

BY GIJS DULLAERT AND
GERTJAN DE LANGE

Editor's note: This is another in a series of articles profiling members of the INFORMS Roundtable.

Paragon unleashes the power of optimization

Paragon Decision Technology originated with and has always operated with the primary purpose of making it easier for organizations to apply operations research, thus unleashing the power of optimization to their operations, processes and (strategic) planning activities. “To bring the benefits of operations research to society” is engraved in the company’s mission, and Paragon achieves this through the development and implementation of its AIMMS optimization technology.

With offices in the Netherlands, the United States, China and Singapore, Paragon employs 30 people worldwide, 20 of whom are researchers, developers and support staff directly involved in the continuous improvement of the company’s flagship product, AIMMS, to be a flexible but powerful optimization technology. Today, AIMMS is used by operations research professionals and students around the world to develop AIMMS-based models and applications that solve a wide variety of problems for the benefit of their organizations and their professional development.

Recently, Paragon has also taken a special interest in extending the reach of operations research further into customer operations. Led by the motto “to marry business and math,” the company developed AIMMS PRO, an enterprise optimization platform that enables companies to rapidly develop and publish optimization ideas, proofs of concept and apps. As such, AIMMS PRO can act as an organization’s optimization app store, running on an internal cloud or via an external cloud provider.

Company History

JOHANNES BISSCHOP founded Paragon in 1989 with a clear vision of offering graphical support during model construction – along with a rich variety of mathematical modeling language concepts – in order to strongly enhance the user experience of the modeler. Guided by this vision, the first commercial version of AIMMS was



The management team of Paragon Decision Technology (l to r): Marcel Roelofs, CEO; Gijs Dullaert, VP Product Strategy, Marketing & Sales; and Gertjan de Lange, CTO.

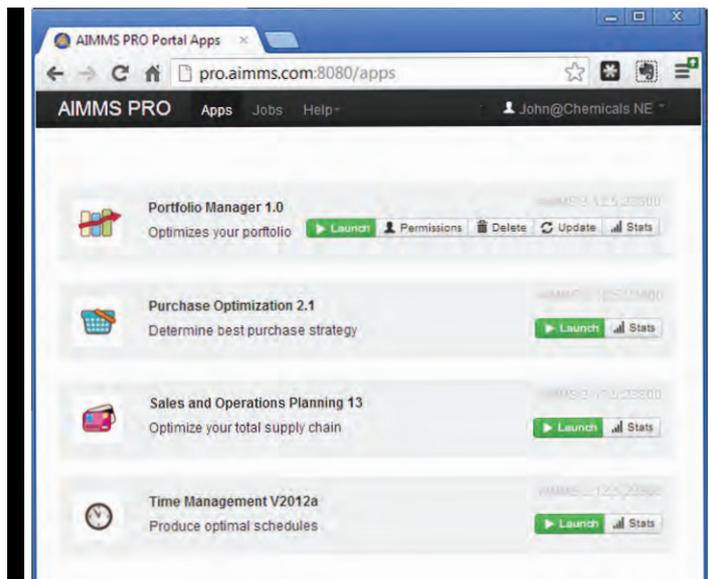


Figure 1: The AIMMS Publishing and Remote Optimization (AIMMS PRO) platform is a collaboration platform launched in 2012 to allow users within a company to access AIMMS-based optimization solutions they use through an easy-to-manage Web portal.

All About the Roundtable

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released in 1993. The introduction of AIMMS 3 in 2000, which added the Model Explorer concept and more to the AIMMS toolbox, marked another huge step toward enhancing both the application development capabilities and the user experience of AIMMS.

In 2003, a management buy-in led by current CEO Gijs Dullaert changed the ownership of Paragon. The vast majority of the shares of the company are now held by its management team and employees. More than 60 percent of Paragon's employees own stock in the company.

Since the release of the first AIMMS version, Paragon's customer base has steadily grown. Many large companies, as well as game-changing start-ups and privately held companies, use AIMMS on a daily base to optimize parts of their businesses.

Company Tenets

BUSINESSES and their decision-makers face increasing complexity in their business environments. Internationalization, sheer size, supply chain interdependencies, sustainability challenges, compliance and risk management are all challenges to making fast and well-informed decisions.

