TNT Express wins Franz Edelman Award 2012!
What is the Franz Edelman Award?

The purpose of the Franz Edelman Award is to recognise and reward outstanding examples of operations research, management science and advanced analytics in practice around the world.

The Franz Edelman competition is held annually by The Institute for Operations Research and the Management Sciences (INFORMS®), an international scientific society with 10,000 members, including Nobel Prize laureates.

On 16 April 2012 in Huntington Beach, California, TNT Expres won the finale for its Global Supply Chain Optimisation programme, known as the GO Programme. The finalists included Hewlett Packard, Intel and Carlson Hotels.
What is Operations Research?

Operations Research is the discipline that deals with the application of advanced analytical methods to facilitate better decision-making. It often involves determining maximum performance in achieving real-world objectives at minimum cost.

A famous example is the Traveling Salesman Problem. How can he solve his challenge of finding the shortest route, visiting each client in different locations, and still return to his starting point at the end of the day?

The answer is provided by the computational mathematics of Operations Research.
The GO Programme

TNT Express optimisation ecosystem

“...My biggest takeaway from their (TNT Express) presentation had nothing to do with their network optimisation models. Rather, it was how they built an entire optimisation “ecosystem” centered on their GO (Global Optimisation) Academy.”

Rob Ende
Vice President Supply Chain, Leviton Manufacturing
The complex Express business

- Highly volatile demand
- Regulations
- Tight service requirements
- Network reconfigurations
The GO Programme

The introduction of Operations Research at TNT Express during the past seven years has significantly improved decision-making quality and resulted in millions of euros in cost savings.

In actual fact, the Global Optimisation (GO) programme is an ecosystem that sustains TNT’s evolution towards its ambitions in cost savings, CO2 emission reduction and customer service, both now and in the future.

The GO initiative has led to the development of an entire suite of optimisation solutions. With the GO Academy, TNT founded a management development programme to train its own people in optimisation principles. In Communities of Practice, both internal and external experts from across the globe come together to share best practices and set out requirements for action.
The tools and the available knowledge allow TNT’s operating units to analyse performance and identify optimisation opportunities.

To date, the most significant savings have originated from the network routing and scheduling solution (TRANS), the tactical route planning solution for pickup and delivery (SHORTREC) and the supply chain solution (DELTA Supply Chain).

As a result, Operations Research is now at the heart of TNT Express. More than €207 million in cost savings and 283 million kg reduction in CO2 emissions were realised over the 2008-2011 period.
Global Optimisation Programme

Solutions through Evolution

Developing > Optimising > Saving > Learning
GO ambitions

Unit cost reduction

Better service

Better & faster fact-based decision-making

Reduce CO2 emissions
GO Programme =

Optimisation solutions + Communities of Practice + GO Academy

Cumulative savings from 2008-2011: € 207 mln
Optimisation solutions: GO Tools
The GO Tools are the econometric models that are used to calculate the best optimisation solutions. As such, they have to meet many different criteria. To name a few: they have to be transportable, so they can be used in different countries, different networks and even in other organisations.

Despite being complex, their design should be user-friendly, so our people can work with them. In addition, they must be able to run massive amounts of data about locations, distances, driving or flying times, vehicles, movements, volumes between all points, and last but not least costs.

GO Tools make our teams much more proactive, fast and effective. It helps them identify many improvements in their daily operations, big and small.
“Little did we know that when the financial crisis hit us hard in 2008, this team would be standing here (at the Franz Edelman Award ceremony) in three years’ time. I can tell you it feels great!”

**Chris Goossens**  
Managing Director Global Networks & Operations, TNT Express
The power of the GO Programme and its tools became apparent at the end of 2008, when TNT Express experienced a strong decline in air transport volumes. The situation required an immediate solution.

The Global Optimisation team investigated the implications of redesigning TNT’s air network by downsizing the number of airports.

The challenge was to drastically reduce cost with a minimum impact on service. This led to the first version of the DELTA tool, a state of the art mathematical model that provides solutions to TNT’s challenges within seconds.
**European air network.**
When redesigning an air network, many restrictions and conditions have to be taken into account, such as time restrictions, volume, weight and night closures of airports.
Communities of Practice

- Eyes and ears of GO
- Think tank
- Action team
Co-creation GO style: COP

Communities of Practice (COP) were developed to ensure the evolution of the GO Programme. The concept has proven its worth. Within TNT Express, COPs from each area of our supply chain meet 3 times per year. Their purpose is to identify, discuss and exchange best practices and potential improvements.

A COP can be made up of a number of specialists from big operating units, suppliers and universities. A COP gives these members a platform to come together to discuss solutions and the generic functionality that is required.

All actions and decisions taken within a COP are immediately fed back to senior management for approval. Functionality defined in one COP meeting can often be shown as a prototype in the next. It can then be released in a subsequent COP, while keeping pace with the users’ learning curve and the quality of data.
The GO Academy

“The GO Academy is probably the best investment TNT ever made”

Marie-Christine Lombard
CEO TNT Express
The main objective of the GO Academy is to train employees in optimisation principles and broaden their views without turning them into mathematicians. The end result is the creation of a global network of talented staff that is able to standardise, identify and implement solutions.

What you’re looking for when initiating an Academy is the chance to explain the principles of optimisation only once, instead of over and over again. To have ambassadors throughout your organisation, representatives who understand that it may be necessary to increase costs in one part of the supply chain in order to attain significant savings in other parts. And education helps prevent resistance to change.

