Reaping the rewards of Operations Research

Operations Research (OR) is a discipline that deals with the application of advanced analytical methods to help make better decisions. Businesses which adopt OR practices successfully can reap the long-term rewards – and not just financially. This series of articles charts TNT’s journey to optimisation excellence with the help of Tilburg University, TiasNimbas business school and ORTEC, how, it has delivered global network savings of €207 million and reduced CO2 emissions by 283 million kilograms. In fact, such is the success of its Global Optimisation programme, that TNT was recognised earlier this year as a leading light in OR techniques and applications when it won the highly-coveted and internationally-renowned Franz Edelman Award.

In the beginning...

Back in 2005, Marco Hendriks, Director Strategic Operations and Infrastructure TNT Express, was reading an article about operations research and its ability to drive cost efficiencies. It was something that had never been done within TNT before but he felt sure that TNT could benefit. He contacted Hein Fleuren, an eminent Professor in Operations Research at Tilburg University to seek advice and approached his manager at the time, Christian Drenthen, then Managing Director of TNT Italy, to propose a pilot project to optimise TNT Italy’s domestic linehaul network.

“I had a vision about how operations research and mathematical modelling could add value to TNT. The timing was right because customers were beginning to challenge the need to pay higher prices for better service quality, so already we were thinking about improving cost efficiencies. Although there was early scepticism about using ‘mathematics’ to help us improve our global operations, I was lucky to have a willing sponsor for the pilot in Italy,” says Hendriks, who set about searching for Operations Research partners as soon as he got the green light.

Both ORTEC and Tilburg University were selected as the best match to TNT’s strategic goals to apply the mathematical modelling and design the solutions. “We resisted the tendency to build a sophisticated optimisation model, instead starting with basic data analysis compiled from separate commercial, finance and operations systems,” says Hein Fleuren. “For the very first time, local management was able to analyse the network performance as a whole, and based on the insights from the analysis, we identified and implemented changes that led to a 6.4% cost reduction.” It was at this point that the Global Optimisation (GO) Programme was born, having gained significant support from TNT’s management board. “After Italy, we took on domestic network optimisation projects in other European countries, and constantly delivered good results,” Hendriks comments.

“I remember very well being invited with Marco to a lunch hosted by (TNT CEO) Marie-Christine Lombard, at TNT’s European Air Hub in Liège, following the success of Italy’s pilot,” recalls Fleuren. “We were grilled about optimisation and operations research; she was very interested to
understand the scientific methodology. Then, a few months later, the GO team was asked to create a model and optimisation plan for the European Air Network. The economic crisis demanded a speedy resolution and, in a matter of months, the air network was rationalised, resulting in savings of more than €20 million annually, and without detrimental effect to service quality.” Since then, the GO Programme has not looked back in its ambition to drive efficiencies across depot and hub, network scheduling and manpower planning.

The power and impact of modelling at TNT is perhaps best illustrated by one particular example. In 2010, the TNT Board decided to use the so-called DELTA Supply Chain Model to help them decide whether the parcel and freight flows in Europe should be separated or remain combined as they are today. The model calculated the end-to-end operational supply chain costs and services. Around 60 million data elements were used to feed the model including volumes, time restrictions, optimal scheduling, flows, vehicle positioning and pick-up and delivery arrival and departure waves for every depot. Once the information was processed, the TNT board could simulate a variety of scenarios and calculate the outcomes in order to come to their strategic decision.

Spreading the word, sharing the dream

Early on in TNT’s GO journey, the GO team recognised the need to educate and include local teams in the field. “Whilst the team was delivering domestic network optimisation projects across Europe we were losing time explaining optimisation and operations research everywhere we went,” Fleuren notes. “We determined that an Academy could teach local operations managers the theory, techniques and application as well as the many benefits. Not only would the TNT students develop the skills to identify and implement optimisation programmes in their local environments, but they would also act as awareness ambassadors and promoters for global optimisation throughout the business.”

The GO Academy was launched in 2007 as a two-year management development programme in collaboration with TiasNimbas Business School. To date, more than 200 managers have been or are going through the Academy, learning about supply chain strategies and strategic optimisation, and applying optimisation techniques across TNT’s networks and operations. “At the end of the programme, all students have to complete a six-month GO assignment – a real business case defined and sponsored by senior management who are committed to implement satisfying results,” Hendriks explains.

TNT has been able to further embed optimisation into the business through the establishment of Communities of Practice (COPs). “Optimisation has to come from within the heart of the business,” says Hendriks. “The COPs provide a key non-hierarchical platform which allows represented communities – from TNT’s operating units, from ORTEC, the university, even the World Food Programme – to come together to exchange optimisation knowledge, best practices, and
experiences. COPs meet three times a year to discuss specific topics and define an agreed approach from which ORTEC, the central GO team and Tilburg University can develop a common solution and tools for deployment,” he explains. “Together with the GO Academy, these Communities of Practice have become the most important cornerstones of the entire GO programme,” Hendriks adds.

Delivering to the next level

Already GO Optimisation within TNT has become a global phenomenon and increasingly self-sustaining and self-supportive at local country level. In South Africa, TNT Managing Director Kobus Fourie who himself graduated from the GO Academy in 2010, is already applying GO techniques to improve local operations. “In the last two years in South Africa, we have doubled the size of our airport facility, enhanced our security features and replaced our vehicle fleet. Not only did we use optimisation tools and techniques to determine what to do first, we also applied optimisation techniques to determine the size and make up of our fleet and where best to increase our warehousing facilities,” says Fourie. “The modelling provided answers that were counter intuitive to my thoughts,” he notes. “For example, when replacing our fleet, I thought it would be more cost effective to keep the vehicles smaller, but the modelling favoured spending more on larger vehicles and upsizing our key facilities to reduce overall unit costs per consignment.”

Juan-Carlos Moro Rodríguez, Regional Operations Director for TNT Southern Europe, Middle East & Africa has had 30 TNT managers from across his broad region attend the GO Academy. “I see a huge change in behaviour in the managers when they graduate,” he enthuses. “They are highly skilled in common techniques and highly focussed on achieving tangible results for the business; they have a hunger to optimise quickly and they speak a common language. Our operational efficiency across Southern Europe has improved significantly in the last five years as a result. From an individual point of view, the GO Programme has also created a real sense of loyalty towards TNT amongst the middle managers who are now also capable of being TNT’s leaders of the future,” he adds.

Meanwhile on a global scale, TNT continues to implement its significant optimisation programmes, particularly through its hubs and depots, whilst seeking new strategic opportunities not just in Operational but in other business functions too. “We are constantly innovating and thinking of new concepts to stay ahead,” Hendriks sums up. “TNT’s operations research journey is succeeding because our GO concept is very strong. The GO Academy, the Communities of Practice, the TNT Board buy in and sponsorship of projects, the tools and solutions altogether have created an ‘eco-system’, which drives the programme. GO is unique. We all share the dream.”

TNT’s GO Programme is supported by:
About TNT’s Global Optimisation (GO) Programme
Operations Research became part of TNT’s modus operandi five years ago to enable the optimisation of its global networks. To date, the projects that have emulated from the research have enabled the company to save more than €207 million through better business decision making, reduce the number of kilometres driven by 60 million and cut CO2 emissions by 283 million kilograms. The GO Programme is an optimisation “ecosystem” built on three Core Pillars: Supply chain optimisation learning through the GO Academy, modelling through Systems & Technology and global Communities of Practice in the workplace.

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