EVO Logistics Yearbook

2014 Edition
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This Yearbook offers plans for effective collaboration in the supply chain and case studies demonstrating that collaboration can be made to work.
Foreword

It is our great pleasure to present the EVO Yearbook 2014 – the seventh instalment in a successful series. Unlike the name Yearbook implies, the authors of this publication are looking to the future rather than contemplating the past.

This year’s theme is ‘collaboration’. For shippers, collaboration is the key to success, and essential if we want to leave the economic crisis behind us. This is especially true for the Dutch economy, which is kept afloat largely by its exports.

Therefore, we were glad when in December 2013 the World Trade Organisation (WTO) took an important step in bringing about harmonisation and transparency in international trade. The WTO agreed to reduce the cumbersome rules on international trade and to promote trade facilitation. However, in order for this to succeed, countries must trust each other’s information. International organisations need to be provided with reliable data through innovations in the modern business environment. As the primary source of such essential information, shippers should be playing an increasingly important role at the beginning of the information flow.

This publication gives an impression of the concerted efforts brought to bear by the Dutch shippers to raise collaboration to a higher level, to the benefit of Dutch trade and industry and our economy. Although in recent years whole stacks of studies have been published on the need for collaboration, with great profits being promised to the participants, many companies are still a long way off from working together in practice. This is not always without reason. Collaboration is complex and there are numerous pitfalls.

This Yearbook offers various step-by-step plans for effective collaboration in the supply chain, as well as case studies demonstrating that collaboration actually can be made to work if only the participants are prepared to meet a minimum of requirements, such as transparency and the willingness to share the benefits.

On behalf of the board of EVO we would like to express our sincere hope that this book will help to further stimulate collaboration in our industry.

Chris Bruggink, Machiel van der Kuijl
Chairman, EVO Executive Director, EVO
About EVO

EVO represents the interests of some 20,000 companies in the Netherlands that transport goods for their own account or contract this out to a professional transport company. They come from all sectors of industry, including wholesale, retail, construction, agricultural and business services.

Members of EVO are users of freight services across all modes of transport: deep sea shipping, short sea shipping, air transport, road transport, rail and inland waterways. They operate both within Europe and overseas. EVO brings the views of member companies to the notice of political decision-makers and public authorities not only at regional level, but also in the Hague and Brussels. We also convey our own and our members’ views to carriers in all modes of transport, both directly and through their organisations.

EVO is an international level member of the European Shippers’ Council (ESC), the International Road Transport Union (IRU) and the International Chamber of Commerce (ICC).
Fourteen points of interest
The essence of Chain Collaboration

One of the most striking developments within the logistics field in the past few decades must be the rise of the field of Supply Chain Management. In actual fact, Supply Chain Management isn’t really a new phenomenon. After all, chains have existed throughout the history of man, and if there are chains, they will also need to be managed. Even so, the scientific field of Supply Chain Management is relatively young and we find ourselves caught up in a tempestuous development process. A major concept within Supply Chain Management is Chain Collaboration, the idea that collaboration between all the chain parties leads to the best results for both the end users and all the collaborating chain parties (win-win). To avoid getting bogged down in definition issues, this article will make no further distinction between the concepts of Supply Chain Management and Chain Collaboration. Instead the simple collective abbreviation of SCM will be used.

In this article we will go back to the source and the essence of SCM. The structure of this article is as follows. Firstly, we will discuss the reason why SCM came to be developed at the current point in time and what its origins and early developments within the field are. Next, we will look at the differences and similarities between SCM and Logistics. We will then discuss the current state of affairs regarding SCM and present fourteen concrete points of interest for the implementation of SCM by shippers. The article concludes with a look at the future of SCM.

SCM Key Concepts

The foundations of SCM are made up of a quartet of key concepts. They are customer focus, continuous improvement, specialisation and process orientation.

The purpose of SCM is simply to provide the best possible result for the end user (the customer, the consumer) at the lowest possible cost. Improved results mean more speed, more quality, more savings, more reliable, more innovative, more flexible and more sustainable, and all of these at the same time. Note the use of ‘more’: SCM is about always doing things better, about learning and about growing.

It may seem obvious that the customer must be the focus of everything we do. Unfortunately this home truth all too often gets forgotten in our daily routine. Having started at a time (say, up to the mid-1980s) in which any kind of supply created its own demand, many of today’s organisations remain highly focused on themselves. There’s no denying however that today’s market is increasingly demand-driven, and so the end-user has become much more important.

A acknowledged pattern in economics is that specialisation leads to better performance. Back in the 18th century, Adam Smith showed that by splitting
up a task in smaller subtasks and having different persons (or organisations) concentrate each on their own subtask, the productivity per subtask increases considerably. In other words, if we have everybody do what they are best at, we don’t waste time and energy on things we are less good at. This is the main reason why we train people for specific functions, why we have specialist departments within organisations and why the various businesses in the chain concentrate on their own core competences. Given the pattern exposed by Adam Smith it is therefore easy to understand why there are so many links in the supply chain and why supply chains are becoming longer, more complex and more international.

