Edelman Awards Gala



THE FRANZ EDELMAN AWARD
Achievement in Operations Research

THE INFORMS PRIZE
Sustained Integration of Operations Research

THE DANIEL H. WAGNER PRIZE
Excellence in Operations Research Practice

UPS GEORGE D. SMITH PRIZE
Strengthening Ties Between Academia & Industry

2013

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April 8, 2013
San Antonio, Texas

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The Edelman Awards Gala

2013 Franz Edelman Award Ceremony

Welcome, Acknowledgements, and Awards to be Presented

Jeffrey Camm, Master of Ceremonies

Presentation of the Wagner Prize

C. Allen Butler, Chair, 2012 Wagner Prize Committee

Summaries of 2013 Edelman Finalist Work

Baosteel
Chevron

Presentation of the Innovative Applications in Analytics Award

Michael F. Gorman, Chair, 2013 Innovative Applications in Analtyics Award Committee

Summaries of 2013 Edelman Finalist Work

Dell
Dutch Delta Program Commissioner

Presentation of the UPS George D. Smith Prize

Donald R. Smith, Chair, 2013 UPS George D. Smith Prize
Randy Stashick, Senior VP for Engineering, UPS

Summaries of 2013 Edelman Finalist Work

Kroger
McKesson

Presentation of the Informs Prize

Stefan Karisch, Chair, 2013 INFORMS Prize Committee

Recognizing Members of the Franz Edelman Academy

Jeffrey Camm, Master of Ceremonies

Announcement of the 2013 Franz Edelman Award Winner

Anne G. Robinson, President, INFORMS
Peter Bell, Chair, 2013 Edelman Award Committee

Master of Ceremonies

Jeffrey Camm



Jeffrey Camm has long been active in the Edelman competition, INFORMS, and the practice of operations research. From 2005 to 2010, he served as the editor in chief of *Interfaces*, the INFORMS journal on practice where Edelman finalist papers are published. He has served as both an Edelman judge and coach. In 1996, he joined an Edelman finalist team with Procter & Gamble (P&G) for work that generated documented savings in excess of $250 million per year in P&G's North American supply chain. In 2006, Camm received *DC Velocity's* Rainmaker Award for his contributions to the practice of supply chain optimization.

Dr. Camm is Professor of Quantitative Analysis, head of the Department of Operations Business Analytics and Information Systems, and founding director of the Center for Business Analytics in the Lindner College of Business at the University of Cincinnati. At UC, Camm also holds the title Fellow of the Graduate School, the University's highest recognition for research excellence.

Camm has published over 30 papers in the area of applied discrete optimization. His work has appeared in *Management Science*, *Operations Research*, *Interfaces*, and other journals, and has been funded by Argonne National Labs, the U.S. Office of Naval Research, and the U.S. Environmental Protection Agency. His joint work on efficient conservation of biodiversity appeared in the journal *Science* and was included in a brief on conservation to President Clinton.

Also an excellent teacher, Camm has received the Linder College's Dornoff Fellowship for Teaching Excellence and was the 2006 recipient of the INFORMS Prize for the Teaching of OR/MS Practice.

A firm believer in practicing what he preaches, he has served as an operations research consultant to numerous companies including Procter & Gamble, Owens Corning, General Electric, Tyco, Starbucks, Zumiez, Road Runner Sports, and Medrad, among others. He uses this experience in the classroom to help his students learn how to be real O.R. practitioners. He is coauthor of five textbooks on management science and statistics.

Camm earned a BS in mathematics, summa cum laude, from Xavier University (Ohio) in 1980. A strong believer in efficiency, he decided against earning a masters degree and instead went straight to the Ph.D., earning that degree in management science from Clemson University in 1984.

Camm and his wife Karen live in Fort Thomas, Kentucky. They have three lovely daughters, who during their teenage years routinely reminded their father that not all problems can be solved by analytics.

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OR

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April 8, 2013
San Antonio, TX

The Operations Research Profession

Introduction

by Anne G. Robinson, Verizon Wireless
President, INFORMS

INFORMS Shines in the Analytics Landscape

The strength of an organization's awards drives the credibility of that organization as a source of expertise in their field. This was one of the key attributes of leading organizations as described by Capgemini and other analyst companies. Looking at the diverse set of awards that INFORMS bestows, no one can debate our position as a leading organization in the analytics landscape. No other group parallels INFORMS in recognizing excellence in the theory and practice of analytics and operations research.

The Edelman Gala is one particular evening each year where analytics professionals can beam with pride witnessing the impact that their profession is making on the world. The financial benefits alone for the Edelman Award, the namesake for tonight's gala, have exceeded $190B cumulatively since the inception of the competition. This is in addition to the significant societal benefits the award



has achieved. Sharing the stage with the Edelman Award are four other awards – the INFORMS Prize, the Daniel H. Wagner Prize, the UPS George D. Smith Prize, and the Innovative Applications in Analytics Award. Each of these prizes spotlights a different type of achievement across the INFORMS portfolio of disciplines.

Tonight we honor this year's top six Edelman finalists. Having served previously as a judge, I appreciate the challenge faced by this evening's judging panel in selecting the winner. Each finalist is evaluated across multiple dimensions including technical difficulty, qualitative and quantitative impact, as well as executive sponsorship and support. However, their unique application of operations research and analytics in their domain and it's extensibility to other areas is generally the most memorable characteristic, as will be evident by the finalist presentations tonight.

Last year we added a new award to our lineup. 2012 marked the inaugural year for the UPS George D. Smith Prize, awarded to the Tauber Institute at the University of Michigan, for effective





and innovative preparation of students to be good practitioners of operations research, management science, or analytics. This year's finalists come from three accomplished academic institutions—Lehigh University's Enterprise Systems Center, MIT's LGO Program, and the Naval Post Graduate School's Operations Research Department. This award demonstrates INFORMS' sustained commitment to encouraging the connection between academia and industry, ensuring continued growth and innovation in our field.

To all of this evening's award nominees and recipients, please accept my heartfelt congratulations. You are an inspiration to all of us.



Now more than ever, making sense of large, complex data sets is critical to an organization's success. Government and business organizations are increasingly looking to big data to create new opportunities and solve their most complex real-world problems. In order to move forward, organizations must be able to analyze data on a massive scale and quickly use it to provide deeper insights, create new products, and differentiate their services. The ability to compete and win in the information economy will come from powerful analytics that draw insights and value from data, and high-fidelity visualizations that present those insights in impactful, intuitive ways. Booz Allen Hamilton has pioneered an entirely new approach for the implementation of big data in the digital enterprise—a way of using technology, machine-based analytics, and human-powered analysis to create competitive and mission advantage. We leverage these analytic capabilities to help clients across the defense, intelligence, and civil government markets and commercial health, financial services, and energy and utilities industries. See our ideas in action at **boozallen.com/analytics**

Booz | Allen | Hamilton

delivering results that endure

Leadership in Advanced Analytics

by Jack Levis, UPS
VP Practice, INFORMS



INFORMS is the premier association in advanced analytics and tonight's program clearly demonstrates that position. A look at tonight's program and conference activities exemplifies INFORMS' leadership in the profession.

INFORMS marks a first with this conference by introducing INFORMS' new Certified Analytics Professional (CAP™) exam and marks a turning point for our association. This establishes the first standard for the profession. INFORMS brings the authority of the best educators in the world to create and administer an exam that confers a quality certification that professionals and employers will accept as a validation of professional worthiness.

Tonight's award ceremony is a testament to analytics and what it has contributed to major organizations. Just look at the INFORMS Prize, which is being presented here at the gala. Ford Motor is a phoenix that flies again after the dark years of the recession, and analytics has played a huge role in Ford's rebirth. Ford is a data-driven automaker that analyzed the numbers to make important decisions contributing to its renewed profitability. CEO Alan Mulally turned to his large analytics department to make crucial choices in the company's product development, logistics, marketing and sales, and even human resources and Ford Credit. He oversaw the development of analytics-driven programs like a dealer vehicle recommendation system. Ford made analytics a major part of its revival, and the results testify to this decision.

The 2013 Edelman competition testifies to INFORMS' role in advanced analytics. This year's finalists have masterly applied analytics and traditional O.R. in a range of industries and callings: steelmaking, public policy, oil refining, computers, retailing, and healthcare. This range is a testament to the importance of analytics in the growth of the world's largest and most important organizations. Closely tied to the Edelman Award is the Daniel H. Wagner Prize, whose latest winner, the U. S. Coast Guard, applied O.R. and analytics to better protect the United States from terrorist threat.

Our INFORMS Analytics Section is only a couple years old, and its impact is shown tonight through its Innovative Applications in Analytics Award. Booz Allen Hamilton won in 2012 for consulting work it did for U.S. Immigration and Customs Enforcement. That work will likely benefit both the private and public sector during a time that the U.S. Congress considers immigration reform and its potential impact on the American economy.

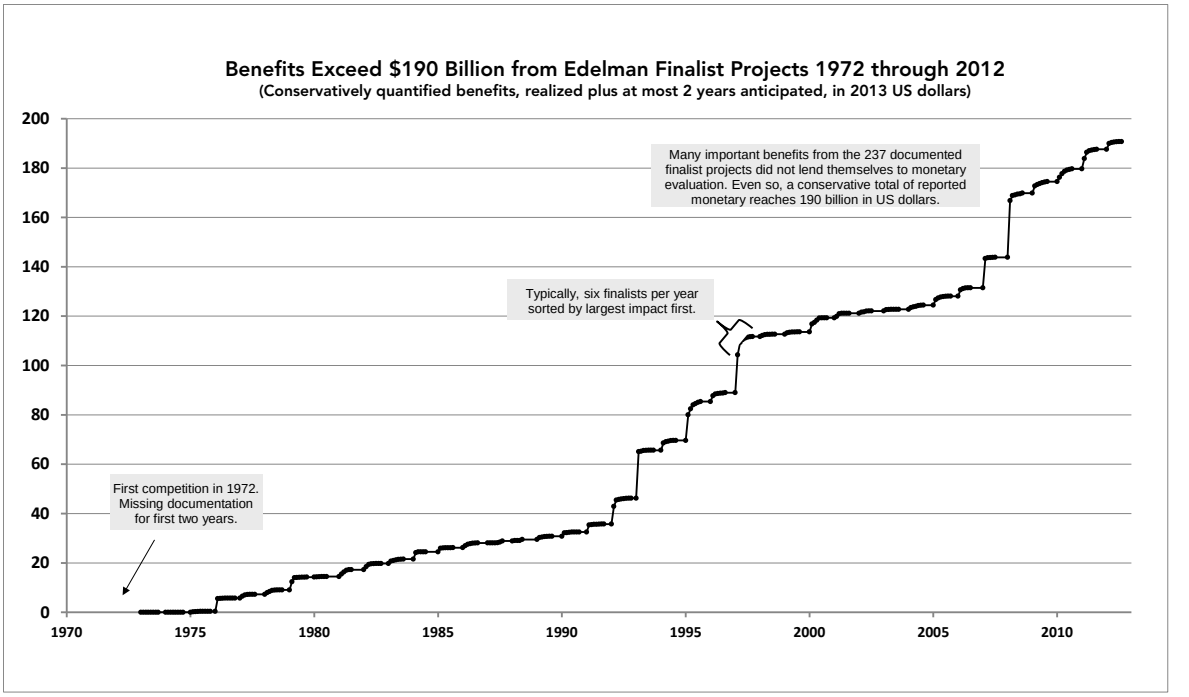
Crucial to the success of analytics and O.R. is preparing our next generation of analytics professionals. That requires industry and academia to synchronize the education and preparation of tomorrow's analytics professionals. That's why I'm so proud that my firm, UPS, has collaborated with INFORMS to create the UPS George D. Smith Prize. It was awarded for the first time last year, to the Tauber Institute for Global Operations at the University of Michigan for its interdisciplinary education aimed at people entering our field. We are excited to see who will win this year's award.

INFORMS has progressed over the last few, significant years. Enjoy tonight's ceremony knowing that you are coming together with colleagues, mentors, and industry leaders at this conference of what is now the premier association in advanced analytics.



Billions Achieved with Business Analytics

by Jeffrey M. Alden
Group Manager, GM Operations Research



Over $190 billion U.S. dollars of impact! That's impressive! Is it believable? What's behind these numbers? How were they were estimated? Is there more?

Beginning in 1974, the Edelman finalists were asked to publish their project accomplishments in the INFORMS journal *Interfaces*. By reading all articles (almost 240), the monetary impact was estimated under the following guidelines:

- Be objective and conservative, yet make a serious attempt to estimate cost savings and increased revenues.
- Use all past reported savings and, to be conservative, include at most two more years of anticipated impact.
- Include only one year of impact when enormous (billions, for example, in some military, utility, energy, and government projects) to downplay huge leverage of organizational size and budget.
- Ignore relative impact analysis even though, for example, doubling company revenues to $10 million for one company may be far more impressive than saving $100 million for a larger company.

These guidelines are definitely conservative and do not include many important yet difficult-to-quantify benefits. Examples of the latter include legal dispute resolution, cancer treatments, airline security, hazardous material deposition, budget allocation, epidemic disease control, organizational structure, on-time railway performance, and space shuttle heat shielding performance. For example, a Center for Disease Control project to reduce fatalities in a U.S. epidemic could be conservatively (and roughly) estimated to be billions,[1] but can we really get agreement on such an estimate to make a monetary benefit claim? Furthermore, almost all finalist papers report nonmonetary benefits and frequently tout them as most important and longer lasting by establishing, for example, ongoing practices and organizational changes that improve health, safety, cooperation, decision making, and job satisfaction. Great! Clearly, the reported monetary benefits understate the full impact of the Edelman finalist projects.

Another important indication of O.R.'s influence is the impressive breadth of applications. The Edelman finalists represent over 100 different application areas, including air traffic, banking, broadcasting, canal operations, consumer products, delivery (express), defense (air force, army), education, financial (pension, investment, credit card, settlement), fire protection, forestry, health care (hospital, pharmaceutical, diagnosis, elderly, disease control), hotel management, energy production and distribution (coal, gas, electric, oil, nuclear), land use, manufacturing (electronics, food, paper, seeds, tires, vehicles, wood), marketing, printing, sanitation, security (airport, police), tax collection, transportation (airline, highway, railway, space), treasure hunting, waste management, water (resources, quality, flow), and weapons dismantlement. There are many more—the list goes on and on!

Finally, the O.R. impact reported here is just the "tip of the iceberg" because the Edelman competition only captures those O.R. professionals choosing to compete! Just think, the entire set of Edelman finalist authors (976 counted) represent less than 10% of the current INFORMS membership. Undoubtedly, there is a vast number of O.R. projects with significant impact that did not compete due to confidentiality or lack of internal support to compete (e.g., no one thought of it, too busy, no management support, inadequate documentation), or because the team was simply unaware of the competition.

The impact is immense. The O.R. professional has unquestionable reason to be proud of their profession—don't you like saying "billions and billions" when asked about the value of O.R.?

[1] For the US: $3B = 314M population * 5% epidemic penetration * 10% die under current practices * 80% fatality reduction under improved practices * 1 epidemic per 100 years * $40K per capita income * 78 US year life expectancy * 50% life lost per fatality * (100% – 3% annual inflation)^(50 expected years until epidemic). Motivating article was: "Advancing Public Health and Medical Preparedness with Operations Research", *Interfaces*, Vol. 43, No. 1, January–February 2013, pp. 79–98. Note Figure 6. Some of these numbers are just reasonable values offered by the author.

The Franz Edelman Award

Recognizing and Rewarding Real Achievement

The Franz Edelman Award Competition is administered for INFORMS by CPMS, the Practice Section of INFORMS.



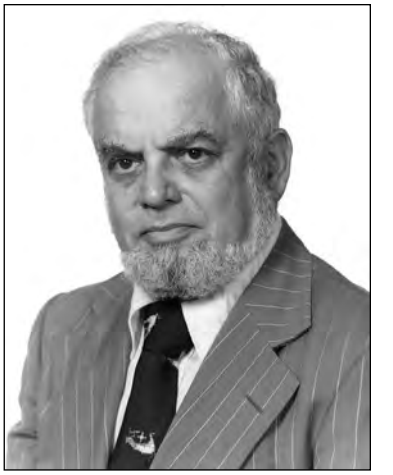
The purpose of the international Franz Edelman competition is to bring forward, recognize, and reward outstanding real-world applications of operations research, management science, and analytics.

