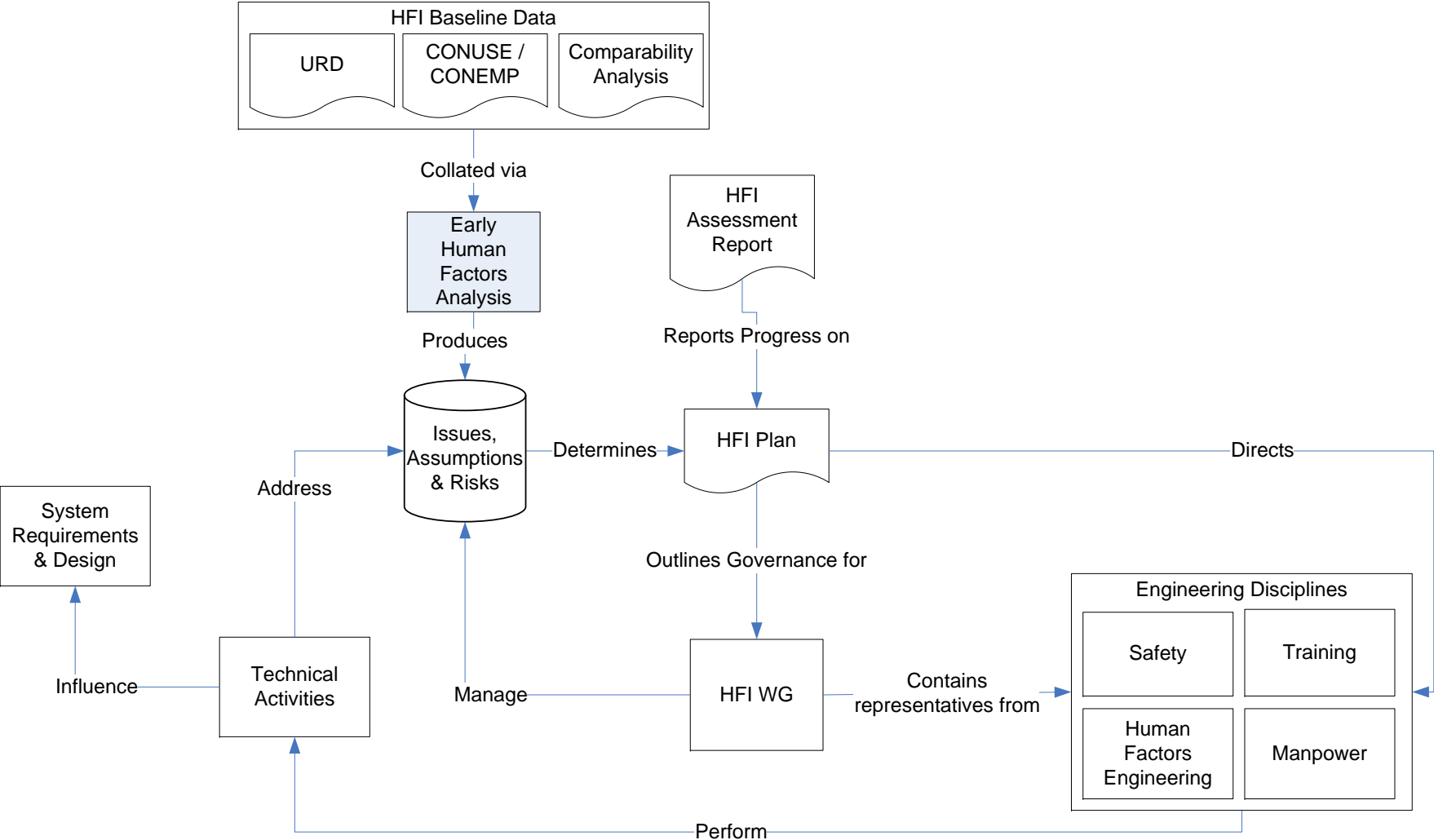
- HFI has been postulated as a form of Systems Engineering for some time.
- Operation of HFI along SysEng lines has been happening to a greater or lesser degree depending on practitioners, customers and organisational processes.



