For nearly 80 years, Jeppesen has helped people safely reach their destinations by providing aviation professionals worldwide with navigational information, flight-planning services, and operations solutions. About 20 years ago, Jeppesen—like many companies—began to struggle with the transformation from the Triassic age of cumbersome machinery and analog pencil-on-paper decision making to electronic media and charting in the fast-moving digital age. Many companies failed to survive this transformation, or they continue to struggle. Jeppesen has thrived in this new world of complex digital technologies, shifting customer demands, and mutable markets. It has done so by moving from a product-based focus to a customer-based focus and by using operations research (OR) as an essential decision-making strategy to improve its ability to satisfy customer demands. Jeppesen’s use of OR is noteworthy; the company won the Franz Edelman Award in 2000 and the INFORMS Prize in 2010. How did it manage the internal change to reach the OR excellence needed to attain such recognition? What are some of the lessons learned along the way? And what is next? One thing is certain: over this period, OR has enabled the improved decision making that resulted in hundreds of millions of dollars in benefits to Jeppesen and several billion dollars in benefits to its customers. In this paper, we describe some pivotal events that led to Jeppesen’s current reliance on OR as a strategic capability.

Key words: practice of OR; performance; decision support; community OR; planning; organization.

History: This paper was refereed.

Early in 1997, Jeppesen management was seeking a sound method to redesign the company’s production system and provide the flexibility needed to effectively respond to an increasingly entropic business environment. Clients had begun to demand customized weekly aviation navigational revision packages and aviation product orders; these new demands led to an alarming number of late deliveries. Jeppesen’s legacy production system was unable to cope with (1) the growing number of customized products, which in turn increased scheduling complexity, (2) an expanding product mix, (3) differing product content, which limited printing economies, and (4) new production processes. The production system was originally developed to manufacture a relatively small number of fairly standardized products with large production runs. New customer demands for customized charts necessitated weekly production requirements of both traditional and low-quantity customized products. Yet, the production process, which involved a combination of heavy equipment and manual labor, had remained virtually unchanged.

Alex Zakroff, then a Jeppesen industrial engineer and today the vice president for Jeppesen’s global navigation services, had heard about Professor Gene Woolsey’s iconoclastic operations research (OR) methods at the Colorado School of Mines, and invited Gene and his students to the Jeppesen facility. This visit was the beginning of OR at Jeppesen.

Alex was looking for a student who could help production solve its product tardiness problems, and the students were looking for dissertation topics. His goal was to establish a joint relationship in which the company would benefit from the students’ analysis
and the students would benefit by meeting graduation requirements. The challenges facing Jeppesen were daunting. In addition, Jeppesen depicted itself as being resistant to change based mainly on decades of tradition and success. This resistance made the company a less-than-ideal candidate for a dissertation project.

On a sunny morning in Golden, Colorado, several PhD candidates were sitting in a local coffee shop. The previous day, they had toured Jeppesen’s facility and discussed production shortcomings with reticent staff members. The tour and staff interactions had left an impression on the group. Gene Woolsey had just begun asking each student if he or she wanted to accept Jeppesen as a dissertation project, but nobody wanted the job. He started to his left; Bill Tarantino was next to him on his right. One by one the students said “No. No way—they will never change.”

When it was his turn, Bill said, “Yes, I think they are a target-rich environment.” Elena Katok, a faculty member at the School of Mines, volunteered to help him on the project. From that point on, he worked with Ralph Tiedeman, an industrial engineer at Jeppesen, and the other production staff, and his days started between 4 AM and 5 AM. The project began as a single defined task—Alex’s need to help deliver weekly products to the airlines on time; however, it eventually culminated in a sea change for a company that prided itself on its traditional methods. Not only did the production system need to be redesigned, but Jeppesen also needed to reconfigure how it conducts business. This project was the beginning of a transformation from a paper-and-pencil firm to an OR leader, using analytics to lead change, form strategy, and inform business decisions.