What Adam Smith didn’t mention is that as soon as you divide a task into subtasks you also create a coordination issue, the question being, how do the various specialised sections work together? Within organisations the traditional solution is to use a combination of hierarchy (various supervisory and management layers) and targets per department. Coordination between organisations is dominated by market-focused thinking, with supply chain partners, for example, being selected on the basis of the lowest tender. Adam Smith didn’t worry about this, and why should he? There was simply no need to in the world of the 18th and 19th centuries. In the 21st century however, such an approach all too often leads to disastrous results. This is because there are some elementary differences in the conditions governing the two eras. In a world in which scarcely educated people carry out simple tasks and in which products are highly standardised, cutting up a process without close coordination is not a problem. Having everybody concentrated on their own task works very well within a standardised mass production process. A free market system tends to work perfectly for standardised commodities such as oil, gold and grain. However, in today’s world in which intelligent professionals work on situations that are constantly changing and thus demand high degrees of flexibility and empathy with local conditions, a combination of hierarchical control and deeply ingrained competition on price would be utterly counterproductive. Customers aren’t simple numbers; they want to be treated with a personal touch. The number of product variations has increased enormously, and the life cycle of products has been drastically decreased. A world with this degree of complexity can only function if the separate parts are continuously kept in line with each other. In other words, we must start to think in terms of integrated systems, and that necessarily involves coordination between the separate, specialised parts. This is exactly the situation in which SCM can prove beneficial.

**Origins and development of SCM**

As so often happens with good ideas, the origins of SCM appear to be lost in the mists of time. It is said that the term SCM as such was conceived in 1982 by Keith Olivier, a consultant with Brooz, Allen & Hamilton. It would take until at least the mid-1990s before SCM would start to play a serious role.

Important developments that predate SCM can be distinguished in the 1980s. With his bestseller “The Goal”, Eliyahu Goldratt introduced process orientation
to a wider public in a practical sense. The Total Quality Management movement, which came from Japan, made it clear that everybody has a customer to deal with (whether internal or external) and that we need to continuously improve. Again from Japan, and even more wide-ranging, was the Lean philosophy, which really managed to spark an interest when an international benchmark study revealed Toyota to be a superior performer, crushing all competition in terms of cost, quality and speed. One of the salient components of Lean was the Just-in-Time principle that enabled Toyota, in collaboration with its suppliers, to considerable reduce the stock levels within the chain. Thinking in terms of end-to-end processes really took off when Michael Hammer introduced the concept of Reengineering. Hammer defined a process as a “group of activities that create value for the customer”. It is striking how much this has in common with the way we think about supply chains today.

SCM received a major boost when it became clear how American retail giant Wal-Mart managed to use optimised communication (including its own satellite in space) to make a resounding success of coordinating its suppliers in the supply chain. At about the same time a report published in 1993 by Kurt Salmon Associates showed that enormous improvements could be achieved if retailers and brand manufacturers would improve their levels of collaboration. Under the name of Efficient Consumer Response (ECR) and under the motto, “to serve the consumer better, faster and at lower costs” this concept, closely related to SCM, gained massive industry acceptance during the 1990s.

In the Netherlands, two industries have taken the lead. During the first half of the 1990s, the so-called agro chain knowledge (Agro Keten Kennis, AKK) initiative managed to draw much attention to agro chain logistics. The Albert Heijn supermarket chain emerged as leader in the FMCG (fast moving consumer goods) sector with its well-known concept of ‘today for tomorrow’ and has remained at the forefront ever since.

SCM is not a new name for Logistics

Given the rapid developments in SCM since the 1990s, it is hardly surprising that so many people have used the hype to spruce up their own field of interest, and so it proved to be the case with Logistics. The result is that even today many people consider Logistics and SCM as two different monikers for what is essentially the same thing, or at the very least two concepts that are more or less extensions of each other. This is a deplorable misconception, a development against which scientific circles warned early on and which has certainly done a disservice to the field.

The definition of SCM has often been the subject of discussion, but probably the most often used definition was given by Mentzer et al. in 2001 as “the systematic, strategic coordination of the traditional business functions and tactics across these business functions within a particular company and
across businesses within the supply chain, for the purposes of improving the long term performance of the individual companies and the supply chain as a whole." The definition clearly indicates that SCM comprises both an internal and an external component. Internally it concerns the coordination between the various business functions (e.g. purchasing, production, marketing, finance and logistics). In other words, logistics is a function within an organisation; SCM is not a function but a coordination mechanism. The external component of SCM concerns the flow of products and services, the information flow and the money flow between organisations, see figure 1. SCM concerns all the flows, including IT, including Finance, including Purchasing, and including Marketing & Sales. Coordination issues can concern stock levels, order volumes and decoupling points, but they can equally be about product and market development, about financial constructs, or about over administrative processes. In other words, although Logistics and SCM overlap, in essence they deal with different issues.

