Corporate Capabilities

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Innovative Decisions, Inc.
1945 Old Gallows Road, Suite 207
Vienna, Virginia 22182
Phone: (703) 854-1130
Fax: (703) 854-1132
E-mail: info@innovativedecisions.com
Website: www.innovativedecisions.com

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Overview

Innovative Decisions, Inc., (IDI) is a management consulting firm serving business and government clients and specializing in the disciplines of decision and risk analysis, operations research, and systems engineering. IDI supports the needs of analysts, managers and senior decision-makers through its decision conferencing, consulting, research, and training services. IDI offers the following management solutions:

- Strategic Planning: Generation of strategic goals and design of robust courses of action for shaping, hedging, and succeeding in an organization's environment.
- Risk Assessment: Analysis and models that solve a specific problem or help make the best decision under uncertain conditions.
- Source Selection: Selection of the best choice among a set of alternatives with multiple, conflicting features or criteria.
- Resource Allocation: Allocation of limited resources among a portfolio of programs or investments to achieve the best overall value.
- Situation Assessment: Drawing sound conclusions from a large amount and variety of ambiguous or incomplete information.
- Process Improvement: Design and simulation of complex processes or systems-of-systems that meet overall user requirements and are affordable and sustainable.
- Operations Planning: Analysis and optimization of order quantities, schedules, or routes to attain the most efficient operations.
- Performance Metrics: Development of quantitative measures of performance, effectiveness, and merit that allow an organization to benchmark performance and track improvements.
- Organizational Assessment: Survey design and assessment of empirical data in order to develop usable information for decision making.
- Decision Conferencing: Facilitating project teams and groups of decision makers and subject matter experts where solutions are based on group consensus.
- Research in Decision-Making: Research on individual and group decision-making processes, decision-oriented methodologies, human factors, and cognitive biases.
- Decision Analysis Training and Coaching: Tailored instruction and mentoring on decision analysis topics pertinent to specific clients.

MOBIS Contract No. GS-10F-0303M

IDI has a current MOBIS contract with GSA. Management, Organizational, and Business Improvement Services (MOBIS) is a Multiple Award Schedule, also known as a Federal Supply Schedule, listing responsible companies that have been awarded a contract by GSA, Federal Supply Service, for certain commercial management consulting services. The MOBIS Schedule offers management services and supporting products in consulting, group facilitation, surveys, and training.

The purpose of MOBIS is to help Federal agencies respond quickly and efficiently to their management services requirements. Since a contract has already been awarded to each company on the Schedule, the agency in need of services simply places an order directly from the MOBIS contractor offering the best value.

Assistance from GSA can be found online at www.gsaAdvantage.gov.

Services Offered

IDI offers a range of decision analysis, group facilitation, research, and training services.

Strategic Planning

Many organizations face more technological uncertainty, greater competition, and more customer segmentation than ever before. Planning in this environment can be challenging. IDI decision analysts help clients conduct stakeholder analyses, generate strategic goals, and design robust courses of action for shaping, hedging, and succeeding in the organization's environment.

IDI specializes in strategic planning models using software such as DPL from Syncopation, Inc. and Analytica from Lumina, Inc.

Risk Assessment

Influence diagrams and decision trees are good ways to structure and analyze many decision problems. IDI decision analysts help clients clarify options, assess impacts of uncertain events and conditions, calculate expected costs and benefits, and set priorities. Fault trees are used to understand the risk of a strategy or system failing, and to find the best way to reduce the risk.

IDI specializes in building decision and risk analysis models using software such as DPL from Syncopation, Inc. and Crystal Ball from Decisioneering.

Source Selection

Many decision problems have more than one objective that must be considered. In source selections and analysis of alternatives, clients must balance objectives that may be in conflict, such as low cost vs. high performance or near term fixes vs. long term efficiency. IDI decision analysts help clients build and use multiple objective choice models.

IDI specializes in building multiple criteria decision analysis models using software such as Logical Decisions for Windows from Logical Decisions and Hiview from LSE Enterprise.

Resource Allocation

Resource allocation decisions usually do not involve an either/or choice among different functions or programs. IDI decision analysts help clients decide how much of their limited resources to devote to each program or area in order to get the most "bang for the buck" out of a limited budget.

IDI specializes in building resource allocation models using software such as Equity from Catalyze, Ltd.

Situation Assessment

Trying to draw conclusions from a large amount and variety of information can be a difficult task. IDI decision analysts help clients build models that use Bayesian Nets, empirical data, and subject matter expertise about the likelihood of evidence occurring under different situations, and then show the probability of each situation given the information.

IDI specializes in building probabilistic inference models using software such as Netica from Norsys, Inc.

Process Improvement

Most company and government agency processes are systems that define the amount and quality of the organization's work outputs. Using continuous or discrete event simulation models, IDI decision analysts help clients visualize and understand exactly how their processes or systems work today, and how to design better ones.

IDI specializes in building simulation models using software such as Extend from Imagine That, Inc.

Operations Planning

Government, industrial and commercial operations are a constant balance between keeping costs down and meeting mission needs or customer requirements. IDI decision analysts help clients optimize their production operations using linear programming, scheduling and network analysis models.

IDI specializes in building optimization models using software such as Risk Optimizer from Palisades, Inc.

Performance Metrics

IDI decision analysts are experts at the development of quantitative measures of performance, effectiveness, and merit that allow an organization to benchmark performance and track improvements.

IDI specializes in building performance metrics that focus on results using methodologies such as the Balanced Scorecard (BSC).

Organizational Assessment

The growing volume of data, rapid pace of change, and uneven quality of information available today can quickly overwhelm the ability of an organization to make use of it. IDI decision analysis help clients collect, assess, and understand their empirical data in order to develop usable information for decision making.

IDI specializes in building surveys and analyzing results using software such as SYSTAT from Systat Software, Inc. and JMP from SAS, Inc.

Decision Conferencing

IDI uses a facilitated approach to analysis of many problems using extensive subjective judgment and subject matter expertise. This approach, known as decision conferencing, attempts to combine the best of both internal and external analytical approaches by bringing together a small group of subject matter experts and key stakeholders who provide substantive expertise, with external facilitators who provide process expertise. The result is a series of intensive meetings that seek to identify key issues, evaluate alternatives, and introduce an implementation mechanism.

Decision Conferences can be viewed as decision facilitation with the major effort being accomplished in several days through a series of very intense group meetings in which key players interact to explore the decision process as well as the decision itself. The expertise of the organization is absolutely essential for success, and the level of expertise needed is typically that which resides in the heads of staff and key experts. While supporting information is important, it is supplemental to the process rather than being its focus. During the decision conference, computer-based models often are used as a focus for group discussion and the structured conference process allows participants to debate issues constructively while forcing the group to represent its collective judgments in a logically consistent and easily communicated fashion.

A typical decision conference consists of a 2- to 3-day session, followed by further analysis and reporting. The overall goal of the conference is to develop informed consensus among key players. The decision conference involves the organization's planners and implementers, as well as a team of three facilitators. Normally, each facilitator plays a distinct role in the conference. The lead facilitator moderates and controls the sessions, elicits information, asks questions, channels responses, and builds analytical models in response to group input. A second team member interacts with a computer to implement in real time the models developed by the group leader. The third team member acts as a conference recorder, documenting all major decisions and providing an audit trail of rationale for the session.

Research in Decision-Making

IDI conducts research on individual and group decision-making processes, decision-oriented methodologies, decision aids, human factors, and cognitive biases.

IDI leads and supports a variety of research studies aimed at understanding how decision-makers think and decide—in groups or as individuals. For example, IDI has assisted research efforts in the field of critical thinking—a new approach to training decision-makers based on dialogue theory. The research focused on how dialogue and critical thinking might be related -- people first learn to think critically by stating views to others, getting response, defending or rethinking. This is internalized as an inner dialogue. Group decision making makes the process external again. So, training in critical thinking dialogue procedures might improve both individual and collaborative process.

IDI also researches and builds prototype decision aids and models. As an example, IDI staff researched requirements for, and the feasibility of, developing a simulation tool that can be used to improve strategic decision analysis. The result of the project was a concept definition of an improved simulation tool for use by strategic decision-makers that included the use of a multi-criteria decision aid (MCDA), decision trees, and dynamic Bayesian probability updating. IDI staff also investigated a means to specify sets of inter-related, cross-functional information needs and their satisfaction criteria, and to automatically task and schedule cross-functional operations to best satisfy a specified set of user information needs using Bayesian inferential algorithms.

Decision Analysis Training and Coaching

IDI provides off-the-shelf or customized training packages to meet specific client needs related to decision and risk analysis, operations research, and systems engineering.

Examples of training packages include but are not limited to:

Decision and Risk Analysis

IDI offers a one, two or three-day course in decision analysis, entitled Innovative Decision and Risk Analysis. The course provides a practical overview and introduction to the discipline of decision and risk analysis. The practical, hands-on format introduces students to decision analysis using the software package DPL. The one-day course provides an introduction to the basic concepts and techniques of decision and risk analysis. The two-day course allows the students to examine a wider variety of decision analysis applications. The three-day course builds on the theories and illustrations provided in the shorter courses and allows each student to practice building models using DPL.

Systems Engineering

IDI offers five courses in systems engineering: Foundations in Systems Engineering, Case Studies in Systems Engineering, Fundamentals in Requirements and Functional Analysis, Fundamentals in Architectures for Systems, Basics of Trade Studies in Systems Engineering.

The Foundations of Systems Engineering course is a 2-day program that emphasizes the importance of systems thinking in the execution of one's job, and encourages and informs those desiring to further their development in the discipline of systems engineering. This course includes lecture, in-class breakout sessions and exercises, and case studies.

The Case Studies in Systems Engineering course is ideal for illustrating the value of systems engineering to top management and other key decision makers. The course covers successes (Black and Decker product line, Boeing 777, Central America gold recovery, Pioneer 10, Wright brothers first flight,) and failures (Air Bag Safety Restraints, Apollo 13, Arianne 5, buffer overflow attacks, Hubble telescope, and Therac 25) traces these back to good and bad practices of systems engineering. This course can be tailored substantially to meet the needs of the organization requesting it.

The Fundamentals in Requirements and Functional Analysis course can be delivered over 1 or 2 days. The course describes the role and importance of requirements, demonstrates the value of starting the definition of requirements outside the system at the mission level and then deriving system-level requirements based upon a functional analysis of the system's interaction with peer (or external) systems. The basics of functional analysis are described and writing of good vs. bad requirements is illustrated via examples. Both the 1 and 2-day courses have student exercises; the 2-day course has more depth and student exercises.

The Fundamentals in Architectures for Systems course describes the role of architectures for defining alternatives that can be used in trade studies as well as providing the foundation for deriving subsystem through configuration item requirements based upon the system-level requirements. Architectural views that represent the functional, physical and interface perspectives of the system's operational capability are described. Techniques for creating these views and enabling consistency among the views are also described. Student exercises complete the 2 days needed to cover this material.

The Basics of Trade Studies in Systems Engineering course is a 2-day course identifies the many and varied types of trade studies conducted during systems engineering, ranging from concept studies through subsystem trades. The course covers brainstorming activities that are key to enumerating the range of alternatives that should be considered, multi-attribute value analysis for defining the value structure of the stakeholders so that consistent and coherent trades can be made throughout the design process. Exercises in these topics and case studies round out the 2 days needed for this course.

Group Facilitation

IDI offers a one, two, or three-day course in group facilitation entitled The Four Faces of Facilitation. The course examines the four stages of group development and provides the student with a framework for guiding a group facilitator's perspective and behavior at each stage. The one-day course provides an introduction to the basic concepts of facilitation, including Tuckman's Stages of Group Development, the Myers-Briggs Personality Type Indicator, and the dynamics of group decision-making. The two-day course allows the students to examine a wider variety of intervention techniques at each stage of group development. These include the use of the icebreakers, the Thomas-Kilmann Conflict Mode instrument, ground rules, conflict management techniques, the norming Pulse Model, deBono's Six Hats, Barker's Paradigm Shifts, Janis's groupthink, and Harvey's Abilene Paradox. The three-day course builds on the theories and illustrations provided in the shorter courses and allows each student to practice facilitating a session of his or her peers. Each facilitation exercise is critiqued by the instructor and the other students and is video-taped for later review and self-critique by the student.

Bayesian Networks

IDI offers a one, two, or three-day course in probabilistic inference and Bayesian Nets entitled Bayesian Network Analysis. The course provides a practical overview and introduction to the discipline of probabilistic inference. The practical, hands-on format introduces students to Bayesian Nets using the software package Netica. At the end of the three day Bayesian net course the student should: be aware of a spectrum of applications of Bayesian networks, be able to structure the nodes and arcs in a Bayesian network while working with experts, be familiar with Netica (a commercial software tool for Bayesian networks), and understand how to build Bayesian networks from data. The first day of the course begins with a demonstration of the key features of Bayesian nets and a discussion of some of the diverse applications. The basis of Bayesian nets in probability theory is then presented along with the algorithms used in Bayesian nets to perform probabilistic analysis. The first day closes with a demonstration of the Netica software package. The second day of the course focuses on the formulation of real world problems as well as the "learning" feature of Bayesian networks. The day opens with a discussion of the standard model structures used in building Bayesian nets. Next, formulation of the nets is demonstrated using problems suggested by students. The resulting models are implemented and analyzed in Netica real time during the class. The third day of the course focuses on the "learning" feature of Bayesian nets.

Multiple Objective Decision Analysis

IDI offers a one, two or three-day course in multiple objective decision analysis (MODA) entitled Making Logical Decisions. The course provides an introduction to Multi-Attribute Utility (MAU) analysis for problems of choice among alternatives. The practical, hands-on format introduces students to MODA using the software package Logical Decisions for Windows. The one-day course provides an introduction to the basic concepts and techniques of MODA. MAU theory is explained, including the use of criteria evaluation hierarchies, developing alternatives, developing performance scales, and assessing utility functions and swing weights. The two-day course allows the students to examine a wider variety of MODA approaches and assessment techniques. The students are introduced to the Analytic Hierarchy Process (AHP) and its controversial axioms. Students are shown techniques for assessing utility functions, including the lottery method and the split-range method. Various techniques for assessing criteria weights are demonstrated, including SMART, SMARTER, pairwise comparisons, and balance beam. The three-day course builds on the theories and demonstrations provided in the shorter courses and allows each student to practice building an MODA model using Logical Decisions for Windows software.