To ensure high-quality academic content, TNT Express established a partnership with Tilburg University and TiasNimbas Business School.
GO Academy

Effect and impact

- Learning optimisation principles
- Overcoming resistance to change
- Building a network of talented staff

Online GO game

- Understanding fact-based analysis
- Managing expectations
# Outline of the academic content

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<th>Topics</th>
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<td>2</td>
<td>Strategic optimisation</td>
<td>Infrastructure design (DELTA)</td>
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<td>3</td>
<td>Networks &amp; PUD</td>
<td>Planning in networks and planned unit developments (Trans &amp; Shortrec)</td>
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<td>4</td>
<td>Hubs &amp; depots</td>
<td>Bottleneck theory, automation/mechanisation principles</td>
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<td>6</td>
<td>Graduation</td>
<td>Presenting for impact, elevator pitches</td>
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6 modules over a period of two years

Become a Supply Chain Master!
Supply Chain Master

The final module of the two-year GO Academy training is the completion of the Master Case. A Master Case is an analysis, followed by an advisory report involving a real business case sponsored by senior management. Graduation Day, where students defend their Master Case, is a momentous occasion at TNT Express.

After their graduation, students earn the title of Supply Chain Master. They now speak the same ‘optimisation language’ and have become part of a global alumni network of experts.

So far, the GO Academy has trained 200 employees from all over the world in its principles. It is this kind of development that has made optimisation at TNT Express so famous. The GO Academy benefits are numerous – and thanks to the Supply Chain Master Cases, the Academy has an impressive return on investment.
Benefits of the GO Academy

- 200 people trained in recent years
- One ‘language’ for optimisation
- Master cases:
  - Real business cases
  - Defined & sponsored by senior management
  - Deliver significant ROI
- Retention of talented staff
- Improved optimisation capability
- Strong Supply Chain Masters network
The GO Programme & our society

How optimising supply chains can deliver environmental and humanitarian reward.

Human interest cases:
- City Logistics
- The World Food Programme
City Logistics: the mobile depot

3 facts about the extremely complex Express business:
- 80% of deliveries are in urban areas (as source or/and destination)
- Customer demand is shifting towards more deliveries per day
- It is TNT’s ambition to deliver zero emissions pickup and delivery in all major cities where it operates

The solution to mitigate undesired effects* on the environment while still remaining competitive as a company was formulated in a GO Academy Master case.

* (Congestion, CO2 emission, air pollution, extra costs and reduced efficiency, governmental regulations)
Using Mobile Depots in combination with (electric) delivery tricycles enabled TNT Express to significantly reduce environmental impact and be cost efficient at the same time.

The Mobile Depot is a concept where a virtual circle is drawn around an inner city. Trucks and vans move no further than this circle. The load is then transferred via mobile depots onto delivery tricycles and distributed into the inner city. This concept enabled TNT Express* to reduce the number of networks and vehicle movements.

It is our aim to realise:
- Covered kilometre reduction of 1300 km per week
- CO2 emissions reduction of 400 kg per week
- Cost efficiency, with 0% impact on service

*TNT Express partners on this project with Vrije Universiteit Brussels.
In Liberia, World Food Programme is providing 2100 schools across the country with food aid. The country’s minimal infrastructure and poor road conditions make it a challenge to distribute efficiently to all schools.

TNT Express supports WFP with expertise, people and knowledge. By introducing various tools developed in the GO Programme, we were able to dramatically increase WFP’s truck utilisation & load capacity utilisation.

The introduction of route planning tools and the relocation of distribution centres in Liberia enabled WFP to optimise its distribution and save a substantial amount of money that can now be spent on food aid.
Results & conclusions

let's GO

Developing  Optimising  Saving  Learning

TNT  sure we can
“One of the challenges was to convince people to trust and implement the optimisation solutions. The outcome of fact-based analysis may sometimes differ from people’s expectations.”

“Accurate benefit tracking and making results manifest are an absolute must.”

“It is not just about the money; it is also about being flexible and agile as a company, in a rapidly changing business environment.”

“We often joke that all the math we need is 10x10x10=1000. It means that every link in the supply chain should be equally strong. Otherwise you’ll never score a thousand points.”

“One of the lessons learned is that what seems obvious may still be vital. Like: acting as a team can overcome any challenge.”

“Move fast, but be patient on results.”

Marco Hendriks, Director Strategic Operations, TNT Express
Hein Fleuren, Full Professor at Tilburg University & independent consultant
Transportability of the GO Programme

Many solutions can be applied in other organisations as well, such as the World Food Programme.
Reducing CO2 emissions

Reducing CO2 emissions by 283 million kg (1,000 trucks 7 times around the earth)

Super sector leader in the transport category of the Dow Jones Sustainability Index
## Impact & value (2008 – 2011)

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<th>GO Subprogramme</th>
<th>Accumulated Savings</th>
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<tr>
<td>Networks</td>
<td>48 M€</td>
</tr>
<tr>
<td>PUD / Warehouse</td>
<td>27 M€</td>
</tr>
<tr>
<td>Supply Chain</td>
<td>132 M€</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>207 M€</strong></td>
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Our mission is to inspire

At Tilburg University, our mission is to inspire students and faculty members to reach their full potential, and in doing so, reap a positive impact on the society around them.

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