The convergence of big data, cloud computing and advanced analytics, however, provide opportunities to develop intelligent systems to support businesses and their decision-makers in response to this increasing complexity.

Optimization is especially fit to solve complex balancing problems, but its use has been limited and only partially effective thus far because of a lack of broad acceptance.

Business professionals, especially at the higher management level, are often not convinced that mathematical optimization can feasibly support them in making tough decisions. The black box nature may not always appeal to decision-makers' natural inclination to try to understand the problem and its solution before making a decision based on facts and intuition.

Despite this, we at Paragon believe that optimization technology can and will be a game-changer in resolving the challenges of increasing complexity that decision-makers are facing. AIMMS is designed to create this change by connecting optimization experts and decision-makers, making optimization approachable via technology that allows professionals with math, specific

The Roundtable consists of the institutional members of INFORMS with member company representatives typically the overall leader of O.R. activity. The Roundtable is composed of about 50 organizations that have demonstrated leadership in the application of O.R. and advanced analytics. The Roundtable culture is peer-to-peer, encouraging networking and sharing lessons learned among members.

The Roundtable meets three times a year. Roundtable goals are to improve member organizations' OR/MS practice, help Roundtable representatives grow professionally and help the OR/MS profession to thrive. Further information is available at <http://roundtable.informs.org>.

The Roundtable also has an advisory responsibility to INFORMS. According to its bylaws, "The Roundtable shall regularly share with INFORMS leadership and advise the INFORMS Board on its views, its suggested initiatives and its implementation plans on the important problems and opportunities facing operations research and the management sciences as a profession and on the ways in which INFORMS can deal proactively with those problems and opportunities." The Roundtable meets with the INFORMS president-elect each spring to discuss practice-related topics of interest to him or her, and with the entire INFORMS Board each fall to discuss topics of mutual concern.

This series of articles aims to share with the INFORMS membership at large some information and insights into how O.R. is carried on in practice today.

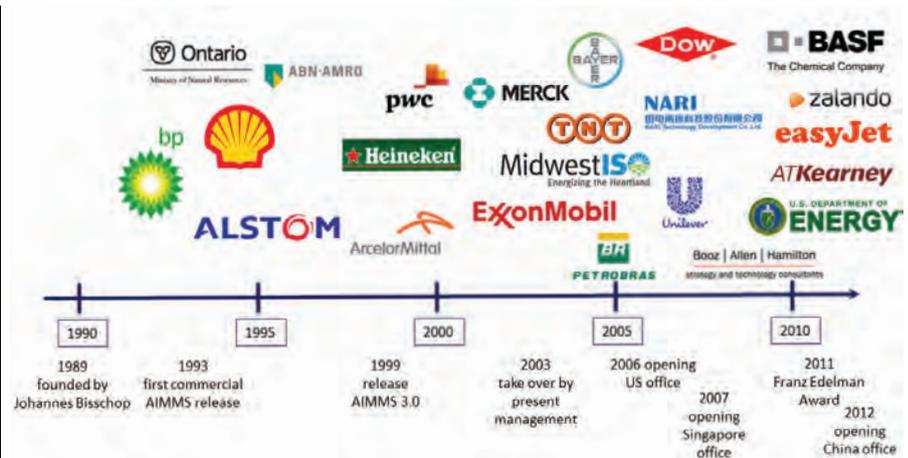


Figure 2: Paragon's company timeline and some of its prominent customers.

domain and general business backgrounds to collaborate and utilize existing data, optimization models and future scenarios to produce dynamic decision-making processes and outcomes.

Through AIMMS, Paragon aims to build optimization technology that is able to connect the "soft" intelligence and intuition of business people and the "hard" intelligence of mathematical optimization to resolve increasing complexity. Paragon aims to connect intelligence of technology and the intelligence of math. Paragon aims to provide optimization technology that helps create "continuous intelligence" to support decision-making by making optimization models readily adaptable and results readily available to decision-makers through customizable decision consoles. Through these connections, Paragon aims to equip business decision-makers like generals, with war rooms that are readily available to help them make their next tactical and strategic decisions.

