The core of Galorath's business is research, analysis, modeling and simulation. Galorath's models and analysis tools have been employed throughout the DoD for 25 years. The primary areas of analysis and modeling that we are focused on include:

- The SEER for Software Suite For Software Estimation, Planning, and Control
- The SEER for Information Technology Suite for estimating complete IT projects
- The SEER for Hardware Suite For Hardware Development, Production, Operations and Support
- The SEER for manufacturing Suite For Parts, Process, and Assembly Costing and Design For Manufacturability Decisions
- And, Risk and Uncertainty modeling using Monte Carlo Simulations.

Our breadth and depth are highlighted by the flagship models and related services that we deliver to the Navy and other federal agencies and contractors.

In addition to our SEER suite of analysis tools, we also develop custom modeling and analysis solutions for the Government. Some examples include:

- Missiles and Munitions: We are the Missiles and Munitions cost modeling, analysis, and Automated Cost Database (ACDB) prime contractor for the Tri-Services (Army, Navy, AF) database and associated analysis
- Software modeling and simulation analyses for the Future Combat Systems Program
- Small Business Innovative Research (SBIR) projects:
  - Naval Air Systems Command (NAVAIR) Joint Strike Fighter – Development of use case diagram sizing methodologies.
  - US Navy- Naval Sea Systems Command (NAVSEA) Reforger – Interfaced with a Product Object Model using a self-learning interface, to aid automatic characterization of foreign Work Breakdown Structure (WBS) components into a native WBS structure suitable for estimates to be derived from.
  - NAVAIR NexGen Phase II – Developed a system that used data mining to arrive at pre-trained software cost formulae. The technique specifically used a series of sorting and assignment filters, passed through statistical goodness and other techniques, to assemble a library of pre-developed formulae for use on demand.
  - United States Air Force (USAF) Auto Software Sizing – A system which interfaced with UML tools to map specific artifacts of that language into a model that was suitable for sizing and, from that, software cost estimation.
  - USAF Requirements Based Cost Models & USAF Cost IQ – Development of a case-based reasoning system that enables subject matter experts to specify a set of domain-specific requirements and obtain new notional work breakdown structures, complete with finely detailed set of parameters for each.

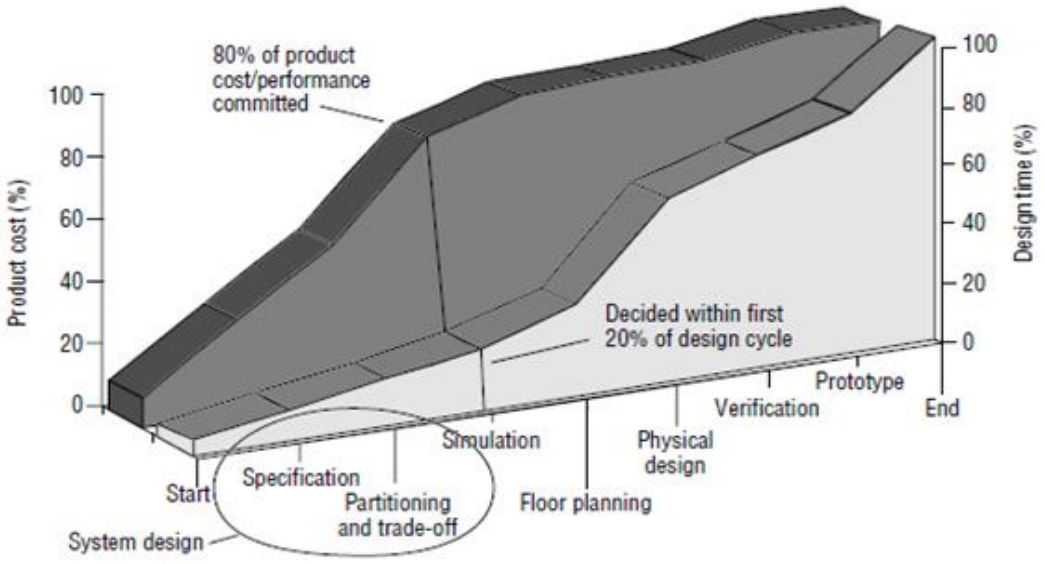
- USAF Far Out Phase II – A suite of methods developed, tested using a rigorous protocol and evaluated against the goal of estimating orbital spacecraft missions up to 20 years into the future.
- USAF Cost Modeling Interoperability – Development of a plugin to Phoenix Integration's process integration and multidisciplinary design optimization software, which permits SEER models to be connected with other engineering software and thus enabling rapid cost optimization within the design space.