Multiple Objective Decision Analysis using Spreadsheets

This course presents the methodology, practice, and art of multi-objective decision analysis. Decision analysis is the appropriate decision support technique for hard problems involving multiple stakeholders, complex value tradeoffs, significant outcomes, and major uncertainties. The course topics include an introduction to decision analysis; the value proposition for a decision analysis study; Value-Focused Thinking principles; alternative generation techniques (including strategy generation tables and scenario planning); qualitative processes (including Gold, Platinum, and Silver Standard methods for value model development and affinity diagrams) and quantitative techniques for multi-objective decision analysis; underlying mathematical assumptions of multi-objective value and utility models; using spreadsheets to evaluate multi-objective value and utility models; quantifying uncertainty in decision analysis using probability and Monte Carlo simulation; use of multi-objective value analysis for resource allocation and portfolio analysis (combining multiple objective decision analysis, optimization, and Monte Carlo simulation); use of spreadsheet models to perform sensitivity analyses to critical parameters; understanding senior decision makers; and clearly and concisely presenting decision analysis results to senior DoD decision-makers. Students work in teams to apply the course techniques to a current analysis problem they are working. Spreadsheet modeling is used extensively and military decision analysis applications are emphasized throughout the course. Course materials include text, bound copy of the course note, spreadsheet macros, and sample spreadsheet files.

Resource Allocation

IDI offers a one, two or three-day course in resource allocation for budgeting and programming entitled Resource Allocation Using Equity. The course provides an introduction to marginal cost benefit analysis and the Equity software. The one day course introduces the students to the various methodologies for allocating resources among a portfolio of potential projects and demonstrates the use of Equity. The two-day course allows students to practice using Equity on a variety of resource allocation problems. The three-day course builds on the student knowledge gained during the first two-days and emphasizes techniques to elicit expert judgments and conduct sensitivity analysis.

Support Products

IDI provides products used in support of our consulting, facilitation, and training. In addition to studies, analyses, and reports, these include additional copies of workbooks, training manuals, slides, overhead transparencies, advanced presentation media, and runtime versions of decision models and simulations. Our support products include both off-the-shelf and custom-designed products. IDI believes these support products and tools play a key role in helping agencies make better decisions and implement problem

solutions. The right tools or products combined with expert consulting, facilitating, or training services provide lasting value to the organization.

Examples of support products include but are not limited to:

Workbooks and Training Manuals

IDI includes course workbooks and other training materials for each participant as part of its training workshops and classes. However, sometimes agencies like to have extra copies of materials, or may have a need for customized versions.

Presentation Media

IDI staff members often use computer-based presentation media as part of a strategic planning off-site or decision conference. These media include Microsoft PowerPoint, Word, and Excel files, as well as graphical and tabular output from other decision analysis tools.

Runtime Models and Simulations

IDI makes use of a wide variety of decision support computer tools in providing consulting, facilitation, and training services to agencies. IDI and its clients use the resulting models and simulations to frame problems, analyze solutions and present results. Normally, if the client needs to run the model or simulation after the project, conference or workshop is ended the company or agency must buy a copy of the original software from the vendor, sometimes at a cost of thousands of dollars. Using runtime versions offered by most decision support software vendors, IDI creates a copy of the model or simulation that the client can keep and use as needed, without the expense of buying and learning to use complex decision support computer tools.

Representative Projects

Decision and Risk Modeling and Analysis

- Financial planning decision aids for QUICKEN's web site
- Risk assessment for R&D projects
- Probabilistic modeling of indicators and warnings for intelligence applications
- Risk analysis of transfer of critical technologies
- Requirements analysis for Marine Corps infantry small arms
- Weapons mix analysis for Army air defense
- Prioritization of R&D needs for municipal solid waste
- Source selection and evaluation for military systems
- Policy analysis for EPA laboratory control measures
- Cost/Benefit Analysis System for tracking upgrades to the air traffic control system
- Facilities evaluation and prioritization for Northrop Aircraft

Decision Conferencing

- Cost/Benefit Analysis for USMC Program Objectives Memorandum (POM)
- Prioritizing R&D expenditures for numerous organizations
- Corporate strategic planning
- Concept definition for light armored vehicles (LAV)
- Evaluation of C^3I lessons learned from Operation Desert Storm
- Definition of the battlefield for Army Infantry Small Arms
- Architecture cost-benefit evaluation for reconnaissance systems
- Prioritization of software conversions for the Public Building Information System
- Requirements analysis for software development for a documents management system
- Organizational downsizing and redesign
- Prioritization of national security issues surrounding reunification of Korea
- Planning for the Defense & Environment Initiative

Research in Decision-Making

- Critical thinking skills for military decision makers
- Applications of Bayesian networks to intelligence problems
- Developing trust in automated decision aiding systems
- Lessons learned for military system acquisition Program Managers
- Decision making under time stress
- Man-machine interface in Army Air Defense Systems
- Evaluating executive vs. novice decision making at the National Defense University

- Uses of artificial intelligence in command, control, and communications systems
- Developing "friendly" decision-aiding systems
- Cognitive skills analysis in situation assessment

Decision Analysis Training and Seminars

- Problem solving and decision making workshop for the Defense Systems Management College
- Value-Focused Thinking for Capability-Based Planning, Joint Staff, The Pentagon, Washington, DC
- Decision analysis and Bayesian Network courses for Army Logistics Management Center, the Environmental Protection Agency, various intelligence agencies
- Multiple Objective Decision Analysis with Spreadsheets" Office of Aerospace Studies, Kirtland AFB, NM, Marine Corps Systems Command, United States Marine Corps, Quantico, VA, Center for Army Analyses, Ft Belvior, VA, Mitre Corporation, Colorado Springs, CO, Warrior Preparation Center, Sembach, Germany, U.S. Army Recruiting Command, Ft Knox, KY
- Introduction to Operations Research with Spreadsheet Modeling, Five Modules (Introduction to OR for Senior Leaders, Single Objective Decision Analysis, Optimization, OR Project Planning, and Monte Carlo Simulation), National Security Agency, Fort Meade, MD
- Fundamental of Systems Engineering for Naval Surface Warfare Center
- Facilitation training for staff and analysts for the U.S. Air Force Air Staff
- Facilitation training for the U.S. Army Edgewood Chemical Biological Center

Professional Staff

L. ANNELYSE AMEY, Senior Analyst

Ms. Amey is a database and software application developer with 11 years of experience in program planning, database design, and programming. She has provided business development, scheduling, and reporting applications to acquisition and system integration programs. She has 4 years experience (1996 – 2000) in the area of Program Planning. She was responsible for the build, maintenance, and status of critical path management networks for major acquisition programs. During that period she also supported the implementation of hardware and software configurations and applications that improved the daily operations of the planning team. She has 7 years (2000 – 2007) experience in database and software development. She has been responsible for the design, development and administration of Oracle and Access databases, Visual Basic, C++, and Java application code for development in support of proposal preparation, task scheduling, simulation support, and data analysis. She has supported two large-scale simulation development projects as a senior software engineer as well as performing operational performance analysis. She also customized COTS products and designed database and spreadsheet solutions. Her database tools have been used for scheduling, Day In the Life exercises, Basis of Estimate proposal preparation, data dissemination and archiving. She has been individually cited in award fee presentations by the customer for her contributions and has received numerous awards from program management for her development efforts. Ms. Amey is currently in the dissertation phase of her Information Systems doctoral program.

EXPERIENCE

2007 – Present Innovative Decisions, Inc., Senior Analyst
1998 – 2007 Lockheed Martin Information Systems and Global Services, Senior Systems Engineer
1996 – 1998 Lockheed Martin Astronautics, Program Planning Specialist

EDUCATION

Ph.D. Information Systems, George Washington University, 2009
M.S. Information Systems Technology, George Washington University, 2000
B.S. Industrial Engineering, Morgan State University, 1996

H. RIC BLACKSTEN, Principal Analyst

Mr. Blacksten provides expertise in operations research, decision sciences, mathematical modeling, system simulation and physics. Over a forty five year career he has performed operations research analyses and developed models and simulations across much of the spectrum of national defense and homeland security, including border security, cargo security, commercial aviation security, IED terrorism, anti-terrorist force protection, urban combat, chemical warfare defense, network interdiction and disruption, joint campaign warfare, C4ISR, conventional weapons effects, manpower and human factors, and physical security systems.

EXPERIENCE

2009-Present	Innovative Decisions, Inc.; Principal Analyst
2005-2009	Analytic Services, Inc., Homeland Security Institute; Senior Analyst
1995-2005	CACI International; Senior Functional Analyst
1988-1995	Human Resources Research Organization (HumRRO); Operations Research Analyst
1981-1985	McLean Research Center, Inc.; Senior Analyst
1972-1981	Ketron, Inc.; Operations Research Analyst
1971-1972	Mt. St. Joseph High School, Baltimore; Mathematics Teacher
1970-1971	Gap year, traveling around USA
1969-1970	Mathematica, Inc.; Mathematician
1967-1969	Tech/Ops -CORG (Combat Operations Research Group); Operations Analyst

EDUCATION

App.Sc.	(Applied Scientist), Operations Research, George Washington University, 1984
M.S.	Operations Research, George Washington University, 1974
Masters studies	Mathematics, University of Maryland, 1967-1971 (a.b.d.)
B.S.	Physics, University of Maryland, 1964

SELECTED PUBLICATIONS AND PRESENTATIONS

Blacksten, H. R. (2009). *Simply scoring and visualizing portfolio heterogeneity*. Proceedings: 42nd Hawaiian Conference on Systems Sciences.

Blacksten, H. R. (2008). *Intelligently allocating resources to interdict a planar supply network*. Annual Meeting of the Institute for Operations Research and Management Science (INFORMS).

Blacksten, H. R., Steele, B., Zimmerman, A., Samuelson, D. (2008). *Agent-based approach to modeling IED blast and shrapnel casualty effects.* 76th Military Operations Research Society Symposium (MORSS).

Blacksten, H. R., Chang, J. (2008). *Fermi estimation of illegal migration deterrence vs. apprehension probability*. Washington Academy of Sciences, Capital Sciences 2008.

Blacksten, H. R. (2007*). Generalized least risk routing (GLRR) with applications to counterterrorism*. Los Alamos National Laboratory, Risk Symposium 2007

Blacksten, H. R., Prince, J. (May, 2003). *A hedge-based approach to fuzzy system learning*. Proceedings, 12th Conference on Behavior Representation in Modeling and Simulation.

Sticha, P.J., Blacksten, H.R., & Buede, D.M. (1986). *Optimization of simulation-based training systems.* Proceedings of the 1986 IEEE International Conference on Systems, Man, and Cybernetics (pp. 1373-1377).

Blacksten, H. R. (1985). *An interactive branch-and bound methodology for multiple-attribute decision-making.* Applied Scientist Degree Project, published by The George Washington University.

TERRY A. BRESNICK, Executive Principal Analyst & CEO

Mr. Bresnick has more than twenty-five years of experience in applying the techniques of decision analysis, operations research, and systems engineering to complex problems of industry and government. Mr. Bresnick has demonstrated his expertise in the areas of resource allocation and budgetary analysis, managerial decision making, evaluation of competing alternatives, cost-benefit analysis, business area analysis, and strategic planning. He has been an Assistant Professor of Systems and Decision Analysis and is a registered Professional Engineer in the State of Virginia. Mr. Bresnick won the David Rist Prize, Military Operations Research Society, for outstanding achievement in 1981.

EXPERIENCE

2001 – Present	Innovative Decisions, Inc., Executive Principal Analyst and CEO
1991-2001	Innovative Decision Analysis, President
1983-1991	Decision Science Consortium, Inc., Vice President
1979-1983	Decisions and Designs, Inc., Decision Analyst
1975-1978	U.S. Military Academy, Assistant Professor of Systems and Decision Analysis

EDUCATION

Degree of Engineer, Engineering-Economic Systems, Stanford University, 1979
M.S. Statistics, Stanford University, 1975
M.B.A. Management Science, George Mason University, l985
B.S. Engineering, U.S. Military Academy, 1969

SELECTED PUBLICATIONS AND PRESENTATIONS

Adelman, L., Bresnick, T., Christian, M., Gualtieri, J., and Minionis, D. Demonstrating the effect of context on order effects for an army air defense task using the Patriot simulator. *Journal of Behavioral Decision Making, 10,* 1997.

Bresnick, T., Buede, D., Pisani, A., Smith, L., and Wood, B. *Airborne and space-borne reconnaissance force mixes: A decision analytic approach.* Oakton, VA. Presented at 65th Military Operations Research Symposium (MORS), June 1997.

Adelman, L., Cohen, M., Bresnick, T., Chinnis, J., and Laskey, K. Real-time expert system interfaces, cognitive processes, and task performance: An empirical assessment. *Human Factors, 35*(2), 1993.
Buede, D., and Bresnick, T.A. Applications of decision analysis to the military systems acquisition process. *Interfaces, 22*(6), November-December 1992.

Carper, W.B., and Bresnick, T.A. Strategic planning conferences. Indiana University Graduate School of Business. *Business Horizons, 32*(5), pp. 34-40, September-October 1989.

ALICIA BRIDGES, Principal Analyst

Ms. Bridges has over nine years of experience as an instructor, cost analyst and operations research analyst. Her expertise is in developing mathematical models to support strategic planning and Milestone decisions for several DoD stakeholders/customers. Ms. Bridges has demonstrated expertise in the design and development of user-friendly cost and decision models. Her focus is on building spreadsheet models with the use of specialized modeling techniques, including Monte Carlo simulations to support risk analysis, as well as traditional ranking methods to support design trade analyses. Ms. Bridges takes special interest in using decision analysis and optimization techniques to provide resource allocation solutions for customers, relying on her experience in cost estimating, risk analysis, cost/benefit analysis and schedule analysis. She has led teams of analysts in providing decision support on competing alternatives for the development of an automated reporting tool for the intelligence community. Ms. Bridges has also presented the results of her analyses to several members of Senior Leadership across the DoD and Intelligence communities. Some of her past work includes supporting trade studies for the Mission-Oriented Risk & Design Analysis (MORDA) of mission assurance activities and supporting modeling efforts to assess adversary behavior.

