

Introduction of KEK QUP's Systemology Support Section (S³)
as an introduction to
the Systems Engineering Session of Quposium2022



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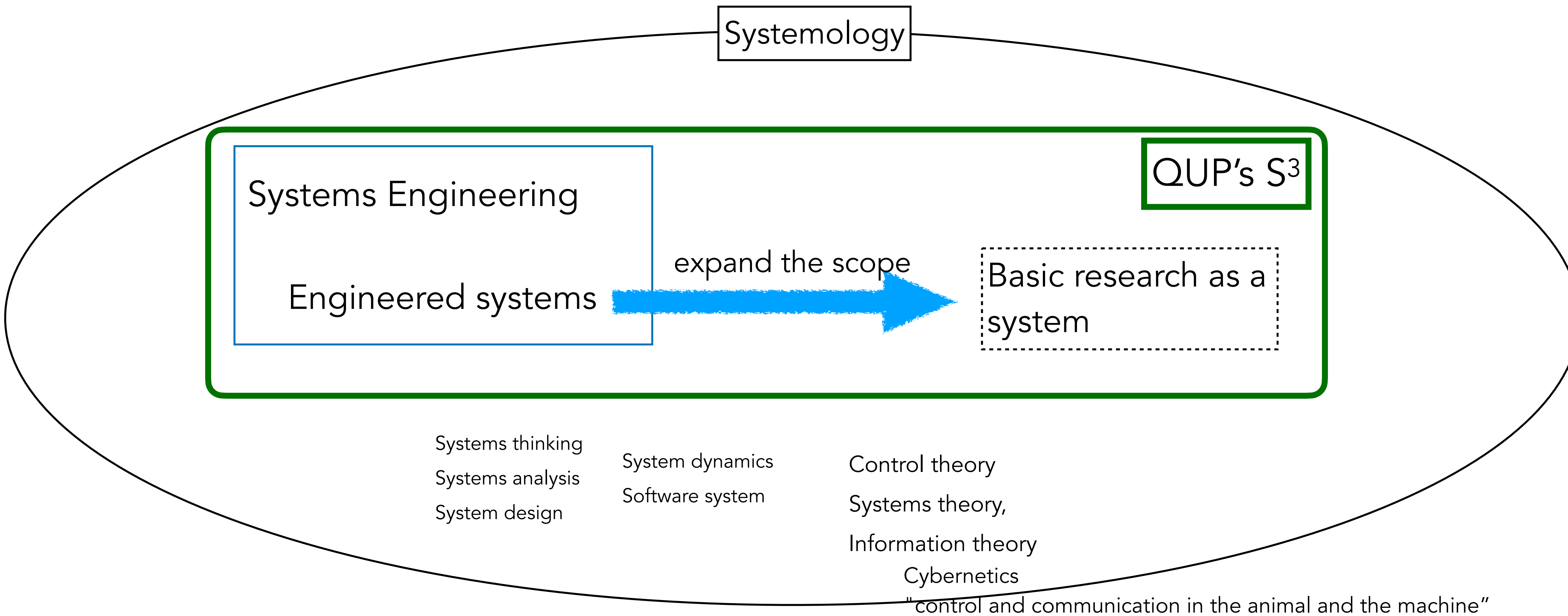
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量子場計測システム国際拠点
International Center for Quantum-field Measurement Systems for
Studies of the Universe and Particles
WPI research center at KEK

Systemology Support Section (S³) of QUP

- S³ is a section which supposed to take care of systems engineerings of QUP.
 - It may be unique for a basic research institution such as QUP to have such a section.
- The scope of systems engineering is "engineered systems".
 - S³ tries to expand it to basic research, taking "research" as a system.



