Probability Management

2019 Annual Report

ProbabilityManagement.org

A letter from our Executive Director

ProbabilityManagement.org has moved into an era of collaborations.

Last year, we developed a SIPmath implementation of the Open FAIR™ risk taxonomy with The Open Group.

We assisted the Government Finance Officers Association in bringing quantitative risk management to a number of municipalities.

We were involved in training and support for the SIPmath tools at Chevron, Lockheed Martin, and PG&E.
Recently I have been working with Connor McLemore and Shaun Doheney in the area of military readiness. For example, if unit A has a 60% chance of accomplishing the mission and unit B has a 70% chance, then if we send them both, they can't have a 130% chance. However, current representations of readiness can't tell us what the chance is.

But the most profound collaboration has involved integrating the SIPmath Standard with Tom Keelin's Metalog System for matching distributions to data and Doug Hubbard's Random Number Management Framework. I am proud to announce that Tom has recently joined ProbabilityManagement.org as Chief Research Scientist, and together, the three of us have developed the concept of "virtual" SIPs, which represent a quantum leap in the discipline of probability management.

Virtual SIPs are created by driving Metalogs, which can compactly represent nearly any continuous probability distribution, with the latest HDR pseudo-random number generators from Doug Hubbard. This results in vast storage savings for SIP libraries and offers many other advantages. Virtual SIPs have already been applied in an industrial setting and this idea has the potential to be easily adopted by any organization wishing to formally model uncertainty.

As always, we are indebted to our sponsors, partners, and supporters, and we are especially thankful to Loring Ward for providing the venue for this year's conference. 2019 is shaping up to be our biggest year yet, as our resources, recognition, and range of opportunities continue to expand.

Sincerely,

Sam L. Savage

Our Sponsors and Affiliates

Probability Management

We gratefully acknowledge financial support from the following organizations.

Sponsors

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LONE STAR The Right Answer

WELLS FARGO

Hubbard Decision Research

LORING WARD
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Foundation for Creativity in Dispute Resolution

Computerlaw Group LLP

Affiliations

UNIVERSITY OF CAMBRIDGE Judge Business School | Centre for Risk Studies

Research Partner

Government Finance Officers Association

Technology Partner

TECHNOLOGY PARTNERZ

2018 Accomplishments

In 2018, ProbabilityMangement.org expanded outreach and education activities thanks to a boost in corporate sponsor funding and strong attendance at our conference and workshops. Key collaborations with partners continue to increase SIPmath capabilities. Below are highlights of our activities.

Collaboration with Tom Keelin on the Metalog distribution

In 2018 ProbabilityManagement.org began a collaboration with Tom Keelin, a PhD Decision Analyst with 40 years of professional experience. Keelin has developed a general analytical approach for matching continuous PDF and inverse CDF functions to data. (http://metalogdistributions.com/)

Some highlights of the collaboration appear below.

- Keelin and Sam Savage developed an approach using Metalogs to create analytical expressions for the sums of IID random variables for a wide class of distributions. These include lognormals and even triangulars.
- Savage developed an approach to coupling Metalogs to Doug Hubbard's HDR pseudo random number generator to create virtual SIPs, which can create libraries with a miniscule size compared with those for actual SIPs. Research continues into preserving statistical dependence to create virtual SLURPs.
- Keelin was appointed Chief Research Scientist at ProbabilityManagement.org, bringing the organization additional prestige.

SIPmath Modeler Tools for Excel

The SIPmath Modeler Tools leverage the native Excel Data Table function to bring interactive Monte Carlo simulation to all Excel users. The models built with these tools do not require the tools to run in Excel.

- The "Chance of Whatever" button was added to all versions of the tools. This button creates a COUNTIF formula in Excel to determine the probability that an output cell exceeds or falls below a user specified limit.
- Three term SPT Metalog was added to all versions of the tools. This is one of the simplest forms of the Metalog distribution, of which the full family will be implemented in 2019.
- Sums of IID triangulars and lognormals with Metalogs was added to the Enterprise Version of the SIPmath Modeler Tools. For example, you can create a poisson random input, N, and create a single cell containing the sum of N lognormals or triangulars.

SIPmath Standard

In the SIPmath Standard, uncertainties are communicated as data arrays called SIPs (Stochastic Information Packets).

- Code was developed to write the SIPmath XML format to and from the R statistical package.
- A first generation Excel SIP Library Standard based on the Metalog and HDR Uniform generator was developed. This has two benefits:
  - Orders of magnitude smaller file size.
  - Control of statistical independence through unique seeds to the HDR Uniform generator.