EXPERIENCE

2008-Present	Innovative Decisions, Inc., Principal Analyst
2002-2008	Northrop Grumman Information Technology – TASC, Operations Researcher
2001-2002	Naval Air Systems Command, Operational Research Analyst
1999-2001	Clemson University, Statistical and Mathematical Instructor

EDUCATION

M.S. Mathematical Sciences (Operations Research), Clemson University
B.S. Mathematics (Actuarial Science), Howard University

SELECTED PUBLICATIONS AND PRESENTATIONS

Bridges, Alicia L., "The Effects of Shift Scheduling on the Sleep-Wake Cycle: Analysis of a Two-Week Shift Schedule," Clemson University, presentation, Clemson, SC, April, 2001.

DAVID P. BROWN, Senior Principal Analyst

Dr. Brown served for over 22 years in the U.S. Navy and has more than 15 years experience as systems engineer, educator and technical manager. A graduate of the U.S. Navy Test Pilot School and the Naval War College, he also holds DAWIA certifications in Program Management, Systems Engineering, and Test and Evaluation. He also has experience in model building for Bayesian and neural networks, developing computer models generated from data sets, and programming. An experienced consultant, he has successfully completed projects for ONR, the U.S. Navy, Marine Corps and Air Force, and NASA. He recently helped facilitate and write a Systems Engineering Policy Instruction for NASA and has also been a consultant in formulation of the acquisition plans for the Constellation Program. Selected to an elite group, Scientists Helping America, to assist with bringing technology to bear in the new war on terrorism after the 9/11 attacks, he received an ONR grant to demonstrate a shared control concept for unmanned vehicles. He has received recognition for contributions to the field of systems engineering with an individual award from the Under Secretary of Defense for Acquisition, Technology and Logistics and a Team Award from the Chief Engineer of NASA.

EXPERIENCE

2006- Present	Innovative Decisions, Inc., Senior Principal Analyst
1997-2006	Professor of Systems Engineering Defense Acquisition University, Community Leader of the Department of Defense Systems Engineering Community of Practice, Curriculum Developer, Researcher, Course Manager, Consultant.
1995-1997	Strike Operations Officer, USS Dwight D. Eisenhower CVN-69.
1994-1995	Propulsion and Lift Systems Integrated Product Team Leader, Joint Strike Fighter Program Office.

EDUCATION

Ph.D.	Information Technology, George Mason University, 2004
M.S.	Aeronautical Engineering, U.S. Naval Postgraduate School, 1985
B.S.	Systems Engineering, U.S. Naval Academy, 1978

SELECTED PUBLICATIONS AND PRESENTATIONS

Brown, D and Mohler, R, "*Artificial Intelligence for Constructing Accurate, Low-Cost Models and Simulation*" presented and published in the proceedings of the 2005 I/ITSEC Conference. Winner of the 2006 Northrop Grumman Best Technical Paper in the Military category.

Brown, David and McVay, Tammi, "*Weblog Technology for Program Management*" Defense AT&L Magazine, Mar-Apr 2005.

Brown, D., "*Building Communities of Practice*", Program Manager Magazine, Nov-Dec 2002.

Brown, Cmdr David P., "*Enterprise Architecture for DoD Acquisition*", Acquisition Quarterly Review, Spring 2000.

Brown, Cmdr Dave, "*Building a Better Mousetrap*", Program Manager, Mar-Apr, 2000.

Brown, Cmdr David P., "*Simulation Based Acquisition-Can It Live Up to Its Promises?*" Program Manager, Jan-Feb 1999

DONALD L. BUCKSHAW, Senior Principal Analyst

Mr. Buckshaw has over twenty years of experience as an intelligence analyst and operations research analyst. His expertise is the invention and formulation of new methods for modeling of complex national defense and intelligence community problems that are both ill-defined and data deficient. Mr. Buckshaw's approach to analysis uses a mixture of small teams of experts and commercial decision analysis tools or customized spreadsheet models. His specialty areas include decision and risk analysis for information technology, counter terrorism models, and strategic planning decision modeling. His insight into the Army intelligence and counterintelligence communities has spawned several adversary behavioral and predictive modeling efforts. Mr. Buckshaw has also pioneered the use of multiple objective decision analysis for mission-oriented information system risk posture modeling. Mr. Buckshaw is also experienced with applying simulation to resolve decisions under uncertainty. His simulations have been used to analyze a semi-conductor manufacturing facility and to determine the intelligence value of alternative telecommunications designs.

EXPERIENCE

2002 – Present Innovative Decisions, Inc., Senior PrincipalAnalyst
2001-2002 EG&G Technical Services, Inc., Senior Operations Research Analyst
1997-2001 National Security Agency, Military Operations Research Analyst
1984-1997 U.S. Army, Intelligence/Counterintelligence/Operations Analyst

EDUCATION

M.S. Systems Management/Operations Research, Florida Institute of Technology, 1999.
B.S. Aerospace Engineering specializing in Astrodynamics, Pennsylvania State Univ., 1988.

SELECTED PUBLICATIONS AND PRESENTATIONS

Buckshaw, D., Buede, D., Parnell, G., Maxwell, D., *Selecting the Best Decision Method*, presentation, Military Operations Research Society Symposium, June 2008.

Parnell, G., Buckshaw, D., Liebe, R., Mosier, R., *Using the Swing Weight Matrix to Improve Decision Analysis Studies*, presentation, Military Operations Research Society Symposium, June 2008.

Dillon-Merrill, R. L., Parnell, G. S., and Buckshaw, D. L., Logic Trees: Fault, Success, Attack, Event, Probability, and Decision Trees, *Wiley Handbook Of Science & Technology for Homeland Security*, John G. Voeller, Editor, Forthcoming 2008.

Buckshaw, D. L., Use of Decision Support Techniques for Information System Risk Management, *Wiley Encyclopedia of Quantitative Risk Management*, Edward Melnick and Brian Everitt (Editors), Forthcoming September 2008.

Buckshaw, D., Parnell, G., Unkenholz, W., Parks, D., Wallner, J. & Saydjari, O. (2005). Mission-oriented risk and design analysis of critical information systems, Military Operations Research 2(10), 19–38. **Awarded 2006 MOR Journal Award.**

DENNIS M. BUEDE, Executive Principal Analyst & President

Dr. Buede has over twenty-five years of experience in both the theoretical development and engineering application of decision support technologies. This experience has addressed military and business decision problems, as well as multisensor data fusion technology. These applications have fallen in the areas of resource allocation, R&D priorities, mission area analysis (or strategic planning), requirements definition, system design, system acquisition, and system development. Dr. Buede has managed projects funded by the National Science Foundation, Army Research Institute, numerous Army and Navy development commands, and the National Security Agency. He is a Fellow of the International Council on Systems Engineering, 2001.

EXPERIENCE

2001 – Present	Innovative Decisions, Inc., Executive Principal Analyst and President
2001- 2004	Stevens Institute of Technology, Professor of Systems Engineering, Department of Systems Engineering and Engineering Management
1990-2001	George Mason Univ., Professor of Systems Engineering and Operations Research; previously Associate Director of the Center of Excellence in Command, Control, Communications and Intelligence (C3I)
1982-1990	Decision Logistics, President
1990	George Washington University, Associate Professorial Lecturer in Management Science
1976-1982	Decisions and Designs, Inc., Manager and Senior Decision Analyst

EDUCATION

Ph.D.	Philosophy, Engineering-Economic Systems, Stanford University, 1977
M.S.	Engineering-Economic Systems, Stanford University, 1973
B.S.	Aerospace Engineering, University of Cincinnati, 1971

SELECTED PUBLICATIONS AND PRESENTATIONS

Buede, D.M. *The engineering design of systems: Methods and models*. New York: Wiley, 2000.

Watson, S.R., and Buede, D.M. Decision synthesis: *The principles and practice of decision analysis*. Cambridge, England: Cambridge University Press, 1987.

Kobylski, G.C., Buede, D.M., Farr, J.V., and Peters, D. “The Use of Dynamic Decision Networks to Increase Situational Awareness in Networked Battle Command”, **Military Operations Research**, forthcoming.

Powell, R.A. and Buede, D.M. “Decision-Making for Successful Product Development”, **Program Management Journal**, March 2006, vol. 37, no. 1, 22-40.

Buede, D.M. “Influence Diagrams: A Practitioner’s Perspective”, **Decision Analysis**, Dec. 2005, Vol. 2, No. 4, pp. 235-237.

Maxwell, D.T. and Buede, D.M. “Composing and Constructing Value Focused Influence Diagrams: A Specification for Decision Model Formulation", **Journal of Multi-Criteria Decision Analysis**, Feb. 2005, Vol. 12, pp. 225 - 243.

CHARLES "CHUCK" D. BURDICK, Principal Analyst

Mr. Burdick has over twenty-five years of experience in modeling and simulation of military systems and has developed and applied several different tactical and operational combat simulations to analytical, training, and testing applications for both the military Services and OSD agencies. Chuck has focused particularly on integrating weapons simulations with command, control, communications, computers, and intelligence, surveillance, and reconnaissance (C4ISR) in large scale models. He has been very active in introducing non-kinetic effects and human behavior representation into military simulations. He is a former Army Military Intelligence officer, a Vietnam veteran, and retired as a Colonel in the Army Reserves.

EXPERIENCE

2008-Present	Innovative Decisions Inc., Principal Analyst
1992 - 2008	Lockheed Martin., Program Manager, Networked Simulations
1974 - 1992	BDM International, Vice President, Systems Technology
1966 - 1973	US Army, Captain, Military Intelligence

EDUCATION

M.S.	Operations Research & Systems Analysis, The George Washington University, 1974
B.S.	Experimental Psych & Physics, Rensselaer Polytechnic Institute, 1966

SELECTED PUBLICATIONS AND PRESENTATIONS

Burdick, Chuck, Holdsworth, David R., and Crino, John R., **"***Detailed to Aggregated: Providing Key Data to a Campaign Level Study"* Presented to 76th MORS Symposium, Working Group 16, Jun 2008

Burdick, Charles, Montgomery, Keith, and Bross, Paul, "*Improving T&E Participation in the Requirements Generation Process"* Presented at the 24th Annual National Test & Evaluation Conference, Feb 2008

Burdick, Chuck, Dzombar, Ken, Crino, John R., and Hanson, Susan, "*Very Small Unit Operations in a Campaign Context"* Presented to 75th MORS Symposium, Working Group 16, Jun 2007

Crino, John R., Burdick, Chuck, and Hanson, Susan, "*Combating WMD Analytic Baseline Study: A Methodology for Integrating C4ISR and Non-Traditional Challenges*" presented to Working Group 7and selected for Barchi Prize competition at 75th MORS Symposium, Jun 2007

Burdick, Charles, Argo, Harry, and Bross, Paul, "*Advanced Land Command and Control"*, Presented to 71st MORS Symposium, Working Group 12, Jun 2003

Burdick, Charles, Prince, Dr. John, Grell, Mihaly, Argo, LTC Harry, Huynh, James, MacQueen, Don, and Bross, Paul, *Plan Building in JWARS,* Proceedings of the 11th Conference on Computer Generated Forces and Behavioral Representation. May 7-9, 2002.

Vakas, Deborah; Blacksten, H. Ric; Prince, Dr. John; Burdick, Charles*; Commander Behavior and Course of Action Selection in JWARS,* Proceedings of the 10th Conference on Computer Generated Forces and Behavioral Representation, May 15-17. 2001.

MICHAEL F. CASSIDY, Executive Principal Analyst

Michael Cassidy has more than 30 years of professional experience in teaching, researching, and consulting on research methodology and measurement; data collection; statistical analysis; decision analysis; computer modeling; and evaluation. His work experience includes positions as member of technical staff (MTS), and technical manager at AT&T Bell Laboratories (1982-1993); Senior Consultant at IBM (1993-1995); and part and full-time university teaching. He is presently tenured Professor, Information Technology and Management Science, and Senior Principal at Innovative Decisions, Inc. Since 2003, he has been Co-Editor of *Performance Improvement Quarterly*, a peer reviewed, interdisciplinary journal. He has consulted in the private and public sector, and conducted research in disciplines such as sociology, forensic psychology, management, measurement, criminology, and training.

EXPERIENCE

1995 - Present Professor, IT & Mgmt Science, School of Business Admin, Marymount Univ.
2003 - Present Executive Principal Analyst, Innovative Decisions, Inc.
1995 - 2003 Principal, Performance Improvement Services

EDUCATION

Ph.D. Instructional Systems; Semiotics, Indiana University, 1980
M.S. Library & Information Science, University of Southern California, 1975
B.F.A. Humanities, California Institute of the Arts, 1974
B.A. Religious Studies; English, Manhattan College, 1972

SELECT PUBLICATIONS AND PRESENTATIONS

Cassidy, M. F. & Buede, D. (2009). Expert judgment and 'common sense': Caveat emptor. *Management Decision, 47(3).*

Cassidy, M. F. (2010). Diversity by design: Creating cognitive conflict to enhance group performance. In S. Schuman (Ed.), *The handbook of working with difficult groups*. NY: Jossey- Bass/Wiley.

Cassidy, M. (2007). *An investigation into the Skill Performance Certificate program for limb impaired and amputee commercial truck drivers*. (DOT – FMCSA Publication), Washington, DC: Federal Motor Carrier Safety Administration.

Cassidy, M.F. & Cassidy M.M. (2006). Principles and practices of group decision making In J.Pershing (Ed.), *The handbook of human performance technology: Principles, practices, and potential*, 3nd edition. Hoboken, NJ: Wiley.

Cassidy, M. & Hodson, W. (2005). *A Technical evaluation of two name trace search engine algorithms*. Classified technical report. Washington: DC.

Cassidy, M. & Hodson, W. (2004). 2004 Annual *report on hiring and retention of minority employees in the intelligence community*. Washington,DC: House Permanent Subcommittee on Intelligence,.

Cassidy, M. (2004, October). *Maximizing value: Realizing opportunities and avoiding errors in armament acquisition*. Lecture delivered to The Portuguese Ministry of Defense. Lisbon: Portugal.