![Figure 1: The supply chain as seen from within an organisation – a connection between a supplier, the company and its customers.](image)

### The current state of affairs regarding SCM

Today in 2014, a lot has been achieved in the realm of SCM. Since the field has received a lot of attention, both within the Netherlands and abroad, from organisations, industry representatives and scientists, a rapidly growing SCM body of knowledge has come into existence. Many professional periodicals have published articles on SCM, numerous seminars and meetings have had SCM as their subject, and at various universities SCM teaching and research has really taken off.

Various industries are attracted by the concept and are taking tentative steps in the right direction. In addition to the early adopters such as the agro chain, the automotive industry and the FMCG sector, we see the same concepts reappearing in for example the construction industry, the fashion industry
(with Zara as a shining example), and even in healthcare and various other government-related chains.

In spite of all the positive publicity, the application of SCM in the Netherlands still trails a long way behind its potential, as witness for example a series of recent incidents and scandals such as the illicit use of horse meat, high-speed trains that won’t run, the soaring cost of the alterations to the Rijksmuseum, Boeing Dreamliners being grounded, and the reports of workers being abused in the Chinese factories making products for Apple and in the garment industry in Bangladesh. All these are problems that could have been prevented by excellence in SCM.

The fact that SCM still doesn’t stand up to scrutiny in practice is also demonstrated by the results of the Dutch National Supply Chain Monitor, in which the current state of affairs of SCM implementation in the Netherlands scored a meagre 60 per cent. In a minimalist culture that might well be sufficient, but SCM is about improvement, and this is not only desirable and possible, but also essential in the present crisis. The results of the Dutch National Supply Chain Monitor also show that in the Netherlands SCM is applied at different levels. There is a large group (40 per cent) of stragglers, another large group (40 per cent) of average performers, and a small group (20 per cent) of front runners. The latter group shows that the wide and in-depth application of the principles of SCM is entirely feasible.

Areas of interest when implementing SCM

If SCM is to take off in the future, a lot of work will first have to be done. In general terms, the agenda for the future comprises three sections, see figure 2.

The first area of interest when implementing SCM concerns strategy. As the definition shows, SCM is a strategic instrument. It is about defining and promoting a vision, mission and key values, about long-term relationships with chain partners and about achieving a sustainable competitive advantage. It
focuses on the concept that a Supply Chain (including all the suppliers and
the company’s own workforce) can be a major source of customer value rather
than a necessary evil.

The second area of interest concerns the SCM infrastructure, the streamlining
of integrated processes between organisations. This includes for instance the
alignment of targets and incentives, the full sharing of relevant information, the
coordination of decisions and the use of a dynamic business and distribution
model. The third area of interest, mindset & behaviour, concerns the human
factor. It involves such aspects as leadership, trust, team spirit and establishing
a culture that makes people want to contribute and collaborate on the
objectives of the organisation and the entire supply chain.

As an aid to shippers considering the implementation of SCM, a list of fourteen
action items will now be discussed in some detail.

1. **Focus on creating value for the end user**
The main function of an organisation is to generate products/services to create
customer value that the customer is prepared to pay for. Of course, reducing
stock levels and increasing loading efficiency are also important, but they also
tend to obscure the importance of customer value. The main question that
needs to be answered time and time again is how you can make the process
faster, better, cheaper, more sustainable, more innovative and more flexible for
the customer, and what would the customer be prepared to pay in return?

2. **Define strategic objectives based on KPIs**
Many organisations suffer from what might be termed ‘strategic poverty’:
they live hand to mouth, often considering a strategy to be nothing but a dim
and distant document slowly turning to dust in a desk drawer somewhere.
However, a strategy is highly important for defining long-term objectives,
for maintaining focus, for setting priorities and for creating a distinguishing
quality. And for creating customer value, of course. Strategy is about making
choices: what will be your area of excellence? Strategy is about setting targets:
what should you have achieved five years from now? To have any chance
of success, everybody must contribute towards achieving these common
targets. That includes the entire workforce as well as the supply chain partners.
Strategy is also about communication: who does what and above all, why?
To make the strategy easier to discuss, key performance indicators can be
very useful. They show you where you are, where you want to go and what the
trade-offs are.