Website, Blog and Social Media

We migrated our website to Squarespace in January 2018 which allows us greater flexibility in adding and updating content. Sam Savage launched a blog called, "Limbic Analytics: devoted to connecting the seat of the intellect to the seat of your pants." ProbabilityManagement.org's LinkedIn group now has more than 900 members and the newsletter goes out to more than 8,200 contacts. The LinkedIn group is a place where professionals share models and best practices and we answer questions from SIPmath practitioners.

Google Grant and AdWords

A special thank you to Rebecca Brafman of Chevron for applying for a Google Grant on our behalf. We now have a grant for Google AdWords campaigns to raise probability management's visibility.

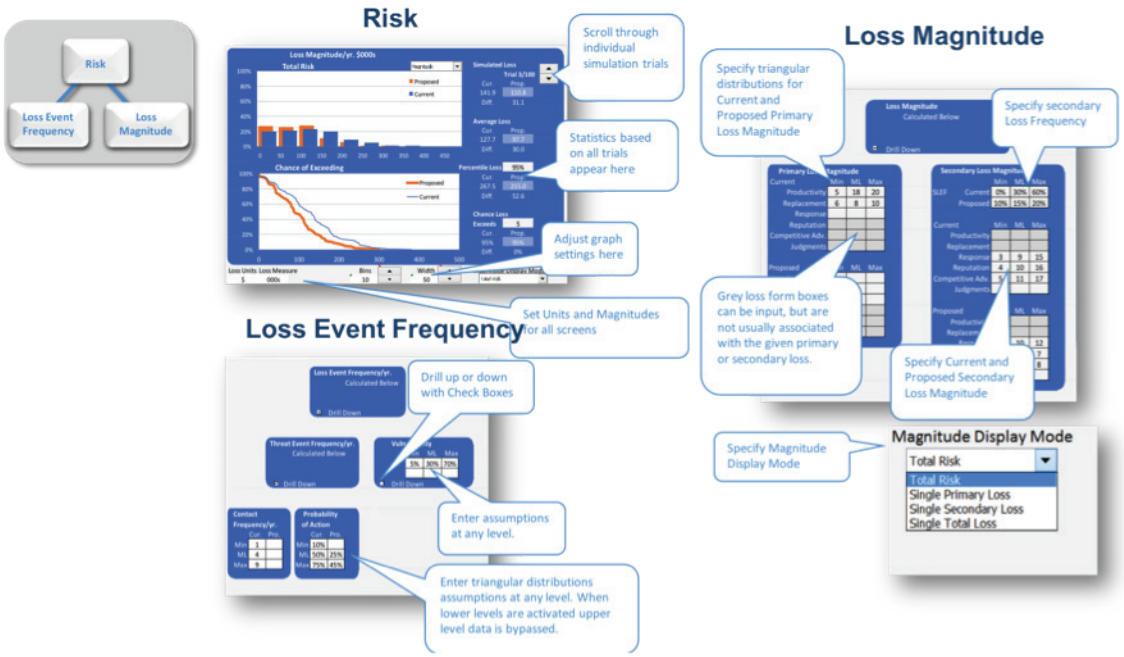
Government Finance Officers Association

ProbabilityManagement.org supported Shayne Kavanagh, Senior Manager of Research for the Government Finance Officers Association, in providing risk management consulting to the following cities: Newport Beach, CA; Douglas County, CO; and Mesquite, TX. This work will continue with other cities in 2019.

Collaboration with OpenGroup on the Open FAIR™ Standard

The Open Factor Analysis of Information Risk (FAIR) Taxonomy is a probabilistic approach to managing cyber threats. Working with the OpenGroup, ProbabilityManagement.org developed an Excel based implementation of this approach. This made use of the pioneering work of Tom Keelin and Sam Savage on representing sums of IID random variables with Metalog distributions.

See https://blog.opengroup.org/2018/03/29/introducing-the-open-group-open-fair-risk-analysis-tool/



ProbabilityManagement.org Conference

On March 27 & 28, 2018, Loring Ward hosted our Annual Conference on Standardizing Risk in San Jose, CA. The conference highlighted the collaboration with FAIR and introduction of the Metalog into the SIPmath Tools.

ProbabilityManagement.org Workshop

On September 12 & 13, 2018, Lockheed Martin Aeronautics hosted a two-day workshop in Fort Worth, TX. Sam Savage presented Probability Management: A Cure for the Flaw of Averages and Doug Hubbard presented Enterprise Risk Management.