Granted annually to an organization that sponsored, implemented, and benefited from an operations research project, the Edelman Award attracts competition entries from organizations large and small, for profit and nonprofit, business and governmental, private and public, worldwide. The common theme shared by all selected finalists is having realized substantial benefit from practical application of the advanced analytical methods of operations research.

Abstracts from papers prepared by past Edelman Award finalists are available through *Interfaces* online; full-text versions of some of those *Interfaces* papers are available in an online archive. Streaming videos and DVDs of past competition presentations—suitable for teaching, marketing, or publicizing O.R. practice successes—are available from INFORMS.

The Institute of Management Sciences (TIMS), together with its College on the Practice of Management Science (CPMS), created the award competition in 1972. In 1986, this CPMS/TIMS award was renamed in memory of Franz Edelman, one of the earliest industry practitioners of O.R. in North America. TIMS merged with the Operations Research Society of America to create INFORMS in 1995, at which time the Edelman Award became an INFORMS award.

After fleeing his native Germany in the late 1930s to escape Hitler and the Nazi regime, the young Franz Edelman found himself in England, where he was interned as an alien and sent to Canada for an interlude of lumberjacking. He received his undergraduate education at McGill University; later he earned a PhD in applied mathematics from Brown University. Franz joined the RCA Corporation as an engineer concentrating on computational topics. Initially a physical science problem solver, he rapidly came to envision the great value of computer systems that would assist with management and with business operations. This insight led Franz to establish RCA's Operations Research Group circa 1950, one of the first such groups in a North American corporation.



Franz Edelman

Franz was well known in the O.R. profession for advocating that success in operations research requires excellence in information technology (IT)—computer software, computer hardware, and communications. Reflecting his great interest in IT, he ultimately became vice president of Business Systems and Analysis, responsible for IT as well as O.R. at RCA. He likely would have been pleased to see our present focus on "analytics" and "business intelligence," where strong analysis combines with strong IT.

Franz retired from RCA after 30 years of service to form Edelman Associates, an O.R. consulting firm. Throughout his career, Franz's O.R. achievements, forward-looking insights, and positive influence on others made him a quintessential practitioner. The Franz Edelman Award was named in his memory because this award advances the operations research practice to which he contributed so much.



Edelman First-Place Award Recipients

2012 TNT Express

"Supply Chain–Wide Optimization at TNT Express"

The application of O.R. improved decision-making quality at TNT Express. TNT's global optimization (GO) program initiative led to the development of optimization solutions to assist the operating units of TNT Express and improve their package delivery in road and air networks. TNT Express established communities of practice, where internal and external subject matter experts meet three times a year. TNT Express created a unique two-year learning environment, the GO Academy, where TNT Express employees are taught the principles, use, and deployment of optimization techniques. As a result of these combined initiatives, O.R. is now an effective part of the core values at TNT Express. Over a seven year period, TNT Express used these O.R. methods to save €207 million.

2011 MISO

"Midwest Independent Transmission System Operator Applies Operations Research to Energy and Ancillary Services Markets, Unlocking Billions in Savings"

The Midwest Independent Transmission System Operator (MISO) used O.R. to design and launch its energy and ancillary services markets. For many years, the U.S. power industry consisted of utilities that focused locally. During the 1990s, the Federal Energy Regulatory Commission (FERC), a power industry regulator at the national level, pushed the industry to reduce individual utilities' market power and to drive more efficiency through the formation of regional transmission organizations (RTOs). In 2001, the FERC approved MISO as the nation's first RTO. Driven by the goal of minimizing delivered energy costs in a reliable fashion, MISO leveraged advances in computing capabilities and O.R. algorithms to launch its original energy market on April 1, 2005, and its upgraded energy and ancillary services markets on January 6, 2009. The MISO region realized between $2.1 and $3.0 billion in cumulative savings from 2007 through 2010 and anticipates an additional $6.1 to $8.1 billion of value through 2020.

2010 Indeval

"Mexican Financial Markets Benefit from Novel Application of Operations Research"

Indeval, the Mexican Central Securities Depository for all financial securities, manages Dalí, the securities settlement system (SSS) that settles securities operations averaging over $250 billion daily, more than 70% of the value settled in the Mexican payments system. In 2005, Indeval and its partners began implementing Dalí, a safer, more reliable, and more efficient SSS. The core of Dalí is an operations-research-based engine that is executed automatically and offers a continuous and secure operation, ensuring that settlement is irreversible. Now many transactions that would remain pending if processed individually are settled together, thus reducing liquidity requirements dramatically—by 52% in cash and 26% in securities. Indeval's SSS enhances and strengthens Mexico's financial infrastructure.

2009 Hewlett-Packard

"HP Transforms Product Portfolio Management with Operations Research"

Working with Strategic Management Solutions, HP developed two powerful operations-research-based tools for product variety management that together address the diverse needs of HP's businesses throughout their products' lifecycles. The first is a framework for evaluating the projected complexity-adjusted return on investment (ROI) for each proposed new product prior to its creation using a complexity ROI calculator. Once products have been launched and a sales history is available, HP applies a second OR tool called revenue coverage optimization. These tools led to hundreds of millions of dollars in bottom-line savings for HP, as well as a streamlined product offering, improved execution, faster delivery performance, lower overhead, and increased customer satisfaction and market share.

2008 Netherlands Railways

"The New Dutch Timetable: The O.R. Revolution"

By 2006, the volume of traffic on the Dutch passenger railway network had increased significantly; more and larger trains had been scheduled without changing the structure of the timetable, thus overloading the system and causing consumer nightmares. Operations researchers working with Netherlands Railways constructed an improved timetable. As a result, the percentage of trains arriving within three minutes of the scheduled time increased, commuter satisfaction improved, and the number of passengers grew. In 2007, this resulted in an additional annual profit of €40 million (approximately $60 million).

2007 Memorial Sloan-Kettering Cancer Center

"Operations Research Advances Cancer Therapeutics"

A key researcher from the Georgia Institute of Technology worked with Memorial Sloan-Kettering Cancer Center to reduce substantially the effects of treating prostate and breast cancer with radiation. The system saved an estimated $459 million per year on prostate cancer alone. Quality of life was improved by delivering less radiation to healthy organs.

2006 Warner Robins Air Logistics Center

"Warner Robins Air Logistics Center Streamlines Aircraft Repair and Overhaul"

At a time of war, the U.S. Air Force maintenance hub reduced its repair time for C-5 Galaxy transports from 360 to 250 days using lean initiatives, then further improved its turnaround time to just 160 days with Critical Chain Project Management, an O.R. technique. The work saves American taxpayers $50 million a year and decreases the demand to truck materiel through the Iraqi combat zone, saving lives as well.

2005 General Motors

"Increasing Production Throughput at General Motors"

Using operations research to achieve one of its signature benefits—greater efficiency—GM has saved over $2 billion through improved productivity at 30 assembly plants in 10 countries.

2004 Motorola, Inc.

"Reinventing the Supplier Negotiation Process at Motorola"

Combining O.R.-aided methods such as innovative bidding, online negotiations, and scenario-based optimization analysis, Motorola launched a comprehensive system to support the company's sourcing process.

2003 Canadian Pacific Railway

"Perfecting the Scheduled Railroad: Model-Driven Operating Plan Development"

Adoption of a newly optimized fixed-schedule railroad approach, including associated benefits from infrastructure and locomotive fleet investment and business process improvements, trimmed costs by CAD $300 million.

2002 Continental Airlines

"A New Era for Crew Recovery at Continental Airlines"

A globally optimized crew recovery solution deals successfully with several high-profile events such as the December 2000 and March 2001 Nor'easter snowstorms, the June 2001 Houston flood, and the September 11th terrorist attack. Throughout, Continental recovered from each event in record

time and generated overall benefits worth tens of millions of dollars.

2001 Merrill Lynch, Inc.

"Pricing Analysis for Merrill Lynch Integrated Choice"

In early 1999 two models showed that revenue at risk for Merrill Lynch, due to the advent of electronic trading and the commoditization of trading, ranged from $200 million to $1 billion. As of September 2000, the Integrated Choice strategy helped client assets reach $93 billion in the new offer. During the first nine months of 2000, net new assets totaled $11 billion and the number of accounts increased 72%.

2000 Jeppesen Sanderson, Inc.

"Flexible Planning and Technology Management at Jeppesen Sanderson, Inc."

Jeppesen Sanderson's customer service level began to deteriorate when a growing product line of more than 100,000 charts overwhelmed its production system. The company developed a suite of optimization-based decision support tools that improved planning in each production area and revealed the value of OR/MS to Jeppesen managers. Jeppesen is now fully committed to O.R., with O.R.-based decision support systems spreading to all areas of the company, and realized cost reductions of $3 million.

1999 IBM

"Extended Enterprise Supply Chain Management at IBM Personal Systems Group and Other Divisions"

AMT consists of an optimization engine, a simulator, and a series of data extraction modules. It is used to study a wide range of issues, including inventory budgets, turnover objectives, customer service-level targets, effects of new product introduction, and supply chain scenario analyses.

1998 Bosques Arauco, S.A.

One of the largest Chilean forest firms, Bosques Arauco employs optimization systems designed by a team from the University of Chile. The impact of these systems has been organizational and financial, with Bosques Arauco reporting a total saving of $5 million over a total annual timber production of $140 million.

1997 Societé Nationale des Chemins de Fer Français (SNCF) and Sabre Decision Technologies

The national railroad of France, Societé Nationale des Chemins de Fer Français (SNCF), and Sabre Decision Technologies teamed up to address the problem of train capacity allocation. The implementation of Rail Plus, composed of a Workset manager and modules on profitability, feasibility, capacity allocation, and routing, is credited with an overall profit increase of 3% to 5%, reductions in manpower and schedule development time, and improvements in planning and scenario evaluation.

1996 South African National Defense Force (SANDF)

A joint Deloitte & Touche and SANDF team created models to determine the size and shape of SANDF. The project resulted in force design savings of more than 22%.

1995 Harris Corporation/Semiconductor Sector

IMPReSS, a linear-programming-based production-planning system, produces plans for six major product lines encompassing over 18,000 individual products, enabling Harris to achieve 95% on-time delivery on commitments made since 1992.

1994 Tata Iron & Steel Company, Ltd.

An optimization-based model was designed in 1985–1986 for guiding marketing strategies in Tata's product mix area; the model is now used throughout the company. Since 1986, the model has contributed a cumulative benefit of $73 million in increased profits.

1993 AT&T

Over 400 Call Processing Simulator (CAPS) studies increased 800-number revenues by more than $1 billion in a $5 billion market. One reorganization yielded an 8% increase in calls completed, at annual savings of over $24 million in customer operating costs, with an increase of $2 million in AT&T revenue in 1992, $3 million in 1993, and a projected $7 million per year for each following year.

1992 New Haven Health Department

To combat the spread of HIV/AIDS via needle sharing among New Haven's drug injectors, a legal needle exchange program was implemented. A new data collection and analysis was developed that provided the needed parameters for mathematical models. Results suggest that the program has reduced HIV/AIDS incidence by 33%.

1991 American Airlines

American Airlines pioneered revenue management as an effective way to manage its seat inventory. The airline used sophisticated O.R. models to determine the overbooking levels of each flight and to allocate each flight's seat inventory to a variety of market/fare classes. By optimally overbooking flights and dynamically pricing the seats based on forecast demand, American Airlines generated an estimated $1.4 billion in incremental revenue over a three-year period.

1990 Health Care Financing Administration

Diagnosis Related Groups (DRGs), developed to measure hospital output in quantitative terms, required a search for structure through millions of patients' records plus the merging of clinical and statistical decision methods. Medicare, 20 states, and 18 other countries are currently using DRGs; Medicare payments to hospitals alone produced a projected reduction of $18 billion in 1990.



1989 ABB Electric, Inc.

1988 City of San Francisco Police Department

1987 Syntex Laboratories, Inc.

1986 Southland Corporation (CITGO Petroleum Corporation Subsidiary)

1985 Weyerhaeuser Company

1984 (dual) Blue Bell, Inc.

1984 (dual) The Netherlands Rijkswaterstaat and the RAND Corporation

1983 Air Products and Chemicals, Inc.

1982 Arizona Department of Transportation

1981 ANR Freight System

1980 Kelly-Springfield Tire Company

1979 The Greater New York Blood Program

1978 Cahill May Roberts, Ltd.

1977 Syncrude Canada, Ltd.

1976 American Telephone & Telegraph

1975 Xerox Corporation

1974 Canadian National Energy Board

1973 The Babcock & Wilcox Company

1972 The Pillsbury Corporation

LOOKING FOR BUSINESS PARTNER IN ASIA?

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ARI R&D and Business Focus

Developing Cloud System Service, Big Data Analytics as core pillar technologies, applied to following market domains: Healthcare, Energy, Community, Tourism and Media.

The aim is to lead and assist industrial innovation, supporting the future development of Smart Living & Business, and create new business opportunities for Taiwan ICT industry.

Business Focus

Smart Media | Smart City | Smart Tourism | Smart Commerce | Smart Healthcare

Tech R&D

Big Data Analytics | Cloud System Services

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E-Mail: ariservice@iii.org.tw
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III
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The Franz Edelman Award Process

The Finest Step Forward: The Franz Edelman Award Competition Process

by Peter C. Bell, Richard Ivey School of Business
2013 Franz Edelman Committee Chair

Are You Ready for the Contest of Your Life?

Every year the Franz Edelman Award process begins with a call for entries in early September. Organizations are asked to provide a three-page summary of a completed practical operations research (O.R.) application and describe results that had significant, verifiable, and, preferably, quantifiable impact on the performance of the client organization.

Typically, over two dozen entries are received and reviewed by the Franz Edelman Award Committee. The committee consists of about three dozen experienced O.R. practitioners and academics from diverse organizations such as AT&T, Bank of America, BNSF Railway, Carnegie Mellon University, General Electric, HP, Intel, IBM, Lancaster University, MIT, Purdue University, SAS, and the Ivey School of Business. Semifinalists are selected in early November, and the further selection of finalists is completed by mid-December.

The committee names as semifinalists a dozen or more entries that have a reasonable chance of becoming finalists if the verification process supports the entries' claims. To this end, each of the semifinalists is assigned a team of verifiers who work with the relevant stakeholders to validate the details and the claims made by their assigned entry.



The verifiers' role is to completely comprehend the O.R. work presented in the assigned entry summary, as well as its potential impact, and to convey this information to the rest of the selection committee. The verifiers communicate directly with the entrant's O.R. team, the users of the work, and client management. Verification is a crucial element of the competition because it ensures that only the highest-quality O.R. work makes it to the Edelman Award finals. All verifiers are provided with written guidelines and sample verification reports, and novice verifiers are paired with more experienced verifiers.

From this group of semifinalists, the Edelman Award Committee then selects the five or six best entries to advance to the Franz Edelman Award finals. Each finalist must begin the preparation of a journal-quality paper and a 40-minute presentation. Each of the finalist teams is assigned a team of experienced coaches to advise them throughout the process. The coaches' major responsibility is to ensure that the team's paper and presentation convey the work clearly to a general operations research audience.

Two months prior to the spring INFORMS Business Analytics and Operations Research Conference, finalist papers are distributed to the judges. The judges study each of the papers and, shortly thereafter, discuss them among themselves.

Each finalist is assigned a focal point judge who conveys feedback from the judging committee to the finalist's coaches. This feedback helps to identify areas in which the finalist's presentation might be improved.

On the day of the competition, each team gives a 40-minute presentation, followed by a 10- to 15-minute period of questioning by the judges. After the presentations are complete, the judges sequester themselves until they reach a decision on which of the finalists best exemplifies the ideals and standards of the Franz Edelman Award for Achievement in Operations Research. Relevant factors considered include the importance of the application, the novelty and portability of the technical solution, the quality and effectiveness of the implementation, and the total impact of the project, in both quantitative and qualitative terms.

Following the competition, the finalists will work with the special editor of the January/February issue of *Interfaces* to prepare their papers for publication. All finalists are invited to reprise their work at a session of the INFORMS Annual Meeting in the fall, with the first-place team giving a keynote address. All of the finalists' presentations become available from INFORMS via streaming video in the summer. *OR*

The Verification Process & The 2013 Verifiers

The Edelman Award Committee wishes to thank the following individuals for their dedication and service as verifiers for this year's Edelman Award.