Bill’s first day was unforgettable. He met the scheduler, a jolly, bearded man who was certain that “no change is good change” and who had been “scheduling production forever.” Like many domain experts, the scheduler was indispensable; he had more than 30 years of work experience in which he had defined the position and amassed experiences that no one else could match. He set out to convince the new analysts that they would fail miserably; what they were trying to do was impossibly complex and just “could not be done,” because demand changed weekly across multiple production dimensions. Although not as overtly skeptical as the scheduler, others also withheld information and limited their collaboration, mainly because they were concerned that they would make the problem worse by using unfamiliar methods. On that first day, as Bill often thought back to the coffee shop discussions, he quickly realized that natural resistance would be the reaction to any solution they would develop. Jeppesen’s problems were not trivial; reliable solutions were needed to keep the company successful in a market that was evolving technology, as customers continued to request more complex, customized products.

Lesson learned—Listen to those currently empowered, but remember that they may not have the solution

Including domain experts on a project team is important. They often have crucial knowledge and they justifiably have the ear of the senior management team who makes the final decisions. However, domain experts cannot always solve their organization’s problems because of their accustomed way of viewing the actions or processes that cause the problems. They develop blind spots that limit the potential range of solutions. A vital and overlooked part of the analyst’s task is to help those who have become immersed in a mindset to see the causation from a fresh perspective, and thus expand the range of possible solutions. Bill was lucky—he gained the friendship and trust of a tireless trio: Ralph Tiedeman, Alex Zakroff, and Paul Vaughn, who was in charge of product assembly. This team of domain experts was willing to evolve; just as importantly, it was willing to help Bill and Elena learn everything about production and join them to create an analysis team. Without this trio’s assistance, the project would not have succeeded.

To put in perspective the production problems they were solving, imagine a large room with stacks of paper piled on tables. Each stack contains multiple copies of the same aviation chart (see Figure 1) and is one to four feet high, depending on the number of copies. The charts vary in size, number, geography,
Figure 1: This example shows a Jeppesen navigation chart, which provides pilots with their flight information (© Jeppesen. Reprinted with permission).
and content, and a combination of different charts makes up an airway manual, as the manuals in Figure 2 show. Many commercial customers require tailored and custom charts that creates an even larger number of possible combinations of charts making up a manual. With all these piles of paper, everyone must be careful not to trip and take down the paper towers.

Now, imagine being in that room with no space for more paper, nobody working, and no final manuals being collated and assembled for shipping to customers. The stacks symbolized the problem; they included plenty of parts and pieces, but production had not printed all the contents needed to collate a single product. The schedule was developed to ensure that the charts would be printed and compiled, but not to complete a product. Yet, even though the growing stacks of paper constantly illustrated the problem of why products were delivered late, change was difficult. The goal was to eliminate the stacks—that is, to ensure 100 percent on-time delivery of Jeppesen’s products.

In addition to this internal evidence, Jeppesen was also receiving external commentary that highlighted a need for change. In early summer 1998, the Air Transport Association (ATA, now Airlines for America) told Jeppesen’s CEO that the timeliness of its service “needed improvement and is not meeting its expanding expectations” (Katok et al. 2001, p. 12). ATA demanded an immediate and dramatic decrease in late revisions and new orders. Pressure from ATA highlighted a realistic danger for Jeppesen—losing customers and its competitive edge as a result of the deterioration in the timeliness of product delivery.

First Success

What seems obvious to someone who is looking through the OR lens is not necessarily obvious to someone else; because of these different perceptions, people can resist changes that the OR practitioner might consider self-evident. Getting others to see things anew can be difficult, even in the face of mounting evidence (or mounting stacks of paper). In a meeting with the production staff and the CFO, the analysis team discussed a new type of collating equipment to automate one of production’s manual processes. The team had recently completed an analysis of this equipment, which projected payback within six months or less for a small investment that eliminated the manual process; thus, the team thought it was a no-brainer. The CFO was sitting next to Bill; she leaned over, looked him in the eye, and said “there is no such thing as a no-brainer,” and then left the room. The team became concerned. If it could not convince the company to change a simple process that seemed like a no-brainer, how could it convince management to make more significant and less obvious changes? The team knew that it needed to continue to build its credibility, especially with the CFO.