JAMES O. CHINNIS, JR, Executive Principal Analyst

Dr. Chinnis has extensive experience in both theoretical and applied aspects of decision analysis, Bayesian statistics, and cognitive science. His industrial and consulting experience includes risk assessment, system evaluation, technology assessment, and the development of computer-based aids for decision analysis, inference, and decision support. A special interest of Dr. Chinnis is the design of software to support inference and decision making. He has designed novel approaches for decision-analytic software tools intended to support both novices and experts. He has conducted research on fire control system user interfaces for the Office of Naval Research (ONR), has analyzed information flow and operability issues on attack submarines for the Naval Undersea Systems Command, has conducted experimental research on aspects of personalizing combat-control software interfaces for operators for ONR, has participated in software safety audits and evaluations of cruise missile control software, and has conducted experimental tests of various man/machine task allocation schemes for the Army Research Institute, particularly in the area of computer-assisted inference in air defense systems.

EXPERIENCE

2003 – Present Innovative Decisions, Inc., Executive Principal Analyst
1991 – Present Decision Science Associates, Inc., President
1978 – 1991 Decision Science Consortium, Inc., President
1973 – 1978 Decisions and Designs, Inc., Research Analyst
1972 – 1973 General Motors Research Laboratories, Associate Senior Research Psychologist
1971 – 1972 University of Michigan Mental Health Research Institute, Research Associate

EDUCATION

Ph.D. Psychology, University of Michigan, 1972
B.S. Physics, Massachusetts Institute of Technology, 1966

SELECTED PUBLICATIONS AND PRESENTATIONS

Fryback, D.G., Chinnis, J.O. Jr., and Ulvila, J.W. *Bayesian cost-effectiveness analysis: An example using the GUSTO trial*. International Journal of Technology Assessment in Health Care, 17 (1), 2001, pp. 83-97.

Adelman, L., Cohen, M.S., Bresnick, T.A., Chinnis, J.O., Jr., and Laskey, K.B. *Real-time expert system interfaces, cognitive processes, and task performance: An empirical assessment*. Human Factors, 35(2), 243-261, 1993.

Ulvila, J.W., and Chinnis, J.O., Jr. *Decision analysis for R&D resource management*. In D.F. Kocaoglu (Ed.), Management of R&D and Engineering. Amsterdam: North-Holland, 1992, 144-162.

ETHAN COMSTOCK, Senior Analyst

Mr. Comstock has five years of experience in the systems engineering, decision analysis, and systems modeling field. He has worked on a team to develop an integrated tool to analyze and visualize a complicated overhead surveillance architecture. Has performed intelligence production impact analysis of discontinuing legacy systems. Since joining IDI in 2005, has worked with government customers using mathematical analysis, risk assessment, and Bayesian belief network techniques to model uncertain events and increase understanding of complex systems processes. He has translated input from subject matter experts into useful decision analysis tools. He has a particular interest in using innovative user-interface and display methods to increase efficiency and reduce error in complicated modeling efforts. Recent work has included development and use of budget models and portfolio management for large government organizations.

EXPERIENCE
2005 – Present Innovative Decisions, Inc., Senior Analyst
2003 – 2005 Welkin Associates, Ltd., Systems Engineer

EDUCATION
B.A. Mathematics, University of Virginia, 2003

STEVEN DARCY, Principal Analyst

Mr. Darcy has a passion for operations research. In particular, he enjoys modeling and simulation. He has nearly 20 years of experience in all aspects of software development, from acquisition policy and guidance through user acceptance. He is an expert object oriented architect, designer and programmer. He has spent the last seven years building and running complex event driven agent based simulations. He has experience in warfare modeling and banking, transportation, and telecommunications systems.

EXPERIENCE

2008 - Pres	Innovative Decisions Inc., Principal Analyst
2007 - 2008	Modern Technology Solutions, Inc., Senior Software Engineer
2004 - 2007	CACI, Inc., Information Technology Scientist
2000 - 2004	GRC International, AT&T Government Solutions, Staff Assistant
1999 - 2000	Verizon, Senior Software Engineer
1998 - 1999	Salient Corp., Consultant
1998	Alchemy Inc., Development Manager
1996 - 1998	OOCL (USA), Inc., Software Engineer
1992 - 1996	EJR Computer Associates, Consultant
1990 - 1992	United Parcel Service, Programmer
1989 - 1990	Electronic Data Systems, Programmer

EDUCATION

M.S.	Operations Research, George Mason University, 2008
B.S.	Physics & App. Physics, Rutgers University & New Jersey Institute of Technology, 1988

SELECTED PUBLICATIONS AND PRESENTATIONS

Darcy, S.M. *Scalable Parallel Architecture for the Joint Analysis Model.* White Paper for CACI

Melim, P.B. and Darcy, S.M. *Assessing the Effects of Joint Fires on Joint Forcible Entry Operations (JFEO).* Presented at 73rd MORS Symposium (June 2005), received MORS impact coin.

Sutherland, Neary, Kolstad, and Darcy *Population and Environment Analysis for Counter-insurgency Evaluation (PEACE).* Presented at George Mason University May 2008.

BRADLEY M. DEBLOIS, Analyst

Mr. DeBlois has 4 years experience conducting a range of systems engineering activities for DHS, DoD and Intel clients. In particular: requirements analysis, system design, test and evaluation, modeling, simulation and analysis. He also has significant training and experience in project management techniques including earned value management and risk management.

EXPERIENCE

2009 – Pres Innovative Decisions, Inc., Analyst
2004-2009 BAE Systems, Systems Engineer

EDUCATION

B.S. Physics, College of William and Mary

ROBIN L. DILLON-MERRILL, Principal Analyst

Dr. Dillon-Merrill specializes in decision and risk analysis. Her research seeks to understand and explain how and why people make the decisions that they do under conditions of uncertainty and risk. This research specifically examines critical decisions that people have made following near-miss events in situations with severe outcomes (i.e., hurricane evacuation, NASA mission management, etc.). Her past research in risk has included supporting the Department of Energy's selection of a new tritium supply facility, aiding NASA's Jet Propulsion Laboratory in decision making for the Mars Exploration Program, and developing a quantitative decision support tool for the management of software project resources based on an analysis of both the information system and the design. She has received research funding from the National Science Foundation, NASA, and the Department of Defense. She has served as a risk analysis and project management expert on several National Academies Committees including the Review of the New Orleans Regional Hurricane Protection Projects. She is an Associate Professor in the McDonough School of Business at Georgetown University and teaches classes in the management of Information Systems and the development of Decision Support Systems.

EXPERIENCE

2003 – Present	Innovative Decisions, Inc., Principal Analyst
2008 – Present	McDonough School of Business, Georgetown University, Associate Professor of Operations and Information Management
2001 – 2008	McDonough School of Business, Georgetown University, Assistant Professor of Operations and Information Management
1999 – 2001	Virginia Tech, Assistant Professor
1993 – 1995	Fluor Daniel Inc., Systems Engineer

EDUCATION

Ph.D.	Industrial Engineering and Engineering Management, Stanford University, 1999
B.S.	Systems Engineering, University of Virginia, 1993
M.S.	Systems Engineering, University of Virginia, 1993

SELECTED PUBLICATIONS AND PRESENTATIONS

Robin L. Dillon and Catherine H. Tinsley, "How near-misses influence decision making under risk: A missed opportunity for learning," *Management Science*, August 2008.

M. Elisabeth Paté-Cornell and Robin L. Dillon, "The Respective Roles of Risk and Decision Analyses in Decision Support," *Decision Analysis*, Vol. 3, No. 4, December 2006, pp. 1-13.

Robin L. Dillon, M. Elisabeth Paté-Cornell, and Seth D. Guikema, "*Programmatic Risk Analysis for Critical Engineering Systems Under Tight Resource Constraints*," Operations Research, Vol. 51, No. 3, May/June 2003, pp. 354-370.

Robin L. Dillon, Richard John, and Detlof von Winterfeldt, "*Assessment of Cost Uncertainties for Large Technology Projects: A Methodology and an Application*," Interfaces, Vol. 32, No. 4, July-August, 2002, pp. 52-66.

M. Elisabeth Paté-Cornell and Robin L. Dillon, "*Probabilistic Risk Analysis for the NASA Space Shuttle: A Brief History and Current Work*," Reliability Engineering and System Safety, Vol. 74, No. 3, 2001, pp. 345-352.

M. Elisabeth Paté-Cornell and Robin L. Dillon, "*Success Factors and Future Challenges in the Management of Faster-Better-Cheaper Space Missions*," IEEE Transactions on Engineering Management, Vol. 48, No. 1, February 2001, pp. 25-35.

PATRICK J. DRISCOLL, Executive Principal Analyst

Dr. Patrick Driscoll served for over 22 years in the U.S. Army and has over 20 years of experience in mathematical modeling and optimization for applications in both industry and government. Currently a professor of operations research in the systems engineering department at the U.S. Military Academy at West Point, he is actively engaged in developing new methods for assessing and mitigating downside risk exposure in decision making for projects and modeling complex infrastructure interactions for policy making. He holds a black belt in Army Lean Six Sigma and is a member of PMI's Risk Analysis SIG. Pat has a significant body of research and proven collaboration both inside and outside the United States, including textbooks, journal papers, refereed proceedings, invited presentations and professional tutorials. He is President-elect of the Military Applications Society (MAS) for the Institute of Operations Research and the Management Sciences (INFORMS).

EXPERIENCE

2008 – Present: Innovative Decisions, Inc., Executive Principal Analyst
2008 Visiting Professor, Department of Defense Analysis, Naval Postgraduate School
2001 – Present: Professor of Operations Research, U.S. Military Academy
1997 – 1998: Associate Dean, Information & Educational Technology, U.S. Military Academy
1989 – 2001: Academy Professor, Department of Math Sciences, U.S. Military Academy

EDUCATION

Ph.D., Industrial & Systems Engineering, Virginia Tech
M.S. Operations Research, Stanford University
M.S. Engineering Economic Systems, Stanford University
B.S. Engineering, U.S. Military Academy

SELECTED PUBLICATIONS AND PRESENTATIONS

Patrick J. Driscoll, *Nothing Is Simple Anymore: Supporting Complex Project Decisions*, 10th Annual PMI Risk SIG Project Risk Symposium, June 23-25, Hilton la Jolla Torrey Pines, San Diego, CA, 2008.

Parnell, Gregory S., Patrick J. Driscoll, Steven Henderson, *Decision Making in Systems Engineering and Management*, John Wiley & Sons, New York, NY, 2007.

Patrick J. Driscoll, *Strategy and Value Modeling*, INFORMS Annual Meeting, Seattle, November 2007.

Patrick J. Driscoll, *Quantitative Visioning, Annual Conference of Operational Research Society (ORS*), Edinburgh, Scotland, September 2007.

Patrick J. Driscoll, Steven Henderson, *A Meta-Model Architecture for Fusing Battlefield Information in Network Centric Operations*, Military Operations Research Journal, Vol 11(1), 27 – 48, 2006.

Patrick J. Driscoll, Niki Goerger. *Linear Stochastic Systems Model for Counter-Insurgency Strategies*, INFORMS Annual Meeting, Pittsburgh, PA, November 2006.

Patrick J. Driscoll, Niki Goerger, *Stochastic System Modeling of Infrastructure Resiliency*, 48th Annual Conference of Operational Research Society (ORS), Bath, England, September 2006.

BARRY C. EZELL, Senior Principal Analyst

Barry has tens years of experience applying operations research and systems analysis in DoD and DHS. Recent experiences include: (1) quick-turn mission to Republic of Georgia to determine air defense capability gaps; (2) special assignment to DHS as technical expert for applying probabilistic risk analysis for weapons of mass destruction CBRN terrorism risk assessment. Barry has authored 24 papers and currently serves as associate editor for *Military Operations Research* and a reviewer for (1) *Risk Analysis, (2) Homeland Security and Emergency Management, (3) Reliability Engineering and System Safety* and (4) *Infrastructure Systems* journals. He is a member of the Society of Risk Analysis, Military Operations Research Society, Association of the United States Army, and recipient of the Distinguished Graduate Award from the Center for Risk Management of Engineering Systems.

EXPERIENCE

2008-Present	Innovative Decisions, Inc., Senior Principal Analyst
2005-2008	TRADOC, Deputy Chief, Studies and Analysis
2003-2005	TRADOC, Deputy Director, Total Army School System
2000-2001	U.S. Military Academy, Deputy Director, Operations Research Center of Excellence
1998-2001	U.S. Military Academy, Assistant Professor, Department of Systems Engineering
1995-1996	Fort Riley, Commander, C Battery, 4-3 Air Defense Artillery
1990-1993	Ft Benning & Operation Desert Shield/Storm, Stinger Platoon Leader, 197th Infantry Brig (M)(S)
1988-1990	Korea, Vulcan Platoon Leader, A/5-5 Air Defense Artillery

EDUCATION

Ph.D.	Engineering Management, Old Dominion University, 2005
M.S.	Systems Engineering, University of Virginia, 1998
B.S.	Mechanical Engineering Technology, University of Mississippi, 1988

SELECTED PUBLICATIONS AND PRESENTATIONS

Barry C. Ezell, *"Critical Infrastructure Vulnerability Assessment Model (I-VAM)"*, Risk Analysis, Vol. 27, No. 3., 2007.

Barry C. Ezell and Kenneth Crowther, *"Philosophical Issues and Their Implications for the Systems Architect"*, Foundations of Science, Jun, 2007.

Barry C. Ezell, Yacov Y. Haimes, and James H. Lambert, *"Risks of Cyber Attack to Water Utility Supervisory Control and Data Acquisition Systems"*, Military Operations Research Journal, Vol. 6, No. 2, 2001.

Barry C. Ezell, John V. Farr, and Ian Wiese, *"The Infrastructure Risk Analysis Model"*, The American Society of Civil Engineers (ASCE): Journal of Infrastructure Systems, Vol. 6, No. 3, 2000.

Barry C. Ezell, John V. Farr, and Ian Wiese, *"An Infrastructure Risk Analysis of a Municipal Water Distribution System"*, The American Society of Civil Engineers (ASCE): Journal of Infrastructure Systems, Vol. 6, No. 3, 2000.

Invited Speaker: Society of Risk Analysis Conference: Quantifying Vulnerability to Critical Infrastructure and Net-centric Risk Analysis,4-6 December 2006; Homeland Security Symposium, University of Southern California, 15-16 January 2005; Keynote Address Inaugural National SCADA Conference of New Zealand, 28-29 October 2003; SCADA Conference, Sydney, Australia, 18 June 2003; and European SCADA Conference, London, England, 14-16 February 2003.