· CATIA Interfacing Products: Teamed with Dassault, Galorath is creating a family connectors into the leading 3D modeling system, CAITA. The first product, SEER-Ply Cost Estimator focuses on modeling of composite parts. Other products will focus on sheet metal, assembly, and machining. The CATIA based products feature direct interfaces into the CATIA modeling system, along with a rules processing engine used to generate the best set of process steps for costing.

· Cost IQ: Galorath teamed with the artificial intelligence (AI) specialists Stottler Henke to bring a case base reasoning engine into a cost model generator, using domain specific attributes and a historical model case base.

Galorath's modeling, simulation and analysis efforts take multiple forms and utilize a variety of methodologies and technologies, as evidence by the examples provided above. However, functionally, one of Galorath's core competencies is in the area of system tradeoff modeling and analysis. These studies are critical to the success of any agency's mission, including the Navy and Marine Corps. Identifying what decisions need to be made to support system design is not always easy, and there is never enough time or money to consider all the myriad alternatives available to satisfy requirements. However, Galorath recognizes that system tradeoff models and analysis are critical to the success of the Navy's mission. System design decisions should always be based on the system requirements. These design requirements, however, must be achieved in a cost effective manner. Tradeoff studies provide the needed information for decision making and the documentation necessary to support the decision. As an example, a significant portion of an electronic system's cost, size, and performance is committed long before physical design (layout and routing) begins, See Figure 1.

Figure 1. System tradeoff modeling and analysis is a critical component of mission success



A trade-off is a situation that involves losing one quality or aspect of something in return for gaining another quality or aspect. It implies a decision to be made with full comprehension of both the cost and benefits (positive and negative) of a particular alternative in order to understand relative efficiency and effectiveness measures.

Galorath develops system tradeoff analyses as systematic, interdisciplinary examinations of the factors affecting system costs. These analyses are accomplished by analyzing numerous system concepts to find acceptable ways to attain necessary performance while balancing essential requirements that must be satisfied to meet Navy and Marine Corps requirements.

System tradeoff analyses, sometimes called Analysis of Alternatives (AOA) is the process of assessing the different methods for achieving system functionality. A system tradeoff analysis creates system scenarios consistent with system modes and performance and documents these alternate system concepts based on scenario and functional definitions. Galorath accomplishes system tradeoff analyses by completing the following activities.

- Conducting design analyses, simulations, and tradeoff studies to provide desired performance measurement data.
- Using modeling and decision analysis techniques to collect the data stipulated by established decision criteria.
- Conducting life-cycle cost and schedule analyses for each alternative under consideration.
- Comparing each alternative and selecting the best one or combining the best characteristics of several alternatives into an entirely new alternative to define the preferred system solution.
- Establishing schedule and cost baselines for the preferred system solution.
- Allocating system functions to actual physical components (hardware, software, and people) of the preferred solution.
- Finalizing the project's physical system architecture.

The objective of the performance trade study is not to minimize the cost of the system, but to achieve a specified level of cost reduction established by the target costing system. Conducting cost/performance trade studies is one of the most effective means used by the analysis community, especially in the early life cycle phases to define a system, to help narrow the universe of potential technologies, processes, and operational concepts to the most optimal solution.

Trade studies of novel approaches and benchmarking studies are performed throughout the early study/proposal/program phases to select the concept, architecture and configuration that best satisfy system prerequisites, limitations and requirements. During the entire concept exploration and definition phase, such studies will be done primarily to establish the system architecture and compare the development approach proposed with alternate approaches. Such studies help ensure that a team's tendency to go directly to a point-design based on past experience will be avoided and that the architecture implemented is one that best satisfies overall customer requirements. To ensure a rational and unbiased selection is made, a structured procedure should be used as a framework for analysis. These are some of the key steps involved in any such analyses:

1) Define Objectives; **2)** Identify Stakeholders; **3)** Identify Needs; **4)** Determine how each requirement should be measured; **5)** Establish list of key customer attributes; **6)** Develop technical performance measures (TPMs); **7)** Prioritize and determine customer importance weights; **8)** Select an evaluation methodology; **9)** Establish thresholds and objectives; **10)** Establish definition for each customer attribute; **11)** Review with customer and make changes as required; **12)** Develop design/architecture; **13)** Create scorecard for the top designs/architectures/alternatives; **14)** Brainstorm/explore design alternatives; **15)** Iterate /review with team; and **16)** Select winning approach.