Lockheed Martin Aeronautics

ProbabilityManagement.org engaged in extensive training at Lockheed Martin Aeronautics in Fort Worth, TX, working with teams led by Phil Fahringer and David Frye to help them further develop their community of practice. This work included in-person training and regularly scheduled webinars hosted by Sam Savage and Brian Putt.

2018 Accomplishments

Spring/Fall Webinar Series: April-June and September-November

ProbabilityManagement.org offered a Spring and a Fall webinar series on a variety of topics. Sam Savage along with a number of guests hosted each webinar.

- Sam Savage - Intro to SIPmath, SIPmath Workbench.
- Brian Putt - SIPmath Modeler Tools Basics.
- Phil Fahringer - Interactive Decision Support at Lockheed Martin using Probability Management Concepts.
- Tom Keelin - The Metalog Distributions.

Additional Webinars

- January 22, 2018 - Brian Putt delivered a webinar to GE employees.
- July 17, 2018 - Sam Savage presented a Flaw of Averages webinar to Chevron employees.
- August 2, 2018 - Savage presented to Chevron's Decision Analysis Leadership Team.
- September 17, 2018 - Savage delivered a Stanford webinar previewing his course in Project Risk Analysis in Stanford's Department of Civil and Environmental Engineering. This course applies the discipline of probability management to such problems as risk return tradeoffs in R&D portfolios and rolling up operational risk across assets such as gas pipelines.

Presentations by Sam Savage on behalf of ProbabilityManagement.org

- February 13, 2018 - FAIR Institute San Francisco Chapter meeting hosted by LendingClub.
- February 27, 2018 - Big Data Meets Risk Management Talk and Networking Reception in San Jose hosted by Loring Ward.
- June 18, 2018 - 86th MORS Symposium: Conducted a tutorial "Interactive Simulation with SIPmath: Creating Simulations in Native Excel."
- June 19, 2018 - 86th MORS Symposium: Presented paper with Shaun Doheney and Connor McLemore on "Scenario-Based Portfolio Planning with Uncertainty: A Model for Budgetary Planning."
- October 30, 2018 - Presented as part of panel about careers for Risk Analysts at the FAIR Institute San Jose Chapter meeting at San Jose State University.

OpenGroup Meetings

ProbabilityManagment.org attended the following meetings to promote The Open Group Open FAIR Risk Analysis Tool based on SIPmath.

- Sam Savage and Danny O'Neil attended The Open Group Conference in January 2018 in San Diego, CA.
- Danny O'Neil represented ProbabilityManagement.org at the Open Group Conference in Houston, TX in July 2018.

Media Coverage

Please visit the "News" page of ProbabilityManagement.org to read the following articles:

- September 2018 - Tom Keelin named Chief Research Scientist for ProbabilityManagement.org
- August 29, 2018 - "The flaw of averages: Why it's risky to assume a fixed rate of return in your financial projections" published on Morningstar.ca
- July 2018 - "A UAV Case Study with Set-based Design" featuring SIPmath presented at 28th Annual INCOSE International Symposium
- May 9, 2018 - "How to profit from probability management" published on BAI.org
- March 29, 2018 - Introducing the Open Group Open FAIR™ Risk Analysis Tool

2019 Proposed Activities

In 2019, ProbabilityManagement.org will continue to improve the communication and calculation of uncertainty through education, best practices, and our open SIPmath™ standard.

Our 2019 goals include:

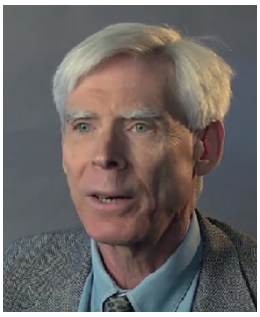
- Fully integrate SIPmath, Metalog, and HDR standards.
- Further integration of Metalogs in SIPmath Tools.
- Continue our work with the Government Finance Officers Association, including work with the cities of East Palo Alto, CA and Denver, CO.
- Continued training and development at Lockheed Martin Aeronautics.
- Develop a plan for Google AdWords to enhance probability management visibility.
- Offer a spring webinar series.
- Continue education and outreach through regular blog posts and newsletters to our subscriber list.