SETH GUIKEMA, Senior Analyst

Dr. Guikema is a risk and decision analyst specializing in risk and reliability analysis for complex infrastructure systems subject to natural hazards and deliberate attacks, modeling the effects of interactions within teams on the performance of technical systems, and environmental life-cycle analysis for complex systems. His research has been funded by the National Science Foundation, the Department of Energy, state agencies, and private utility companies. Dr. Guikema is an assistant professor in the Department of Geography and Environmental Engineering at Johns Hopkins University and has taught courses on risk and decision analysis, uncertainty modeling, and project management.

EXPERIENCE

2008-present	Johns Hopkins Univ, Dept of Geography and Environ Eng, Assistant Professor
2008-present	Univ of Stavanger (Norway), Dept of Indust Econ, Risk Mgmt/Planning, Prof II
2008-present	Innovative Decisions, Inc., Senior Analyst
2005-2007	Texas A&M Univ, Zachry Dept of Civil Eng, Assistant Professor
2003-2005	Cornell Univ, Dept of Civil and Environ Eng, Postdoctoral Researcher

EDUCATION

Ph.D	Philosophy, Management Science and Engineering, Stanford University, 2003
M.S.	Civil and Environmental Engineering, Stanford University, 1999
M.E.	Civil Eng, University of Canterbury (New Zealand), 1999
B.S.	Civil and Environmental Engineering, Cornell University, 1997

SELECTED PUBLICATIONS

Han, S., S.D. Guikema, S.M. Quiring, K. Lee, D. Rosowsky, and R.A. Davidson. 2008. "*Estimating the Spatial Distribution of Power Outages during Hurricanes in the Gulf Coast Region*," Reliability Engineering & System Safety [in press].

Guikema, S.D. and J.P. Coffelt. 2008. "*A Flexible Count Data Regression Model for Risk Analysis*," Risk Analysis, Vol. 28, No. 1, pp. 213-223.

Dillon, R.L., M.E. Paté-Cornell, and S.D. Guikema. 2003. "*Programmatic Risk Analysis for Critical Engineering Systems Under Tight Resource Constraints: Applying APRAM*," Operations Research, Vol. 51, No. 3, pp. 354-370.

Paté-Cornell, M.E. and S.D. Guikema. 2002. "*Probabilistic Modeling of Terrorist Threats: A Systems Analysis Approach to Setting Priorities Among Countermeasures*," Military Operations Research, Vol. 7, No. 4, pp. 5-23. (Best Paper for 2002: Military Operations Research Society and INFORMS Military Applications Section)

Guikema, S.D. and M. Milke. 1999. "*Quantitative Decision Tools for Conservation Program Planning: Practice, Theory, and Potential.*" Environmental Conservation, Vol. 26, No. 3, pp. 179-189. (Selected as the best paper in the journal for 1999)

STEVEN M. HEIDORN, Senior Principal Analyst

Mr. Steven M. Heidorn is a highly accomplished systems engineer with over 20 years experience practicing and teaching systems engineering and systems architecting at Innovative Decisions, Incorporated, The Aerospace Corporation, The MITRE Corporation and at IBM Federal Systems. Over this period, Mr. Heidorn has provided leadership of teams and working groups and has gained extensive skills in systems architecting, systems engineering, systems analysis, real-time multiprocessing software development, digital signal processing analysis and design, and training. He is skilled in the use of systems engineering tools such as System Architect, Metis, MATLAB, SPW, RDD-100, and RTM. Mr. Heidorn also has valuable experience working in an SEI Level 4 and ISO-9001 development organization.

In addition to his broad experience in systems engineering, Mr. Heidorn has specific domain experience in ISR, satellite communication, sonar, radar, ESM and tactical communication systems. He has experience on programs and projects for the Navy, Air Force, Army, as well as joint DoD programs. He has been responsible for architectural concept development (including core JCIDS functions of needs analysis, gap analysis, solution synthesis and CONOPS development), requirements analysis, simulation and performance modeling, signal processing analysis and design, hardware development, software development, test and integration.

EXPERIENCE
2006 – Present: Innovative Decisions, Inc., Senior Principal Analyst
1999 – 2006: The Aerospace Corporation, Senior Project Leader
1996 – 1999: The MITRE Corporation, Senior Signal Processing Systems Engineer
1985 – 1996: IBM Federal Systems, Advisory Systems Engineer

EDUCATION
B.S. Electrical Engineering, 1984, University of Illinois at Urbana-Champaign.
M.S. Electrical Engineering, 1985, University of Illinois at Urbana-Champaign.

SELECTED PUBLICATIONS AND PRESENTATIONS
Decision Analysis Case Study, T.P. Anderson, S.M. Heidorn, M.H. Jones, N.M. White, J.W. Evans, F.W. Merritt, A.J. Jacobovits, Presented at the Decision Analysis Affinity Group, March 2006.

Aerospace Decision Analysis Primer, September 2005.

Independent Verification and Validation of the Trilogy Virtual Case File, Delivery 1: Final Report, S.M. Heidorn, J.E. Gayek et al, 21 January 2005.

Tutorial: *"Architecture Frameworks and Modeling: A Structured Approach,"* INCOSE International Symposium, 2002, 2003.

"A Data Flow Approach to ESM Processing," American Defense Preparedness Association Avionics Technical Symposium presentation, 1987.

KENNETH P. KUSKEY, Senior Principal Analyst

Dr. Kuskey has practiced decision analysis since 1976, working with about 100 organizations, chiefly in the U.S. government. Typical projects involve the design and facilitation of organizational processes and/or workshops for strategic planning, budgeting, system design, source selection, and performance measurement. He also does decision modeling and software design. Experience highlights: Facilitate resource allocation for the U.S. Marine Corps Program Objective Memorandum since 1978; facilitate the Clinton Administration's Defense Science and Technology Strategy for the Director of Defense Research and Engineering; facilitate the organizing meeting of the Partnership for Public Warning in 2002. Dr. Kuskey's specialty is optimum allocation of resources in enterprise and program budgeting.

EXPERIENCE

2003 – Present	Innovative Decisions, Inc., Senior Principal Analyst
1995 - 2003	The MITRE Corporation, Lead Operations Research Analyst
1994 – 1995	The George Washington University, Dept of Engineering Mgmt. Professorial Lecturer
1978 - 1995	Decisions and Designs, Inc. (DDI), Vice President
1976 - 1978	Independent Consultant
1970 - 1976	Stanford University, Research Assistant
1963 - 1969	U.S. Navy Metrology Engineering Center, Physicist GS-11

EDUCATION

Ph.D.	M.S., Engineering-Economic Systems, Stanford University, 1980 and 1971
B.D.	New Testament Language and Literature, Talbot Theological Seminary, 1967
B.S.	Physics, Harvey Mudd College, 1963

SELECTED PUBLICATIONS AND PRESENTATIONS

Kuskey, K. P. *1-2-3 Invest; A Frame of Reference for Public-Sector and Non-Profit Investment Selection Studies*. MTR 00W0000130. McLean, VA: The MITRE Corporation, September 2001.

Leitch, S., Kuskey, K. P., Buede, D. M., and Bresnick, T. A., "*Of Princes, Frogs, and Marine Corps' Budgets; Institutionalizing Decision Analysis Over 23 Years*," Decision Analysis Practice award presentation at the Philadelphia PA Meeting of INFORMS, November 1999.

Kuskey, K. P. "*New Directions and Strategies for the Society of Naval Architects and Marine Engineers; Recommendations of the SNAME Ad Hoc Strategic Planning Group*," Marine Technology, May 1994, pp. 2, 23-30.

Kuskey, K. P. *Model-Based Forecasts of Nuclear Reactor Commercial Operation Dates and Power Generation; Concepts, Methods, and Algorithms*. Technical Report DDI/TR 82-15-186.23. DDI, December 1982.

CHRISTOPHER LANDON, Principal Analyst

Mr. Landon has over eight years of experience as an intelligence officer and operations research analyst. As an intelligence officer, Mr. Landon provided strike operations intelligence and targeting support to operations in Afghanistan and Iraq. His interests in operations research began when he reformatted updated target database architectures to automatically revise and populate carrier-borne strike package folders, allowing for the inclusion of near-real time threat updates and subsequent minimum-risk flight path generation. Mr. Landon's expertise is the formulation and modeling of social networks using a commodities flow-based approach and identifying critical vulnerabilities for both safeguarding and interdiction scenarios. His most recent work has been in implementing and formalizing an intelligence community program portfolio management process that includes budget allocation optimization using decision and risk analysis and incorporates the future performance likelihoods of programs based on a weighted portfolio regression model. Mr. Landon has also applied minimum risk transit routing models to airport security vulnerabilities to identify optimal mitigation measures. His specialty areas include decision and risk analysis for portfolio management and quantitative network analysis.

EXPERIENCE

2008 – Present	Innovative Decisions, Inc., Principal Analyst
2000-2008	U.S. Navy, Intelligence Officer/Joint Targeting Officer/PA&E
1994-1996	U.S. Marine Corps, Communications and Radar Electronics Technician

EDUCATION

M.S. Operations Research, Naval Postgraduate School, 2005
B.S. Economics, United States Naval Academy, 2000

SELECTED PUBLICATIONS AND PRESENTATIONS

Landon, Christopher G., *Identifying Critical Information Operations Vulnerabilities Within a Social Network*, Naval Postgraduate School - Thesis, Monterey, CA, June 2005.

Landon, Christopher G., *Blue Considerations for a Near-Peer Air-to-Air Combat Scenario in the South China Sea*, Naval Postgraduate School - Joint Combat Analysis, Monterey, CA, March 2005.

Landon, C., Takagi, K. Watts, K., "*Minimum Risk to Identification Transit Routes Through Airport Security*", Naval Postgraduate School - Network Interdiction Red-Cell Project, Monterey, CA, Sept 2004.

ROBERT M. LIEBE, Senior Principal Analyst

Mr. Liebe has over eighteen years of experience as a Marine officer and military operations research analyst. As a Marine helicopter pilot, Mr. Liebe achieved mission commander and instructor qualifications during a series of assignments as an operations officer, maintenance officer, and instructor pilot, including shipboard deployments to Haiti, Europe, and Africa. As a Marine Corps analyst, Mr. Liebe has applied a wide array of analysis techniques to many different challenges. He developed a mixed integer optimization model to create 10-year aircrew training plans and facilitate resource investment decisions for the Marine Corps' transition to tilt-rotor aircraft. Mr. Liebe applied Markov transition matrices to model military dental readiness and to help forecast wartime equipment attrition. Web-based survey, categorical data analysis, and structured interviewing techniques enabled Mr. Liebe's analysis team to assess the comparative value of traditional and distance education programs for Marine officers. He used influence diagrams to communicate an analog-to-digital transition strategy for 2d Marine Division, and he deployed to Iraq with 3d Marine Aircraft Wing in Spring 2003, where discrete event simulation and spreadsheet modeling assisted operational planning and subsequent operational assessment during Marine forces advance to Baghdad. Since joining IDI, Mr. Liebe has assisted in development of discrete event simulations of assembly processes aboard Maritime prepositioning Ships (Future) and also developed discrete event simulations supporting process improvement efforts at a government organization. He has also conducted research on risk analysis methods, techniques, and tools and their applicability to homeland security. He applied these analysis techniques in supporting Navy installation protection investment decisions. Mr. Liebe continues to serve in the Marine Corps Reserve.

EXPERIENCE

2004 – Present Innovative Decisions, Inc., Senior Principal Analyst
2000 –2004 Marine Corps, Operations Research Analyst
1990 –2000 Marine Corps, Helicopter Pilot, Mission Commander, Flight Instructor

EDUCATION

M.S. Operations Research, Naval Postgraduate School, 2000
B.S. Mathematics, United States Naval Academy, 1990

SELECTED PUBLICATIONS AND PRESENTATIONS

Liebe, Robert M. and James Scouras, "*Security Risk Analysis Framework: Development and Application,"* presentation to Security Analysis and Risk Management Association, Fairfax, VA, May 2008.

Liebe, Robert M, "*Homeland Security Risk Assessment: Illustrative Framework and Applicable Methods and Techniques*," presentation to Society for Risk Analysis, Orlando, FL, December 2005.

Liebe, Robert M., "*Operations Analysis in Support of Marine Forces in Operation Iraqi Freedom*", presentation to Military Operations Research Society Education Colloquium, West Point, NY, April 2004.

Woodaman, Ronald and Liebe, Robert, "*Value of Resident PME: Results and Recommendations From 2001 PME Study*", Marine Corps Gazette, July 2002, v. 86, no. 7, p. 30-33.Vol. 7, pp. 30-31.

DAVEN L. MADSEN, Senior Principal Analyst

Mr. Madsen served for over 27 years in the U. S. Navy. He flew F-14s and is a graduate of the U.S. Naval Test Pilot School. He has over 19 years experience in Program Management, Systems Engineering, and Test and Evaluation and is DAWIA Level III certified in all three areas. Mr. Madsen's analysis work is highlighted by performance versus cost trade studies of notional Joint Strike Fighter avionics suites. Based on Joint Strike Fighter operational requirements, historical avionics costs and parametric analysis he helped define an affordable avionics package that best met warfighter needs. He was also responsible for development of an end-to-end integrated Intelligence, Surveillance and Reconnaissance (ISR) architecture modeling capability that provided objective, repeatable and quantifiable metrics to define cost effectiveness of ground, airborne and space based ISR systems. He recently led analysis and engineering efforts that reduced the complexity, risk and cost of a net centric intelligence analysis, data sharing, collaboration and targeting system for the Navy that will be interoperable with other services and intelligence agencies.