Simulation and probabilistic analysis is integrated into virtually all of our efforts. Galorath has developed its own Monte Carlo simulation engine that is used to perform probabilistic analyses on numerous key technical and performance parameters. Mathematical distributions are established and incorporated into the model through the simulation engine, generating a range of possible results and their associated probabilities. The expertise and capability to perform simulations is critical for enabling Navy and Marine Corps decision makers to understand all of their options and likely outcomes, as well as less likely but potentially high impact adverse impacts.

Figure 2. Simulation of the number of possible defects in a system

3.18.2 Professional Development and Training Support

Galorath has a long history of providing training to the Navy, Marine Corps, other Government agencies, and industry personnel. For example, Galorath performs training (approximately 40 classes per year) for the Navy, other DoD agencies, NASA, and industry. Of those 40 classes, approximately 20 are provided to the Government directly, 15 to federal contractors, and another 5 to commercial clients. Recently, Galorath was at SPAWAR Systems Center Atlantic, Naval Station, Norfolk, Virginia teaching a class on software estimating. Galorath also has outstanding internal training programs for new employees that cover a wide range of topics such as cost estimating and analysis, database development and analysis, DoD Acquisition, and Earned Value Management Systems (EVMS). Additionally, Galorath staff are frequently trainers at the International Cost Estimating and Analysis Association (ICEAA) Professional Development and Training Workshops for topics such as database development, data collection, data normalization, and analysis fundamentals.

Galorath provides training to Government customers on a variety of functional areas and topics. A few examples include:

- Hardware estimating and analysis. Ships, aircraft, satellites, integrated circuits and electro optical systems are just a few commodity areas that we cover.
- Software estimating and analysis
- Information technology (IT) estimating and analysis
- Manufacturing estimating and analysis

Our training has been recognized by many of our customers as the benchmark for teaching the process of cost estimating. After each class, Galorath training effectiveness is surveyed using Survey Monkey. After several years of this “student” evaluation process we have maintained a superior score. The training techniques and classroom exercises we utilize have evolved to provide students an excellent analytic training experience. Our focus is on teaching students to navigate real world exercises that directly translate to analysis support tasks. We approach

analytical models as a tool to effectively complete the task but our training focuses on the overall process. Our training prepares analysts to support estimating tasks for a wide selection of defense systems for the Navy, Marine Corps, Air Force, Army, Coast Guard, and joint service programs.

All training programs are based on an approach consistent with the estimating processes defined in the Government Accountability Office (GAO) Cost Estimating Handbook. Before the GAO Handbook was published, Galorath worked closely with each of the services to ensure consistency with service level estimating guidance. Our strength is that we teach the analytic processes and lead students in hands on exercises to learn the models and tools. We use lecturing and presentations to introduce new concepts but more than 80% of the time in our classes is spent hands-on with students exercising analytic models.

In addition to the core classes mentioned above that we frequently teach, we also develop and deliver specialized training courses at the request of customers. Some examples recently delivered specialized courses include:

- Estimation Fundamentals Workshop – Generic
- Agile Software Development Workshop
- Story Point Counting
- Function Based Sizing
- Estimation Essentials

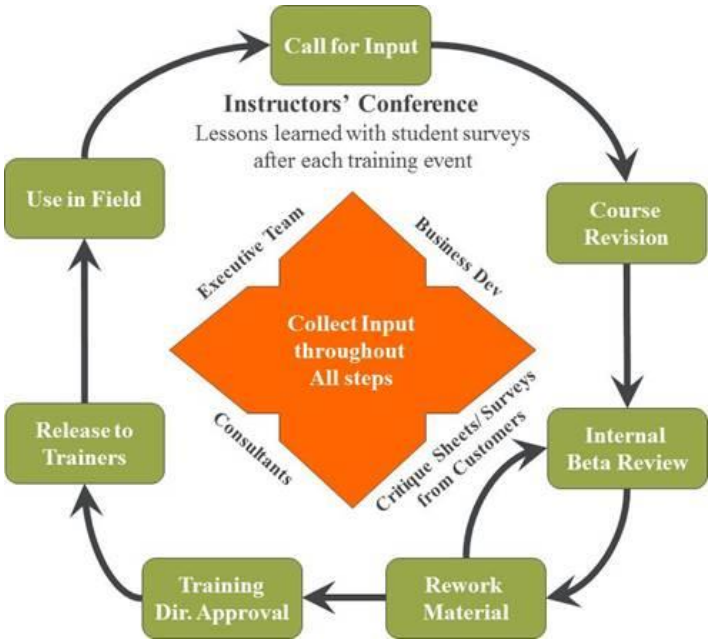
Furthermore, we have a number of courses in development at the request of customers, including