# HFI & Systems Engineering



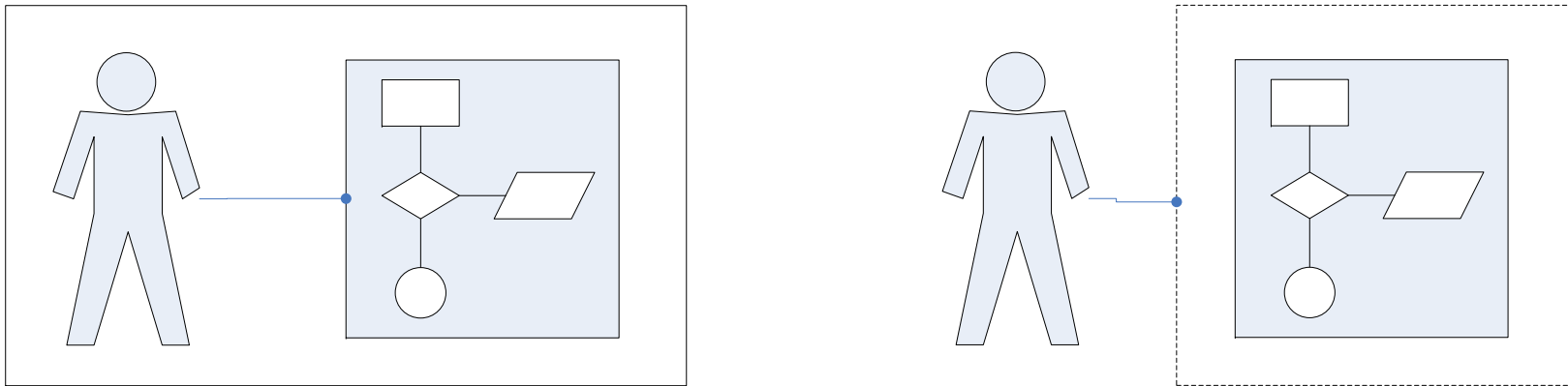
# A Model-Based Approach



# Modelling Users

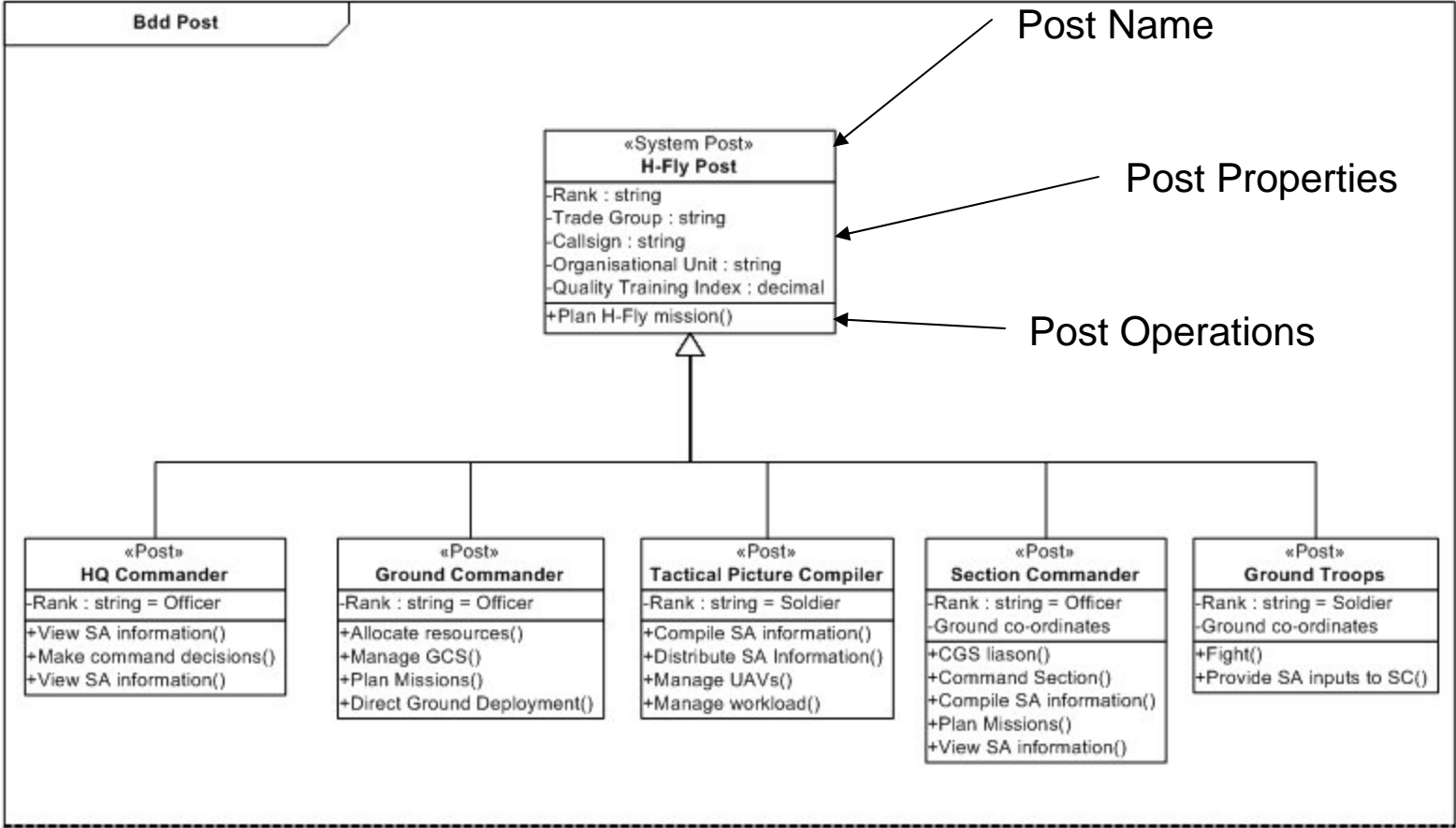
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- The operator acts upon the equipment system and thus is defined as an actor
  - In certain cases it may also be useful to describe the operator as processor or black-box component in the system.