EXPERIENCE

2008 – Present	Innovative Decisions, Inc., Senior Principal Analyst
2005 – 2008	Deputy & Acting Program Manager, Distributed Common Ground System-Navy Program Office
2003 – 2005	Enterprise Architectures Department Chief, National Security Space Office
2000 – 2003	Chief Test Pilot & Commanding Officer, Air Test and Eval Squadron THIRTY
1998 – 2000	Analysis and Integration & Systems Eng Integration Team Lead, Joint Strike Fighter Program Office
1996 – 1998	F-14 Integrated Prog Team Military Lead, Naval Weapons Test Squadron-Pt Mugu
1993 – 1996	Deputy Assist F-14 Class Desk & F-14D Integ ProgTeam Lead, F-14 Prog Office
Prior to 1993	Flight tests, F-14 squadron, and operational aviation staff assignments

EDUCATION

M.S. Systems Management, University of Southern California, 1989
B.S. Life Sciences, University of Nebraska-Lincoln, 1980

SELECTED PUBLICATIONS AND PRESENTATIONS

"USN C4I Migration to A Service Oriented Architecture and Common Computing Environment", presented at the National Defense Industrial Association Net Centric Operations Conference, Norfolk, VA, March 2007

"System Architectures: A System of Systems Viewpoint", presented at the Massachusetts Institute of Technology 2003 Systems Engineering Conf., Cambridge, MA, October 2003

SUZANNE M. MAHONEY, Senior Principal Analyst

Ms. Mahoney leads efforts that model complex phenomena characterized by uncertainty, incomplete data, dynamic environments and a variety of evidence sources of varying credibility. Applications range from object level identification and situation assessment, to the dynamic allocation of resources and aggregation of model estimates. She is particularly experienced in leveraging a combination of methods, including the elicitation of knowledge from experts, learning from available data, and automatically constructing situation specific models from a knowledge base.

EXPERIENCE

2004 – Present Innovative Decisions, Inc., Senior Principal Analyst
1996 – 2004 Information Extraction and Transport, Inc. (IET), Senior Analyst
1989 – 1995 George Mason University, Researcher
1968 – 1989 Control Data, Analyst

EDUCATION

Ph.D. George Mason University, Information Technology, 1999
M.A. University of Michigan, Mathematics, 1967
B.S. University of Michigan, Mathematics, 1966

SELECTED PUBLICATIONS AND PRESENTATIONS

Daniels, D.C., L. D. Hudson, K.B. Laskey, S. M. Mahoney, B.S. Ware, E. J. Wright (2008) Terrorism Risk Management in O. Pourret, P. Naim, B. Marcot (eds) *Bayesian Networks A Practical Guide to Applications*, John Wiley and Sons, Chichester, West Sussex, England.

Mahoney, S.M., Buede, D., Tatman, J. (2005) Patterns of Report Relevance, UAI Applications Workshop, Edinburgh, Scotland.

Mahoney, S.M. and E. Wright (2002) "*Bayesian Network Engineering for Modeling Missile Defense Decisions*", Proc. 2000 MSS 2002 Meeting of the MSS Specialty Group on Missile Defense Sensors, Environment sand Algorithms, Monterey, CA, February

Laskey, K.B. and S.M.Mahoney (2000) *Network Engineering for Agile Belief Network Models*. In IEEE Transactions on Knowledge and Data Engineering, Vol. 12, No. 7. July/August.

Mahoney, S.M. and K.B. Laskey (1998) *Constructing Situation Specific Networks*. In Cooper, G. and Moral, S. (eds) Uncertainty in Artificial Intelligence: Proceedings of the Fourteenth Conference, San Francisco, CA: Morgan Kaufmann.

Laskey, K.B. and S.M.Mahoney (1997) *Network Fragments: Representing Knowledge for Constructing Probabilistic Models*. In Gieger, D. and Shenoy, P. (eds) Uncertainty in Artificial Intelligence: Proceedings of the Thirteenth Conference, San Francisco, CA: Morgan Kaufmann.

F. FREEMAN MARVIN, Executive Principal Analyst & Vice President

Mr. Marvin has over twenty-four years of experience as a senior group decision support facilitator, analyst, and consultant. His expertise is in the integration and application of organizational development, operations research, and electronic collaboration technologies. His approach to helping a group solve its problems blends his group facilitation skills, his knowledge of decision analysis methods, and his experience using computer tools and groupware in small group settings. He has facilitated numerous decision conferences and electronic meetings, developed decision models using a variety of software, and taught courses on group decision support for traditional facilitators, managers, and analysts. Mr. Marvin is a Certified Professional Facilitator (CPF) with The International Association of Facilitators.

EXPERIENCE

2001 – Present	Innovative Decisions, Inc., Executive Principal Analyst and Vice President
1999-2001	Decision Advantage, Principal
1993-1999	Litton-TASC, Senior Principal Member of the Technical Staff
1985-1993	Decision Science Consortium, Inc., Project Manager
1984-1985	Rockwell International, Operations Research Analyst
1977-1982	U.S. Army, Officer

EDUCATION

Masters in Public Policy, Kennedy School of Government, Harvard University, 1984
B.S. National Security and Public Affairs, U.S. Military Academy, 1977

SELECTED PUBLICATIONS AND PRESENTATIONS

Marvin, F.F., Klimack, W., Buckshaw, D., *Soft-Skills Workshop: Working with Collaborative Groups*, INFORMS Practitioner's Conference, Baltimore, MD, April 2008.

Marvin, F.F., Walther, J., and Hayes, S., *Using GroupSystems with simulation tools.* Face to Face Technology 2000 Conference, Chantilly, VA, 2000.

Marvin, F.F. *Decision support tools and applications.* George Washington University lecture in Individual and Group Decision-Making, 1999.

Hansen, G., and Marvin, F.F. *Using simulation for long range project planning.* International Business Process Summit Conference, Reston, VA, 1999.

Walther, J., Marvin, F.F., and Hayes, S.A. *Use of operations research models in validation of the BW improved response Template*. In Proceedings of the 67th Military Operations Research Society Symposium. West Point, NY: 1999. (Selected as best working group paper.)

Constantine, M.M., and Marvin, F.F. *Explicitness and discretion in government source selections.* In Proceedings of INFORMS Fall Symposium, 1996.

Adelman, L., Bresnick, T.A., Black, P.K., Marvin, F.F., and Sak, S.G. *Research with Patriot air defense officers: Examining information order effects*. Human Factors, June 1996, pp. 250-261.

LAURA McLAY, Senior Analyst

Dr. Laura McLay's expertise is in the field of operations research, with a particular focus on discrete optimization and algorithm design. Her research examines the interface between discrete optimization and decision analysis for risk applications in homeland security. One current area of her research designs and analyzes nuclear interdiction models using multi-layered, risk-based methods. Another area of her research explores issues in next-generation emergency medical service system design to optimize patient survival rates for emergency medical patients.

EXPERIENCE

2008- Present	Innovative, Decisions, Inc., Senior Analyst
2006- Present	VA Commonwealth Univ., Assistant Professor, Dept of Stat Sci & Ops Research
2007	Department of Defense, Distinguished Visiting Professor, SPORT
2002- 2006	Research Assistant, University of Illinois at Urbana-Champaign

EDUCATION

Ph.D.	University of Illinois at Urbana-Champaign, Industrial Engineering, 2006
M.S.	University of Illinois at Urbana-Champaign, General Engineering, 2001
B.S.	University of Illinois at Urbana-Champaign, General Engineering, 2000

SELECTED PUBLICATIONS

McLay, L. A., S. H. Jacobson, and A. G. Nikolaev, 2008. *"A Sequential Stochastic Passenger Screening Problem for Aviation Security,"* IIE Transactions (to appear).

McLay, L.A., 2009. *"A Maximum Expected Covering Location Model with Two Types of Servers,"* IIE Transactions (to appear).

McLay, L. A., S. H. Jacobson and J.E. Kobza, 2008. *"The Tradeoff between Technology and Prescreening Intelligence in Checked Baggage Screening for Aviation Security,"* Journal of Transportation Security (to appear).

Nikolaev, A. G., S. H. Jacobson, and L. A. McLay, 2007. *"A Sequential Stochastic Security System Design Problem for Aviation Security,"* Transportation Science 41(2), 182 – 194.

McLay, L. A., S. H. Jacobson, and J. E. Kobza, 2007. *"Integer Programming Models and Analysis for a Multilevel Passenger Screening Problem,"* IIE Transactions 39(1), 73 – 81.

McLay, L. A., S. H. Jacobson, and J. E. Kobza, 2006. *"A Multilevel Passenger Prescreening Problem for Aviation Security,"* Naval Research Logistics 53 (3), 183 – 197.

Jacobson, S. H., J. E. Virta, L. A. McLay, J. E. Kobza, 2005. *"Integer Program Models for the Deployment of Airport Baggage Screening Security Devices,"* Optimization and Engineering 6(3) 339 – 359.

Jacobson, S. H., L. A. McLay, J. E. Kobza, J. M. Bowman, 2005. *"Modeling and Analyzing Multiple Station Baggage Screening Security System Performance,"* Naval Research Logistics 52(1), 30 – 45.

WILLIAM D. MILLER, Executive Principal

Mr. Miller has thirty-four years of experience in both the conceptualization and engineering application of communications technologies, products and services. This experience has addressed both commercial and government sectors. These applications have fallen in the areas of resource allocation, R&D priorities, strategic planning, requirements definition, system modeling, system design, system acquisition, system development, system integration and system test. Mr. Miller has managed projects funded by Bell Laboratories, AT&T, Army and Navy development commands, and the National Security Agency. He is a 40 year member of the IEEE and a 14 year member of the International Council on Systems Engineering and was elected secretary of the latter organization for three terms (1996-1997, 2003-2004 and 2005-2006).

EXPERIENCE

2009	Innovative Decisions, Inc., Executive Principal Analyst
2006-2007	Innovative Decisions, Inc., Senior Operations Research Analyst
2002-Pres.	Stevens Institute of Technology, Industry Professor in the System Development and Operational Effectiveness (SDOE) Program
1998-Pres.	WDM Systems, Consultant in Communications Systems and Systems Engineering
1996-1998	AT&T, District Manager and Program Manager for Fixed Wireless Services
1983-1995	Bell Laboratories: Member of Technical Staff, Technical Manager in Federal Systems Business Unit from 1985
1979-1983	AT&T General Departments: Staff Manager, Project Manager and Product Manager, Business Marketing
1973-1979	Bell Laboratories: Member of Technical Staff, Network Planning Division

EDUCATION

M.S. Electrical Engineering, Pennsylvania State University, 1973
B.S. Electrical Engineering, Pennsylvania State University, 1971

SELECTED PUBLICATIONS AND PRESENTATIONS

B. R. LaCava, W. D. Miller and B. Yaged, *Last Trunk Usage Measurements in Step-by-Step Switching Systems*, BSTJ, Vol. 55, No, 10, 1553-1572, December 1976.

J.C. Lawson, W. D. Miller, G. P. McNamara, K. G. Oza and G. J. Ryva, *The Impact of Potential New Telecommunications Services on the Structure of the Local Network*, Proceedings of the International Symposium on Subscriber Loops and Services, Georgia Institute of Technology, Atlanta, March 1978.

Pamela J. Hurst and William D. Miller, *Trends in Undersea Fiber Optic Systems*, MTS/IEEE Oceans 2000, Providence, RI, September 2000.

William D. Miller, Gay McCarter and Craig O. Hayenga, Ph.D., *Modeling Organizational Dynamics*, IEEE International Conference on Systems of Systems Engineering, SMC, Los Angeles, CA, April 2006.

RUSSELL B. MOSIER, Senior Principal Analyst

Mr. Mosier has fourteen years of experience as a Naval Officer and decision analyst. As a Supply Corps Officer, he achieved surface qualification and led the supply department on several deployments. While at the Naval Management Consulting Service, Mr Mosier worked on studies that focused on Business Process Reengineering and instilling the use of performance metrics in order to make fact based management decisions. Mr. Mosier has applied decision analysis techniques in Analysis of Alternatives, Business Case Analyses, Trade Studies, Strategic Planning, and Resource Allocation studies for Joint and Service programs of all ACAT levels. His analyst toolkit includes Multiple Objective Decision Analysis techniques, linear programming, discrete event and Monte Carlo simulation, combat modeling, and spreadsheet cost modeling, among other techniques for delivering insights to his clients and executive decision makers. Mr. Mosier has experience as a facilitator and lead analyst as well as experience in both domestic and international consulting. He has led projects ranging from resource allocation for the Department of Energy Spent Nuclear Fuel Program to the development of a Strategic Roadmap for the Egyptian Navy. Mr. Mosier is belt certified in both Six Sigma and QFD.

EXPERIENCE

2007 – Present	Innovative Decisions, Inc., Principal Analyst
1999 – 2007	Booz Allen Hamilton, Inc., Senior Decision Analyst
1995 – 1999	Naval Management Consulting Service
1992 – 1999	US Naval Supply Corps Officer

EDUCATION

M.B.A.	George Mason University, 1999
B.S.	Computer Science, United States Naval Academy, 1992.

SELECTED PUBLICATIONS AND PRESENTATIONS

Mosier, Russell B., Newton, Harry, et al. "Using VFT and Optimization to Create Acquisition Portfolio", MORSS and INFORMS 2008

Mosier, Russell B., et al. "*Ground Vehicle Analysis A-Z*", instructional symposium given for Light Armored Vehicle Conference, 2004.

Mosier, Russell B. and Brassard, Daniel, "*Marginal Benefit and Cost of HA, PA, and DA for M1A1 MBT*", presentation to Ground Vehicle Survivability Symposium, Monterey, CA, February 2004.

Mosier, Russell B., "*Boat Requirements Trades Studies using Quality Function Deployment*", presentation to Multi-Agency Craft Conference, Little Creek, VA 2003.

AARON R. NEWMAN, Senior Principal Analyst

Mr. Newman has over 15 years of experience in information technology and aerospace systems engineering, with particular interest in intelligence, surveillance, and reconnaissance (ISR) applications. He has had the opportunity to provide modeling and simulation support to the Air Force and the Defense Airborne Reconnaissance Office (DARO), serve as Technical Advisor to the Director of the DARO, spend a year as a National Reconnaissance Office (NRO) Technology Fellow, work on data fusion issues for the National Security Agency (NSA), analyze the Air Force's time sensitive targeting process, study records management issues for the National Geospatial-Intelligence Agency (NGA), and support the development of the Joint Unmanned Combat Air System (JUCAS) at the Defense Advanced Research Projects Agency (DARPA). He has also been privileged to serve in multiple technical and business leadership roles at Adroit Systems, Inc., SRA International, Inc. and The Analysis Corporation. He is certified as a Project Management Professional and a Certified Information Privacy Professional/Government.

