ELI-ALPS Research Institute
TOWARDS THE SHARP END OF ATTOSCIENCE

ENGINEERING SUPPORT ACTIVITIES AT ELI-ALPS THROUGH A SYSTEMS ENGINEERING PERSPECTIVE

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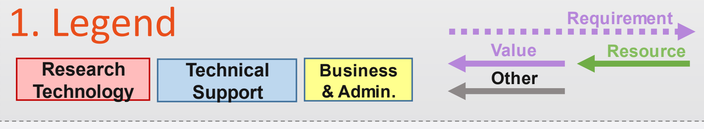
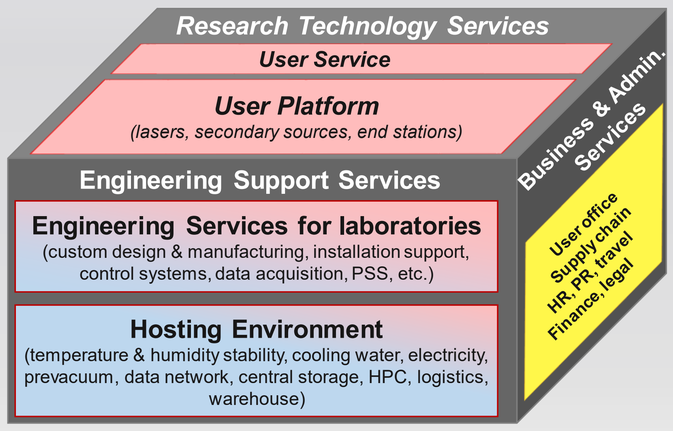
Big picture

Engineering services are really at the heart of the ELI-ALPS research facility: it is heavily connected towards the research technology as the major internal customer, however, it also has strong connection towards all other areas. Therefore, in order to have a common understanding about the role and place of the engineering services, two high-level models have been developed: the cuboid model on figure 2 represents the major areas of ELI-ALPS, meanwhile the high-level workflow on Figure 3 gives how these areas work together to achieve the common goal. These views are a good basis of communication about any project or task, not only for engineering but in general. Figure 1 shows the color coding of boxes and relations.