Our 2019 planned activities include:

- January 8 - Sam Savage to present to Investment Strategy Team at Loring Ward.
- January 23 - Savage to present at the George Shultz Roundtable at Stanford's Hoover Institution.
- February 21 - Savage and Matthew Raphaelson will present "Probability Management: A Cure for the Flaw of Averages," a free lecture and networking reception hosted by PG&E in San Francisco, CA.
- February 2019 - Savage and Tom Keelin will offer guest webinars for Hubbard Decision Research.
- March 7-8 - Savage to present to Decision Analysis Affinity Group (DAAG) in Denver, CO.
- March 25-27 - Probability Management Annual Conference in San Jose, CA. The theme is Applications of Probability Management.
- April 14-16 - Savage to present with Shaun Doheney at INFORMS Business Analytics Conference in Austin, TX.
- June 17-19 - MORS Symposium in Colorado Springs, CO. Savage is currently writing two papers with Shaun Doheney and Connor McLemore on military readiness.
- December 8-11- Savage is co-chair for Risk Analysis Track of Winter Simulation Conference (WSC) INFORMS meeting in Maryland.

Board of Directors

Sam L. Savage
Executive Director and Chairman of the Board



Sam L. Savage led the development of the open SIPmath standard for storing probability distributions as auditable data. Sam is also the author of *The Flaw of Averages: Why We Underestimate Risk in the Face of Uncertainty*, and is a Consulting Professor at Stanford University.

After receiving his Ph.D. in computational complexity from Yale University in 1973, Sam spent a year in the Mathematics Department at General Motors Research Laboratory, and then joined the Management Science faculty of the University of Chicago Graduate School of Business. Here he discovered that an Algebraic Curtain separated the bulk of his management students from management science. In 1985, Dr. Savage led the development of software called What'sBest!®, which coupled Linear Programming to Lotus 1-2-3. The package won PC Magazine's Technical Excellence Award in 1986. Since then, Sam has continued working to bring analytical tools to managers in an algebra-free environment. In 1990, Sam moved to Stanford, where he teaches Management Science in the Engineering School. He has been a Visiting Professor at Northwestern University's Kellogg School of Business and the Naval Postgraduate School in Monterey, and is a Fellow of the Judge Business School at the University of Cambridge.

Dr. Savage consults and lectures extensively to business and government agencies through his consulting firm, SIPmath Group, an AnalyCorp venture, and serves as an expert witness.

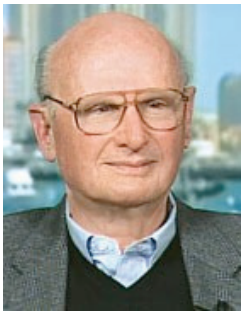
Michele Hyndman
Associate Director and Board Member

Michele Hyndman has over 20 years of public relations and communications experience. She has worked in broadcast television, at a public relations firm and was the public relations manager at Stanford University Medical School Blood Center for over 10 years. Michele works effectively and cooperatively with people at all levels of an organization, media and industry contacts, and vendors to achieve successful branding, media, marketing, advertising and communications plans. In 2012, she launched MMH Communications to leverage her experience and industry contacts to help other nonprofits and small businesses thrive in a highly competitive landscape. Michele is inspired by organizations that help to improve the lives of others.

As Associate Director, Michele manages communication and marketing strategies, coordinates outreach to corporate sponsors and partners, and oversees Probability Management conferences and events.

Michele holds a Bachelor of Arts (BA) in Communication and Media Studies from California State University, Sacramento.

Harry Markowitz
Board Member



Dr. Markowitz has applied computer and mathematical techniques to various practical decision making areas. In finance: in an article in 1952 and a book in 1959, he presented what is now referred to as MPT, "modern portfolio theory." This has become a standard topic in college courses and texts on investments, and is widely used by institutional investors and financial advisors for asset allocation, risk control and attribution analysis. In other areas: Dr. Markowitz developed "sparse matrix" techniques for solving very large mathematical optimization problems. These techniques are now standard in production software for optimization programs. Dr. Markowitz also designed and supervised the development of the SIMSCRIPT programming language. SIMSCRIPT has been widely used for programming computer simulations of systems like factories, transportation systems and communication networks.

In 1989 Dr. Markowitz received The John von Neumann Award from the Operations Research Society of America for his work in portfolio theory, sparse matrix techniques and SIMSCRIPT. In 1990 he shared the Nobel Prize in Economics for his work on portfolio theory. Dr. Markowitz is the principal of Harry Markowitz Company. He is also an adjunct professor at the Rady School of Management, UCSD.