- Software Non-functional Assessment Process (SNAP) Counting
- Project Monitoring and Control
- Project Management Professional (PMP) Guide to Parametric Estimation
- SEER for Software Certification

A key to excellent training is to develop excellent trainers. Prior to becoming a trainer, our analysts must first demonstrate technical proficiency in the subject matter. Then the potential trainer must sit through the class they may potentially lead. The next step is to let the potential class instructor team-teach with an experienced instructor. After the team teaching experience, the potential instructor receives critical feedback regarding the strengths and weakness of their performance. This process may occur several times until new instructor demonstrates the necessary level of competency on the subject material to do an excellent job. To insure our quality is never reduced, a student survey is taken after each class.

Another key to providing excellent training is excellent training material. Excellent training material is developed and maintained through a continuous improvement process. The Galorath continuous improvement process for training is displayed in the figure below. The first element is to solicit potential training updates from students, product users, and trainers. Next, course material is reviewed, modified, tested, and reviewed again as necessary. The updated training material is reviewed by the training director, and, upon approval, the new/revised material is released to the instructor for use. We have found that this process must cycle at least annually for each set of training material. It is truly a continuous process.

Figure 3. Continuous Process Improvement Flow for Training



Finally, effective training must be mobile and flexible. Galorath has fixed facilities that can be utilized to deliver effective training, portable computers to support training at remote facilities, and the resources and existing contacts to rent training centers if no Galorath or Government facility is appropriate or available. Galorath is also experienced and well versed in providing training via WebEx and other online mediums when a single user or small group of users require training and the costs of travel can be avoided.

As described above, we regularly review course surveys and use course critiques to assist us with revising and improving our training materials. We use surveys and critiques to evaluate instruction and instructors. Any instructor that fails to maintain our high standards is promptly replaced.

3.20 Program Support

Better Buying Power, Will Cost, Should Cost, Performance Assessments, Root Cause Analyses, Interim DoD Instruction 5000.02, and the unique Navy application of the Programming, Planning, Budgeting, and Execution System (PPBES) require technical, analytical and financial breadth and depth. We have a unique perspective on the acquisition systems and the milestone review process that incorporates a historical (lessons learned), technological (current with cutting edge technology experience), and current DoD/Navy guidance . Galorath has the requisite knowledge, experience, and technical skills to meet the challenges of the acquisition process and the current decisions faced by the Navy.

Galorath's experience and capability is highlighted by the following example projects:

- US Army Integrated Personnel and Pay System – Galorath is the prime contractor supporting the range of program support tasks necessary to accomplish this ACAT 1 program to include financial management, scheduling, contracting, and earned value management.
- NAVAIR 4.2 Cost Department – Assisted cost department personnel in evaluating annual software maintenance budgets for programs administered at NAS Patuxent River, MD. Also Performed several ad-hoc software effort, cost, schedule, and risk analyses on a variety of systems.

- US Navy Tomahawk Missiles (ATWCS/TTWCS) PMA 282 – Led a software cost model calibration task that included employee training, customer education, data collection, and Work Breakdown Structure (WBS) & technical baseline development. Was awarded a follow-on contract to expand the effort with additional contractor data.
- Joint Precision Approach and Landing System (JPALS) - Developed and calibrated models for JPALS, providing estimates for total systems costing for aircraft onboard systems, ground and ship based landing control systems.
- AIM-9X Missile - Developed and calibrated models to provide cost, schedule, and risk estimates for AIM-9X Missile upgrade for a F-16 fleet.
- US Army Future Combat Systems Manned Ground Vehicles – Calculated most software estimates for BAE Systems (formerly United Defense, L.P.) Armament Systems Division on the FCS MGV program. Effort included employee training, customer education (presentations), data collection, WBS & technical baseline development, scenario generation, and estimate calculation & documentation.
- US Army Future Combat Systems Unmanned Aerial Vehicles – Calibrated a hardware cost model and led hardware cost estimates for a private contractor's bid on the FCS UAV program. Effort included employee training, customer education (presentations), data collection, WBS & technical baseline development, scenario generation, and estimate calculation & documentation.