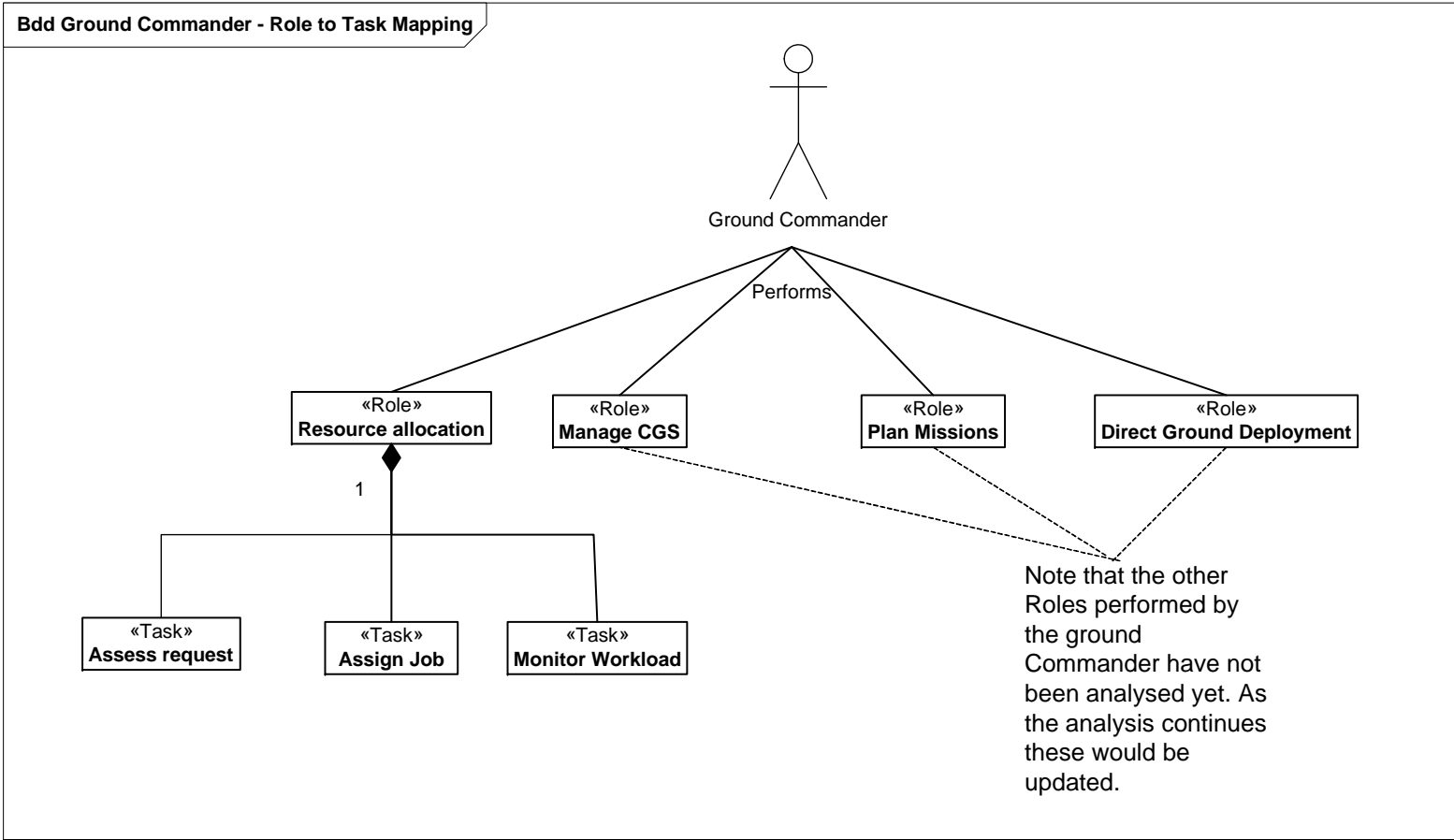


- This can then be modelled in a manner that is common with other Systems Design teams