Our Team

Tom Keelin
Chief Research Scientist

Tom Keelin has combined a career in decision analysis practice with innovations to advance the field. As Chairman of Millennial Capital, LLC, he has served as general partner for multiple successful real estate funds. He leads strategic decision-making for acquisitions, operations, dispositions, and portfolio management – using decision-analysis, modeling and probabilistic-simulation. Tom is also a founder and Managing Partner of Keelin Reeds Partners, a management consulting firm that provides strategy and decision analytic services. In that role, he has developed asset valuation, portfolio management, and business-development-deal-terms methodologies that have enabled greater success for dozens of client companies. In both roles, he recognized the need for better continuous-uncertainty representations and developed and published new probability distributions accordingly.

Previously, as Worldwide Managing Director of the Strategic Decision Group, he led the client work for and co-authored the Harvard Business Review article "How SmithKline Beecham Makes Better Resource Allocation Decisions" (Mar-Apr '98). Through that work, he and his colleagues invented the portfolio-management standard which subsequently was adopted widely across life-sciences industry. Earlier, with Decision Focus, Inc, Tom developed the Over/Under Capacity Planning model, which effectively addressed demand uncertainty in electric power system planning and was widely adopted by many utilities and regulatory commissions over the following decade. Tom is a Fellow of the Society of Decision Professionals, and a founder and director of the Decision Education Foundation, a not-for-profit organization that helps youth learn good decision skills for life. Tom holds three degrees from Stanford University: BA in Economics and MS and PhD in Engineering-Economic Systems.

June Klein
Chief Financial Officer

June Klein attended University of California, Santa Barbara, where she obtained her bachelor's degree in Business Economics in 1980, and was selected as the Outstanding Graduating Senior in Economics. June became a Certified Public Accountant in California in 1983. She was awarded an MBA focusing on Management of Technology from the Walter A. Haas School of Business at U.C. Berkeley in 1988. In 2010, June received her Doctorate in Education at Fielding Graduate University through their Educational Leadership and Change program. In 2016 she was awarded Nonprofit CFO of the Year from the Silicon Valley Business Journal.

Melissa Kirmse
Director of Operations

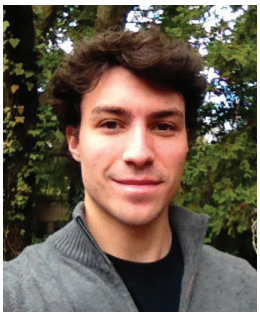
Melissa Kirmse has over 20 years of project coordination, administrative, and technical writing experience. She has worked for various tech companies including Microsoft and TiVo. Together with Dr. Sam Savage, she coauthored the article "Probability Management 2.0," which appeared in the October 2014 issue of *OR/MS Today*. Melissa was promoted to Director of Operations at ProbabilityManagement.org in 2014. She set up an accounting system for the company and manages the day-to-day accounting. She manages event planning, corporate communications, and logistics. Melissa graduated summa cum laude from the University of Maryland with a degree in Communication Studies.

Dave Empey
Director of Software Development

Dave Empey has more than 20 years of experience with Monte Carlo simulation. He has worked with Dr. Sam Savage since the early 1990's, and developed Monte Carlo and decision tree software for Anadarko Petroleum Corporation, the Bessemer Trust, the NSA, Royal Dutch Shell, and Lockheed Martin, among others. With Dr. Savage, Dave has developed software for creating and manipulating Stochastic Information Packets (SIPs), and a compressed form of SIP representation called Distribution Strings.

Our Team and Committee Chairs

Mary Claire Meijer
Executive Assistant
Mary Claire Meijer supports the Executive Director and other team members by managing internal and external communications, coordinating travel, and organizing speaking and meeting schedules that are essential for the company to promote its mission. She has a background in senior care housing, and while raising her family was actively involved in numerous volunteer efforts including multiple years of directing a large volunteer team for a 200+ member high school cross country and track program. Mary Claire graduated with a Bachelor of Arts Degree in Health and Society from Brown University.



Jordan Alen
Technology Coordinator

Jordan Alen is responsible for the implementation and management of the website. Jordan has worked closely with Sam on projects ranging from the DARPA proposal abstract to the events scheduled at conferences. His interests include astrophysics and Toastmasters meetings.