Each of the semifinalists is assigned a verifier who works behind the scenes, often with an assistant verifier, to validate the claims made by their entry. A verifier's primary role is to understand an applicant's O.R. work and its impact in detail, and to then convey this to the rest of the committee, both orally and in a written report. Verification is a crucial element of the competition since it ensures that only the highest-quality O.R. work with verified impact makes it to the Edelman Award finals.

Verifiers and Assistant Verifiers

- Susan Albin, Rutgers University
- Cynthia Barnhart, MIT
- Carrie Beam, Carrie Beam Consulting
- John Birge, University of Chicago
- Srinivas Bollapragada, General Electric
- E. Andrew Boyd, University of Houston
- Gavin DeNyse, HP
- Pooja Dewan, BNSF Railway
- Ken Fordyce, Arkieva
- Mingguo Hong, MISO
- Yoshiro Ikura, Saitech
- Shailendra Jain, HP
- Peter Kolesar, Columbia University
- Russell P. Labe, Bank of America
- Yingdong Lu, IBM
- R. John Milne, Clarkson University
- Patricia Neri, SAS Institute
- Yanni Papadakis, Bank of America
- Atul Rangarajan, eBay Inc.
- Graham Rand, Lancaster University
- Randall S. Robinson
- Michael Trick, Carnegie Mellon University
- Rajesh Tyagi, GE Global Research

The Coaching and Judging Process & The 2013 Coaches and Judges

The Edelman Award Committee wishes to thank the following individuals for their dedication and service as coaches and judges for this year's Edelman Award.

The major role of the coach is to ensure each team's paper and presentation convey the work in a manner that may be well understood by a general operations research audience. Often a coach is paired with an assistant coach who lends another perspective to the process.

The judges must work together, evaluating the evidence to determine which finalist is most deserving of the Franz Edelman Award for Achievement in Operations Research. The award is for implemented work that has had significant, verified, and preferably quantified impact.

Coaches and Assistant Coaches

- Carrie Beam, Carrie Beam Consulting
- John R. Birge, University of Chicago
- Yonghong Chen, MISO
- Ken Fordyce, Arkieva
- Mingguo Hong, MISO
- Yoshiro Ikura, Saitech
- Peter Kolesar, Columbia University
- Yingdong Lu, IBM
- Yanni Papadakis, Bank of America
- Randall S. Robinson
- Mark Squillante, IBM
- Rajesh Tyagi, GE Global Research

Judges

- Peter Bell, Chair, University of Western Ontario
- Susan Albin, Rutgers University
- Srinivas Bollapragada, General Electric
- Anthony Brigandi, AT&T
- Grace Lin, Institute for Information Industry
- R. John Milne, Clarkson University
- Patricia Neri, SAS Institute
- Graham Rand, Lancaster University
- Leon Schwartz, Informed Decisions Group

The Edelman Laureates

The men and women who author Edelman finalist papers are deemed Franz Edelman Laureates.

Authors of finalist papers are recognized with this distinction, and each is formally presented with the Franz Edelman Medal.

Laureates are recognized for their significant contribution to work that each year is selected as representative of the best applications in the world of analytical support for decision making.

The Laureate recognition is distinct and separate from membership in the Franz Edelman Academy.



The Edelman Academy

Each year, a limited number of organizations may be inducted as members of the Franz Edelman Academy.

The primary client organization, or beneficiary of the finalist work, is inducted into the Academy at the annual Edelman Award Ceremony.

In addition, organizations that played a major role in the work, and therefore deserve academy membership, may also be inducted. The most common example would be an organization that provided the professionals who did the majority of the analytical work.

The membership of the Franz Edelman Academy represents 42 years of extraordinary contributions to society through the innovative application of operations research.

Nothing But the Best:

The 2013 Franz Edelman Finalists

Introduced in the pages that follow are the six finalists for the 2013 Franz Edelman Award.

Over the past several months these teams have demonstrated to the judges that their work is among the finest examples of operations research practice in the world. One of these organizations will be recognized as the best in class, the first-place recipient of the 2013 Franz Edelman Award.

Each finalist's work is described here in a shortened summary. Full papers will be published in the January/February 2014 issue of Interfaces*, the INFORMS journal dedicated to improving the practical application of operations research and the management sciences in today's organizations and industries.*

The Finalists for the 2013 Franz Edelman Award Are

Baosteel

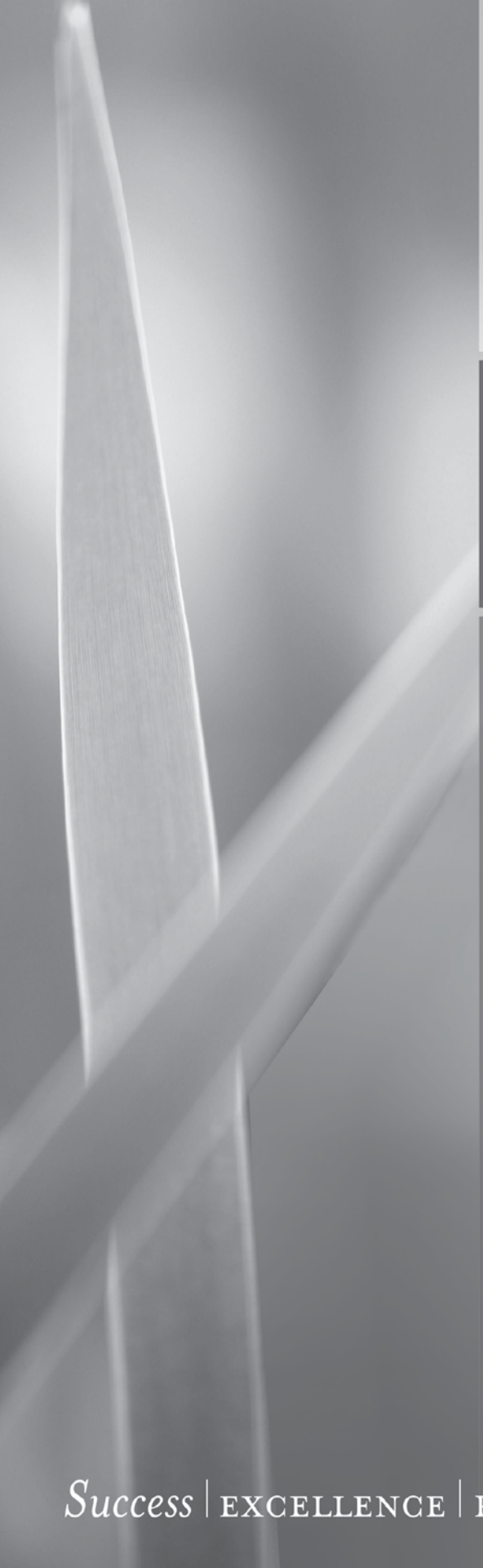
Chevron

Dell

Dutch Delta Program Commissioner

Kroger

McKesson



REVENUE™
ANALYTICS

INTELLIGENCE ON DEMAND℠

As proud members of the Edelman Academy, Revenue Analytics congratulates this year's finalists.

Where ART *meets* SCIENCE

STRATEGY *meets* EXECUTION

The result is WORLD CLASS *Pricing & Revenue Management* CAPABILITIES

Success | EXCELLENCE | RESPECT | *Integrity* | FUN

2013 Edelman Competitors

by Barry List, INFORMS

The Continued Rise of Analytics and O.R.

Are you feeling requited?

Operations researchers and analytics experts have long maintained that our unique approach to analyzing problems, developing math models to address those problems, and aiding better decisions were a treasure waiting to be discovered. Now, with the ascendance of Big Data, analytics, and decision processes that are directly linked to operations research, those in the field can point to high profile examples of the field's invaluable contributions. Case in point: the six finalists for the 2013 Franz Edelman Award.

How does a country's leading steelmaker improve its decision support systems and yield greater efficiency, higher profits, and better environmental marks to boot? China's **Baosteel** did it by bringing important O.R. techniques to the table. The company, founded in 1978, for years used a reliable but dated management information system that forced supervisors to make important production and logistical decisions primarily by personal judgment. Early attempts to use math modeling to improve its "9672 System" resulted in nothing more than frustration and suspicion of math modeling to add a much-needed level of sophistication. The breakthrough came when Baosteel turned to researchers at Northeastern University of China. The university's researchers proved their mettle by resolving an important production planning problem. They went on to examine bottlenecks in four processes: iron and steel making, hot rolling, cold rolling, and final product delivery. With additional assistance from the University of Maryland and Loughborough University, they went on to apply O.R. to tackle highly complex challenges—one class of problems has an average 3.5 million binary integer variables and 36,000 constraints—and develop innovative solutions. The results, at their main Shanghai plant alone, generated a 16% improvement in operations management and reduced annual carbon monoxide emissions by over 500,000 tons.

Picture the work of the major energy company **Chevron** as a supply chain that goes from pumping and acquiring crude oil and natural gas, to refining the highly individual, differentiated grades, and finally to retailing the finished fuels, lubricants, additives, and byproducts to fuel consumers in transportation and other industries. Market prices vary throughout every day, and only a software system with sophisticated math modeling capabilities can consider the variables throughout the supply chain that produce top results in a highly competitive industry. Using a system called Petro that Chevron first developed in the 1980s and has been updating and improving ever since, the company applies



optimization techniques to purchasing, refining, and even environmental analysis. The result: Petro gets credit for an estimated $10 billion in value over its 30 years of contributing to Chevron.

How many different ways can you customize a computer? Lots, **Dell** has proven over the years, and using scientific methods to personalize computers for consumers and businesses has been an important concentration for the Center of Excellence for Operations Research at Dell. O.R. became an important player when Dell went from a delivery model of direct sales through a game-changing channel transformation to offer fixed configurations online and through retailers, distributors, and other channel partners. The company needed to develop the right product offerings if this major change was to succeed. Enter Configuration Optimization, which the company's operations researchers and management used to determine the best possible configurations among millions of options. The company went further, using O.R. techniques in many crucial business areas: to optimize its online store, manage inventory and forecast demand for specific products, determine optimal price points, analyze its market and supply chain needs in countries with emerging economies, make smarter marketing decisions, and more. Dell estimates that in the last two years alone, these O.R./analytics solutions have contributed $140 million to its fixed configuration business, which went from zero to $15 billion in just five years.

In 2012, residents of many cities and towns in New York and New Jersey experienced massive flooding of a kind that had never before visited the East Coast of the United States. The damage was not only in the billions of dollars, it was also in confidence: state government officials suddenly felt that they had to begin preparing to prevent a future flood.

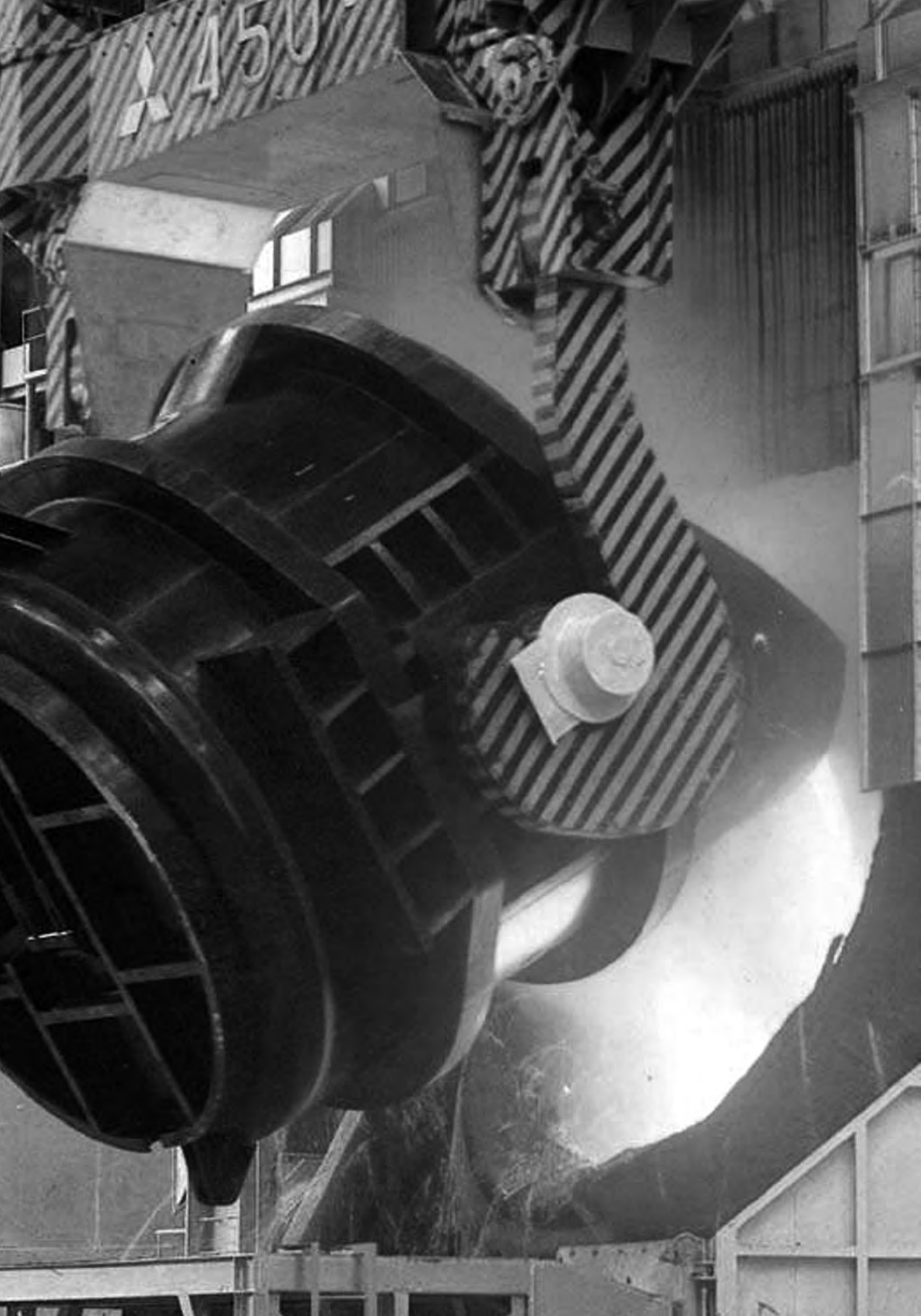
The people of Holland have lived with this fear for centuries, but the perils became acute in 1953, when a severe flood resulted in the deaths of 2,000 people. A flood warning in 1995 led 200,000 Dutch citizens to flee their homes. The damage caused in the United States by Hurricane Katrina brought renewed concern to the Netherlands. The **Dutch Delta Program Commissioner** of Holland is charged with maintaining and fortifying dykes that can withstand the kind of flooding that could result in deaths and severe economic loss. An initial report made a costly recommendation: increasing the protection factor of all 53 dyke rings by a factor of 10. The commissioner, working with his partners, used optimization and O.R. techniques to find a safe, more cost-effective approach that reduced the costs by €7.8 billion while guaranteeing flood protection.

If you're one of the world's largest grocery retailers like **Kroger** and your goals are simultaneously to reduce cost and improve consumer satisfaction, you have to use the best O.R. and analytics techniques if you want to succeed. Focusing on its in-store pharmacies, Kroger, collaborating with Wright State University, used operations research and advanced analytics to make inventory management a key method for implementing its goals. Kroger has 2,000 in-store pharmacies that annually fill about 150 million prescriptions. The challenge: examine customer demand and in-store inventory, then forecast demand better to reduce inventory, keep medications from going out of stock, satisfy customers with the ability to fill their prescriptions promptly, and gain customer share as a result. The Kroger O.R. team created an automated inventory management system that models empirical distributions, visualizes inventory results, and also provides management with the ability to react to take into account user feedback. Kroger conducted pilot studies in 1 store, then 7, and finally 20 stores before adapting the new system throughout. Before, 3.4% of prescription requests were out of stock at any given time. Using O.R. and advanced analytics, Kroger reduced that rate to 2.4%, in the process filling 1.5 million more prescriptions annually. With success in hand, Kroger has begun applying these O.R. techniques to its supermarkets' meat and fish departments, with the intention of improving its bakery, deli, produce, and general merchandise departments by the time its work is complete.

Great minds think alike, and **McKesson**, the world's largest healthcare services company, has also applied O.R. and analytics techniques to pharmaceuticals, in this case, the supply of pharma to retailers like Kroger as well as hospitals and clinics. Working with IBM, McKesson set out to develop analytics and software that would allow it to model its entire pharma supply chain from end to end so it could introduce efficiencies. The Supply Chain Scenario Modeler consists of analytical engines that optimize the distribution network, inventory policies, supply flows, and vehicle routes. The modeler finally allowed McKesson to assess the financial effects produced by its supply chain and make changes for the better. This translated into changes that saved the company $1 billion in working capital since it was introduced in 2010.

