When delivering projects, particularly complex ones, Systems Engineering (SE) and Project Management (PM) both desire a successful outcome – completing the project with the realisation of a new or enhanced system. PM focuses on controlling the introduction of the desired change. SE focuses on defining customer needs and required functionality early and then proceeding with design and validation, all while considering the whole problem.

PM and SE add the most value to a project when there is clarity over PM and SE roles and responsibilities, together with mutual respect and understanding of each other’s areas of focus, aided by a common language for project artefacts, roles and skills. Together they can establish and satisfy the right balance of stakeholder needs with time, quality, and cost.

This Z-Guide indicates where the key touch points between SE and PM occur, suggesting where close cooperation may achieve the greatest impact on successful project outcomes.
Key fusion points between Project Management and Systems Engineering

Concept

Project Management
- Business case and KPIs
- Project management plan
- Work, cost, and organisation breakdown structures
- Staff and team selection, RASCI, Competencies
- Time / quality / cost trade-offs and targets
- Team building
- PM framework / approach selection and tailoring

Systems Engineering
- Problem analysis and mission concept
- Requirements definition
- Measures of performance
- Solution options / trade studies
- Solution architecture
- System Engineering management plan
- Product breakdown structure
- Lifecycle selection and tailoring

Design and Delivery

Project Management
- Risk management
- Make / buy / design decisions
- Detailed project schedule
- Change, cost, and quality management
- Subcontract management
- Resource management
- Gate reviews

Systems Engineering
- Configuration management
- Architecture, KPIs and design decisions
- Impact analysis
- Integration, verification, validation and acceptance
- Acquisition framework

Operation, Support, and Disposal

Project Management
- Asset management
- Handover
- Transition to operations
- Lessons learnt
- Programme integration
- Benefits realisation

Systems Engineering
- Through life capability management
- Handover
- Transition to operations
- Lessons learnt
- Maintenance
- Disposal
- Achievement of quality targets
- Service delivery

Joint engagement with all stakeholders will ensure needs and perspectives are fully understood.
- Business case and KPIs drive requirements analysis which drives the solution.
- Solution PBS should be mirrored in the WBS and CBS.
- Explore whole system and mission to make appropriate trades affecting time, quality, and cost targets.
- RASCI defines responsibilities across the project and is closely linked to the PBS.

Review gates and decision points must bring together solution maturity, risk, schedule, and cost considerations.
- System architecture affects “make or buy” decisions which in turn may impact on subcontract management.
- “Make or buy” decisions impact on the integration, test, and acceptance, which then impacts on gate reviews and payment.
- Design decisions impact on time, quality, and cost and are controlled by change management.

Execution of previous stages should allow the handover and transition to the operation stage to proceed smoothly.
- Programme integration and benefits realisation are more easily achieved by satisfying appropriate quality targets.

Better outcomes are achieved when Systems Engineering and Project Management work well together.