Shaun Doheney
Chair of Resources and Readiness Applications

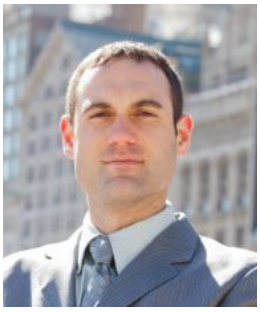
Shaun Doheney is a Principal Analyst at Innovative Decisions, Inc. He holds a B.S. in Mathematics, an M.S. in Operations Analysis, and a Graduate Certificate in Data Analytics. As a Marine Corps Lieutenant Colonel (Retired) and Marine Operations Research Analyst, he performed qualitative and quantitative analyses and evaluations across major DoD decision support processes. His past projects featured optimization, multiple-objective decision analysis, quantitative risk analysis, discrete event simulation, and survey design and analysis. He has applied these techniques to force development system processes; wargaming; concept-based assessment; capabilities-based assessment; operational risk analysis; cost-benefit analysis; manpower and human resource development processes; and assignment and schedule optimization. His more recent efforts have focused on guiding adoption of analytic methods and optimizing allocation of resources across operational scenarios to inform portfolio funding decisions over a multi-year horizon.

Doug Hubbard
Chair, Decisions and Measurements

Mr. Hubbard is the inventor of the Applied Information Economics (AIE) method and founder of Hubbard Decision Research (HDR). He is the author of one of the best-selling business statistics books of all time, *How to Measure Anything: Finding the Value of Intangibles in Business*. He is also the author of *The Failure of Risk Management: Why It's Broken and How to Fix It*, and *Pulse: The New Science of Harnessing Internet Buzz to Track Threats and Opportunities*. He has sold over 100,000 copies of his books in five different languages and his books are used in courses in over a dozen major universities.

Mr. Hubbard's career has focused on the application of AIE to solve current business issues facing today's corporations. Mr. Hubbard has completed over 95 risk/return analyses of large, critical projects, investments and other management decisions in the last 20 years. AIE is the practical application of several fields of quantitative analysis including Bayesian analysis, Monte Carlo simulations, and many others. Mr. Hubbard's consulting experience and financial analysis totals over 27 years and spans many industries including pharmaceuticals, insurance, banking, utilities, cyber security, interventions in developing economies, mining, federal and state government, entertainment media, military logistics, and manufacturing.

Shayne Kavanagh, Chair, Government Finance Applications



Shayne Kavanagh is the Senior Manager of Research for Government Finance Officers Association. Shayne has been developing the practice and technique of long-term financial planning for local government. In addition to working with local governments in a consulting capacity on financial planning and risk analysis, he is the author of a number of publications on financial planning and budgeting.

Lieutenant Commander Connor McLemore Chair, National Security Applications

Lieutenant Commander Connor S. McLemore is a designated E-2C Naval Flight Officer. He was deployed to the Persian Gulf, flying in support of Operations Southern Watch, Iraqi Freedom and Enduring Freedom, and to the Indian Ocean and Western Pacific in support of the humanitarian Operation Unified Assistance and was the lead Navy Air Officer in the Joint Task Force Headquarters in support of Philippine Typhoon relief, Operation Damayan.

Lieutenant Commander McLemore graduated from the U.S. Naval Academy with a Bachelor of Science in Mechanical Engineering. He completed an Operations Research Masters Degree at the Naval Postgraduate School in Monterey, California. His NPS thesis was awarded the Military Operations Research Society Stephen A. Tisdale Graduate Research Award. He also completed a National Security and Strategic Studies Masters Degree, awarded with distinction, from the Naval War College in Newport, Rhode Island. He is a graduate of the Navy Fighter Weapons School (Topgun) and Naval Strike and Air Warfare Center's Advanced Mission Commander Course (AMCC).

Lieutenant Commander McLemore is an Operations Research Analyst and Section Head at the Pentagon.

Brian Putt, Chair, Energy Practice

Brian is an Independent Consultant applying probabilistic analysis to Decision Quality practices with over 40 years' experience in Oil and Gas operations and development. He has been using and promoting the use of SIPmath for the past five years. He was instrumental in promoting the use of SIPmath at Chevron as the Organization Capability Manager for Upstream Oil & Gas before his retirement from Chevron in 2016. He has given presentations about Decision Quality to both industry groups and Universities that have included examples of SIPmath applications. He conducts training classes on the SIPmath Tool Bar. He has developed a series of more than 40 YouTube videos discussing the use and application of SIPmath. Brian has provided valuable support in the design and testing of SIPmath over the past several years. He holds a BA in Economics from Claremont McKenna College, BS in General Engineering Stanford University, and a MS in Operations Research from Stanford University.