In this age, when appreciation has finally come to Big Data and the analytics necessary to analyze it, the 2013 Franz Edelman competition takes note of six teams that are the world leaders in their field. The good news is that in 2013, the world, especially the world of business and government, is finally taking notice.





Baosteel

Operations Research Transforms Baosteel's Operations

Project Summary

Headquartered in Shanghai, the leading steel manufacturer Baosteel consists of four production sites in China, including Shanghai, Ningbo, Guangdong, and Xinjiang. The Shanghai plant is the largest, with a steel output accounting for 61% of the total steel output of Baosteel.

Baosteel has long used advanced manufacturing facilities, processing technologies, and information technology (IT) systems. One critical challenge was fully leveraging its advanced IT infrastructure to improve decision making and operations management. Baosteel had mainly relied on rule- and experience-based manual planning methods to make production and logistics decisions. Because of the myopic nature of the manual planning methods used, the decisions made were often substantially suboptimal. Consequently, Baosteel frequently experienced order tardiness and quality problems on the one hand, and high production, inventory, and logistics costs on the other. In addition, because of the large scale and highly complex nature of the underlying planning and scheduling problems, management often took a long time to make planning and scheduling decisions. Hence, the planning process was highly inefficient.

In 2005, Baosteel started systematic collaboration with a team consisting of researchers from the Logistics Institute of Northeastern University of China, University of Maryland, and Loughborough University in the United Kingdom. The team was tasked to develop advanced operations research-based planning tools to improve the Baosteel Shanghai plant's operational efficiency throughout its entire production process.

In the following six years, the research team developed a number of novel optimization and sophisticated heuristic solution algorithms. To guarantee optimality or near optimality of the solutions for such difficult problems within a reasonable amount of computation time, the research team exploited the structures of the problems and applied a number of innovative optimization techniques. These included branch and bound, column generation, dynamic programming, valid inequalities, variable reduction techniques,

and various neighborhood search schemes. The team developed a number of computerized decision support systems (DSSs) and implemented them at many production lines of the Shanghai plant to replace manual planning. Thanks to their flexibility, stability, efficiency, and excellent performance, the decision support systems were praised as "Five Star Optimization Software" in Baosteel's system review in 2011, winning the highest possible honor a software system can receive from Baosteel.

The use of DSSs has brought scientific operations management to Baosteel and transformed the Shanghai plant's production and final product delivery operations. It has greatly increased the Shanghai plant's productivity and product quality, with reduced energy and resource consumptions. In the period from 2007 through 2012, the use of the DSSs at the Shanghai plant is estimated to have generated a total cumulative economic benefit of $76.8 million. Based on the current usage of the DSSs at the Shanghai plant, it is estimated that the DSSs will continue to generate an annual economic benefit of $19.8 million, which represents a 16.8% improvement of Baosteel's IT and operations management capability. In addition, the use of the DSSs reduced annual carbon dioxide emissions at Baosteel by about 585,770 tons, making a significant contribution to environmental sustainability. As a key state-owned enterprise (SOE) in China, Baosteel's pioneering experience in adopting O.R.-based planning methods for its operations management has set an important precedent for SOEs in steel and nonsteel industries in China.



Organizational Overview

Baosteel
Shanghai Baoshan Iron and Steel Complex (a.k.a. Baosteel) is the world's third largest and China's largest steel company. Baosteel was ranked 197th in the Fortune Global 500 for the ninth consecutive time in 2012. *Money* magazine rated it as one of the "World's Most Admired Companies" in 2011. Baosteel also does business in six other areas, including resource development and logistics, steel in-depth processing, engineering technology services, coal chemical engineering, financial investment, and production services.

The Logistics Institute of Northeastern University of China
The Logistics Institute is committed to achieving excellent research in O.R. while at the same time transforming the production and logistics operations of the steel industry. Research at the Logistics Institute focuses on frontier areas such as batching and scheduling of production operations, planning and scheduling of logistics operations in the steel industry, combinatorial and integer optimization, and optimization theory.





The Robert H. Smith School of Business at the University of Maryland
The Robert H. Smith School of Business is an internationally recognized leader in management education and research. One of 12 colleges and schools at the University of Maryland, College Park, the Smith School offers undergraduate, full-time and part-time MBA, executive MBA, executive MS, PhD, and executive education programs, as well as outreach services to the corporate community.

Loughborough University
Loughborough University is a public research university located in the market town of Loughborough, Leicestershire, in the East Midlands of England. The School of Business and Economics at Loughborough is a leading international player in research and teaching across business, management, finance, and economics.

Chevron

Optimizing Chevron's Refineries

Project Summary

As one of the world's leading integrated energy companies, Chevron is involved in virtually every facet of the energy industry. The upstream organization explores for and produces crude oil and natural gas. In the downstream organization, seven wholly operated refineries produce fuels, base oils, and other products marketed under three brands: Chevron, Texaco, and Caltex.

Crude oil goes into Chevron refineries, where it is made into a spectrum of products ranging from fuels (gasoline, jet, and diesel) to base oils (lubricants) to specialty products (additives). To produce these products efficiently, thousands of factors across the supply chain need to be considered. Crude oils from around the world, each with their own unique qualities and pricing, are considered for purchase. Each refinery has a unique configuration and a different capability to handle various types of crude oil and to manufacture different product mixes. With market prices of crudes and products constantly in flux, determining the best way to operate the refineries is quite complex.

To meet this challenge, Chevron built an in-house software tool called Petro. Analysts trained in running the tool work in refineries and next to traders in each of Chevron's trading hubs in Houston, London, San Ramon, and Singapore. Used by 25–30 people each day and processing tens of thousands of equations, Petro considers a long list of dynamic variables and helps the analyst advise traders on whether a particular bid makes sense at that time. Because crude oil costs typically represent 70%–80% of the total cost of refining, acquiring crudes that economically fit Chevron's ability to refine them has a great deal of value. Given that Chevron processes almost two million barrels of crude oil per day, finding just one cent per barrel is worth millions of dollars annually to Chevron. Petro also helps analysts decide how to operate refinery processing equipment to make the most of every part of a barrel of crude oil. In addition to advising crude traders, analysts running Petro also guide the refineries and product traders on the most economic mix of products to produce, buy, or sell.

Petro allows analysts to explore more planning alternatives and arrive at the best recommendations faster than other refinery planning technology. Petro


Chevron
Food Mart
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DIESEL
Chevron
3
Self
with TECHRON
Techron. It's that extra something cars love.
Techron. It's that extra something cars love.
Towel
Trash



employs an operations research technique called distributive recursion-based linear programming to process 400 to 500 variables associated with crude oil characterization, along with thousands of refinery-capability variables, to arrive at the best solution within a few seconds. Petro has been in use at Chevron since the late 1980s. Over the years, this application of operations research, along with its supporting systems and work processes, has continuously improved. Petro's value to Chevron has increased as it has evolved. For example, Petro is helping to build future leaders at Chevron; using Petro to carry out economic evaluations is part of the career development for Chevron downstream management. In conjunction with decision analysis, Petro now helps planners decide how to efficiently invest Chevron Downstream's annual capital program of approximately $3 billion per year.



The value of the tool is not limited to internal applications. Petro has been used in discussions with the Environmental Protection Agency and the California Resources Board to analyze different fuel blends under consideration for future regulations. Analysis using the tool identified formulations that had less impact on supply and cost while still meeting environmental targets.

Today, through crude oil selection, product optimization, and refinery process unit optimization, Petro brings Chevron and its licensees about $600 million per year in continuous earnings from operating the business. Petro generates an additional $400 million per year by enabling Chevron to make better decisions in capital allocation. Chevron estimates that Petro has generated approximately $10 billion in value over the past 30 years.

Organizational Overview

Chevron is one of the world's leading integrated energy companies and conducts business worldwide. Chevron is involved in virtually every facet of the energy industry. This includes

- exploring for, producing, and transporting crude oil and natural gas,
- refining, marketing, and distributing transportation fuels and lubricants,
- manufacturing and selling petrochemical products,
- generating power and producing geothermal energy,
- providing energy efficiency solutions, and
- developing the energy resources of the future, including research for advanced biofuels.

Chevron's refining resources are concentrated in North America, South Africa, and the Asia-Pacific region and serve customers around the world. Chevron's global refining system manufactures fuels and other products



sold by Chevron's marketing, lubricants, and supply and trading organizations. Manufacturing operates seven refineries that produce fuels, base oils, and other products that are marketed by Chevron under three brands: Chevron, Texaco, and Caltex. These retail products are available on six continents.

In 2011, Chevron processed 1.8 million barrels of crude oil per day and averaged 2.9 million barrels per day of refined product sales worldwide. Total downstream earnings in 2011 were $3.6 billion.




LOCAL
PICK UP

Dell

Dell's Retail Transformation through Analytics

Project Summary

Dell pioneered the direct sales model by offering its customers a wide variety of offerings—technology products and services—through full-system configurability. High Internet penetration and efficient e-commerce ecosystems enabled the success of this model in developed markets. Changing market dynamics, technological advancements, and Dell's global expansion required that the company cater to customer segments with diverse needs and purchasing behaviors by going beyond the direct sales model. Therefore, five years ago, Dell embarked upon its channel transformation by offering fixed configurations through online, retailer, distributor, and other channel partners. This was aimed to assist Dell in fulfilling its vision of delivering technology solutions that enable people everywhere to grow and thrive. Dell has been leveraging its Center of Excellence for Operations Research and advanced analytics to drive critical initiatives across the value chain to deliver profitable growth in new channels.

Developing the right product offerings was a significant phase of the transformation journey. The key challenge was to determine the best possible configurations among millions of possible combinations. The Configuration Optimization solution successfully identified the optimal set of fixed hardware configurations for each product category. It involved demand cluster analysis to identify naturally occurring demand patterns in billions of historical transactions. Further optimization involved multiple considerations such as modeling the cost of upgrading customers to higher configurations, technology trends, and the competitive landscape. This resulted in more accurate forecasts, with the final offerings being built and stocked in advance, and a reduction in product complexity.

Website Layout Optimization aimed to improve the online purchase experience and maximize the conversion rate of potential fixed configuration visitors into end customers. A number of techniques such as driver analysis and competitive benchmarking were used to identify key factors that influence visitors' purchasing behavior. These factors were subjected to

a series of A/B tests and multivariate analyses followed by response surface optimization to arrive at optimal site designs. Implementing these designs improved conversion across regions, resulting in increased revenues and higher customer satisfaction.

The retail channel demands accurate demand–supply matching, faster time to market, minimal cost of stockouts, and low inventory obsolescence. Retail Margin Maximizer utilizes better demand sensing processes and a promotion uplift model to proactively manage inventory risk and recommend promotions for margin improvement. The solution comprises a combination of inventory optimization and promotion uplift models. This enables efficient collaboration with retailers and makes Dell a vendor of choice.

In addition to the above initiatives, Dell has leveraged O.R. to develop several innovative solutions in various business functions to solve challenges across



channels. Pricing Intelligence helped in deciding the optimal price point for various offerings. Network Optimization in emerging economies enabled the supply chain redesign to cost effectively serve the indirect channel. Marketing Investment Optimization improved return on investment (ROI) by efficiently allocating what Marcom spends on different marketing vehicles. In the after point of sales, support affinity analysis helped reduce repeat dispatches of service parts.





Organizational Overview

Analytics has solved complex business problems across channels and facilitated Dell's growth in the fixed configuration business from $0 to $15 billion in just five years. Over the past two years, these O.R. solutions have delivered a margin impact of more than $140 million through reduction in markdown expenditure, improved ROI on marketing communication expenditure, increased ocean shipment, and improved customer satisfaction. The success Dell has experienced in these transformational initiatives has strengthened confidence in the resolution of complex business problems through operations research. It has also helped create a culture of data-driven decision making in the organization.

Dell Inc. listens to customers and delivers innovative technology and services that give them the power to do more. The world's third largest supplier of personal computers (PCs), Dell is a Fortune 500 company that provides a broad range of technology products for consumers, businesses, and government. In addition to its line of desktop and notebook PCs, Dell offers network servers, data storage systems, printers, Ethernet switches, and peripherals, such as displays and projectors. The company's services unit provides asset recovery, financing, infrastructure consulting, support, systems integration, and training, as well as hosted IT services. The company is one of the largest technological corporations in the world, employing more than 103,300 people around the globe.

Dutch Delta Program Commissioner

Economically Efficient Flood Standards to Protect the Netherlands against Flooding

Project Summary

Protection against flooding is a vital issue in the Netherlands because 55% of the country is susceptible to flood risk. Each year the Dutch government spends roughly €1 billion on protection by dikes and dunes. In total, there are 3,500 kilometers of primary dikes in the Netherlands.

History has taught the importance of prevention: In 1953, the southwestern portion of the Netherlands was flooded, and 2,000 people lost their lives. The accompanying economic damage was enormous. In 1995, several areas around the Netherlands were again menaced by a forecast of flood waters, and 200,000 people were evacuated. Fortunately, no serious flooding occurred.

The Dutch Water Act sets down flood protection standards for all dike ring areas in the Netherlands. These standards range from 1/1,250 per year for dike ring areas along the upper part of the Rhine to 1/10,000 per year for the most important dike ring areas along the coast.

In 2008, the second Delta Committee advised the government to increase the protection standard of all dike ring areas by a factor 10. This committee also convinced officials about the urgency of action. A Delta Programme, chaired by the Delta Commissioner, was initiated to foster protection against high water and to keep freshwater supplies up to standard, now and in the future. It was also decided to update the protection standards in the Water Act by 2017. To form a scientific basis for the political decision process, Deltares was asked to determine economically efficient flood protection standards for all dike ring areas.

A cost–benefit model was developed to derive the optimal investment strategy for each dike ring area. In this strategy, the total long-term social costs, consisting of the investment costs for heightening dikes and the expected loss by flooding, are minimized, taking into account the dynamic effects of climate change and socioeconomic growth. State-of-the-art mixed integer nonlinear programming techniques were used to find optimal strategies for all 53 dike ring areas in the Netherlands.


SUCRE

The conclusion was that, from an economic point of view, it was not necessary to increase protection standards for all dike ring areas by 10 times. The current protection standards were acceptable, except for three regions: areas along the Rhine and Meuse rivers, the southern part of Flevoland, and two areas near Rotterdam. Economically efficient flood protection standards for these three areas have been established.

The final results have been discussed in the House of Parliament and in several committees and organizations. In 2012, the state secretary accepted the recommendations as the basis for policy planning. The final protection standards will gain force of law in 2017.

The operations research approach not only played a crucial role in finalizing the political discussion about determining the right flood protection standards, it also resulted in a significant increase in protection for these regions, where two-thirds of the benefits of improvements are concentrated. These O.R. methods saved €8 billion in investment costs as well.





Organizational Overview

Dutch Delta Program Commissioner
The object of the Delta Programme is to protect the Netherlands against flooding and ensure a sufficient supply of freshwater. It is a concerted effort by the national government, provincial authorities, municipal authorities, and water boards, with input from civil society organizations and the business community. Every year, the annual report on the Delta Programme with the planning for the years ahead is presented to the House of Representatives on Prinsjesdag (the state opening of parliament in September).

CPB Netherlands Bureau for Economic Policy Analysis
CPB Netherlands Bureau for Economic Policy Analysis (CPB) was founded in 1945. Research at CPB is carried out on CPB's own initiative or at the request of the government, parliament, individual members of parliament, national trade unions, or employer federations. CPB works at the crossroads of the economic sciences and public policy.



Delft University of Technology
TU Delft cooperates with many other educational and research institutions, both in the Netherlands and abroad. The quality of its research and teaching is renowned. TU Delft has numerous contacts with governments, trade associations, consultancies, industry, and small and medium-sized companies.

Deltares
Deltares is an independent institute for applied research in the field of water, subsurface, and infrastructure. Throughout the world, Deltares works on smart solutions, innovations, and applications for people, environment, and society. Its main focus is on deltas, coastal regions, and river basins. Managing these densely populated and vulnerable areas is complex, which is why Deltares works closely with governments, businesses, other research institutes and universities at home and abroad.

