System Development Is for the End-userâ€¦

Most projects share a common lifecycle with phases of analysis, design, implementation and support. The initial phase, analysis, being the most critical. This is true for both survey and engineering development projects.

For survey projects the phases may consist of defining the scope of work, survey planning, including identifying resources and equipment, data collection and processing and creating products and reports. As hydrographers, working with teams of engineers on new survey tool developments, the same philosophy is applied. For a systems development project the phases may be described as requirements definition, system design, manufacture of hardware and development of software and documentation, testing, acceptance and transition into service.

The analysis phase of any new development project should determine the system requirements from a number of perspectives including the customer, the operator, the business and the host vessel or aircraft. There may also be external influences such as government legislation and international standards which may impact the requirements. Some requirements may contradict others or be inconsistent with an acceptable project budget, schedule and risk and tradeoffs may be necessary. Requirements may need to be prioritised as essential, desirable, optional or unnecessary.

As far as possible, requirements definition should remain independent of any specific design as failure to do so may result in more efficient approaches being overlooked. It is also useful to describe how each requirement will be tested to ensure they are both real and measureable. Requirements should be succinctly documented in a simple table, thoroughly reviewed and then signed off by the project sponsor. This keeps the project on track and minimises scope creep, avoiding increased project costs, risk and schedule.

Following the requirements definition phase, the design phase may initially investigate a number of concept designs to determine the feasibility of alternative technical approaches. Once a preferred technical solution has been identified, the preliminary and detailed design phases can proceed. During the design phase it is important to frequently review the project against the approved requirements, however: these may be modified in the light of new information, provided any changes are documented and approved, and the project risk, cost and schedule are updated as necessary.

For complex projects, preliminary studies prior to project commencement have been found to be beneficial in estimating the scope, budget and schedule prior to project approval. This approach also provides a go / no-go gate before serious resources have been committed, reducing the risk of a failed project.

There is little doubt that the initial phases of development are the most important to prevent costly rework and project overruns. It is strongly recommended that requirements be formally documented, reviewed, approved and if necessary updated during the life of the project. This should be considered the most important element to ensure the design, implementation and support phases run smoothly, and the project is ultimately successful. It has been said that a dollar spent on analysis is worth 10 dollars on design and 100 dollars on implementation... And who wouldn't wish for a return like that?