Matthew Raphaelson, Chair, Banking Applications

Matthew Raphaelson is a former senior finance executive in banking with 25 years industry experience. He has also served as a Director of BAI, a banking industry association focused on research, training and thought leadership. Throughout his career, he has applied quantitative modeling and decision-making under uncertainty to launch new business initiatives and manage multi-billion dollar businesses.

Raphaelson is a graduate of the University of Michigan, with degrees in economics and political science, and holds an MBA from Stanford Graduate School of Business. He is a Trustee of the San Francisco Conservatory of Music.

Committee Chairs

Steve Roemerman
Chair, Best Modeling Practices

Steven D. Roemerman is Chief Executive Officer at Lone Star Analysis. He has served on the boards of a number of corporations, authored dozens of papers on technology and management, and he holds patents in the defense, telecommunications and energy sectors. Much of his work deals with large, complex systems, whether human institutions, computer systems, networks, or systems of systems.

He holds a degree in Applied Mathematics with post graduate studies in mathematics, business, telecommunications and signal processing. He is a Senior Member of the IEEE, a Life Member of the NDIA, and a member of the SPE.

Kennan Scott, Chair,
Secondary Education

Kennan Scott was born and raised loving transportation and the New York City Subway. After receiving his Bachelors of Science in Civil Engineering from Northeastern University he bolted for the west coast and the allure of automated public transit. Shortly after arriving in the Bay Area he found work with BART, the automated transit system he coveted and began designing transit infrastructure. It was during his time working with BART on the eBART extension that he was able to reconnect with and seek out his own emotional and social connections with transportation. In order to better serve riders, Kennan received a Masters in Urban and Regional Planning from San Jose State University with a focus on transportation management. The son of a long tenured special education teacher, Kennan always held education in high regard. When given the opportunity to change fields and teach engineering in West Oakland, he saw this as a chance to make a difference in the black community. Kennan Scott is passionate about creating healthy communities, advancing the field of education through interdisciplinary approaches that merge planning, engineering, advocacy, and coalition building.

John Marc Thibault
Chair, Standards Committee

John Marc Thibault is an independent consultant with a twenty-year practice focused on technical analysis, design and planning. His clients have included a large fraction of the Canadian federal government's departments and a variety of high-tech companies. His earlier experience includes over a decade of marketing and technology roles at Xerox, and senior management in two high-tech startups. He has a physics degree from Loyola College in Montreal.

Author of the "Art of the Plan" blog at goodplan.ca, he is developing software and operational techniques to fix the Flaw of Averages in project planning, and to correct the systemic errors that result in high-risk plans and unattainable targets.

Financials

Probability Management

Statement of Operations

For the years ended December 31,

	2018 Unrestricted	2017 Unrestricted
Income		
Contributions		
Corporate Contributions	79,500.00	42,500.00
Individual Contributions	2,510.00	3,705.00
Matching Gifts	3,000.00	500.00
Program Service Fees	39,425.75	59,267.47
Enterprise Tools Sales	3,500.00	4,000.00
Education	39,700.00	N/A
Other Income	2.89	0.37
Total Income	**169,638.64**	**109,972.84**
Expenses		
Program Services		
Education & Outreach	102,464.60	75,416.65
Standards	0.00	0.00
Tools	17,867.75	10,561.00
Program Service Support		
General & Administrative	14,632.96	11,482.07
IT	4,191.64	3,251.32
Facilities	96.00	90.00
Total Expenses	**139,252.95**	**100,801.04**
Change in Net Assets	**30,385.69**	**9,171.80**

Statement of Cash Flows

For the years ended December 31,	2018	2017
Cash Flows from Operating Activities		
Change in net assets	$30,385.69	$9,171.80
Adjustments to reconcile change in net assets to net cash provided by operating activities:		
Accounts Receivable	$0.00	$0.00
Accounts Payable	($810.00)	($300.00)
Prepaid Expenses	($611.50)	$0.00
Unearned or Deferred Revenue	$1,530.00	$3,620.00
Net cash provided by Operating Activities	$32,821.19	$10,812.55
Cash Flows from Investment Activities		
Purchase of property and equipment	$0.00	$76.69
Net cash provided by Investing Activities	$0.00	$76.69
Net Change in Cash and Cash Equivalents	$32,821.19	$10,889.24
Cash and Cash Equivalents at the beginning of the period	$34,054.06	$23,164.80
Cash and Cash Equivalents at the end of the period	$66,875.25	$34,054.04