Galorath has spent over 25 years developing and improving our program management, resource analysis, and cost estimating processes. Galorath is currently the Business Management Division (BMD) prime contractor for the Army's Integrated Personnel and Pay System-Army (IPPS-A), an ACAT 1 program (see Past Performance for additional information). Galorath supports the IPPS-A program office in planning and managing the full range of business/financial management, cost/schedule estimating and analysis, business case/economic analysis, acquisition/contract management support, operations management support, risk management and analysis, and executive assistance support.

In the program planning and analysis area we are:

- Providing support for studies and analyses related to the Enterprise Resource Planning (ERP) system acquisition, business and financial management process, programmatic functions, organizational management and improvement, business financial analysis, cost/schedule analysis and management, and other system acquisition related functions as required.
- Reviewing and assessing the impact of revised or new policy guidance and regulations for business, schedule and cost impact on the IPPS-A program.
- Participating in the Integrated Product Team (IPT) process.
- Providing program scheduling support expertise to monitor and control program activities and to develop the Program Integrated Master Plan (IMP) and Integrated Master Schedule (IMS) to determine program progress, track costs, assess financial risk and to determine the need for management action.
- Developing an analysis schedule to replicate the Program IMS and conduct schedule analysis and Schedule Risk Analysis (SRA). Assisting in the development and support of the Cost Analysis Requirement Description (CARD), Program Office Estimate (POE), Cost Risk Analysis (CRA), Cost Analysis, Economic Analysis (EA), Tradeoff Studies, Business Case Analysis (BCA), Schedule Management and Analysis, Acquisition/Financial Management of Acquisition Category Information Automated

(ACAT IA) Program, Acquisition Reports for ACAT IA Program, and Risk Management and Analysis.

- Evaluating the cost-effectiveness of all relevant plans and programs and assess how effectively they meet organizational priorities.
- Assisting in the development of comprehensive plans, programs, special reports (including acquisition documentation), briefing support studies, analysis and plans.

In the area of ACAT I Acquisition Reporting, Galorath is:

- Integrating and correlating program execution data with the program baselines to accurately develop, maintain, and update acquisition reports such as the Monthly Acquisition Report (MAR), Major Automation Information System (MAIS) Acquisition Report, Defense Acquisition Executive Summary (DAES), Acquisition Program Baseline (APB), Office of Management and Budget (OMB) Exhibit 300, and supplemental reports as required by DoD policy for MAIS ACAT IAM program IAW DoDI 5000.02, and additional mandates that arise in the annual National Defense Authorization Act (NDAA).
- Acting as a liaison between auditors and program personnel. Galorath coordinates correspondence between external audit agencies and the program office. External audit agencies include the Government Accountability Office (GAO), the Army Audit Agency (AAA), the Department of Defense Inspector General (DoDIG), and any other auditing organization.
- Modifying, maintaining, and updating the program office's IMP and IMS IAW "DoD Integrated Master Plan and Integrated Master Schedule Preparation and Use Guide".