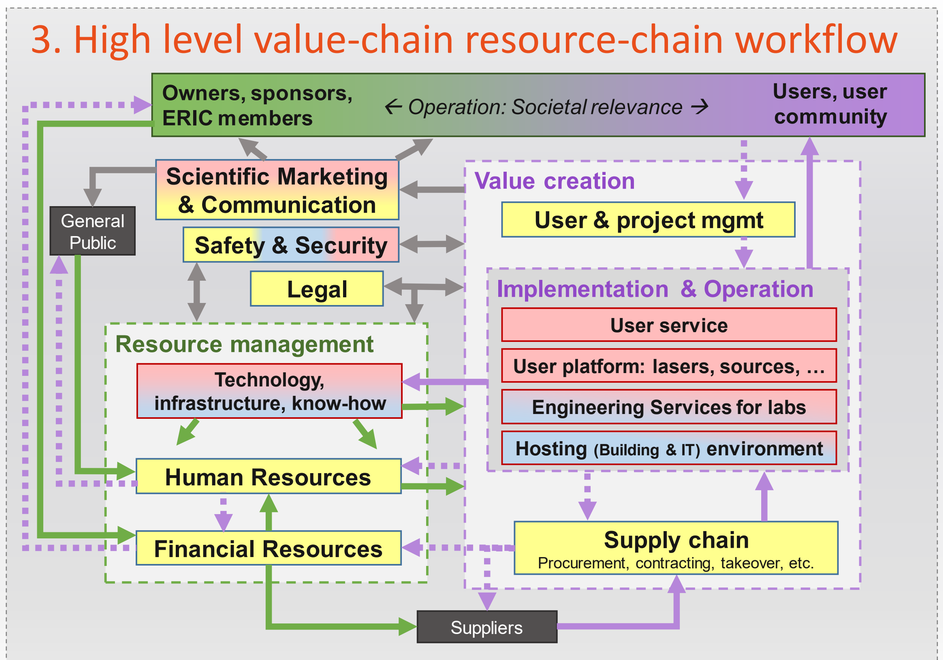
1. Legend



2. Major areas



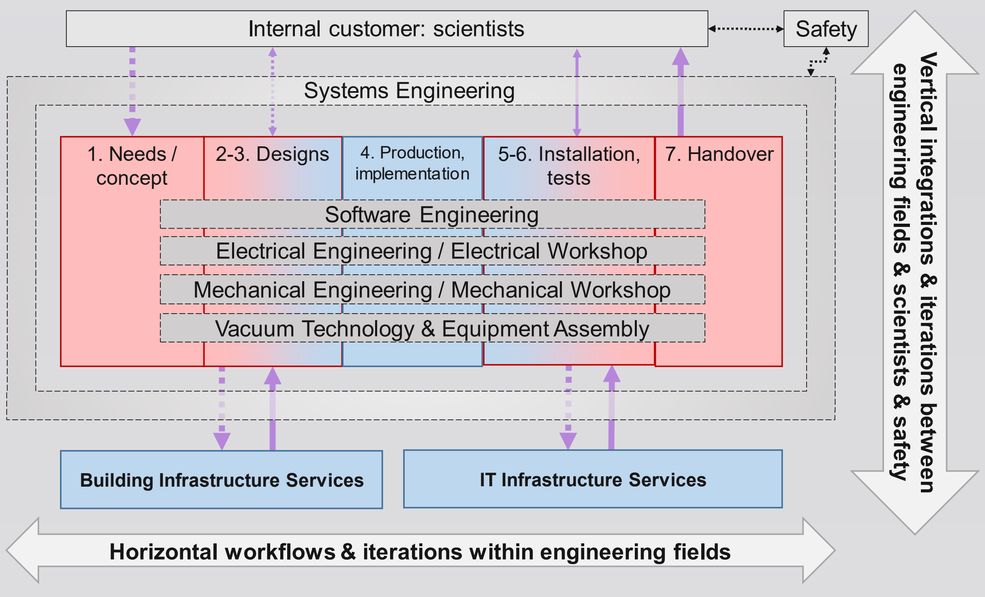
3. High level value-chain resource-chain workflow