HKV Consultants
HKV Consultants provides consultancy services and research in water and safety. Established in 1995, it has quickly grown to a dynamic firm with a staff over 60, four offices, and a sister company in Germany. Its experts are highly qualified and internationally recognized, most with long-term experience in their specific fields and with extensive, up-to-date knowledge of the complex world of water and safety.

Ministry of Infrastructure and the Environment, The Hague
The Ministry of Infrastructure and Environment is committed to improving quality of life, access, and mobility in a clean, safe, and sustainable environment. The ministry strives to create an efficient network of roads, railways, waterways, and airways; effective water management to protect against flooding; and improved air and water quality.

Tilburg University
Complex social issues such as aging, the euro crisis, sustainability, self-reliance, and giving life meaning require analyses and solutions. Through top-level research and outstanding teaching, Tilburg University seeks to contribute to a better society. Its faculty and students acquire new ideas and insights by researching, learning, and understanding. Every day, they seek to better understand how people function in this world. Knowledge at Tilburg University often arises as a result of collaborations between different research disciplines, a process that is frequently innovative and inspirational.



Kroger

Simulation and Optimization Improves Pharmacy Inventory Management at the Kroger Company

Project Summary

The Kroger Company, one of the largest food retailers in the world, employs more than 339,000 associates who serve customers in 2,422 supermarkets and 1,950 in-store pharmacies. Kroger's unique formula for success is to continually reduce the overall cost of running the business and use those savings to fund investments that strengthen Kroger's connection with customers. Improving customer service is at the heart of Kroger's "customer first" business strategy.

Kroger's operations research team, in collaboration with faculty from Wright State University, designed an innovative simulation and optimization model for pharmacy inventory management to help the business better predict pharmacy demand and reduce out-of-stock prescriptions.

In pharmacy, traditional standard statistical distributions fall short of providing accurate pharmacy demand profiles. To overcome this problem, the Kroger Operations Research team delivered an automated inventory management system that could model empirical distributions, visualize inventory results, and provide end users an intuitive experience that could adapt to user feedback and allow "plug-and-play" experimentation.

The team's approach evolved through three phases: (1) development of a spreadsheet inventory simulation and optimization model to visually demonstrate how simulation optimization can be used to solve inventory problems; (2) creation of fast optimization algorithms to efficiently find optimal or near-optimal inventory policies for millions of drugs regardless of their demand distributions; and (3) visualization of the modeling approach and results to engage Kroger's pharmacists and management in the decision process. This efficient algorithm allows sufficient time for all stores to update their inventory on a weekly basis and offers an intuitive visual approach for inventory optimization issues.

The results of implementing the new inventory optimization system have been tremendous. Since the system was implemented at scale in October 2011, every Kroger pharmacy has reduced out-of-stock prescriptions by 1.5 million per year, ensuring greater patient access to medications when they need it. The



efficiencies created by the reduction in out-of-stock prescriptions also resulted in additional revenue of $80 million per year, a reduction in inventory costs of more than $120 million, and a labor cost reduction equivalent to $10 million per year. The model and methodology have proved their scalability and application as an inventory optimization system for perishable product lines as well.

Since its inception, the new inventory optimization system has become a critical platform for the application of advanced analytics and operations research throughout Kroger, which, as a retail industry leader, aims to deliver the right products at the right time to customers in every store. By increasing revenue and reducing inventory, the operations research team succeeded in creating value for Kroger customers and shareholders. Additionally, the success of the inventory management system has significantly contributed to the growth of operations research within Kroger, enabling scientific inventory management to become a strategic priority for the company.



Organizational Overview

Kroger

Kroger, one of the world's largest retailers, employs more than 339,000 associates, who serve customers in 2,422 supermarkets and multidepartment stores in 31 states under two dozen local banner names including Kroger, City Market, Dillons, Jay C, Food 4 Less, Fred Meyer, Fry's, King Soopers, QFC, Ralphs, and Smith's. The company also operates 790 convenience stores, 344 fine jewelry stores, 1,141 supermarket fuel centers, and 37 food processing plants in the United States. Recognized by Forbes as the most generous company in America, Kroger supports hunger relief, breast cancer awareness, the military and their families, and more than 30,000 schools and grassroots organizations. Kroger contributes food and funds equal to 160 million meals a year through more than 80 Feeding America food bank partners. A leader in supplier diversity, Kroger is a proud member of the Billion Dollar Roundtable and the U.S. Hispanic Chamber's Million Dollar Club.





Wright State University

A Carnegie-classified research university, Wright State University's main campus is 12 miles northeast of downtown Dayton, Ohio, near the historic landmarks where the Wright brothers taught the world to fly. Wright State serves nearly 18,000 students and offers more than 190 undergraduate, graduate, doctoral, and professional degree programs through eight colleges and three schools. Wright State ranks as one of Ohio's top state universities in terms of federal research. It is one of an elite group of universities doing research in cutting-edge fields, making new discoveries that are improving the world around us and collaborating with corporations and businesses to create new jobs and provide qualified graduates for the workforce.

McKesson

A Holistic Supply Chain Sustainability Management Solution

Project Summary

McKesson is the world's largest healthcare services company, with annual revenues over $120 billion. The Pharmaceutical Supply Division is the largest division of McKesson, with revenues of over $97 billion a year. The Pharmaceutical Supply Division is at the center of the Pharmaceutical supply chain, serving all pharmaceutical manufacturers and over 25,000 pharmacies, hospitals, and clinics.

McKesson has a long-standing strategy of leveraging analytics in operations management and planning. As such, McKesson and IBM Research launched a joint project in 2009 with the objective of creating a software solution that could model McKesson's end-to-end supply chain. This joint IBM/McKesson-developed Supply Chain Scenario Modeler allowed McKesson to quantify the impacts of fundamental changes to its supply chain including changes in its distribution network, supply flows, inventory policies, procurement policies, and other processes.

The Supply Chain Scenario Modeler uses mathematical models to capture the dynamics of McKesson's distribution operations. The model consists of a number of analytical engines that optimize the distribution network, inventory policies, supply flows, and vehicle routes. The model also has analytical engines that calculate many key financial and operational metrics as well as sustainability metrics. The model restates history with all of the transactional detail of that period under the various scenario alternatives with a full profit and loss statement of the impacts.

The model was developed into a software solution as a hosted service. The development effort started in spring 2009 and took a full year and a team effort between the two organizations. Since the completion of the solution in 2010, a variety of analyses have been conducted that helped McKesson take a number of supply chain actions.

Prior to the model development, it was impossible to see the differences in financial performance of the different supply flow alternatives. McKesson took a number of actions as a result of analyses conducted using this model. These actions include the creation of a new supply chain that involves





air shipment of selected products, updating the current pricing models to include the supply chain differences, and taking advantage of new opportunities for profit and service improvements that were made visible by the model.

The model development necessitated the creation of a data analytics support structure of related business intelligence that did not exist before. The sheer magnitude of the number of transactions processed each day made the project challenging. McKesson Pharmaceutical Supply handles 60,000 active items in 30 distribution centers shipping two million pieces a day to 25,000 customer locations. The new data analytics has been the source for a multitude of business projects that would not have been possible before this model and is the basis for quantifying the financial impact of the changes made.

Since the model was put in use in 2010, McKesson has reduced its working capital by over $1 billion from improvements in its supply chain while improving its service in critical product areas.

Organizational Overview

McKesson
McKesson's vision is to help create a healthcare system where quality is higher, mistakes are fewer, and costs are lower. As the nation's leading healthcare services company, McKesson provides pharmaceuticals, medical supplies, and healthcare information technologies that make healthcare safer while reducing costs. McKesson touches virtually every aspect of healthcare.

McKesson is America's oldest and largest healthcare services company, with its pharmaceutical wholesaling roots dating back 180 years. In fact, the company created the first national drug distribution system. For more about McKesson's history, as well as all of its current businesses, please see its online media kit.

By combining its industry-leading healthcare information technology and scale with unsurpassed clinical knowledge, McKesson is helping healthcare providers deliver better, safer care while reducing unnecessary costs.

Headquartered in San Francisco, California, McKesson employs more than 32,000 people across the nation and around the world. McKesson is dedicated to delivering vital medicines, medical supplies, and healthcare information technology solutions that touch the lives of patients in every healthcare setting.

IBM Research

IBM Research is a division of IBM Corporation consisting of 12 worldwide laboratories spanning six continents. The IBM Research division was established in 1945 as the Watson Scientific Computing Laboratory at Columbia University. The Thomas J. Watson Research Center, located in Yorktown Heights, New York, was opened in 1961 and houses the division headquarters as well as a majority of the division's researchers. The center has been the location of some of the most notable technological and scientific business breakthroughs of the 20th and 21st centuries, including the invention of dynamic random access memory, the FORTRAN programming language, and the relational database, and the development of copper interconnects. These discoveries helped create and shape the world's computing industry, whereas more recent breakthroughs, including Deep Blue computing systems, breaking the Petaflop barrier, and the introduction of Watson, the deep question answering natural-language computer system, are blazing the computing trails of the future.



In 2012, IBM patents covered a range of areas, including analytics, Big Data, cyber security, and cloud, mobile, social networking, and software-defined environments, as well as industry solutions for retail, banking, healthcare, and transportation. These inventions and others will also advance a major shift in computing, known as cognitive systems. The Business Analytics and Mathematical Sciences Department at IBM Research is currently celebrating its 50th anniversary.



Call for 2014

Franz Edelman Award Applications

Call for 2014 Applications

THE FRANZ EDELMAN AWARD

43rd Annual International Competition for Achievement in Operations Research

A $15,000 Competition with a $10,000 First Prize
Call for Success Stories

INFORMS and CPMS, the Practice Section of INFORMS, are pleased to announce the 43rd International Competition for the Franz Edelman Award for Achievement in Operations Research. The competition will take place at the 2014 INFORMS Conference on Business Analytics and Operations Research in Boston, Massachusetts.

Any work done in recent years is eligible, unless it has already been described by a Franz Edelman Award finalist. Previous publication of the work does not disqualify it. Anyone is eligible for the competition except a member of the 2014 judging panel.

The purpose of the competition is to recognize and reward outstanding examples of O.R. in practice. The prize is awarded for implemented work, not for a submitted paper or for the presentation describing the work. The client organization that used the winning work receives a prize citation; the authors receive a cash award. In addition, finalist organizations become members of the Franz Edelman Academy; authors receive the Franz Edelman Medal and are officially recognized as Laureates.

To submit, provide a 3-page summary of your achievement and a 60-word abstract, plus the name, address, phone number, and affiliation of each author by Wednesday, October 16, 2013.

Complete instructions will be announced online at **www.informs.org/edelman**.

Each finalist group will give an oral presentation of their work on March 31, during the analytics conference in Boston.

See you at the 2014 Franz Edelman Award Competition!
www.informs.org/edelman

The Wagner Prize:

Excellence in Operations Research Practice

2012 Winner
The Daniel H. Wagner Prize
for Excellence in Operations Research Practice



The first place winners are Bo An, Milind Tambe, Eric Shieh, Rong Yang, University of Southern California; Fernando Ordóñez, Universidad de Chile; Craig Baldwin, Joseph DiRenzo, Ben Maule, Garrett Meyer, and Kathryn Moretti, United States Coast Guard.

Their paper, "A Deployed Quantal Response Based Patrol Planning System for the U.S. Coast Guard," describes the model, theory developed and deployment of PROTECT, a game-theoretic system in use by the United States Coast Guard (USCG) in the Port of Boston for scheduling patrols. PROTECT (Port Resilience Operational/ Tactical Enforcement to Combat Terrorism) makes optimal use of limited patrolling resources, while taking into account the relative importance of the different targets to be protected and the presence of adversaries that can observe security measures before deciding to attack.

Recent research and applications have used what are known as Stackelberg Security Games to model the interaction between a security provider and attackers. The optimal defensive strategies to these games are mixed strategies over the different patrolling actions, making the optimal decisions unpredictable to the attacker while taking into account the relative importance of the different targets and the strategic behavior of the attackers. Previous work on security games assumes the human attackers are perfectly rational. PROTECT addresses this limitation by drawing from what is known as quantal response (QR) theory to represent the adversary's behavior.

The USCG evaluated the deployment of PROTECT in the Port of Boston as a success and is currently evaluating the system in the Port of New York, with the potential for nationwide deployment.

The Daniel H. Wagner Prize for Excellence in Operations Research Practice

2012 Finalists

The final component of the 2012 Wagner Prize competition took place at the INFORMS Annual Meeting in Phoenix, Arizona. There, six teams gave presentations to a CPMS judging committee seeking to demonstrate that the quality and coherence of their analysis in a real-world application qualified them to win this prestigious award for outstanding practice of operations research and advanced analytics.

All finalists' presentations can be viewed in the INFORMS Video Learning Center at http://livewebcast.net/INFORMS_AM_Wagner_Prize_2012. A special issue of *Interfaces* will publish the winning paper along with those of the other five finalists:

Jonathan C. Woodall, Duke University Health System; Tracy Gosselin, Amy Boswell, Duke Cancer Institute; Michael Murr, Brian Denton, North Carolina State University:
"Improving Patient Access to Chemotherapy Treatment at Duke Cancer Institute"

Ram Gopalan, Rutgers University; Steven O. Kimbrough, University of Pennsylvania; Frederic H. Murphy, Temple University; Nicholas Quintus, Philadelphia Water Department:
"The Philadelphia Districting Contest: Designing Territories for City Council Based Upon the 2010 Census"

Bex George Thomas, Srinivas Bollapragada, Kunter Akbay, David Toledano, Peter Katlic, Onur Dulgeroglu, Dan Yang, General Electric Global Research:
"Automated Bed Assignments in a Complex and Dynamic Hospital Environment"

Salal Humair, Harvard School of Public Health; John Ruark, Logility, Inc.; Brian Tomlin, Dartmouth University; Sean P. Willems, Boston University:
"Incorporating Stochastic Lead Times into the Guaranteed Service Model of Safety Stock Optimization"

Eva K Lee, Fan Yuan, Georgia Institute of Technology; Alistair Templeton, Rui Yao, Krystyna Liel, Jame CH Chu, Rush University Medical Center:
"Biological Planning for High-Dose Rate Brachytherapy: Application to Cervical Cancer Treatment"

The Daniel H. Wagner Prize for Excellence in Operations Research Practice

A History

The Wagner Prize is awarded annually in honor of the late Dr. Daniel H. Wagner. During his years as president and principal owner of Daniel H. Wagner Associates, Dr. Wagner brought many high-quality mathematicians into the operations research community. This led to significant advances in the firm's fields of endeavor and delivery of significant applications to the Navy, Coast Guard, and other clients. Many of the applications are still in service today.

Dan Wagner earned his PhD in mathematics from Brown University in 1951. His dissertation, "On Free Products of Groups," was published in the *Transactions of the American Mathematical Society* in 1957. Dr. Wagner joined the Navy's Operations Evaluation Group at the Pentagon, working on operations research for naval warfare. He worked there until 1956, with a one-year leave of absence for postdoctoral research on free algebras at MIT. Dr. Wagner then joined Burroughs Research Center, where he directed a group of mathematicians performing analysis for the development of digital computers.

In 1957, Dr. Wagner and Dr. John D. Kettelle formed the partnership of Kettelle and Wagner, which was dissolved in 1963. That same year, he formed a new company, Daniel H. Wagner Associates, Inc. This company applied itself to cutting-edge work in the mathematics of naval tactics, especially antisubmarine warfare, detection theory, and search planning.

After retirement from the firm he founded, Dr. Wagner held various teaching and research positions with the U.S. Naval Postgraduate School and the U.S. Naval Academy. Dr. Wagner was a member of INFORMS/ORSA for more than 40 years. Dan passed away in March 1997.

2012 Wagner Prize Committee

C. Allen Butler, Daniel H. Wagner Associates, Inc., Chair
Susan L. Albin, Rutgers University
William J. Browning, Applied Mathematics, Inc.
Manoj Chari, SAS Institute
Joseph H. Discenza, SmartCrane, LLC
Uday S. Rao, University of Cincinnati
Randall S. Robinson
Lawrence D. Stone, Metron, Inc.

Call for 2013

The Wagner Prize Applications

Call for 2013 Abstracts

THE DANIEL H. WAGNER PRIZE

Excellence in Operations Research Practice

Deadline Midnight May 1, 2013

The Wagner Prize is given to the authors of a previously unpublished paper detailing a real-world, provably successful application of operations research or advanced analytics that required innovative mathematical development, a unique new algorithm, or a series of coherent O.R. advances.