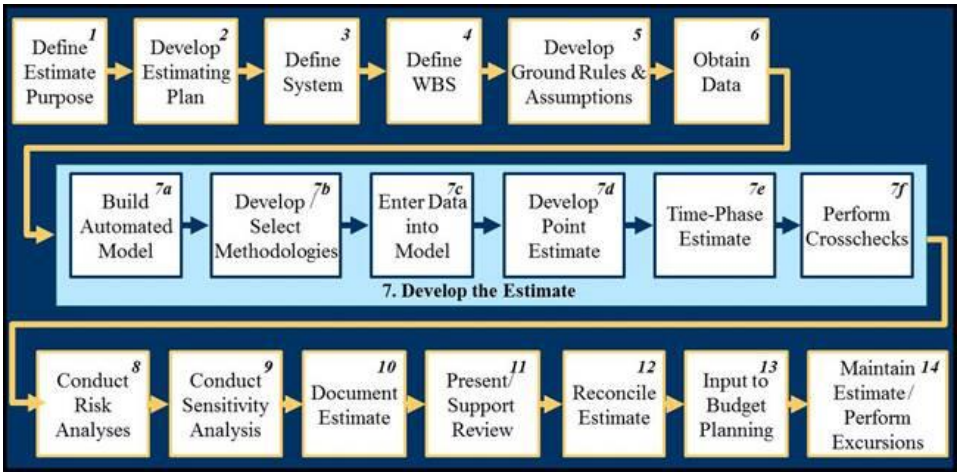
In the area of financial management support, Galorath is developing, training, briefing, integrating, correlating, and analyzing various phases of PPBE within the IPPS-A DoD portfolio. These activities include Development of the Program Objective Memorandum (POM), Budget Exhibit Preparation, Staffer Day Briefing preparations, funds receipt, Analysis Reporting, Spring Program Review (SPR), Investment Budget Review, Program Management Reviews (PMRs), Mid-year Execution Reviews (MERs), Baseline Execution Reviews (BER), POM Briefings, Financial Planning Working Group (FPWG), Financial Management Review (FMR), Acquisition Mission Support (AMS), Business Management Reviews (BMR), Budget (OMB) Exhibit 300, and Tri-Annual reviews.

Galorath is also evaluating program office and Program Contractor Earned Value Management (EVM) related reports such as MAR, DAES, MAIS Acquisition Report, OMB Exhibit 300, and PMR IAW Defense Acquisition Guidebook and Monthly Acquisition Report Guidance in the MAR Guidebook, and the best practices and guidelines identified in the Earned Value Management Implementation Guide (EVMIG). Galorath is supporting the Integrated Baseline Reviews (IBRs) to provide insight into contract cost and schedule performance issues IAW the DoD EVMIG and IBR process. This support includes: assisting in verifying and validating the Program Contractor's baseline, identifying risks and analyzing risk mitigation plans, analyzing the resources loaded into the technical baseline, IMP traceability, IMS horizontal and vertical integration, all EVM related information (including Contract Performance Report (CPR), Control Account Plans, etc.) and analysis of actual performance to provide insight into contract technical, cost and schedule performance baseline issues.

In addition to the aforementioned Program Support experience, Galorath has a particularly strong core competency in the area of cost estimating and analysis, which has been the company's primary service line for the last 20+ years. Our systematic approach ensures a comprehensive and complete estimate that is compliant with the Government Accountability

Office (GAO) Cost Estimating and Assessment Guide, Department of the Navy Cost Estimating Guide and Department of the Navy Economic Analysis Guide. Figure 4 illustrates the Galorath Incorporated process for developing, maintaining, and updating cost estimates for program managers in support of Milestone Decisions and Navy costing efforts. Our general approach to program management and cost estimating is tailored to meet the needs of varying customers along the life cycle spectrum.

Figure 4. A Proven, Comprehensive Program Management Cost Estimating Process



Galorath understands that the final approval and disposition of our estimates rests with the appropriate Government leadership. Our analysts always ensure that the customer is fully aware of and understands any limitations, caveats, and implications of the analysis.

Galorath will provide credible technical and consulting support related to Navy and Marine Corps systems. We understand that such technical and consulting support may address a wide range of topics, and we are prepared to respond to any Navy requirement. Our Team has the cost analysis, systems engineering, schedule development, hardware/software development and program management skills to efficiently respond in this ambiguous, rapidly-moving environment. We have been successfully integrating engineering, economics, planning, and monitoring for over 25 years.

Solving unique problems associated with cost/technical/schedule research studies requires a mixture of cost analysis skills and systems engineering talent, a blend that Galorath Incorporated was specifically formed to achieve. Our multi-disciplined company provides the Navy with outstanding consulting support to perform studies and analyses when directed by task assignment. Our consultants have accrued a vast heritage of Navy, Marine Corps, Army, and Air Force related cost expertise and are presently engaged in activities at the system and component level in many areas of interest to the Navy.

Our cost estimate development approach supports all the requirements for program management milestone decisions and other Navy cost analyses. Our skilled analysts follow this systematic process to ensure a comprehensive and complete estimate.