Success Stories

Petrobras

BRAZIL'S LEADING energy company, Petrobras operates several oil and gas fields in the Campos basin. The fields are explored by more than 30 oil platforms, and the produced gas is either delivered onshore for selling or used at the platforms to generate energy or to be re-injected in order to support and enhance oil production.



The planners for these sites are constantly challenged to generate optimal supply and demand flows, navigate intuitively through the gas network, and identify bottlenecks quickly so they can respond in time and assure that platforms are operating at maximum capacity.

AIMMS and operations research helped Petrobras to develop a sophisticated, scalable and integrated system that provides fast, reliable and intuitive decision support.

Midwest ISO

Midwest ISO manages a power grid that serves customers in 11 states and the Canadian province of Manitoba. Together with Alstom Grid and Paragon Decision Technology, Midwest ISO leveraged advanced computing capabilities and operations research algorithms for energy and ancillary service markets. Specifically, the company added significant value to the Midwest region through improved reliability and increased efficiencies of the region's high-voltage power grid. Based on its annual value proposition study, the Midwest ISO region realized between \$2.1 billion and \$3 billion in cumulative savings from 2007 to 2010. Midwest ISO also estimates that an additional \$6.1 billion to \$8.1 billion of value will be achieved through 2020.



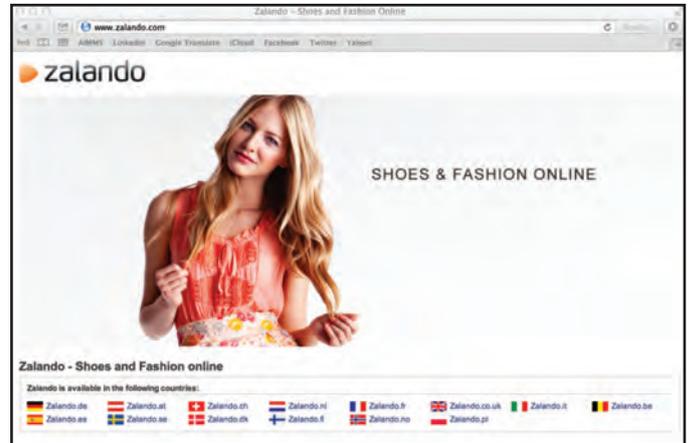
As partners in this project, Midwest ISO, Alstom and Paragon received the Franz Edelman Award from INFORMS in 2011.

Zalando

ZALANDO IS EUROPE'S leading online retailer for shoes and fashion. Following its highly successful launch into the German market in 2008, Zalando expanded to several additional European countries, starting with Austria in 2009 and the Netherlands and France in 2010. Expansion to Italy, United Kingdom and Switzerland followed in 2011, and this year Zalando started shipping to Sweden and Belgium.

Facing an increasingly complex delivery network, both in terms of its European customer base and its warehouse setup, Zalando quickly recognized the need for an advanced optimization tool to help design its network

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and transport flows. This optimization would ultimately be the key to ensuring a consistently high service level toward their customers at a justifiable cost. AIMMS technology allowed Zalando to build prototypes quickly and benefit from unique optimization applications that create a competitive edge for the company.

The Future

PARAGON'S MISSION to bring the benefits of operations research to society is a journey of marrying business to optimization. It is a journey of reaching out to businesses to understand the specific challenges and needs that organizations are facing in decision-making. It is a journey of understanding the challenges organizations face in applying optimization to the benefit of their businesses.

On this journey, Paragon's specific, near-term goal is to make AIMMS an enterprise optimization app store with a menu of intelligent- and customer-specific optimization apps, marketplaces and serious games. Providing businesses with these AIMMS-based decision consoles at strategic, tactical and operational levels will support fast and intelligent decision-making from every angle. These innovations will continue to trigger the enlistment of new staff, development of new products and the expansion of the company's customer base in 2013, while the focus remains firmly on Paragon's passion to put the power of optimization into the hands of people. **IORMS**

Gijs Dullaert is CEO of Paragon Decision Technology. Gertjan de Lange is responsible for global sales & marketing and product strategy at Paragon.