Lesson learned—Nothing can beat hands-on experience for building an understanding of the problem and your credibility

Since their arrival, the analysts had worked through every aspect of the production process, including product preparation phases, plating chart negatives, printing, folding charts, assembling products, machine collating operations, stuffing envelopes with products, boxing, and finally mailing the products. Employees and production floor managers witnessed the analysts on the production line working and struggling to understand the production processes; their efforts earned them credibility. The production line experiences also started to build greater familiarity and trust in analysis among the managers, but the analysts needed to expand their knowledge and credibility beyond production.
After the CFO session, they continued to work making minor no-cost improvements throughout production to aid on-time delivery. They also strengthened relationships by involving themselves with workshops and discussions outside of production. After meeting with the CFO and discussing perspectives of past production investment payoffs, the team realized that it needed to continue to build trust with the CFO and prove it could deliver on its savings projections. Providing the CFO with weekly written reports and focusing on a range of possibilities that highlighted uncertainty and risk (as opposed to a point estimate) in the analysis proved helpful. In the end, the analysis team was working in an environment in which production failed to meet past savings projections (e.g., claims that a new piece of equipment would save time and costs, and pay for itself). Incremental success, total transparency, simple and effective analytics, and trust in the analysts helped the team to gain the respect of the CFO, who finally approved the purchase; the collating equipment exceeded projections.

Lesson learned—Build on small successes and there is never a “no-brainer”

This first success strengthened the credibility of the team members even more and helped them to chisel away at the barriers in front of them. They added incrementally to their recommendations. As they developed multiple production planning tools, they provided these tools in an evolving toolbox, rather than moving directly to extensive production changes or software development efforts that would have derailed much-needed change. For example, they built simple spreadsheets to calculate production differences based on equipment choice for each system decision. Then, they combined the system spreadsheets into more complex decision tools for each production area, prior to introducing a singular scheduling solution. As they built on each small success, they found that the incremental approach worked. Management became supportive after the monetary savings of the first collating-equipment purchase exceeded expectations. Alex, Ralph, and Paul provided much-needed internal analytical support and, as the first informal OR team, they introduced a new scheduler model that enabled production to take on-time delivery back to 100 percent. The company started the transition from traditional offset printing to a mixed printing solution, including print-on-demand systems. Fifteen years later, Jeppesen still applies the same principles, as it continues to build on its successes to support further change and form company strategy.

The Edelman Award

Jeppesen won the 2000 Franz Edelman Award for Achievement in Operations Research and the Management Sciences, and Elena, Bill, and Ralph became Edelman Laureates. Ralph stayed at Jeppesen as a founding member of the new OR Group. Elena eventually went to Penn State University, and Bill continued as a Jeppesen consultant.

Our Edelman project included two parallel efforts; we paraphrase the remainder of this section from Katok et al. (2001, 2003). In the first effort, strategic economic analysis, we studied how to improve the production process by making targeted investments in alternative production technologies. We developed a list of technology alternatives to increase throughput in the production areas and a method that combines simulation and optimization to analyze these alternatives and justify investments. In the second effort, we created a suite of decision support tools for production planning; these tools efficiently used all available resources, including new capacity from additional equipment. We built several spreadsheet-based and database management tools that became popular among planners. Our OR modeling efforts covered several aspects of production. First, a large-scale linear program, which we called the scheduler, optimized production of the weekly revision. Second, a mixed-integer programming model optimized the completion of new orders each day. Third, a stochastic dynamic inventory-management model controlled the disposal of outdated charts, which outside vendors typically print. Finally, an interactive, knowledge-based heuristic, based on the approximate solution of a large-scale nonlinear mixed-integer program, minimized scrap when making plates for offset printing.
This early work had a direct impact on customer service and efficiency; however, it also highlighted the effectiveness of OR throughout the company. Management noticed early on that OR could make a measurable difference and continued its growth in different areas.

**OR Leads Change**

Based on the successes that led to our receiving the Edelman Award, Jeppesen management started its internal OR group in 2000, kick-starting actions needed to set the stage for further change across the enterprise.

**Lesson learned—OR is a change agent and needs to challenge the status quo**

Since its inception, the OR group has improved operations and supported decision making related to resource utilization, capital investments, market strategy, and pricing by using models to improve objectivity and define profitable opportunities. Although early OR efforts had an internal focus, acquisitions eventually broadened this to offering OR services to external customers.