Our approach to developing estimates is initiated with a full understanding of the ultimate use of the estimate, what organizations will be using the estimate, the organization's priorities, and the impacts of trade-offs between requirements. This part of the process helps to assure properly focused analyses with credible backup information. As part of developing the Technical

Baseline, Galorath will assess and select appropriate estimating methodologies. The choice of estimating methods and tools depends upon the maturity of the program, the data available, and timeline for estimate delivery. Our cost models are built using the best tools suited to the needs of the Navy program. We will work closely with the Navy and Marine Corps to build dynamic and flexible program management and decision analysis products. Estimates will be routinely updated to keep financial resources in balance with the true program requirements and ensure that program costs are an integral part of the development and execution of the program review, approval, and budget process.

As necessary, we will work with program management to expand the Work Breakdown Structure and develop new and updated Cost Estimating Relationships (CERs) and Cost Performance Estimating Relationships (CPERs) for new technologies and related program lifecycle activities, encompassing all work to be performed during development, production, deployment, operations, support, and disposal. Our flexible process also supports updates to production Nonrecurring Engineering (NRE)/Engineering Change Proposal (ECP) production support, and cost improvement curve analyses. This process is directly designed to develop cost factors, CERs, CPERs, schedule estimating relationships, and cost improvement curves. The details of our analysis supports Development and Production Phase cost methodologies and Independent Cost Estimates (ICE), Component Cost Estimates (CCE) for new and/or existing Navy systems to be used for Milestone Decisions Reviews and other cost efforts as needed.

Galorath has extensive experience in researching, analyzing, developing, updating and maintaining relevant automated estimating tools as evidenced by the SEER family of models. These tools are commercially available and as such, have successfully endured significant scrutiny and review by the Government and industry. Through long lasting technical excellence and continuous corporate commitments, these tools are also still widely accepted and employed throughout the Navy and DoD today. These tools also demonstrate the successful identification and separation of nonrecurring and recurring costs as well as the full lifecycle of costs.

Galorath Incorporated is the developer and maintainer of SEER for Hardware, SEER for Software, and SEER for Information Technology. These products have a demonstrated track record of successfully conducting component and assembly level cost research and building, updating and maintaining bottom up parametric cost models that estimate at the component level. For example, another product that Galorath developed and maintains, Cost IQ, is an example of cost research and model development, while examples of relevant component and assembly level research includes the electro-optical systems and integrated circuits modules associated with SEER for Hardware.

For each study, we begin with a thorough understanding of the customer requirements. We spell these out early in the task in the Task Assignment Plan's ground rules and assumptions. At task completion, the results are fully documented so that other researchers can continue to update and refine the conclusions to reflect the subsequent availability of additional data. The final report will contain the source data, normalized data, and all analysis associated with the data. We have the statistical analysis tools and expertise to professionally and efficiently analyze normalized or raw data.

Galorath is ready to pursue any analytical tasking that the Navy may wish to pursue. We understand the current challenges facing the Navy in maintaining current systems and projecting requirements for recapitalizing, upgrading and building new systems. We have a long history of producing solid analytical studies and new applications.

Historical financial, schedule and cost research and analysis is vital to assisting Navy and Marine Corps leadership to forecast, plan and ultimately control the Services' acquisition program finances and funding. Affordability will continue to drive decisions in this constrained

budget environment, making the ability to justify and defend required funding and financial performance at all levels of the Navy and USMC critical to successfully supporting the warfighter. Galorath has been performing technical and cost research, and utilizing this research to develop cost estimating models for more than 25 years. Some of the commodity areas where Galorath has performed technical/ performance and cost research are detailed in Table 1.

Table 1 – Galorath has a Depth and Breadth of Cost Research and Database Experience in Relevant Commodities

Commodity	Service/Agency
Software	Navy/USMC/USAF/Army/National Security
Surface Vehicles	USMC/Army
C4ISR	Army/USAF/NASA
AIS	Army/USAF/National Security
Electronics	Army/USAF/NASA
Missiles	Army/USAF
Aviation	Army/USAF

Although the research that Galorath provides includes robust and accurate data normalization, it is important to also enable traceability to raw data so that the analyst can perform normalization as he/she sees fit. Our proven method to build and update cost/technical databases has been demonstrated for the Navy, other DoD, and NASA clients.

Galorath also performs schedule development and analysis. Detailed scheduling knits together the numerous tasks performed by different individuals with different areas of expertise to produce the end product of the program. Furthermore the schedule allows for continuous monitoring of tasks to ensure that the program will be completed on time.

Other enabling functions like contracting and financial management support critical program needs by applying the rules, regulations, and best practices of each discipline. Each professional practitioner and the expertise that they bring to the table is critical to the success of the overall program and program manager.