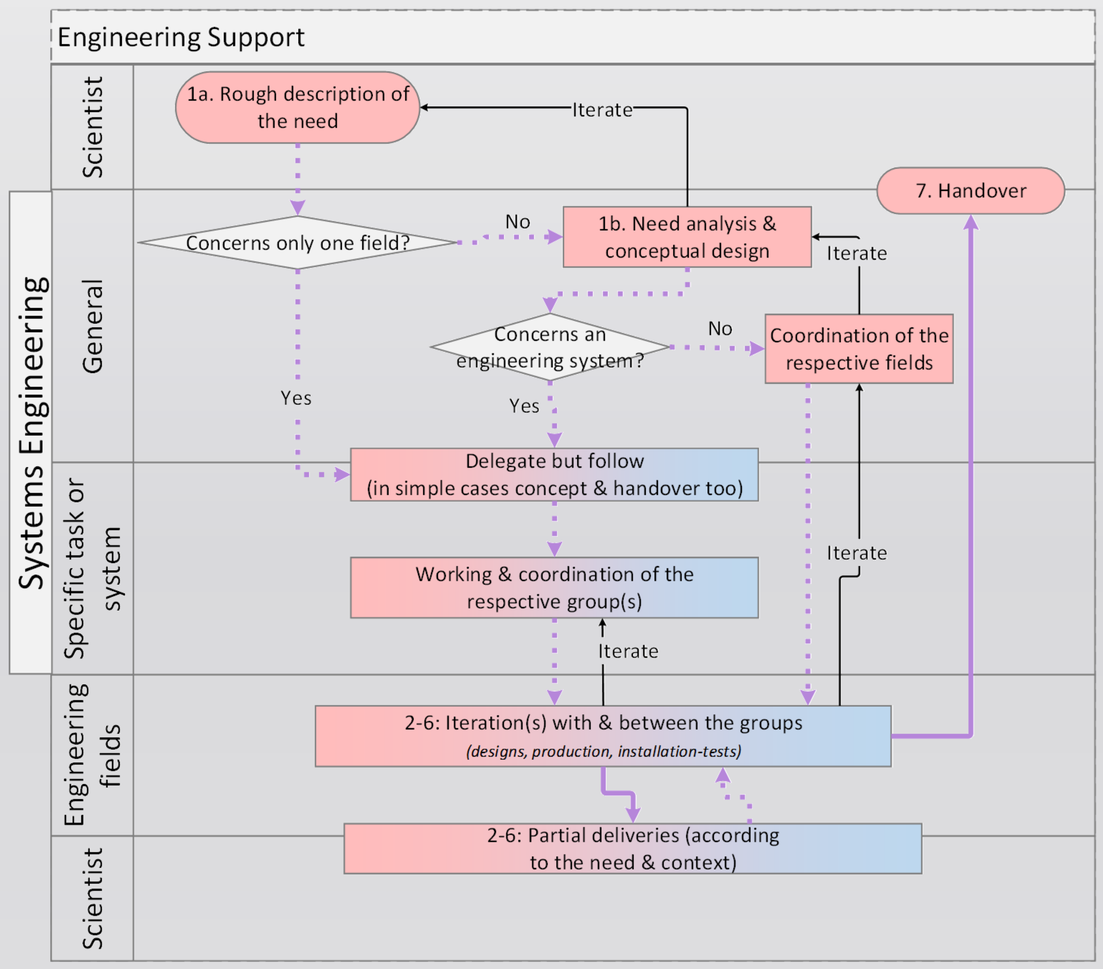
Engineering Support Services

Each engineering & researcher fields works with its own standard tools, workflows and best practices. The question is how to integrate these? How to combine general project management and traditional engineering methods with still being flexible and agile regarding frequently changing and evolving needs of scientists? These questions has driven the development of methodologies: a general engineering lifecycle (Fig. 4) together with a general engineering workflow (Fig. 5), as well as a general view of key systems and layers (Fig. 6). Briefly, key systems are: research equipment systems (lasers and end-stations received as black-box systems, beam transport and secondary sources developed in-house), facility-wide engineering systems (PSS, vacuum control, optical control, vibration monitoring) and hosting environment systems (building services & utilities, IT infrastructure). Key technical documents for all developments: Conceptual Design Reports (CDRs), Technical Design Reports (TDRs), Factory Acceptance Test reports (FAT), Site Acceptance Test reports, requirement sheets in order to eliminate potential integration risks (Fig. 7).

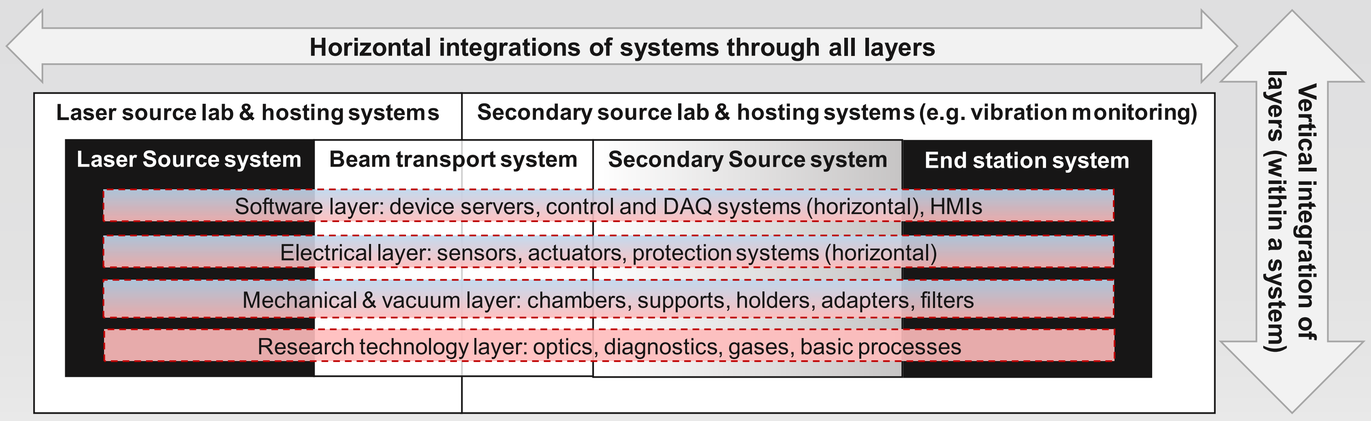
4. Engineering Lifecycle



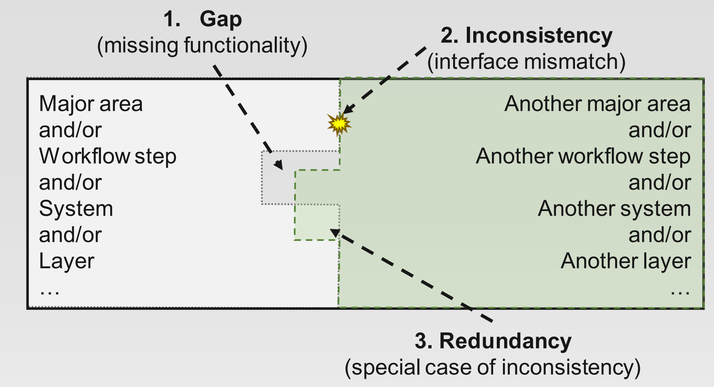
5. Engineering Workflow



6. Systems and Layers



7. Risk Assessment Methodology & Tool



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