In 2006, Jeppesen acquired Carmen Systems, a leading provider of resource optimization solutions for the airline and rail industries, to complement its offerings in airline operations services. With this acquisition, Stefan Karisch, vice president of operations research at Carmen Systems, joined Jeppesen. The Carmen acquisition provided another strong OR supporter, which helped in the company’s transformation.

**Lesson learned—Successful OR and analytics help define and create significant business value**

In 2008, Jeppesen acquired Ocean Systems Incorporated, a leading provider of vessel and voyage optimization solutions that became a part of Jeppesen’s marine division. Today, as a result of its expanded OR capability, Jeppesen can offer its clients optimization-based solutions to improve their own bottom line. For example, today airlines are expanding, new airlines are entering the market, routes are constantly evolving, and fuel costs are changing daily along with the weather, adding to an already difficult planning problem for the airlines. Jeppesen’s optimization-based solutions (e.g., crew scheduling, flight planning, and vessel voyage optimization) help customers develop their strategic advantages as they deploy the latest advancements in optimization technology.

**Internal OR Application**

OR continues to lead change by enabling Jeppesen to take a proactive view by using supporting analyses for business-related transformational projects. OR provides feasible alternatives derived from mathematical analysis and extensive data reviews, which provide fact-based analytics. For example, by supporting production decisions with OR tools and analysis, OR enabled the successful launch of a product offering called Airside Services, which Jeppesen offers to customers globally. Airside Services relieves pilots of the tedious and time-consuming task of replacing old pages with updated ones in their navigational and technical manuals. Because the Airside Services model is based on aircraft-specific ship-sets of manuals rather than pilot-issued sets, it reduces the use of paper by as much as 80 percent. The ship-set requirement means that the pilot’s resource-intensive and time-consuming amending of the manuals must be incorporated into the production process; OR enabled these process changes with supporting economic, production, and decision analysis.

The rapid growth of Airside Services added complexity and additional workload to operations and impacted other offerings. The result was an urgency to rapidly grow the service to better position core products in a very competitive environment. The business had to move fast and production had to find a way to reliably implement the service. Stefan recalls, “I knew that we had to produce results very quickly to support the new service and also make it commercially viable. Our internal customers were very nervous, and so was my OR team.”
Lesson learned—OR and analytics add credibility and rigor to a decision

The task was daunting, because a delivery delay of a ship-set could ground a flight, which would cost the affected airline hundreds of thousands of dollars. A key to the team’s success was the strategy of combining production inputs with analytics and a Lean manufacturing approach. For example, the team held an accelerated improvement workshop with all global stakeholders to rapidly form a plan. After implementing this plan, existing production processes were immediately improved using Lean principles to optimize flow. At the same time, the team developed a set of analytical business and operational models that highlighted feasible options for the sustainable growth of Airside Services and helped create a successful Airside Services strategy.

Over the past 10 years, Jeppesen has shifted from paper to digital solutions using a program that it calls the paper-to-digital initiative (P2D). Airside Services were positioned as a strategic bridge offering that would allow customers to go from paper to less paper, and eventually paperless. Today, OR is in the middle of P2D, supporting paper replacement initiatives and production footprint downsizing, and providing analytics to help form the digital solution strategy. The market adoption of mobile technology is quickly reducing the need for paper (see Goyer 2011). One of Jeppesen’s challenges during this digital transformation is paper-demand uncertainty and the threat of overinvesting in print capacity. Several external factors contribute to this uncertainty, such as an acceleration of the transition from paper to electronic solutions through enabling technologies (e.g., the Apple iPad as depicted in Figure 3) and the increase in revision activity from aviation regulators.

As paper and print volumes continue to shrink at an uncertain rate, analytics determine the resources needed to minimize production costs, while still meeting all customer demands. Analytics also help determine how the company can retire paper products altogether as customers migrate to digital solutions. OR helped build flexibility into the production system through improved decision models, developed modeling capabilities and what-if scenarios to optimize Jeppesen’s response to P2D, and determine the best timing strategy to retire paper products to avoid a lag in cost reductions. In many cases, OR challenged common beliefs about system performance, implications of changing demands on production requirements, and the best ways to manage the P2D transition by providing analytics-based recommendations. For example, by looking holistically at the extensive production system, OR successfully challenged experience-based decision making with fact-based decision making, which reduced print capacity significantly and still met customer expectations through a revised distribution chain. Today, all these strategic decisions are made based on sound analytics, and Jeppesen’s senior executives require that OR and analytics help form the company’s P2D strategy.