Financials

Statement of Financial Position

For the years ended December 31,	**2018**	**2017**
Assets		
Current Assets		
Cash and cash equivalents	66,875.25	34,054.04
Accounts receivable	0.00	0.00
Prepaid expenses and other assets	1,523.18	911.68
Total Current Assets	68,398.43	34,965.72
Property and Equipment	0.00	0.00
Total Assets	68,398.43	34,965.72
Liabilities and Net Assets		
Liabilities		
Accounts payable and accrued expenses	2,097.00	580.00
Unearned or deferred revenue	5,150.00	3,620.00
Total Liabilities	7,247.00	4,200.00
Net Assets		
Opening Balance Equity	2,431.25	2,431.25
Unrestricted Net Assets	28,334.49	19,162.67
Net Income	30,385.69	9,171.80
Total Net Assets	61,151.43	30,765.72
Total Liabilities and Net Assets	68,398.43	34,965.72

Detailed Income and Expenses

For the years ending December 31,

	2018 Unrestricted	2017 Unrestricted
Income		
Contributions		
Corporate Contributions		
Chevron	7,500.00	7,500.00
Foundation for Creativity in Dispute Resolultion	2,000.00	
Lockheed Martin	30,000.00	
Lone Star	10,000.00	10,000.00
PG&E	30,000.00	25,000.00
Individual Contributions	2,510.00	3,705.00
Matching Gifts	5,000.00	500.00
Program Income		
Program Service Fees	39,425.75	59,267.47
Enterprise Tools Sales	3,500.00	4,000.00
Education		
GFOA	4,700.00	
Lockheed Martin	35,000.00	
Other Income		
Interest Income	2.89	0.37
Tax Refund		
Total Income	**169,638.64**	**109,972.84**
Expenses		
Program Services		
Education & Outreach		
Compensation and Benefits	73,418.45	52,377.97
Travel Expenses		
Airfare	3,644.14	2,967.40
Lodging	1,616.82	2,916.29
Ground Transportation	408.91	2,124.79
Parking	151.80	163.75
Travel Meals and Entertainment	823.14	461.76
Internet Access		25.57
Total Travel Expenses	6,644.81	8,659.56
Meals and Entertainment	1,791.77	518.68
Marketing and Publicity		
Trade Shows		167.24
Conferences	18,267.41	12,025.09
Marketing Collateral		156.72
Marketing Materials	729.61	591.28
K-12 Education		
Email Marketing		
Public Relations	99.00	850.00
Total Marketing and Publicity	19,096.02	13,790.33
Other Expenses		
Books, Dues, and Subscriptions	1,354.19	(16.45)
Office Supplies	119.81	86.56
Total Other Expenses	1,513.55	70.11
Total Education & Outreach	**102,464.60**	**75,416.65**
Standards	**0.00**	**0.00**
Tools		
Compensation and Benefits	17,867.75	10,561.00
Total Tools	**17,867.75**	**10,561.00**
Total Program Services	**120,332.35**	**85,977.65**

For the years ending December 31,

	2018 Unrestricted	2017 Unrestricted
Program Service Support		
General & Administrative		
Compensation and Benefits	5,915.00	3,240.00
Office Expenses		
Office Supplies	55.76	
Postage and Shipping	58.79	163.74
Business Taxes and Fees	570.00	70.00
Insurance		
Directors & Officers Insurance	1,980.00	1,980.00
Liability Insurance	715.50	500.00
Professional Services		
Accounting	2,468.00	2,219.00
Legal Fees	1,190.00	820.00
Banking and Financial		
Bank Fees	154.80	232.43
Checks		
Online Payment Fees	1,525.11	2,256.90
Total General & Administrative	**14,632.96**	**11,482.07**
IT		
Compensation and Benefits	430.00	595.00
Software and Hardware		
Software Site Licenses	3,014.64	1,876.47
Expensed Software and Hardware		343.16
Depreciation and Amortization		76.69
Software and Hardware - Other		
Website	747.00	360.00
Meals and Entertainment		
Total IT	**4,191.64**	**3,251.32**
Facilities		
Rent Expenses		
Rent - PO Box	96.00	90.00
Repairs and Maintenance		
Total Facilities	**96.00**	**90.00**
Total Program Service Support	**18,920.60**	**14,823.39**
Total Expenses	**139,252.95**	**100,801.04**
Change in Net Assets	**30,385.69**	**9,171.80**

Probability
Management

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