EXPERIENCE

2009-Present	Innovative Decisions, Inc., Senior Principal Analyst
2007-2009	The Analysis Corporation, Senior Director of Technology Solutions
2003-2007	SRA International, Inc., Director, Defense and Space Intelligence Programs; Technical Director, Civil Sector; Technical Director, Adroit C4ISR Center
1993-2003	Adroit Systems, Inc., Deputy Division Manager; Senior Information Technology Engineer; NRO Technology Fellow; Technical Advisor to the Director, DARO; Deputy Manager, Modeling and Simulation; Software Engineer

EDUCATION

Graduate Certificate, C3I Systems Engineering, George Mason University, 1996
M.S. Aeronautics and Astronautics, Massachusetts Institute of Technology, 1993
B.S. Aeronautics and Astronautics, Massachusetts Institute of Technology, 1992

SELECTED PUBLICATIONS AND PRESENTATIONS

Newman, Aaron, Steve Sokoly, Ian Brown, William Sullivan, John Jackson, and Robin Leonard. *"Improving Time Critical Targeting: A Process Analysis."* Proceedings of the 2003 Joint Advanced Weapons Systems Sensors, Simulation and Support Symposium, Monterey, CA, 2003.

Newman, Aaron R. *"Confidence, Pedigree, and Security Classification for Improved Data Fusion."* Proceedings of the Fifth International Conference on Information Fusion, Annapolis, MD, July 2002.

Newman, Aaron R. *"Confidence, Pedigree, and Security Classification for Improved Data Fusion."* Proceedings of the 2000 MSS National Symposium on Sensor and Data Fusion, San Antonio, TX, June 2000.

Diaz, Maj. Gerald and Aaron R. Newman. *"Simulating Airborne Reconnaissance Systems in a DIS Environment."* Proceedings of the 11th Workshop on Standards for the Interoperability of Distributed Simulations, Orlando, FL, September 1994.

HARRY N. NEWTON, Senior Principal Analyst

Dr. Newton has over 22 years experience applying modeling and simulation, operational analysis, and decision analysis to real world problems for the Air Force, the National Reconnaissance Office, and Lockheed Martin. He has lead modeling and simulation studies, authored analysis results summaries for senior leaders, and chaired working groups for the Military Operations Research Society. He has been awarded the NRO Director's Circle Award (2003), NRO Gold Medal (2005), and NRO Director's Team Award (2006). Dr. Newton holds an NRO Systems Engineering Level-3 Certification.

EXPERIENCE

2007 – Present	Innovative Decisions, Inc., Senior Principal Analyst
2005 – 2007	Lockheed Martin Integrated Systems & Solutions, Systems Engineering Principal
2002 – 2005	National Reconnaissance Office, Deputy Director, DDSE Analysis Group
1999 – 2002	Air Force College of Aerospace Doctrine, Research and Education, Chief, Air University Research Support Division
1990 – 1999	United States Air Force Academy, Chief, Faculty Research Division and Assistant Professor of Math Sciences
1985 – 1989	Air Force Logistics Management Agency, Operations Research Analyst

EDUCATION

Ph.D.	Industrial and Systems Engineering, Auburn University, 1996
MA	Mathematics, University of Texas at Austin, 1990
B.S.	Mathematics, Clemson University, 1985
B.S.	Computer Science, Clemson University, 1985

SELECTED PUBLICATIONS AND PRESENTATIONS

NRO Integrated Technical Investment Process, with Buddy Wood, Stephen Chambal, Terry Bresnick, and Chris Cullenbine, Military Operations Research Society (MORS) Symposium 73, June 2005.

Working Group Chair for Operational Contributions of Space Systems, MORS Symposium 73, June 2006 & June 2007.

Future Imagery Trade Space (FITS) Study, with David P. Yonika, MORS Symposium 67, June 2003

Downsizing Air Force Space Command's Headquarters by Value-Focused Thinking, with Robert M. Block, MORS Symposium 67, June 1999

HENRY H. PAIK, Senior Principal Analyst

Mr. Paik is an experienced laser and optical scientist and analyst who brings a wealth of knowledge and experience from having worked on numerous ground optical sights and weapons programs involving Army's Night Vision Electro-Systems Directorate, Air Force Armstrong Medical Research Office and Human Effective Center, and DARPA Project including Iron Curtain and Crosshair. He has supported large and small Non-lethal and lethal optical devices development and acquisition programs involving Human-in-the-loop laser/eye optical devices and human eye response to various laser frequency and intensity for the purpose of developing specialty filters and optics. In addition, Mr. Paik has supported DRPM/EFV, ARL/SPO, TRAC/WSMR and TACOM in developing optical system requirements, developed and analyzed multiple laser and EOIR sensor systems for Analysis of Alternatives and Cost Benefit Analysis. For Army's Night Vision Electro-System's Directorate, he has worked over 17 years in assisting and developing their premier human-in-the-loop target detection, identification recognition model called ACQUIRE+. For Air Force, he has done multi-year study of laser effects on combat pilots in a combat situation against the enemy's clandestine use of laser weapons and assisted in developing filters, protective goggles and HMDs (Helmet Mounted Displays) for F16 and F22 programs working together AF Armstrong Medical Lab and Human Effectiveness Center. Mr. Paik is an experienced program manager, scientist and analyst in the following technical areas having supported DARPA (17 years), Army (15), USMC (12), DIA (5) and OSD (3): EOIR Sensors/Optics (20), Lasers (15), RF/MMW (12), Ground Vehicle Survivability (17) and Modeling & Simulation.

EXPERIENCE

2009 - Present	Innovative Decisions, Inc., Senior Principal Analyst
1991 – 2008	Booz Allen Hamilton, Senior Associate
1988 - 1991	General Dynamics - Senior Engineer
1986 - 1988	Radiation Research Associates – Physicist

EDUCATION

Ph.D.	Quantum Electro Optics, University of North Texas, 1987
M.S.	Physics (Applied Optics and Lasers), University of Tennessee, 1986
B.S.	Physics, University of Dallas, 1984
J.D.	George Mason University, 1997

GREGORY S. PARNELL, Executive Principal Analyst

Dr. Parnell has over 30 years of experience as a practicing decision and risk analyst; university professor and researcher; and consultant to senior decision-makers. He is currently a professor of systems engineering at the United States Military Academy at West Point. He is a member of the Chief Technology Office and Information Assurance Panels of the National Security Agency Advisory Board and Chair of a National Research Council Study on Bioterrorism Risk Analysis for the Department of Homeland Security. He has published 100 publications including: a book, book chapters, refereed papers and conference proceedings. Dr. Parnell is an associate editor of the Decision Analysis journal. He serves as Past President of the Decision Analysis Society of the Institute for Operations Research/Management Science (INFORMS). Previous service includes President of the Military Operations Research Society (MORS) and editor of the Military Operations Research journal. He has received numerous awards for studies including Army's Wilbur Payne Award, INFORMS Koopman Prize and MORS Rist Prize. He was awarded the MORS Thomas Laureate in 2002 for technical contributions and service to the military operations research community. He was selected the 31st Fellow of MORS in for outstanding contributions to military operations research in 1997.

EXPERIENCE

2003 – Present	Innovative Decisions, Inc., Executive Principal Analyst
1999 – Present	U.S. Military Academy, Professor of Systems Engineering
1996 – 2003	Toffler Associates, Principal
1995 – 1999	Virginia Commonwealth Univ., Assoc/Asst Prof of Mathematical Sciences
1993 – 1995	Air Force Institute of Technology, Head of the Operational Sciences Dept.
1989 – 1993	Air Force Studies & Analyses Agency, Chief, Resource Analyses Division and Chief, Force Analyses Division

EDUCATION

Ph.D.	Engineering-Economic Systems, Stanford University, 1985
M.S.	Systems Management, University of Southern California, 1980
M.E.	Industrial & Systems Engineering, University of Florida, 1974
B.S.	Aerospace Engineering, State University of New York at Buffalo, 1970

SELECTED PUBLICATIONS AND PRESENTATIONS

Parnell, G. S., Driscoll, P. J., and Henderson D. L., Editors, **Decision Making for Systems Engineering and Management**, Wiley Series in Systems Engineering, Wiley & Sons Inc., 2008

Dillon-Merrill, R. L., Parnell, G. S., and Buckshaw, D. L., Logic Trees: Fault, Success, Attack, Event, Probability, and Decision Trees, *Wiley Handbook Of Science & Technology for Homeland Security*, John G. Voeller, Editor, Forthcoming 2008.

Parnell, G. S., Chapter 19, Value-Focused Thinking Using Multiple Objective Decision Analysis, *Methods for Conducting Military Operational Analysis: Best Practices in Use Throughout the Department of Defense*, Military Operations Research Society, Editors Andrew Loerch and Larry Rainey, 2007.

Parnell, G., Dillon-Merrill, R., and Bresnick, T. Integrating Risk Management with Security and Anti-terrorism Resource Allocation Decision Making, *McGraw-Hill Homeland Security Handbook*. 2006.

Ewing, P., Tarantino, W., and Parnell G., "Use of Decision Analysis in the Army Base Realignment and Closure (BRAC) 2005 Military Value Analysis," *Decision Analysis Journal*, Vol 3, No1, March 2006, pp. 33-49.

WILLIAM M. PATCHAK, Decision Analyst

Mr. Patchak has over three years of experience working in the US Intelligence Community (IC), with an emphasis on social network analysis and the provision of tactical analytic support to the US military and the IC. Additionally, he is familiar with and has implemented a variety of analytic tools and techniques to process and evaluate raw intelligence, and has assisted in operational planning and the development of program performance metrics. Mr. Patchak's experience working in the IC provides him with an understanding of how the IC's component agencies collaborate, and his academic background includes the study of game theory, econometrics, and international security.

EXPERIENCE

2009- Present Innovative Decisions, Inc., Decision Analyst
2006-2009 Central Intelligence Agency, Crime and Narcotics Center, Targeting Analyst

EDUCATION

B.A. Economics and International Relations, College of William and Mary, 2006

J. SCOTT SEMEL, Senior Principal Analyst

Dr. Semel has 9 years experience in projects using optimization, operations research, causal analysis, and expert systems. He has worked with military and government senior level managers to investigate modeling problems for operational purposes. He has several years of experience modeling infrastructure and network vulnerabilities and writes most software in MATLAB or Visual Basic. He performed decision analysis on new hypothesis generation techniques for applications in data mining. He developed stand-alone software using Java and MATLAB with C-compiler, fuzzy logic, statistics, optimization, and mapping toolboxes and developed data mining and classification techniques based on association rules, artificial neural networks, decision trees, and logistic regression. He aided in directing research for Air Force and Navy graduate students toward realistic application of theory, compared the use of hidden Markov models versus neurodynamic programming to code world event data, and modeled lines of communications vulnerabilities for various military exercises. He directed development of time-expanded quickest transshipment algorithm to model movement of military convoys. He developed method and code using deconvolution of brain potential maps with statistical and decision analysis on patients with mild traumatic brain injury versus normal patients, tested different wavelet compression algorithms for EEG data transmission across the Internet, and tested the value-added in ROI of additional electrode sampling.

EXPERIENCE

2006 – Present Innovative Decisions, Inc., Senior Principal Analyst
2000 – 2006 Science Applications International Corporation, Senior Mathematician
1998 – 2000 Joint Warfare Analysis Center, Operations Research Analyst

EDUCATION

Ph.D. Applied Mathematics, University of Louisiana at Lafayette, 1997
M.S. Applied Mathematics, University of Louisiana at Lafayette, 1992
B.A. Mathematics, University of Southern California, 1988

SELECTED PUBLICATIONS AND PRESENTATIONS

R.D. Sidman, J.S. Semel, T.D. Lagerlund, and M.R. Ford, "*The Effect of Reference-Electrode Choice on the Spatial Resolution of Topographical Potential Maps in the Discrimination of Deep Cerebral Sources*," J. Neuroscience Methods, 68 (1996) 175-184.

R.D. Sidman, C.H. Chu, T.D. Lagerlund, and J.S. Semel, "*Computing Environment and Tools for Network-Based Interactive Neuroscience Data Visualization*," (abstract) J. Clin. Neurophysiology, 13 (1996) 440-441.

J.S. Semel, R.D. Sidman, L. Ke, and T.D. Lagerlund, "*The Effect of Noise in Scalp-Recorded EEG and EP Data in Approximating Voltages on the Cortical Surface*," (abstract) J. Clin. Neurophysiology, 13, (1996) 453.

HEATHER N. SHAFFER, Analyst

Ms. Shaffer has more than 8 years of experience in development environment as a programmer and computer systems analyst. She has expertise and experience in all phases of project life cycle namely analysis, design, and coding, testing, training, and implementation phases. She possesses excellent communications skills and the ability to work in a team environment, as she has demonstrated these skills in several organizations and project supporting government clients. She has recent experience building databases and models to support program performance and pricing analyses.

EXPERIENCE

2009-Present	Innovative Decisions, Inc., Analyst
2005-2009	Caswell Developmental Center, Applications Developer
2001-2005	P.A. Department of Revenue, Applications Developer
1999-2001	P.H. Glatfelters, Applications Developer

EDUCATION

B.S. Business Administration (Business Information Systems), Shippensburg University, 1999

GARY R. SMITH, Senior Principal Analyst

Mr. Smith has over 25 years experience as a senior decision analyst and decision analysis software developer. He has developed decision analysis software tools that are widely used and that define the state of the art for multi-objective decision analysis. He also has wide experience as a decision analysis consultant, providing model development, group facilitation, problem definition and training to a wide variety of clients in business, government agencies and the military. Mr. Smith has worked with clients to define problems and scopes of work, developed methodologies, performed analysis and documented and presented results. Technical skills include decision and risk analysis, operations research methods, computer programming and others.

EXPERIENCE

2004 – Present	Innovative Decisions, Inc., Senior Principal Analyst
1984-Present	Logical Decisions, Principal
1978-1984	Project Decision Analyst, Woodward-Clyde Consultants
1975-1977	Staff Analyst, E. B. Cochran and Associates

EDUCATION

M.S. Engineering-Economic Systems, Stanford University, 1975
B.A. Applied Mathematics, University of California, Berkeley, 1974

SELECTED PUBLICATIONS AND PRESENTATIONS

Smith, G.R., *Logical Decisions Portfolio User's Manual,* Fairfax, VA, Logical Decisions, 2003-2008

Smith, G.R., *Logical Decisions User's Manual,* Fairfax, VA, Logical Decisions, 1991-2008

Gary R. Smith, James Scouras, Robert M. DeBell, (2009) "Qualitative Representation of Risk" chapter in Wiley Handbook of Science and Technology for Homeland Security, in press.