Lesson learned—OR and analytics can form strategy

External Application of OR

Beyond enabling better internal decision making, OR has become an integral part of Jeppesen’s resource optimization solutions, and has helped improve the operational efficiency of many transportation providers. This led to the successful registration of Optimization Matters® as a trademark, which is testament to Jeppesen’s commitment to creating OR
and analytics value for its customers. For example, a Jeppesen crew-scheduling system schedules more than 300,000 pilots and flight attendants each month, helping airlines better manage the second-largest variable cost in their operations. Today, 6 of the 10 largest airlines rely on these crew-optimization systems. A conservative estimate, based on customer benchmark analysis, is that Jeppesen’s airline customers save hundreds of millions of dollars annually by using Jeppesen’s solutions.

These solutions are often based on original research at Jeppesen. For example, Hjorring (2004) and Kohl and Karisch (2004) describe how increasingly large and multifaceted crew-scheduling problems can be modeled and solved. Grönkvist (2005) combines mathematical and constraint programming approaches for fleet scheduling, and Andersson et al. (2005) and Karisch et al. (2011) investigate the bigger picture of airline operations.

Lesson learned—OR thinking is contagious and enables fact-based discussions on critical topics

OR at Jeppesen is now a way of thinking. For example, reducing fatigue-related accidents and incidents has been on the National Transportation Safety Board’s most-wanted list of safety improvements since it was initiated in 1990. In commercial aviation, crew schedules are regulated by laws that define maximum duty time limits, flight time limits, minimum rest periods, and other constraints. These rules and limits, collectively referred to as flight-time limitations (FTLs), are intended to limit and account for fatigue, and thereby ensure safety. The differences between FTL regulations around the world are significant and can affect, to varying extents, crew productivity and the levels of crew alertness. To address this important field of flight safety, Boeing and Jeppesen have jointly developed unique analytics capabilities to alleviate crew fatigue and engage all aviation stakeholders—regulators, operators, and crew—in informed discussions. Based on results obtained through analytics-based fatigue risk management (FRM) work, Jeppesen proposed a shift in focus to emphasize fatigue models as part of crew scheduling to further reduce crew fatigue risk (Romig and Klemets 2008, Hellerström et al. 2010). The FRM innovation demonstrates how analytics can provide more accurate FTLs that enable operational advantages, resulting in more productive crew schedules and reduced fatigue risk.

Jeppesen also provides optimization-based flight-planning and dispatch services for commercial, military, and business aviation operators worldwide. An operational flight plan is required to ensure an airplane meets all operational regulations for a specific flight, to give the members of the flight crew information to help them conduct the flight safely, and to coordinate with air traffic control (ATC). Flight-plan calculations are necessary for safety and regulatory compliance; however, they also provide airlines with an opportunity to minimize costs by determining the optimal route, altitudes, speeds, and amount of fuel to load on an airplane. Optimal overall performance is influenced by many factors, including dynamic route optimization, accurate flight plans, optimal use of redispacht, and dynamic airborne replanning. Optimization in this decision space is difficult because it must take into account both the correct physics (i.e., airplane performance and weather) and route restrictions from ATC and regulatory restrictions.

The environment is also one of Jeppesen’s considerations as it improves its route selection. Although most computer flight-planning systems can optimize routes, many airlines still use fixed company routes. In a recent study, Jeppesen looked at the benefits of dynamic route optimization for an airline that used company routes in its computer flight-planning system. The airline, which had 60 single-aisle airplanes, used fixed routes developed using historical wind-and-flight-experience data and ATC requirements. The study determined that by using routes optimized with the most recent forecasted winds, and with numerical constraints that model ATC requirements, the airline would save approximately one million gallons of fuel per year and reduce its annual CO₂ emissions by about 20 million pounds (Altus 2009). Ballou et al. (2008) discuss similar results obtained through Jeppesen’s vessel and voyage optimization solution in the marine business.
An OR and Optimization Community