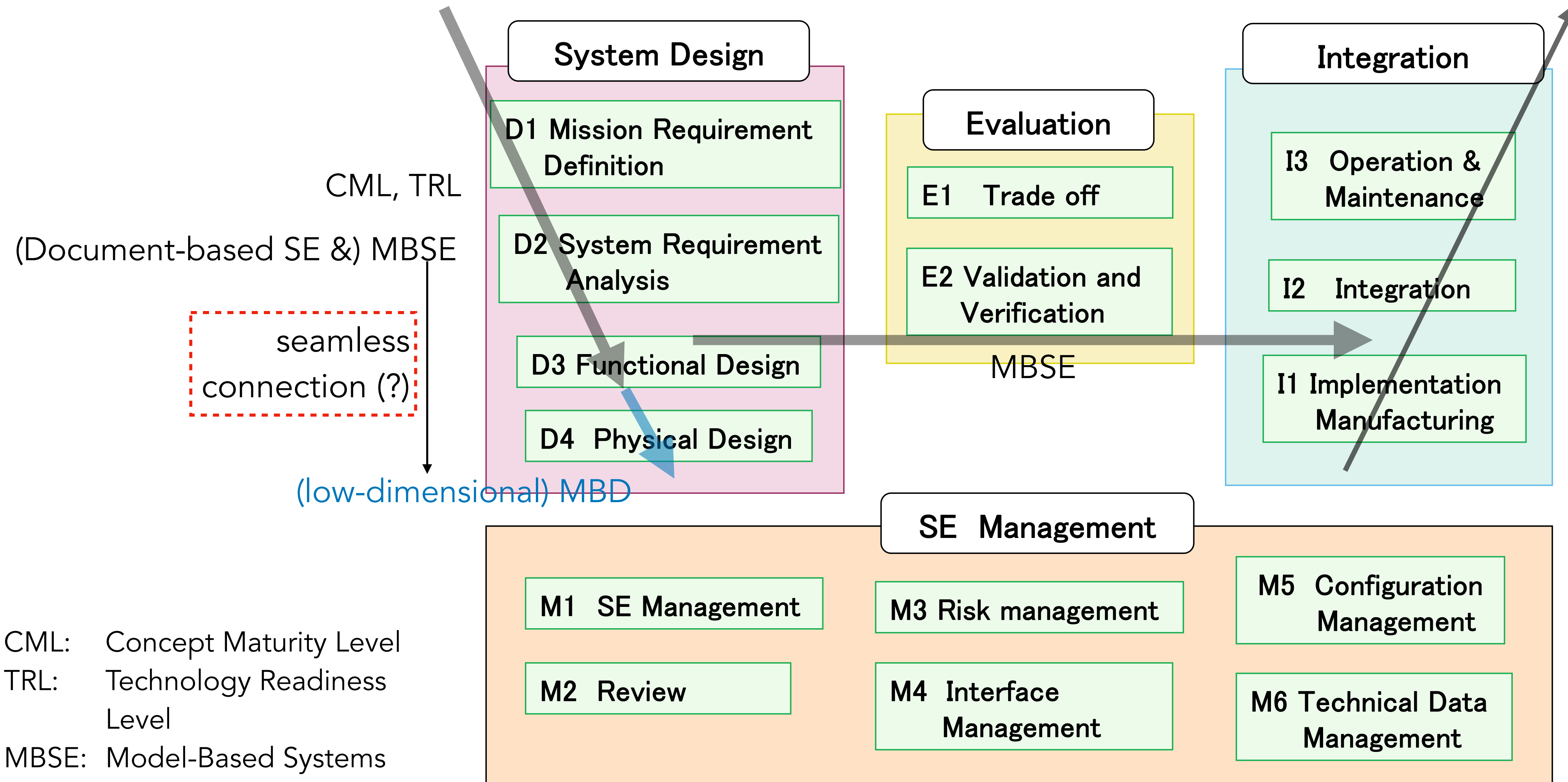
A "system" is a construct or collection of different elements that together produce results not obtainable by the elements alone. (NASA SE handbook)

Goals and objectives of QUP's S³

- Long-term (~10 years) Goals
 - To find best-practice engineering for researches for success.
- Objectives for the first few years
 - (A) To provide SE support for the QUP participation of LiteBIRD, which is presently at the exit of Pre-Phase A.
 - (B) To try to refine SE processes and tools including CML and MBSE so that they suit researches, and to apply them to concept studies of research-project candidates at QUP.
 - (C) Utilizing opportunities (A) and (B), to develop young system architects who have experiences in architectural design for system realization.
- Objectives in subsequent years
 - (A) To continue SE support for QUP's contribution to LiteBIRD .
 - (B) To continue SE support for research projects, and to find "best" SE process and tool sets for researches.

Typical SE processes

useful not only for engineered systems but also research projects



CML: Concept Maturity Level
 TRL: Technology Readiness Level
 MBSE: Model-Based Systems Engineering
 MBD: Model-Based Design

from "Basics of Systems Engineering", JAXA BDB-06007B