The application process begins with a one- to two-page abstract, written verification of application success, and a commitment, if selected as a finalist, to give a 30-minute oral presentation at the INFORMS Annual Meeting in Minneapolis, Minnesota, and, if selected as a winner, to reprise the presentation at the spring Analytics Conference in Boston, Massachusetts. The finalist papers are published in a special issue of *Interfaces*.

Submissions can be made to the Wagner Prize Chair, Dr. C. Allen Butler, at allen.butler@va.wagner.com. For more details on the application process, please visit www.informs.org/wagnerprize.

The prize amount for 2013 is $1,000.

INFORMS thanks the firms of Metron, Inc., Daniel H. Wagner Associates, Inc., and Applied Mathematics, Inc., for the generous endowments that enable the funding of this prize.

See you at the 2013 Wagner Prize competition!
www.informs.org/wagnerprize

25
Years of CPLEX

S T R E N G T H

1000+
Operations Research Experts

I N N U M B E R S



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Congratulations to the 2013 Finalists for the Franz Edelman Award.

This prestigious honor recognizes outstanding examples of innovative operations research that improves organizations—and changes peoples' lives. IBM is honored to support these innovative organizations in their quest to achieve new heights in operations research, and also proud that more finalists use IBM ILOG® CPLEX™ Optimization Studio than any other optimization product.

Together with the advanced analytics and the consulting expertise of IBM Research and Global Business Services®, IBM's industry-leading ILOG Decision Optimization technology is allowing businesses to take the guesswork out of decision making.

More than 1,300 corporations and government organizations are using IBM ILOG Decision Optimization solutions to bridge the gap between analytics and execution with prescribed recommendations that improve operational effectiveness, revolutionizing all stages of the commerce lifecycle. Delivering significant cost savings, increasing business results, creating life-changing benefits—these corporations and organizations are making it happen, with help from IBM.



Learn more at Booths 13-15 and at **www.ibm.com/optimize**

Innovative Applications in Analytics Award

Recognizing Creative Application of Analytics

2013 Finalists
Innovative Applications in Analytics Award
Recognizing Creative Applications of Analytics

Client: Con Edison (submitter: MIT)
"Machine Learning for Power Grid Reliability: Predicting Manhole Events in New York"
Cynthia Rudin, Massachusetts Institute of Technology; Steve Ierome, Delfina Isaac, Con Edison; Rebecca Passonneau, Axinia Radeva, Columbia University
The authors present innovations in proactive power grid maintenance stemming from collaboration between Con Edison, New York City's power utility company, and Columbia University. Specifically, they describe the Manhole Events Project, where the goal is to predict electrical failures, including manhole fires and explosions. They discuss the data mining process where raw historical data was transformed into a ranking model that predicts manhole vulnerability. These ranked lists are currently assisting with the prioritization of future inspections and repairs in Manhattan, Brooklyn, and the Bronx.

Client: Mount Sinai Medical Center, New York (submitter: GE Global)
"Whole-Hospital Operational Forecasting System"
David S. Toledano, Kunter S. Akbay, Onur I. Dulgeroglu, Peter L. Katlic, Bex G. Thomas, General Electric Global Research Center
Every day hospitals make complex patient flow decisions to manage admissions from the emergency room, surgery and other clinics into a scarce supply of inpatient beds, with relatively little decision support to identify those likely to be over-subscribed. In partnership with the Mount Sinai Medical Center (MSMC) in New York, the team is prototyping a novel whole-hospital forecasting system which accurately estimates patient flow movements and bed shortages over the 24 hours after admission and displays operational feedback through interactive dashboards. The system utilizes real-time data and historical patterns within a discrete-event simulation and currently achieves more than 98% accuracy on forecast census at the hospital level.

Client: Westfield Insurance (submitter: IBM)
"Insurance Agency Productivity, Efficiency and Prospecting"
Mark Grabau, IBM; Elizabeth Riczko, Westfield Insurance
Insurance company leaders want a fact-based, decision-making process for managing their agency distribution channel to make it more productive and profitable. This application presents an approach that combines Data Envelopment Analysis, Predictive Modeling, Collaborative Filtering, and Reporting to objectively meet that need.

Innovative Applications in Analytics Award

About the Award

Tonight INFORMS recognizes the Innovative Applications in Analytics Award, which celebrates the very finest practice work of the association, its communities, and its special interest groups. The competition, sponsored by the Analytics Section of INFORMS, promotes awareness of analytics techniques in unusual applications, as well as in creative combinations that provide unique insights and business value.

Purpose of the Award

The purpose of the Innovative Applications in Analytics Award is to recognize the creative and unique application of a combination of analytical techniques in a new area. The prize promotes the awareness and value of the creative combination of analytics techniques in unusual applications to provide insights and business value.

The prize is not meant to recognize strictly theoretical advances, though theoretical advances might be an enabler to innovative applications. Similarly, the prize is not focused on implementation value created, but such value creation might add credibility to the innovation.

Applicants can submit proposals that span applications of descriptive, predictive or prescriptive analytics, as well as data creation, collection and dissemination which support or enable novel analytical methods.

Descriptive innovation could include novel measures, visualization methods, or creative approaches to the analytics process improvement among others. Predictive innovation might be statistical application, text analytics or simulation, among others. Prescriptive innovation might include, for example, game theory or optimization. New sources of data creation and collection, and new avenues for dissemination of analytical approaches, can also help demonstrate the innovativeness of the submission. The lists above are not meant to be exclusive, but rather illustrative examples of areas of innovation.

2012 Winner

Booz Allen Hamilton

The first presentation of the prize was made to Booz Allen Hamilton, which won for "Enhancing Immigration Enforcement with Decision Analytics."

Join the Analytics Section of INFORMS to view presentation slides of the prize winner. http://www.informs.org/Community/Analytics/Presentations.

Call for 2014 Applications

Innovative Applications in Analytics Award

Recognizing Creative Applications of Analytics

Deadline July 25, 2013

Applications for the INFORMS Section on Analytics 2014 Innovative Applications in Analytics Award are now being accepted.

The purpose of the Innovative Applications in Analytics Award is to recognize creative and unique developments, applications or combinations of analytical techniques used in practice. The prize promotes the awareness of the value of analytics techniques in unusual applications, or in creative combination to provide unique insights and/or business value.

Judging Criteria

- The judging criteria will be based on the level of uniqueness, creativity, value and (potential) contribution of the analytical techniques developed.
- Submissions will be evaluated based on applications of at least two of the three dimensions of analytics: descriptive, predictive or prescriptive. Submissions that span all three dimensions of analytics are preferred.
- Implemented approaches are required to demonstrate their use in practice; to the extent implemented savings are claimed in the submission, the judging panel will seek verification of the implementation.
- Submissions that have the potential for more widespread use will be given added consideration, but particularly clever innovations with narrow focus are also highly valued.

The judging panel, solely at its discretion, might choose to call in subject matter experts to provide insights on an individual submission. All decisions of the judging panel are final. The judging panel can decide in any year that no award be given if no suitable applications are received.

Applicants must submit a brief (500-1,000 word) summary of their work by July 25, 2013 to Pooja Dewan, 2014 Chair, at Pooja.Dewan@BNSF.com. For more information, please visit: **www.informs.org/Innovative-Applications-in-Analtyics-Award**.

Each semi-finalist will present their work at the 2013 INFORMS Annual Meeting in Minneapolis, Minnesota, on October 6, 2013.

The UPS
George D. Smith Prize

The UPS George D. Smith Prize



The UPS George D. Smith Prize is awarded to an academic department or program for effective and innovative preparation of students to be good practitioners of operations research, management science, or analytics. It is accompanied by a $10,000 cash award.

The prize committee is pleased to announce the finalists for 2013, (in alphabetical order):

- Lehigh University, Enterprise System Center and Department of Industrial and Systems Engineering
- Massachusetts Institute of Technology, Leaders for Global Operations Program
- Naval Postgraduate School, Department of Operations Research

The UPS George D. Smith Prize is an exciting new award created in the spirit of strengthening ties between industry and the schools of higher education that graduate young practitioners of operations research.

The UPS George D. Smith Prize is named in honor of the late UPS chief executive officer who was a patron of operations researchers at the leading Fortune 500 corporation. George D. Smith was the second CEO of UPS, holding the position from 1962-1972. He joined UPS as an accountant in 1925 and at some point in his long and illustrious career held almost every functional title within the company.

While his background was steeped in finance, George Smith had a keen engineering mind. In the late 1940s, after learning about operations research, George Smith realized that intuition alone would not be enough to help UPS master the many issues it faced as it grew in size from a regional to nationwide carrier.

George Smith recognized O.R. as an engineering approach to making decisions, and started advocating the use of operations research concepts in UPS. Quantitative analysis became the bedrock on which UPS's engineering function was built. Because of George's vision, UPS now employs thousands of engineers whose focus is efficiency, sustainability, and service.

He was a strong believer in investing in our younger generation. For him, nurturing them was the key to sustained prosperity. This prize embodies George Smith's beliefs: to recognize the importance of operations research in practice, and ensure that our younger generation gets proper exposure to its value, and in turn benefit society.

The UPS George D. Smith Prize

About this year's competition

Since the first days of operations research there has been highly divergent opinion about how effectively our universities are preparing students to be effective practitioners. From the perspective of the committee charged with administering the UPS George D. Smith Prize this year, there is strong evidence that overall our universities are doing very well in this area.

The Prize Committee members feel confident that there will be a truly outstanding winner this year and for many years to come. It was hard but rewarding work to choose the finalists. Selecting the winner from the finalists will also be very difficult.

Seeing the diversity, quality, and innovation of these entries has given the committee a unique and encouraging picture of how well we, as a profession, are preparing future practitioners. Please look at the following pages for additional information about the finalists. We will announce the winner tonight. Plan to attend the special presentation at the conference on Tuesday in which the winning team members will describe their program in more detail. All of us will undoubtedly learn something about how to better prepare practitioners, and also experience a taste of the many reasons that the committee is so excited about the overall state of academic practitioner training.

UPS George D. Smith Prize Winners

2012

University of Michigan, Tauber Institute for Global Operations

The 2013 UPS George D. Smith Prize Committee:

Donald R. (Bob) Smith, Monmouth University, Chair
Ranganath Nuggehalli, UPS, Vice Chair
Susan Albin, Rutgers University
Cynthia Barnhart, MIT
Michael Gorman, University of Dayton
Russell Labe, Bank Of America
Patricia Neri, SAS Institute, Inc.

Lehigh University
Enterprise System Center (ESC) &
Dept of Industrial & Systems Engineering (ISE)



Lehigh University is distinguished by a 37-year history of pervasive use of industry-driven experiential learning at all levels of its operations research curriculum – undergraduate, Master's, and Ph.D. The ESC maintains close contact with local companies such as Kraft Foods and Nestle to provide students with course projects and internships. Lehigh employs a system called "layered mentoring", combining relationship managers from the ESC, industry partners and faculty to give teams of undergraduate and graduate students well-rounded practical and rigorous theoretical guidance on the application of O.R. Its tenured and tenure track faculty have extensive practical consulting experience, and its "Leadership Fellows" program includes retired executives with decades of management experience to help in the mentoring process.

Lehigh's ISE department works collaboratively with the ESC to emphasize real-world project learning throughout its curriculum. Students have opportunities to work on an applied capstone project for a corporate client. Many students work on multiple projects over the course of their student careers, gaining exposure to multiple companies and playing different roles on the modeling team. Real-world projects and problems can be found throughout the curriculum, with Lehigh estimating about a quarter of the curriculum in total is based on such projects. Such practical engagement extends beyond the classroom as well, with many students engaging in ESC-sourced internships.

Over the years, the ESC has sponsored more than 1,000 projects with over 400 companies. More than 3,000 undergraduate and graduate students have participated in these practical projects. In total, Lehigh graduates approximately 130 students per year (5 Ph.D., 50-60 undergraduates, 65-75 masters students), and its program is growing both in number of faculty (from 13 to 16), number of students (e.g., undergraduate major has grown 35% in the last 3 years) and course offerings (over a dozen new courses have been recently created).

The program includes a number of innovations beyond the focus on experiential learning. The curriculum includes a focus on consultative and leadership skills, with an optional Engineering Leadership minor, along with several courses on Leadership Development. The ESC established a Collaboratoy to facilitate virtual teleconferencing with corporate sponsors, student teams, and coaches. An industry roundtable and analytics innovation advisory board help identify new and innovative content. They developed and launched new practice oriented degrees including Health Systems Engineering and Manufacturing Systems Engineering. The ESC collaborates with a number of government agencies and institutions to help identify and solve practical problems, including the Pennsylvania Agile Manufacturing Initiative, Pennsylvania Ben Franklin Technology partners, National Science Foundation Center for Engineering Logistics and Distribution, Iacocca Institute' innovative manufacturing program, and a new ESC Analytics laboratory in collaboration with the SAS Institute.

Massachusetts Institute of Technology, Leaders for Global Operations Program



The Leaders for Global Operations (LGO) program, formerly known as Leaders for Manufacturing, was started in 1988 to develop technically trained managers who would lead the U.S. manufacturing industry. It was the first program in the U.S. to forge a partnership between industry and schools of management and engineering. Since its inception, the program has evolved to reflect the rise of the service industry and the increasingly global nature of operations and manufacturing.

LGO is a two-year dual degree program. Upon graduation, its students receive an MBA or MS from the Sloan School of Management and an MS from one of seven MIT engineering programs. Each year, approximately 48 students with science and engineering backgrounds and an average of five years of work experience are admitted, resulting in a total enrollment of 96. Every LGO student receives a fellowship sponsored by one of the program's industry partners that covers a substantial portion of tuition costs. In addition, merit scholarships are awarded to outstanding students. LGO graduates are among the most sought-after in the industry.

The LGO curriculum is based on the belief that fundamental knowledge of operations research is essential to achieving superiority in operations. Operations research courses are central to the LGO core curriculum and form a critical part of its electives. LGO is supported by a distinguished and diverse faculty from MIT's schools of management and engineering who are at the forefront of operations research and engineering practice. In addition to technical skills, the students also get strong training in "soft skills" that are vital for translating theory into practice.

Intense hands-on training is a significant part of the LGO curriculum. Students help companies improve their operations through two electives centered on real-world operations management practice. In "Operations Lab," they work with local companies, and in "Lion Teams," they work in operations at Chinese companies with their peers from an affiliated program called China Leaders for Global Operations.

The central part of practical training in LGO is a required six-month internship at an industry partner company. During this internship, students work on specific operations challenges and draw on their LGO training to solve it. The internship research and results form the basis of the dual master's thesis.

LGO graduates also benefit from a strong alumni network that fosters development long after leaving the program. Its graduates, who now number more than 1,000, hold important positions in the industry and continue to lead operations and manufacturing around the globe.

Naval Postgraduate School
Department of Operations Research

The Naval Postgraduate School (NPS) began offering its degree program in operations research in 1951, making it the first O.R. degree program in the United States. Approximately 55 students per year graduate from the Naval Postgraduate School with a Master of Science in Operations Research (MSOR) degree. The program is unique in its strong and inexorable link to its sponsor, the U.S. Department of Defense (DoD), which keeps NPS students and faculty focused on applying methods to problems facing the military with a focus impacting operational efficiency and effectiveness.



NAVAL POSTGRADUATE SCHOOL

Its students are practitioners upon entry to the program, and on exit. They come to NPS in midcareer in the military, and leave it with a position in the military. They are, in fact, full time employees of the military even as they undertake the NPS O.R. program. Thus, the practical usefulness of the material is paramount.

Students' theses are all applied. They are required to conduct a three-week 'experience tour' in which they immerse themselves in the field to gain first-hand experience with the application of their research topic. The department celebrates student O.R. practice with a competition within each graduation class for the MORS/Tisdale award that is won by the student whose thesis demonstrates the greatest impact of operations research on the DoD.

The NPS faculty regularly publishes on its pedagogical philosophy in *OR/MS Today* and other outlets, and is regularly among the top schools in practical research according to the Rothkopf Rankings. They have received multiple Teaching of OR/MS Practice awards from INFORMS, among other awards.

The NPS program treats real world practice as laudable and necessary products of O.R. As such, NPS seeks to influence policy. NPS acts as a trusted source of policy advice for our government, and has been credited with advising and shaping defense investments of over a trillion dollars.

