NASA SBIR 2008 Phase I Solicitation

S4.03 Cost Modeling

Lead Center: ARC

Participating Center(s): GSFC, JPL

An integrated cost-design model is required, one that incorporates the regression analysis and statistical validity of historical parametric cost models with the flexibility and relevance of a ground-up, or grassroots, cost model. By explicitly focusing on the prime cost determinant, labor, as opposed to the spacecraft parameters, and determining the historic relationships between the tasks on the WBS and cost for a given institution/firm, as opposed to space industry in general, a cost model can be produced that is specific to the production process used by an institution. Such a cost model would predict the cost of individual tasks at sub-system and component levels within a given institution, enabling cost to be included as an endogenously determined variable in the design process.

Such an integrated cost-design model is currently embodied only as human capital in individual managers who have, through their personal experience, accumulated knowledge of cost-design relationships. When these experienced managers leave, the institution loses the understanding of the relationship between cost and design choices that the manager had built up through years of experience. Without this experience, ground-up cost models can be wildly inaccurate and as a result, only parametric cost models such as the NASA/Air Force Cost Model (NAFCOM) and the Small Satellite Cost Model (SSCM) are accepted for Technical Management and Cost (TMC) reviews. This is particularly problematic for small low-cost spacecraft where designs are rapidly evolving, management structures are more varied, and the entire purpose is to provide spacecraft at costs lower than what has historically been considered possible.

This subtopic seeks proposals to define management system requirements and develop software that would enable cost (and schedule) data at the task-level to be collected and centralized creating a base dataset for institution-based cost models and cost management research. The system would codify cost information of projects ensuring it is preserved beyond the careers of individual managers and would, over time, accumulate long time-series of task-level cost information that would enable ground-up institution-based cost models to stand on a rigorous statistical framework. This would enable the development of a generic institution-based design-cost model that can then be tailored for individual institutions and used across the industry.

Research should be conducted to demonstrate technical feasibility during Phase 1 and show a path toward a Phase 2 hardware and software demonstration, and when possible, deliver a demonstration unit or software package for NASA testing at the completion of the Phase 2 contract.

In Phase 1, research should provide examples of proven cost benefits and project successes based on the use of integrated management tools for management of multiple simultaneous distributed projects. Architectures should be proposed for implementation of an integrated multi-project management tool.

In Phase 2, a management tool set will be implemented and demonstrated as part of an actual small satellite management project. The tool will be evaluated for ease of use, effectiveness as a NASA project set-up tool,

management information tool, and reporting tool. Feasibility for a single manager to effectively manage and report on multiple simultaneous projects will be assessed. Project users from the WBS elements of the satellite project will evaluate ease of use of uploading data.

Proposals should show an understanding of one or more relevant science needs, and present a feasible plan to fully develop a technology and infuse it into a NASA program.Â