After Jeppesen acquired Carmen Systems in 2006, the company started internal discussions on how to best leverage any acquired OR capabilities. As the executive owner of OR, Marilyn Aragon, vice president of quality and business operation services, embraced the new competencies as a way to further transform and prepare the company for future business challenges. Marilyn led OR-related discussions and was instrumental in creating additional OR-value opportunities within products and possible efficiencies throughout the company. Additionally, her presence as an OR champion on the senior leadership team ensured that the cultural change toward informed decision making at all levels could be sustained. A relatively small corporate function focused on providing analytical business consulting and Lean support; other OR analysts were made part of the various business and functional units to be close to the customer. Today, the corporate OR department has the mission to make optimization matter as it analyzes, organizes, and realizes value—decision makers and peers throughout Jeppesen share this mission.

Lesson learned—An internal community is important and facilitates frequent communication with decision makers

That same year, the community met for the first annual Jeppesen Operations Research Symposium at the company headquarters in Denver. The senior leadership team participated in a roundtable discussion with senior representatives of the company’s OR community to discuss opportunities to expand the use of OR and understand leader expectations. The event provided focus, emphasis, and excitement for the community. Stefan remembers:

I was the facilitator of this exchange and it did not take long until Mark Van Tine, our CEO, started to drive the discussion. Mark had always been a passionate supporter of OR and he understood how much more Jeppesen could do with OR across the enterprise. It was great to see how he encouraged his senior leadership team to embrace these new opportunities. Everybody was excited, especially my OR colleagues, because we saw how much more of an impact we would be able to have.

Since then, five more OR symposia, in which Jeppesen discussed new ways for creating optimization value, have taken place, with senior leaders and academic, business, and customer colleagues participating. Each symposium continues to highlight OR’s importance, integrate activities, and help our senior leaders visualize opportunities.

Figure 4 illustrates the significant strides that OR has made at Jeppesen since it received the Edelman Award in 2000. Today, approximately 80 professionals apply analytics at the company to make better decisions, build better products, and offer better services. As described previously, most of these people are embedded in Jeppesen’s business and service units around the world to ensure that OR is practiced and applied for both internal and external customers. In addition to regular and ongoing communication among OR professionals, the community meets formally twice a year to refine OR’s value proposition and to show company leaders how OR benefits the company, its customers, and the industry. Jeppesen
continues to collaborate with leading research institutions, such as the Chalmers Institute of Technology, Georgia Institute of Technology, Massachusetts Institute of Technology, and the University of Queensland. World-class original research and the ability to apply the results to solve business problems have further enhanced Jeppesen’s competitive advantage and have allowed a sustained and growing OR capability to emerge within the company.

Jeppesen is a proud member of the Edelman Academy and an active member of the INFORMS Roundtable. Its employees have contributed in leadership roles at INFORMS, the Airline Group of the International Federation of Operations Research Societies, and at several national OR associations. Jeppesen believes that, as an “OR company,” it has an obligation to contribute to the health of the OR profession and share its experiences with others.

The INFORMS Prize

Jeppesen’s continued use of OR methods and its integration of internal and external OR strategies helped the company win the 2010 INFORMS Prize. INFORMS annually awards the prize for effective integration of OR into organizational decision making. The award is given to an organization that has repeatedly applied OR principles in pioneering, varied, novel, and lasting ways. The prize citation reads:

“Jeppesen uses OR to address both the strategic and tactical problems we encounter on a continual basis,” said Mark Van Tine, as he accepted the award (see Figure 5). “INFORMS has bestowed a significant honor upon us. It independently confirms the impact OR has at Jeppesen, while highlighting our commitment to leveraging OR for the benefit of our customers and the success of our company. We simply could not do much of the highly sophisticated work we do without this fundamental capability.”

