Systems Engineering Project Support

Purpose and Approach

Since its formation, BHW has supported clients in applying Systems Engineering to active projects. Our approach is one of guidance and facilitation to help project teams apply the Systems Engineering processes and tools to their specific engineering tasks. This can range from creating a Systems Engineering Management Plan, facilitating a team to gather and write User Requirements, helping to create Systems Design Requirements through to Verification and Validation planning.

Key to success is a 1-day planning session with appropriate project team members, to determine the scope, purpose and outcomes of the support, together with a "road map" and dates for the support activities. Because each project is different, the number and duration of support sessions is unknown, but typically they are 1 to 3-days duration with a separation period of 2 to 3 weeks.

We recommend that the support for a particular project be subject to its own separate proposal that would be generated following the 1-day Planning Session. The proposal lays down clear aims and objectives for the support activities, together with the deliverables and the road map with support dates. The proposal will also provide detailed costs for the support activity.

Benefits to the Organization

Organizations new to Systems Engineering are often daunted by the variety and number of tools that assist the engineering community undertake the processes that constitute the Systems Approach. Moreover, legacy approaches and designs are often not aligned to Systems Engineering philosophy and doctrine and in consequence present both cultural and technical challenges. As tool and process experts, BHW are able to support and facilitate project team members at the "coal face" in undertaking the Systems Engineering tasks, allowing the project to be pursued on a realistic timescale with credible and valuable output.

The approach also allows the organization's staff to "learn on the job" thereby increasing their competency and confidence to apply Systems Engineering.

Non-disclosure

As the support work will involve BHW consultants actively involved in project work of a commercial nature, we are always happy to sign any necessary non-disclosure agreement.

Indicative Costs

The costs are based upon a day rate of £1,350 plus expenses for travel, accommodation and subsistence. The expenses are always invoiced at cost and using prevailing HMRC rates for travel.

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Common Support Activities

While we recognise that every project is different, our experience with many organizations over the last two decades has led to the formulation of a number of commonly addressed tasks that we can support.

Task	Duration	Activity	Output	Outcome
Generation of Requirements Gathering Strategy	1-day	Identification of product stakeholders. Prioritisation of stakeholders and determination of elicitation approach.	A list of key stakeholders together with the best means of requirements elicitation for each.	Ability to gather product requirements from key stakeholders to write the Stakeholder (User) Requirements Document
Requirement Elicitation from a Stakeholder Group	½-day	Identification of Stakeholder Group members. Generation, capture and organization of raw stakeholder requirements.	Requirement Tree Diagram for the Stakeholder Group members.	Ability to write the Stakeholder (User) Requirements Document.
Requirement Elicitation by interview	Two ½ - day sessions	1. Creation of the interview capture plan 2. Interview support	Interview notes	Ability to write the Stakeholder (User) Requirements Document
Writing Stakeholder (User) Requirements	1-day	Process and approach to translate raw requirements into correct requirements.	Initial draft Stakeholder Requirements.	Ability to write the Stakeholder (User) Requirements Document.
Determining System Requirements (functional)	1 to 2-days	Determination of the product functionality that represents the future value proposition for customers.	Functional Breakdown Structure Functional Model.	Ability to write the System Requirements Document.
Determining System Requirements (performance)	½ to 1 day	Determination of the performance requirements(initial) for each function.	Functional specification leading to the creation of a function library.	Ability to write the System Requirements Document.
Determination of functional and Physical Interfaces	1 to 2-days	Determination of the functional architecture of the product. Identification and definition of the functional Interfaces.	Candidate functional Architectures Definition of functional interfaces.	Ability to write the System Requirements Document.
Investigation of system frailties	1 to 2-days	Determination of Functional Failure Modes, Effects and Causes. Identification of Functional sensitivities.	Functional Failure Mode and Effects Analysis. Functional Parameter Diagrams.	Identification of critical functions – variation and failure sensitive. Support of Hazard Analysis.
Writing Systems Requirements	1-day	Process and approach to translate raw requirements into correct and complete system requirements.	Initial draft System Requirements.	Ability to write the System Requirements Document.
Generating Candidate Product Concepts	1-day (assuming system functionality is known)	Identification of functional solution choices. Creation and documentation of candidate product concepts.	A number of product concepts for further elaboration.	Ability to define a number of product concepts for evaluation.
Down-selection of Product Concepts	1-day	Identification and definition of down-selection criteria. Evaluation and down-selection of concepts.	Down-selected concepts.	Ability to define selected product concept for detailed design.
Writing Validation and Verification Requirements	1-day	Process and approach to writing Validation (acceptance) and Verification Requirements.	Initial Validation Requirements Initial Verification Requirements Draft Verification Compliance Matrix.	Ability to begin designing verification test plans. Ability to monitor on-going V&V activity via the Verification Compliance Matrix.

More Information and Contact Details

For more information about Systems Engineering Support or any of our Systems Engineering courses or Workshops please contact **Dr Stuart Burge** on +44 (0) 7803 131614 or sburge@burgehugheswalsh.co.uk.