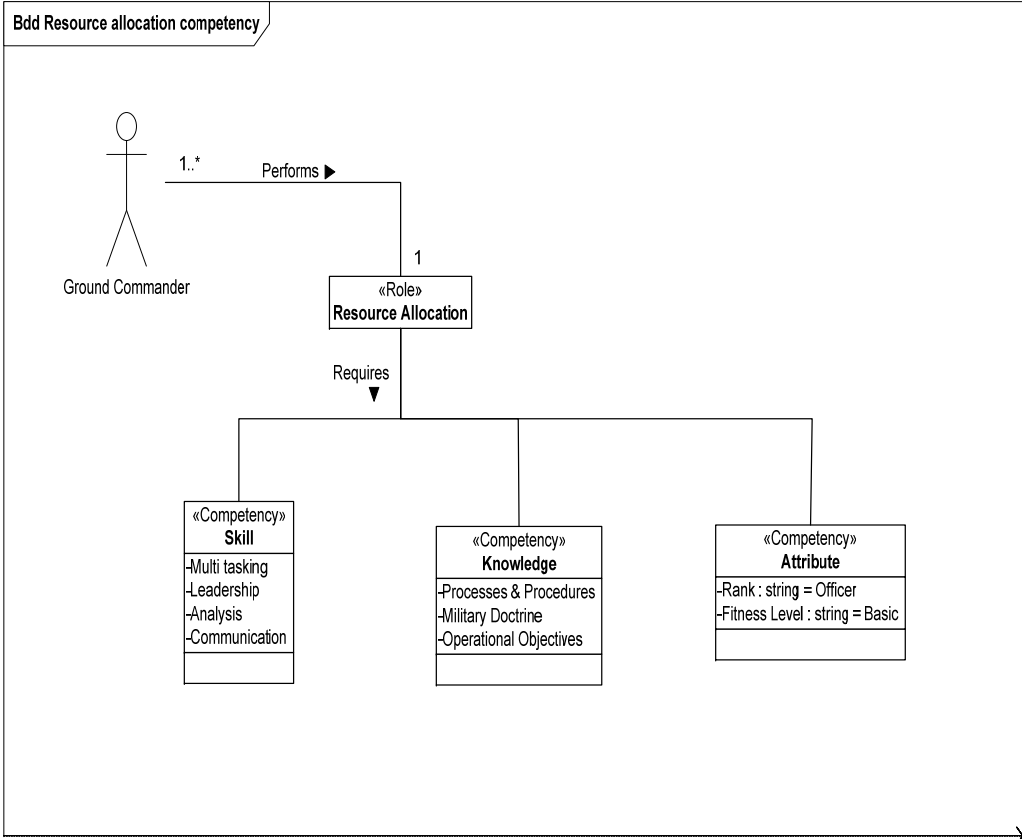
# Modelling User Roles & Competencies



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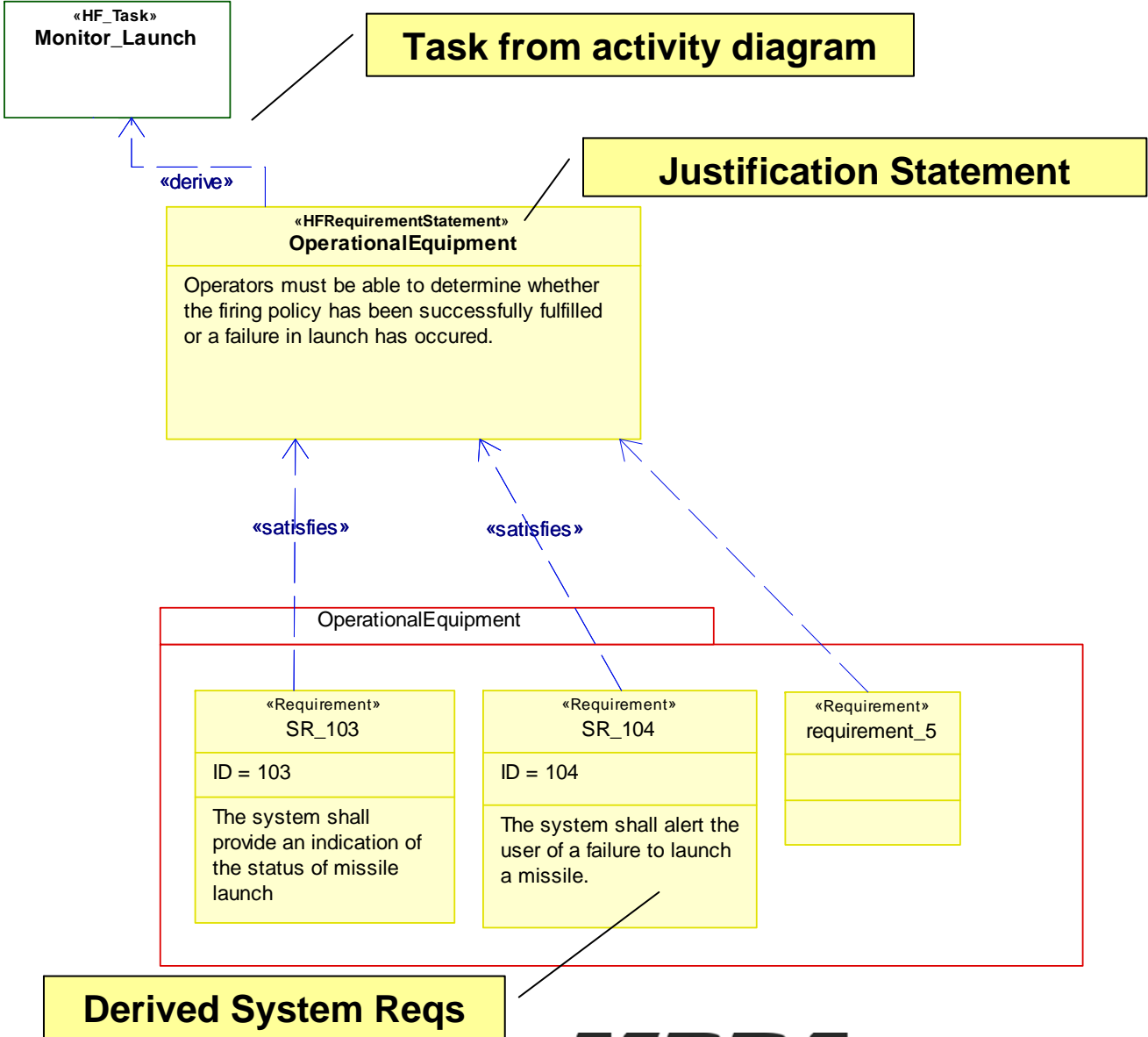


# Modelling User Roles & Competencies



# Managing HF requirements

## HF Requirements Traceability Diagram



## Summary

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- HFI can integrate effectively with other Systems Engineering activities.
- HF Requirements can be adequately managed within a SysML model.
- The outputs of technical activities can be characterised in a SysML model.
- The capture of task data in the model supports consistency between engineering disciplines.
- Integration with a system-wide model promotes accurate communication cross-disciplines.
- But... Remember the model is not an end in itself!

# Questions?

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