Lesson learned—External validation of OR capabilities further increases internal credibility

Concluding Comments

Through the application of OR, Jeppesen successfully revived its struggling chart production and distribution processes in the late 1990s. From that learning
experience, OR has emerged as a staple of the company’s operations and provides it with a distinct competitive advantage. It is an essential part of Jeppesen’s business strategy and central to the development of end-to-end value solutions that allow clients to operate more efficiently and provide better services to their customers. World-class, original research in OR, and the ability to apply results to solve business problems, while building long-term relationships with customers, sharpens Jeppesen’s competitive edge. The enterprise-wide application of OR has contributed hundreds of millions of dollars of benefits to Jeppesen as a result of improved decision making and, potentially, billions of dollars of benefits to its customers. OR will be an even more significant factor in the future as Jeppesen continues to pioneer new ways of transforming transportation through the application of intelligent information solutions.

Indeed, OR is a vital company competency, consistently used to address strategic and tactical problems. When Jeppesen partners with its customers, OR enables the most comprehensive, accurate, and timely solutions available for their air, sea, or ground transportation needs. CEO Mark Van Tine summarizes OR’s importance to Jeppesen: “Operations Research contributes a significant value to our bottom line every year and generates even bigger value for our customers. More and more, Operations Research has become the business of Jeppesen.”

Acknowledgments

Many friends and partners have been instrumental to the success of OR at Jeppesen. Besides the people mentioned in this paper, we also recognize that there are more than 80 OR professionals and countless others at Jeppesen, all of whom ensure daily that optimization matters and support our goal of providing Jeppesen’s customers an analytical advantage through OR applications. To everybody who supports and furthers the cause of OR at Jeppesen, we are deeply indebted. We also wish to acknowledge the reviewers and the manuscript editor for their detailed and valuable comments on earlier versions of this manuscript.

References


Verification Letter
Mark A. Van Tine, Jeppesen, a Boeing Company, 55 Inverness Drive East, Englewood, CO 80112, writes:

“Since introducing the discipline at Jeppesen 15 years ago, Operations Research has helped us optimize our business processes and make better decisions for our company and, more importantly, has brought tangible benefits for our customers. Over the years, we have broadened the reach of Analytics even further, allowing us to leverage the power of OR to some of the world’s largest airlines and other transportation providers.

“This letter of support acknowledges the extensive value that OR provides our company and customers. Inside the company, we have improved processes and supported management decision making, realizing significant contributions to our bottom line. Externally, we have successfully applied OR to make the air, marine, rail, and ground operations of our customers around the world more efficient and reliable. The world class optimization technology developed by our OR experts helps our customers become more efficient and thereby ensure their viability and competitiveness.

“At Jeppesen, OR is a critical heartbeat of the company. OR and Analytics are not only key strategic enablers, they have also shaped our strategy as we transform from a navigation solutions provider to a provider of intelligent information solutions. Our tremendously talented OR people at Jeppesen work with our business and service units on a daily basis to further improve our decision making and provide greater benefits to our customers.

“As president and CEO of a company active in the OR community and a proud member of the Edelman Academy, I am honored to support the submission of this paper to Interfaces, which shows our quest for OR excellence and our continuous belief in the application of advanced analytical methods to make better decisions.”

Stefan E. Karisch began his career in 1998 with Carmen Systems, which was purchased in 2006 by Jeppesen, an information solutions company and wholly-owned Boeing subsidiary focused on global air and sea transportation. He has worked in a variety of commercial and technical leadership roles for Carmen Systems and then Jeppesen in Gothenburg (Sweden), Montreal (Canada), and now Denver. In his current position, Stefan oversees corporate Operations Research and Optimization. Prior to his career in industry, Stefan held academic positions in Denmark and Austria. He received a doctorate and a master’s degree in mathematics from Graz University of Technology (Austria) and a master’s degree in mathematics from the University of Waterloo (Canada). In addition, Stefan served as vice president of INFORMS, and is currently president of the Airline Group of the International Federation of Operational Research Societies (AGIFORS).

William J. Tarantino has been a Jeppesen Operations Research consultant for 15 years and was the lead analyst for the Jeppesen 2000 Franz Edelman Award Team. In addition, he consults for both government and corporate clients in the strategic planning and decision analysis areas. Bill received the INFORMS Koopmans Prize for outstanding publication in military operations research in 2006 and was the lead Operations Research strategy analyst for the 2012 NASCAR Championship Team. Bill has a PhD from the Colorado School of Mines, Golden Colorado and a MS from the Naval Postgraduate School, Monterey, California.