Donald L. Buckshaw, Dr. Gregory S. Parnell, Willard L. Unkenholz, Donald L. Parks and Gary R. Smith "A Comparison of Aggregation Techniques for Mission Oriented Risk and Design Analysis (MORDA) Attack Values", Innovative Decisions Technical Report 2004-03, Vienna, VA, 2004.

Smith, G.R., *Aggregation of Information in Large Projects Using Multi-attribute Utility Theory*, ORSA/TIMS Joint National Meeting, Philadelphia, Nov 1990.

Keeney, R.L., Sicherman, A., Smith, G.R., *Analyzing Radionuclide Emissions from Coal Fired Power Plants*, Interfaces, Sept.-Oct. 1985.

Keeney, R.L., Smith, G.R., *Evaluating the Implications of Possible MC&A Regulations on Employees in Nuclear Facilities,* IEEE Transactions on Systems, Man and Cybernetics, Nov. 1982.

Coffey C., Smith D., Smith, G.R., *Methods for Land Use Suitability Mapping*, Computer Graphics World, Sept. 1982.

Smith, G.R., *Textured Sets: An Approach to Aggregation Problems with Multiple Concerns,*. IEEE Transactions on Systems, Man and Cybernetics, April. 1980.

JOSEPH A. TATMAN, Executive Principal Analyst

Dr. Tatman has more than 22 years experience in the application, research and teaching of strategic planning, decision-making, design and analysis. Specializes in the application of Bayesian networks in a broad array of applications including the analysis of complex political-economic-military problems, analysis of risk in complex system development projects, and interactive, online web analysis tools. Developed the "risk net" concept for applying Bayesian networks to executive-level risk analysis of a major systems development program. Leads user utility assessments of prototype space and sensor systems using innovative structured process based on multi-attribute utility theory. Currently focusing on development of interactive, online analysis tools.

EXPERIENCE

2001 – Present	Innovative Decisions, Inc., Executive Principal Analyst and Vice President
2000-2001	Stratilus, President
1997-2000	Litton-TASC, Senior Principal Member of the Technical Staff
1999-2000	George Mason Univ, Adjunct Professor, Systems Eng and Ops Research Dept.
1992-2000	Marymount University School of Business, Adjunct Professor
1993-1997	Science Applications International Corporation, Senior Decision Analyst
1992-1993	Air Force Office of the Assistant to the Vice Chief of Staff for Policy.
1990-1992	Air Force Studies and Analyses Agency
1985-1990	Air Force Institute of Technology, Associate Professor

EDUCATION

Ph.D.	Engineering-Economic Systems, Stanford University, 1985
M.S.	Electrical Engineering, Air Force Institute of Technology, 1979
B.S.	Electrical Engineering, University of Notre Dame, 1978

SELECTED PUBLICATIONS AND PRESENTATIONS

Buede, D.M., Mahoney, S.M., Tatman, J.A. *Bayesian Networks*. Wiley Handbook Of Science & Technology for Homeland Security, John G. Voeller, Editor, 2008.

Sticha, P.J., Tatman, J.A., et al. *Reading the Behavior Signature: Predicting Leader Personality from Individual and Group Actions.* Submitted to Technosocial Predictive Analytics Conference, March 23-25, 2009, Stanford University.

Bolkcom, C.C., and Tatman, J.A. *US military R&D portfolio.* Jane's Information Group, 1997.

Tatman, J.A., and Shachter, R.D. *Dynamic programming and influence diagrams*. IEEE Transactions on Systems, Man, and Cybernetics, 20(2), March-April, 1990.

Tatman, J.A. *On being a bottom line, value adding organization*. Military Operations Research Society PHALANX, June 1997.

Tatman, J.A., "Injecting Market Dynamics into the Provision of Social Services. Submitted in application for 1994-1995 Whitehouse Fellows Program.

Tatman, J.A., et al. START II study. Proceedings, Military Operations Research Society Symposium, June 11-13, 1991. (Arms Control Working Group best paper award.)

Kabrisky, M., Tatman, J.A., et al. The First Cortical Implant of a Multiplexed Multi-Electrode Semiconductor Brain Electrode, AAIA (Dayton/Cincinnati), 1983.

MIKE TIMMONS, Analyst

Mr. Timmons has over 8 years of experience developing customized software solutions for government clients. He is experienced in HTML, Java, C++, C, Assembly, Visual Basic, VBA, ASP.net, Action Script and C#. During the past 5 years, his main focus has been database driven web applications using the ASP.net framework with C# as the scripting language. Additional areas of expertise include system administration, networking and databases.

EXPERIENCE

2009-Present Innovative Decisions, Inc., Decision Analyst
2005-2009 Think Tank Enterprises, Inc., Software Engineer
2001-2005 National Security Agency, Database Administrator

EDUCATION

B.S. Computer Information Systems, currently pursuing (expected completion date August 2011)
A.S. Computer Science, Anne Arundel Community College

JACOB W. ULVILA, Executive Principal Analyst

Dr. Ulvila has 27 years of experience applying decision analysis and related quantitative techniques to management problems in government and industry. His technical experience spans a wide range of areas including decision support systems, program planning and management, technology assessment, development, and implementation, strategic planning, risk assessment and management, computer security, software measurement and metrics, expert systems, testing and evaluation, and software management. His forty published articles have appeared in *Harvard Business Review*, *Operations Research, Decision Sciences, Computers and Operations Research, Omega: The International Journal of Management Science, IEEE Transactions, Journal of Forecasting, Expert Systems with Applications*, and elsewhere. As a Visiting Associate Professor at the University of Virginia, he taught graduate courses in decision analysis, operations research, and decision support systems. He won a Franz Edelman Management Science Achievement Award from the Institute of Management Sciences (now INFORMS) for his assessment of postal automation technology.

EXPERIENCE

2001 – Present Innovative Decisions, Inc., Executive Principal Analyst and Vice President
1991 – 2001 Decision Science Associates, Inc., Executive Vice President and Principal
1980 – 1991 Decision Science Consortium, Inc., Executive Vice President
1982 – 1983 University of Virginia, Visiting Associate Professor of Business Administration
1974 – 1980 Decisions and Designs, Inc., Decision Analyst

EDUCATION

D.B.A. Mathematical Analysis and Managerial Decision, Harvard University, 1979
M.B.A. Finance, University of Michigan, 1974
B.S. Electrical Engineering, University of Illinois, 1972

SELECTED PUBLICATIONS AND PRESENTATIONS

Gaffney, J.E., Jr. and Ulvila, J.W. *Evaluation of intrusion detectors: a decision theory approach.* Proceedings of the 2001 IEEE symposium on security and privacy, Los Alamitos, CA: IEEE Computer Society, 2001, pp. 50-61.

Fryback, D.G., Chinnis, J.O., and Ulvila, J. *Bayesian cost-effectiveness analysis: An example using the GUSTO trial*. International Journal of Technology Assessment in Health Care, 17 (1), 2001, pp. 83-97.

Ulvila, J.W., Boone, J.M., Gaffney, J.E., Jr., Notargiacomo, L., and Welke, S.R. *A framework for information assurance attributes and metrics* (Technical Report 01-1). Vienna, Virginia: Decision Science Associates, Inc., 2001.

Ulvila, J.W. and Gaffney, J.E., Jr. *A management tool for software risk and uncertainty*. Proceedings of the Planning, Budgeting, and Estimating Symposium. Mt. Laurel, NJ: PRICE Systems, 2001.

ALAN WARSAW, Senior Analyst

Mr. Warsaw has over 16 years of experience in applying software engineer principles to real world problems for the Air Force, the Pentagon, NATO, the National Security Agency and other government agencies. As a software engineer, he led the development of the Mission Analysis Tracking and Tabulation System in support of the Kosovo Conflict. This relational database system provided analysts with a tool capable of linking battle damage imagery to mission reports, providing operation research analysts with the ability to immediately analyze campaign effectiveness in support of the war fighter. He also has over nine years of experience developing web-based applications using advanced web technologies like ASP .net, Flex3 and ColdFusion. As Systems Development Technical Lead for Headquarters Air Force Software Engineering Directorate, Mr. Warsaw led the development of a multi-faceted web-based Presidential Advance Agent Scheduling System used to support presidential travel.

EXPERIENCE

2009 – Present Innovative Decisions, Inc., Senior Analyst
2008 – 2009 Think Tank Enterprises, Inc., Software Engineer
2004 – 2008 National Security Agency, Lead Software Engineer
2002 – 2004 Air Force Pentagon Communications Agency, Technical Lead
1998 – 2002 Warrior Preparation Center, Chief Software Engineering Branch
1994 – 1998 Andrews Air Force Base, Software Developer

EDUCATION

B.S. Computer Studies, currently pursuing (expected completion date August 2010)
A.S. Computer Science Technology, Community College of the Air Force

DARRIN L. WHALEY, Principal Analyst

Mr. Whaley has 20 years experience as an operations research analyst and Marine Corps artillery officer. As an analyst, Mr. Whaley has applied a wide array of analytical techniques to a diverse set of challenges. He has applied optimization techniques to military recruiting, training, manpower, and equipment fielding. Mr. Whaley has applied combat modeling to Analysis of Alternatives for equipment procurement. He has applied multi-objective decision analysis to theater security cooperation, alternative combat system benefit comparison, procurement quantity benefit comparison. Mr. Whaley utilized data analysis to develop combat system requirements and to compare armored protection provided by fielded combat vehicles. As an artillery officer, Mr. Whaley served as a battery commander and in a variety of other positions in artillery battalions and in an Air Naval Gunfire Liaison Company. His operational experience includes combat duty in Operations DESERT STORM, ENDURING FREEDOM, and IRAQI FREEDOM.

EXPERIENCE

2009 – Present	Innovative Decisions, Inc., Principal Analyst
2007 – 2009	Operations Research Analyst, Marine Corps Warfighting Laboratory
2004 – 2007	Officer-in-Charge, 5th Air Naval Gunfire Liaison Company
2001 – 2004	Operations Research Analyst, Marine Corps Studies and Analysis
1989 – 2001	Marine Corps artillery officer, multiple command/staff assignments

EDUCATION

M.S. Operations Research, Naval Postgraduate School, 2001
B.S. Ocean Engineering, United States Naval Academy, 1989

SELECTED PUBLICATIONS AND PRESENTATIONS

Zaffram, C., Whaley, D., Jennings, L., Landry, P., Miller, S., *Estimation of Marine Infantry Rifle Squad Load Weight*. Presented to 73rd Military Operations Research Society Symposium, Westpoint, NY, June 2005.

Whaley, D. L., *Advanced Amphibious Assault Vehicle Acquisition Objective Study*. Studies and Analysis Division, Quantico, VA, April 2004.

Lepson, M. D. and Whaley, D. L., *Assessment of USMC Horn of Africa Theater Security Cooperation*. Presented to 70th Military Operations Research Society Symposium, Leavenworth, KS, June 2002.

Whaley, D. L., *Scheduling the Recruiting and MOS Training of Enlisted Marines*. Naval Postgraduate School, Monterey, CA, September 2001.

RONALD F. A. WOODAMAN, Principal Analyst

Mr. Woodaman served 20 years as a Marine Corps infantry officer in a variety of roles: combat, special operations, training, and operations analysis. Since retiring from the Marine Corps in 2007, he has focused on counter-IED research for the Joint IED Defeat Organization, specifically counter-IED resource allocation and modeling of IED. His experience as an operations research analyst covers diverse application areas: amphibious operations, aviation requirements, business process improvement, combat assessment in Operation IRAQI FREEDOM, combat identification, cost analyses, counter-IED, defense acquisition analyses of alternatives, naval facilities support and services, operational logistics, and technology transition. His analytical proficiencies include analytical combat models, cost-benefit analysis, decision analysis, discrete-event simulation, mathematical programming, portfolio analysis, probability models, statistics and data analysis, stochastic processes, and survey questionnaire methods. He is a certified defense acquisition professional in Systems Engineering DAWIA Level III with a TOP SECRET clearance. He is fully fluent and literate in Spanish.

EXPERIENCE

2008-present	Principal Analyst, Innovative Decisions, Inc.,
2007-present	Research Associate, C4I Center, George Mason University
2007-2008	Principal OR Analyst, Concurrent Technologies Inc.,
2004-2007	Senior OR Analyst, Econ & Business Analysis Team, Marine Corps Systems Command
2000-2004	OR Analyst, Marine Corps Studies & Analysis Division
1987-2000	diverse USMC operational, training, and educational assignments

EDUCATION

Ph.D.	Studies, SE/OR, George Mason University, Fairfax, VA, projected 2009.
M.S.	Operations Research, Naval Postgraduate School, Monterey, CA, 2000.
B.S.	Systems Engineering, United States Naval Academy, 1987.

SELECTED PUBLICATIONS AND PRESENTATIONS

Woodaman, R.F. *Analytical Support to MARCENT during Operation IRAQI FREEDOM*. 72nd Military Operations Research Society Symposium, U.S. Military Academy, June 2004.

Woodaman, R.F. *Capital Budgeting, Partial Buys, Alternative Utility: Keys to a Better POM?* 74th Military Operations Research Society Symposium, U.S. Air Force Academy, June 2006.

Calhoun, T.R., and Woodaman, R.F. Strategic Business Team Assessment. 74th Military Operations Research Society Symposium, U.S. Air Force Academy, June 2006.

Bresnahan, S., and Woodaman, R.F. *Cost Risk Analysis of Satellite Bandwidth Services.* Joint ISPA/SCEA International Conference, New Orleans, LA, June 2007.

Kolesar, P.J., Woodaman, R.F., and Leister, K.G. *Time Series Analysis of Improvised Explosive Device Incidence*. C4I Center Technical Report, George Mason University, Sept 2008.

Woodaman, R.F., and Leister, K.G. *Modeling IEDs as Compound Poisson Arrival Processes on Arcs of the MSR Network.* C4I Center Technical Report, George Mason University, Sept 2008.