Call for 2014

George D. Smith Prize Applications

Call for 2014 Applications

THE GEORGE D. SMITH PRIZE

Strengthing Ties Between Academia and Industry

Deadline for Applications is Monday, October 28, 2013

The UPS George D. Smith Prize was created in the spirit of strengthening ties between industry and the schools of higher education that graduate young practitioners of operations research. INFORMS, with the help of CPMS, will award the prize to an academic department or program for effective and innovative preparation of students to be good practitioners of operations research, management science, or analytics.

The UPS George D. Smith Prize is named in honor of the late UPS chief executive officer who was a champion of operations researchers at a leading Fortune 500 corporation. UPS has generously underwritten the award in his memory.

The prize will be awarded to an academic program or department. It will include a trophy and a $10,000 cash award. The UPS George D. Smith Prize winner will be announced at the 2014 INFORMS Franz Edelman Gala.

The application process begins with a summary of the role of operations research in the academic program and why competence in operations research practice is one of the goals of the program, written verification of program success, and a commitment, if selected as a finalist, to give a 30-minute oral presentation at the spring Analytics Conference in Boston, Massachusetts, and, if selected as a winner, to reprise the presentation at the INFORMS Annual Meeting in San Fransisco, California. The finalist papers are published in a special issue of *Interfaces*.

Submissions can be made to RNuggehalli@ups.com.
For more details on the application process, please visit **www.informs.org/smithprize**.

See you at the 2014 INFORMS Conference on Business Analtytics and Operations Research!
www.informs.org/smithprize

The INFORMS Prize:

Sustained Integration of Operations Research

2013 Winner

The 2013 INFORMS Prize is awarded to Ford Motor Company for the outstanding widespread use and influence of operations research (O.R.) throughout the company. Ford not only perfected the moving assembly line, but also brought O.R., management science (M.S.), and financial discipline to the company early on, helping to transform it into a data-driven and successful modern organization.

Ford's focus on data-driven decisions was reinforced with the arrival in 2006 of chief executive officer Alan Mulally, who guided the company's restructuring. Analytical tools and the Analytics/O.R./M.S. team supported many decisions in this period, and a number of critical applications were developed: a dealer vehicle recommendation system; a detailed econometric model enabling the study of what-if analyses of inventory, production, pricing, and sales; and a strategic sourcing model to restructure the auto interiors division.

Analytics, O.R., and M.S. form a large, important, and vital activity in Ford, with hundreds of practitioners on three continents. Analytics is applied in Marketing and Sales, Ford Credit, Product Development, Corporate Economics, Human Resources, Material Planning and Logistics, and a number of other organizations at Ford. Its impact is measured not only in over one hundred million dollars of annual profit that analytics applications enable, but also in the major strategic and tactical decisions it supports. The level of engagement by senior executives and support of the analytics work inside the company is impressive.

By awarding the 2013 INFORMS Prize to Ford Motor Company, INFORMS recognizes Ford Motor Company's widespread application of innovative, world-class operations research.

The INFORMS Prize

A History

This is the fifth year in which the INFORMS Prize has been honored during the Edelman Awards Gala. While the Edelman Award and the Wagner Prize recognize single projects that demonstrate outstanding accomplishments in O.R. practice, the INFORMS Prize complements them by recognizing long-term, multi-project achievements.

The INFORMS Prize is awarded annually to recognize effective integration of operations research into organizational decision making. The award is given to an organization that has repeatedly applied the principles of O.R. in pioneering, varied, novel, and lasting ways.

INFORMS Prize Winners

2013 Ford
2012 Memorial Sloan-Kettering Cancer Center
2011 Sasol
2010 Jeppesen
2009 Intel *Decision Technologies Group*
2008 GE Global Research *Risk & Value Management Laboratory*
2006 Schneider National, Inc.
2005 Air Products & Chemicals, Inc.
2004 Procter & Gamble
2003 UPS
2002 Hewlett-Packard
1999 IBM
1998 Lucent Technologies
1997 Merrill Lynch Private Client Group
1996 Pfizer Inc
1995 Bellcore
1994 AT&T and US West Technologies
1993 New York City *Office of Management and Budget* and United Airlines
1992 San Miguel Corporation
1991 American Airlines and Federal Express

2013 INFORMS Prize Committee

Stefan E. Karisch, Jeppesen, Chair
Michael Gorman, University of Dayton, Past Chair
Pete Buczkowski, Disney Parks & Resorts
Timothy L. Jacobs, US Airways
Jeffrey Stonebreaker, NC State University
Sridhar Tayur, Carnegie Mellon University
Jeff Winters, UPS

Notes:
Prior to 1995, the award was called the ORSA Prize.
No prize recipients were chosen in 2000 and 2001.

To adjust to the new INFORMS Prize presentation schedule, no award was given in 2007.



The INFORMS Prize

Criteria

Variety of Applications of O.R. The demonstrated use of a wide set of disciplines and application areas led to a richer set of offerings, leading to greater opportunities for impacting the winning organization.

Competitive Advantage to the Organization. O.R. adoption within an organization is clearly varied among organizations. There are examples where O.R. permeates the parent organization's operations and was considered integral and of strategic competitive advantage for the organization. Companies that soundly demonstrate this type of adoption were rated higher by the prize committee.

Impact. There are several ways that O.R. professionals can quantify and qualify the impact their work is having on the organization as a whole. The prize committee took one-off project impacts into consideration, as well as those O.R. applications that were used on a sustained, systemic manner and the quantifiable value they delivered. Some applicants demonstrated instances in which O.R. made fundamental changes to the client organization's overall business model and/or organizational structure, and the prize committee considered these examples in which O.R. truly made an impact on the organization's operations.

Model for Success. Applicants' business models vary, based on different industries. Some are represented very well, including marketing, budgeting, cost recovery, research funding approaches, and strategic planning. This provides a sense of sustained, growing capability, and of direction for O.R. in the organization.

Endorsements. Strong submissions include personally written endorsements from top-level organization management.

Overall Quality of the Application. The best applicants clearly put extra effort into creating a singular submission with all supporting references and endorsements. A well-written application, taken together with the overview statement, aids the prize committee and, in turn, the applicant.

Call for 2014

INFORMS Prize Nominations

Call for 2014 Nominations



Applications for the 2014 INFORMS Prize are now being accepted.

Organizations in the public and private sectors are eligible. Outside contractors to a candidate organization are not eligible, unless a proven, dedicated relationship exists over a prolonged time period between the vendor and the client organization. In this case, the client organization and vendor will be co-recipients of the prize, presented to appropriate executives of both organizations.

The measurement of the contribution is judged relative to the impact OR/MS has had on the overall success of the organization. Thus, a multibillion dollar firm that has a large OR/MS staff but integrates OR/MS techniques only occasionally might be ranked relatively lower than a small firm that uses OR/MS throughout its activities.

Potential applicants can be assured that strict guidelines regarding the confidentiality of their application are enforced.

The Awards Committee may conduct site visits to those organizations selected as finalists. The award is presented to the key executive in charge of OR/MS activities within the organization.

Please include the following with your application:
A summary description (1-3 pages) of the scope, scale, and impact of OR/MS activities in the organization, and more detailed descriptions (1 page each) of two or three major OR/MS projects and their impact. For more information about the application process, please visit: **www.informs.org/informsprize**.

Deadline is December 1, 2013.

See you at the 2014 INFORMS Conference on Business Analytics and Operations Research! March 30–April 1, Boston, Massachusetts

The Institute for Operations Research and the Management Sciences

About INFORMS, a Pioneer in Analytics

The Institute for Operations Research and the Management Sciences is the leading professional society for advanced analytics professionals.



With the tremendous growth in recent years of analytics, Big Data, and business intelligence, the Institute for Operations Research and the Management Sciences (INFORMS) has risen to become the leading professional association for professionals in these fields – a place where business executives gain assistance, professionals obtain credentials and recognition, and academics publish new, influential research.

This conference, with a special component for executives, is just one example of the way that management can engage with analytics by attending sessions on using analytics at their firms, watching presentations by the best analytical teams at the Edelman Competition, comparing notes at an Executive Forum, and interviewing potential employees at Analytics Connect.

Professionals turn to INFORMS to obtain credentials—witness the Certified Analytics Professional (CAP™) exam being given for the first time at this conference. They compare notes at conferences and through publications written for them. They join a new analytics community, a special interest group for people like them. And soon they will gain a new tool being developed by INFORMS: an analytics maturity model that will help them assess the state of analytics at their organization, how their organization compares to others, and how they should approach strengthening their current assets and improving, moving their analytics efforts to a new, more beneficial level.

INFORMS has expanded its offerings to the business world through *Analytics* magazine, an online publication for those who analyze data in the marketplace and

those who work with them and direct their departments. The magazine's new online homepage, www.analytics-magazine.com, offers breaking news, feature articles, and an Executive Edge column written by guest writers like Bob Page, a vice president at eBay, and UPS vice president Chuck Holland.

INFORMS was established in 1995 with the merger of the Operations Research Society of America (ORSA) and the Institute of Management Sciences (TIMS). The international scientific society, which has over 10,000 members, is dedicated to applying scientific methods to help improve decision making, management, and operations. Members of INFORMS represent industries as diverse as airlines, healthcare, the military, finance, and telecommunications.

Academics share their research in INFORMS journals like *Interfaces*, the INFORMS Journal on the Practice of Operations Research, which shows





how business and government execute important, successful analytics projects. Indeed, INFORMS publishes 13 journals with the most important research in all the specialized subjects that have brought scientific contributions from the related disciplines of math modeling, O.R., management science, and, of course, analytics.

INFORMS is often a leader in identifying the world's foremost researchers—for example, Lloyd Shapley, who would win the 2012 Nobel Prize in Economic Sciences, was recognized with INFORMS' John von Neumann Theory Prize 31 years earlier, in 1981.

INFORMS dominates a special place at the intersection of industry and research. Its leaders salute this year's Edelman finalists and all those who have made advanced analytics an important contributor to business, government, the military, healthcare, and higher education.

Congratulations to Edelman Award winners both past and present

Merrill Lynch salutes the honorees of the 2013 Edelman Awards. And we applaud INFORMS for understanding the value of innovations in operations research and management science. As a member of the Franz Edelman Academy, we proudly congratulate all Edelman Award winners.



Merrill Lynch
Wealth Management®
Bank of America Corporation

The Franz Edelman Award, presented annually by the Institute for Operations Research and the Management Sciences (INFORMS), recognizes outstanding examples of operations research, management science and advanced analytics in practice throughout the world.

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Bringing You a Crown Jewel of the Operations Research Profession

By Russell P. Labe, Chair, CPMS: The Practice Section of INFORMS

Background of the Edelman Award and an Invitation to Participate



As we celebrate the outstanding achievements of this year's Franz Edelman Award finalists, let's take a look at the background of the influential Edelman Award, including the central role of CPMS, the Practice Section of INFORMS.

"CPMS" is an acronym originally derived from "College on the Practice of Management Science." A long-standing acronym often becomes the name, and later we rarely think of its origin. Consider for example AT&T, which once stood for American Telephone and Telegraph, yet is still the acronym even though "telegraph" is no longer part of the AT&T business. So it is for CPMS. "College" was terminology used within The Institute of Management Sciences (TIMS), which merged with the Operations Research Society of America (ORSA) in 1995 to found INFORMS; more appropriate today is the term "Section."

CPMS supports the practice of operations research and the management sciences (OR/MS), also called the practice of advanced analytics. Rather than giving attention only to specific technical methods or areas of study, CPMS, like a family physician, focuses on general practice: how OR/MS may be carried out successfully in any and all organizations where executives and operating personnel seek assistance from qualified practitioners to help improve real organizational performance.

One of the most important activities of CPMS is administering the Franz Edelman Award. This present stewardship directly evolved from the earlier CPMS role in initiating, nurturing, and growing the competition in stature and visibility. First established by TIMS in 1971 as the CPMS Prize, the award was renamed to honor Franz Edelman shortly after his death in 1982. Franz was the founder of one of the



first industrial operations research groups in the United States, at RCA, circa 1950. Today, becoming an Edelman finalist is widely viewed to be rigorous certification that an organization has benefited from the application of state-of-the-art, highly impactful operations research. The finalists' stories and their presentations, available from the INFORMS Video Learning Center, in papers published in the journal *Interfaces*, and on DVD, are widely employed in education and otherwise to help strengthen the profession. Past and present finalist organizations and team members are rightfully honored at our gala award ceremony every year, during the spring analytics conference, where the competition takes place.

Administration of the competition is a rigorous, highly organized effort. The committee of volunteers who operate the competition consists of 35 to 45 OR/MS professionals, most of whom are CPMS members. The committee's chair, typically serving a two-year term, is assisted by 8 to 10 judges, 10 to 15 coaches and assistant coaches, 20 to 25 verifiers and assistant verifiers, and 35 to 40 reviewers (some volunteers take multiple roles).





The competition would not be possible without an effective support-and-evaluation infrastructure. We are always looking for new members to get involved in the prize committee. If you would like to help administer the Edelman competition in the future, a good starting point is to volunteer to become one of the reviewers.

CPMS also oversees a number of other activities important to practitioners, including the Daniel H. Wagner Prize and the UPS George D. Smith Prize (both recognized during the Edelman Gala award ceremony), cluster sessions at INFORMS meetings, isolated practitioner workshops, and a newsletter.

If you are not a member of INFORMS or of CPMS within INFORMS, please join us and pitch in as we serve all full-time practitioners, part-time practitioners, and researchers interested in practice. If you are already a member but not actively involved, contact us (at russ.labe@bankofamerica.com) to find out how you can further benefit from your membership through participation. As the cliché goes about university lecturing, "Nobody learns as much as the teacher." There is no better way to learn the ropes of successful OR/MS practice!

Congratulations to the
2013 Franz Edelman Finalists!

METRON

SCIENTIFIC SOLUTIONS

$$p(t_0, s_0) = q_0(s_0) \quad \text{for } s_0 \in S$$

$$p^-(t_k, s_k) = \int_S q_k(s_k|s_{k-1}) p(t_{k-1}|s_{k-1})\, ds_{k-1}$$

$$L(y_k|s_k) = \Pr\{Y_k = y_k | X(t_k) = s_k\}$$

$$p(t_k|s_k) = \frac{1}{C} L_k(y_k|t_k) p^-(t_k, s_k)$$

Applied Mathematics, Physical Modeling, and Computer Science



www.metsci.com

The Edelman Laureates

2012

Ahmar Abdullah
Suresh Acharya
Sofia Archontaki
Bernard A. Benecke
Greg Burel
Arnab Chakraborty
Kyle Christianson
Frederic Deschamps
John Dimotikalis
Prasanna Dhore
Feryal Erhun
Phillip Finch
Hein Fleuren
James Fuller
Chris Goossens
Marco Hendriks
Erik F. Hertzler
David W. Hill
Karl G. Kempf
Iraklis Lazakis
Eva K. Lee
Marie-Christine Lombard
Kathleen Mallery
Jacquelyn Mason
Ronald P. Menich
Ineke Meuffels
Pelin Pekgün
Chen Peng
Ferdinand H. Pietz
John Poppelaars
Timothy R. Rosenberg
Bharathan R. Shamasundar
Manav Shroff
Ritwik Sinha
Girish Srinivasan
Suresh Subramanian
Rohit Tandon
Osman Turan
James Van Sistine
Orestis Varelas
Takis Varelas

2011

Naoki Abe
Fernando Alarcon
Gary F Anderson
Gustavo Angulo
Alex Beiza
James J. Bennett
Cristian Berner
Brian Carlson
Jaime Catalan
Yonghong Chen
Brent R. Cooley
Kenneth Cooper
Jin Dong
Xing Dong Zhang
Craig Eister
Rafael Epstein
Timothy Gardinier
Edward Godlewski
Cristian Gonzalez
Guillermo Gonzalez
Jon A. Higbie
Mingguo Hong
Sergio Hurtado
Florencio Infante
David L. Jensen
Roy Jones
Dev Koushik
Kevin Larson
Gregory Lee
Guo Li Jie
Xingwang Ma
Prem Melville
Gerard Miller
Mauricio Naveas
Andres Neely
Peter Nieuwesteeg
Cezar Pendus
Xi Quan Wang
Chandan K Reddy
Haili Song
Kimberly Sperry
Matthew Tackett
Doug Taylor
Li Thomas
Vince P. Thomas
Fernado Valenzuela
Jie Wan
Melissa Weatherwax
Andres Weintraub
Liu Xiao Hu
Ming Xie
Jun Yin Wen
Daniel Yung
Eugene Zak
Bin Zhang

2010

Gerkotze Bonthuys
Ebert Cawood
Jay Cunningham
Esmi Dreyer
Ingrid Farasyn
Andrea Feunekes
Ugo Feunekes
Marc Fischer
Michele Fisher
Tjark Freundt
Wolfgang Giehl
Francisco J. Herrería
Salal Humair
Johan Janse van Rensburg
Jaco Joubert
Joel I. Kahn
Peter Kolesar
Miguel de Lascurain
Willem Louw
John MacNaughton
Kim Mathisen
Marlize Meyer
David Fernando Muñoz
John J. Neale
Arturo Palacios-Brun
Steve Palmer
Hylton Robinson
Omar Romero-Hernandez
Oscar Rosen
Ruan Rossouw
John Ruark
Luis de los Santos
James Serio
Francisco Solis
Gerrit Streicher
William Tarlton
Hentie van den Berg
Anette van der Merwe
Wim Van de Velde
Lorraine van Deventer
Jaime Villaseñor
Glenn Wegryn
Sean P. Willems
Cecile Wykes

2009

Dharma Acharya
Jason Amaral
Dirk Beyer
Ann Brecht
Matt Callahan
Brian Cargille
Felipe Caro
Russ Chadinha
Kathy Chou
Matt Collins
Juan Correa
José Manuel Corredoira
Prashant Dave
Gavin DeNyse
Miguel Díaz
Alexey Ershov
Graeme Everett
Qi Feng
Chris Fry
Jérémie Gallien
Javier García
Rune Gjessing
Michael F. Gorman
Sharon Hormby
Shailendra Jain
Shiva Kumar
Rick Lawrence
Michele Meyers
Holger Mishal
Marcos Montes
Julia Morrison
Thomas Olavson
Cookie Padovani
Claudia Perlich
Andy Philpott
Sesh Raj
José Antonio Ramos
Saharon Rosset
David Sellers
Kurt Sunderbruch
Robert Tarjan
Timothy Tenca
Kjetil Vatn
Krishna Venkatraman
Julie Ward
Joseph Woods
Bin Zhang
Jing Zhou

2008

Erwin Abbink
Terra Baranowski
Jonathan Berry
Erik Boman
Michael Brennan
Robert Carr
Lorne Cass
Michael Cirillo
Maria Delbom
Charles B. Duke
Helga Einarsdottir
Mats Eklund
Patrik Eveborn
Pieter-Jan Fioole
Matteo Fischetti
Marte Fodstad
Kim Fox
George Gray
William Hart
Lars Hellemo
Jonathan Herrmann
Ken Howard
Dennis Huisman
Robert Janke
Leo Kroon
Miro Lehky
Vaughn Lowe
Gábor Maróti
Kevin Morley
Regan Murray
James Oiesen
Cynthia Phillips
Cyndi Quan-Trotter
Sudhendu Rai
Lee Ann Riesen
Frode Rømo
Mikael Rönnqvist
Thomas Scheermesser
Lex Schrijver
Adri Steenbeek
Ved Sud
Midori Tanino
Thomas Taxon
Asgeir Tomasgard
James Uber
Jean-Paul Watson
James Wetherly
Roelof Ybema

2007

Corne Aantjes
Deirdre Borrego
Dwight Branvold
Vinayak Deshpande
Kent Everingham
Matt Gaskins
Jerry Hwang
Tim Hyatt
Irina Ionova
Ananth Iyer
Michael Jacks
Goos Kant
Alexei Khavaev
Eva K. Lee

Patty Mackenroth
Venu Nagali
Gary Polaski
Mark Pridgen
Frederick C. Riedlin
David Sanghera
Patrick Scholler
William V. Shearin
Michael A. Shirk
Greg Shoemaker
Jorge Silva-Risso
Tim Thurston
Marco Zaider

2006

William Best
Raymond H. Bittel
Richard Carnevale
Sridhar Chandrasekaran
Louis Cox, Jr.
Ross Darrow
Stéphane Dauzère-Pérès
John Elieson
Christoper A. Forgie
Dirk Guenther
Kjetil Haugen
Ulrich Koester
William H. Lee
Per Olav Myrstad
John J. Nestor
Atle Nordli
Asmund Olstad
Robert M. Peterson
Douglas Popken
B.V. Rao
Alf Reistad
Barry C. Smith
Mandyam Srinivasan
Geir Teistklub
Russell Wooten
Faker Zouaoui

2005

Jeffrey Alden
Dennis Begg
D.A. Beis
Ann Bixby
Lawrence Burns
Michael Concordia
Theodore Costy
Brian Downs
Toshiharu Hasegawa
Rick Hughes
Richard Hutton
Craig Jackson
Jim Jacobs
David Kim
Kevin Kohls
David Levine
P. Loucopoulos
Paul Martyn
Jonathan Owen
Y. Pyrgiotis
Tuomas Sandholm
Mihiro Sasaki
Katsushige Sawaki
Mike Self
Atsuo Suzuki
Mark Turnquist
David Vander Veen
K.G. Zografos

2004

Martin Barkman
John C. Butler
Alexander Chebeskov
Herman Chiu
Mathieu Clerkx
Ton de Kok
Jacques Desrosiers
Yvan Dumas
James Dyer
Thomas A. Edmunds
Rob Harlan
Richard Hicks
Fred Janssen
Jianmin Jia
Mike Kanaley
Joshua Kanner
Alev Kaya
Byung-In Kim
Seongbae Kim
Bob Kraas
Benoit Lacroix
Kam-Keung Lai
Edmond Leung
Yong Liu
Jiyin Liu
Richard Madrid
Sean Marshall
Theresa Metty
Chris Milligan
Tom Moore
Thomas Morris
Katta Murty
Alexander Oussanov
Winfried Peeters
Alexander Popov
Kevin Potts
Robert Pruneau
Olga Raskina
Jeffrey Robbins
Surya Sahoo
Quentin Samelson
Avner Schneur
Rina Schneur
James Smith
Ron Sorensen
François Soumis
Sridhar Tayur
Loren Troyer
Mitchell Tseng
Jan van Doremalen
Erik van Wachem
Yat-Wah Wan
Elan Yaniv

2003

Kirk Abbott
Surain Adyanthaya
Vedat Akgun
Andrew P. Armacost
Mordecai Avriel
Cynthia Barnhart
Corey Billington
Chris Born
E. Andrew Boyd
Gianpaolo Callioni
Monica Carbajal
Rod Case
Barrett Crane
John Fallis
Edward Feitzinger
Chyi-Fu Hong
Phil Ireland
Curtis Keller
Jason Kuehn
Jin Liu
Ronit Meiri
Marc Meketon
Wayne New
Avi Peretz
Robert Prior
Hanna Pri-Zan
Julie Unruh Rapp
Tom Rieger
John Ruark
Robert Slavens
Pat Smith
Jerry Trimarco
Carl Van Dyke
Mark Wallace
Keith A. Ware
Trace White
Sean P. Willems
Alysia M. Wilson
Bert Winemiller
Ron Woestemeyer

2002

Chae An
Michael Argüello
Fred Blakeley
Burçin Bozkaya
Buyang Cao
Andrew Davenport
Ralf Elsner
Wolfang Hall
Gail Hohner
Arnd Huchzermeier
Philip Jones
Jayant Kalagnanam
Greg Kegler
Gilles Kern
Jospeh Knolmajer
Manfred Krafft
Ho Soo Lee
Thierry Lemoine
Timothy Lowe
Sandra McCowan
Ed Ng
Alain Patchong
Grant Reid
John Rich
Gao Song
Rodney Traub
Anna White
Gang Yu

2001

Stuart Altschuler
Rick Ayer
Vince Barabba
Donna Batavia
Jeff Bennett
Srinivas Bollagragada
Robert Butchers
José Vicente Caixeta-Filho
Hong Chen
Fred Cooke
Antonio de Pádua Wagemaker
Robert Fancher
Marc Garbiras
Tim Gibbs
Gregory Hoscheit
Chet Huber
Mark Humphresville
Jeenyoung Kang
James Knowles
Russ Labe
Robert Leachman
Bonnie Liao
Vincent Lin
Kevin Lyman
Raj Nigam
Je Oh
Mark Paich
Greg Parlier
Mary Phillips
Nick Pudar
Surya Sahoo
Michael Scholes
Jim Smith
Jan Maarten van Swaay-Neto

2000

Eric Bibelnieks
Mark Bullock
E. Rod Butchers
Deb Campbell
Kan Chang
Kenneth Chelst
Harlan Crowder
Paul R. Day
Randy Erdahl
Andrew P. Goldie
Michael Haydock
Ken Howard
Doug Johnson
Elena Katok
Jeffrey Lockledge
Peter Lyon
Jeff A. Meyer
Demetrios Mihailidis
Stephen Miller
R. John Milne
Rick Oiesen
Robert Orzell
Alex Przebienda
Robert Rice
David Ryan
Amanda Scott
Laura Shisler
John Sidelko
Midori Tanino
William Tarantino
Ralph Tiedeman
Chris Wallace
Michael Wambsganss

1999

Rob Allan
Ken Ambs
James Angelo
Nader Azarmi
Sugato Bagchi
Steve Buckley
Rony Cremmery
Sebastian Cwilich
Nicolas De Schuyter
Mei Deng
Markus Ettl
Gordon Gould
Ron Holcomb
Terry Holeman
Richard Hopson
David Houck
John Hudson
Dean Jones
Kerry Kim

Edwin Kjeldgaard
Lisa Koenig
Marc Lambrecht
David Lesaint
Grace Lin
George List
David Lynch
Clive Morgan
Charles Muir
John Mulvey
Bret Naccarato
George Pfeil
Shahram Taj
Mark Turnquist
Nico Vandaele
Christos Voudouris
Dicky Yan
David Yao

1998

Henry Alden
Dean P. Angelides
Franz Behlau
Dimitris Bertsimas
Buyang Cao
James Causby
Christopher Darnell
Rafael Epstein
Matthew J. Etzenhouser
L. Russell Fletcher
Corrie Heynen
Scott P. Holmen
R. Jaikumar
Ralph Kaiser
Albert Kuttner
Ramiro Morales
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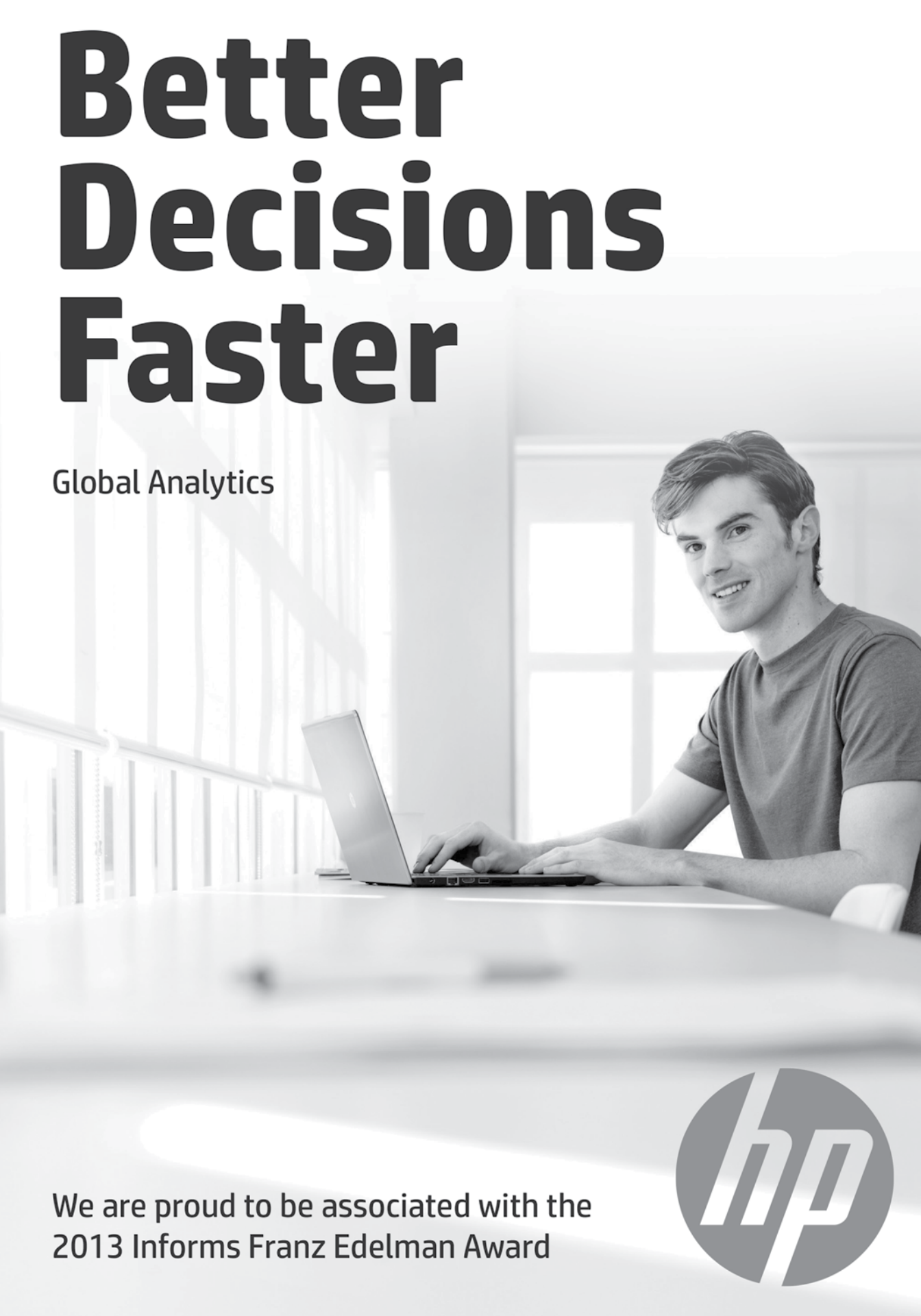
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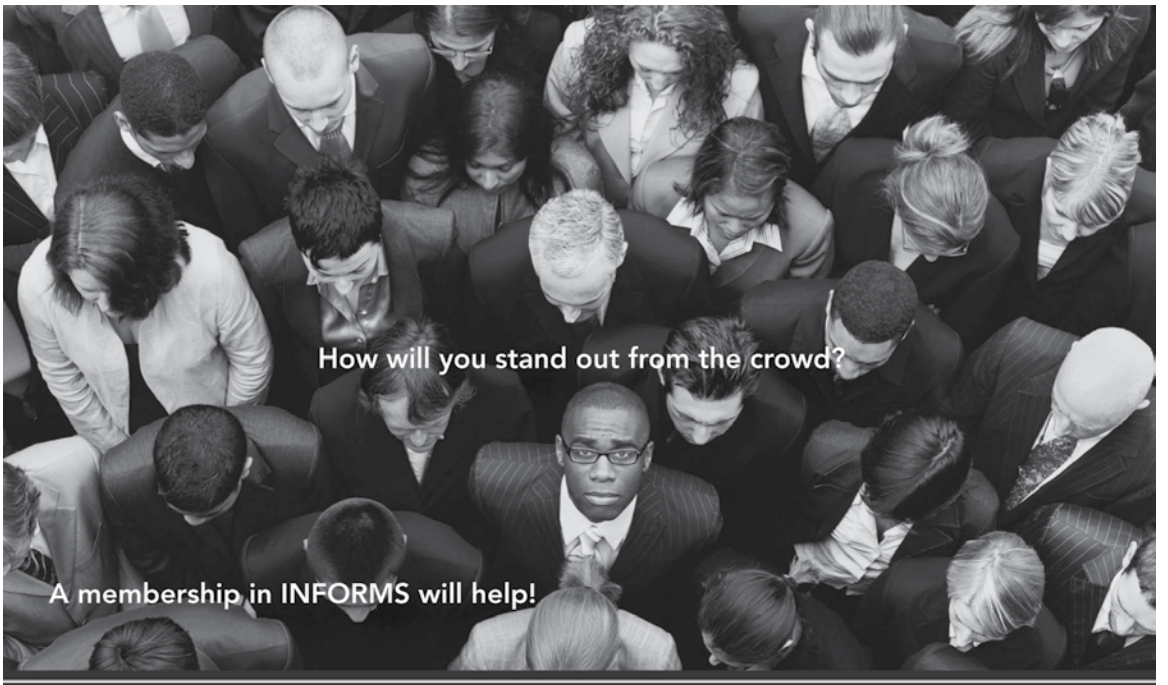
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