3. **Make the supply chain part of the strategy**
The supply chain may well be the most essential part of the organisation (after
all, that is why it’s part of the primary process), and so it goes without saying
that the supply chain needs to be involved in defining and executing the
strategy. Therefore, a seat in the board room would seem to be on the cards for
the supply chain. However, rather than focusing on this long-cherished wish,
the supply chain will first have to do its homework and trade in its short-term operational dissatisfied mode for a vision of how to create strategic customer value. What is the supply chain’s contribution to the long-term business objectives? And who can we collaborate with to improve on this?

4. Improve the (joint) processes
The typical thing about processes is that the various activities are performed by different people, departments, business units and various links within the chain. All too often we tend to focus on improving individual activities such as sales, production, warehousing, transport and service rather than the overall process. This needs to change; the only way we can serve the customer to the best of our ability is by doing it together. The SCM of the future does not focus on the means of production, but on the processes in which we collaborate with our focus on the customer. Get together a diverse team, sit down together and see how you can improve both the internal and the external processes.

5. Communicate and share information, always, everywhere
Sharing information; in today’s chain this is a ‘conditio sine qua non’. Even so, in practically every organisation poor or inadequate communication is a source of constant frustration. Miscommunication leads to misunderstandings and mistakes and causes opportunities to be missed. Basically, you simply cannot overdo communication, in particular when complex issues and rapidly changing circumstances are involved. Unfortunately, communication is often considered to be a question of repeated ‘sending’, as in ‘let me explain this one more time’. To listen is also a form of communication. So is articulating a question. And so is proactively retrieving information. Proper communication and information-sharing require a culture of wanting to understand what the other party needs in the way of information in addition to wishing to operate openly and transparently with respect to others. Real communication is something you can only do together.

6. Find the win-win
Ask your suppliers the question: how will you contribute to my strategic objectives? And then ask yourself the question: how can I contribute to the strategic objectives of my customers? All too often we revert to short-term thinking in prices, with the inevitable result that there must be a winner, so the other party will automatically end up being the loser. And since we all want to be winners, a strange kind of competition between suppliers and customers ensues. It’s about time we stopped this nonsense. Use your chain partners to create superior customer value, together and innovatively. Start by analysing every relationship to see what’s in it for them. No win-win means no collaboration.

7. Get your decision-making in line
A supply chain or an internal business process forms a system. Dynamic system theory teaches us that if the various subsystems all optimise their own situation independent of each other, the resulting system performance will be
deplorable. Consultation and coordination between all the decision-makers is therefore crucial. S&OP (Sales & Operations Planning) is a case in point. The same can (read: must) of course also be done with your chain partners. You can get really brilliant decision-making support systems for this purpose. However, that is not the point. Collaboration starts with the desire to get your own decisions in line with others.

8. Go for long-term relationships
Today’s organisations suffer from a common disease in that they are afraid to enter into long-term relationships. Every two years contracts need to be renegotiated on the pretext of keeping the suppliers on their toes. This is a typical case of penny wise and pound foolish. The problem is that it takes a while in a supply chain relationship to build up sufficient trust to start working on improvements, innovations and joint risk management as part of a joint effort. Stability is also needed if both sides are to free up capital for investments. Long-term agreements enable us to learn from one another and to recoup the costs of our inevitable mistakes.

9. Management supports and facilitates the process
With the focus on customer-oriented processes and chains rather than departments and individual organisations, with increasingly higher-trained professionals, and with today’s modern means of communication, the role of management also changes. The traditional business hierarchy and the concept of ‘being in charge’ have mostly ceased to be relevant. Modern leadership is typified by natural authority and by an inspirational vision. The leader monitors the long-term objectives, the company culture, ensures that everybody can function to the best of their ability, and coaches the team process. It’s all about serving, coaching and connecting leaders who set out to enable each employee to contribute from their own position to the joint process and to the general interest – which is also the customer’s interest.

10. Create a common sense of profit, loss and risk
It is inevitable that the various actors (parties in the supply chain, departments, persons) each have their own interests. All too often these interests will be in conflict. Even so, there ultimately is only one single company interest, which is the joint implementation of the strategy. And in the same way there is only one single chain interest, which is to serve the end user in the best possible way. The art lies in tying together the various interests at the right level to ensure that the individual interests match the company’s interests and so create a joint interest by together creating value and together mitigating the risks. Collaboration without explicitly agreeing on a joint objective simply is too difficult.

11. Discuss your key values
The way in which people interact is decided not so much by contracts, rules and regulations and directives from the top as by mutual convictions, standards and values. It is therefore essential to understand one another’s key values. In logistics collaboration the main key values are honesty, reliability,
fairness, transparency and openness. Now this is of course a set of values that would be hard to disagree with. Unfortunately different people tend to interpret these values in different ways. And then there is the old adage which says that a person will judge himself by his intentions and others by their actions. And sadly there is often quite a gap between our intentions and our actions, with the inevitable result that with regard to our key values, we tend to think we’re doing a really good job while others are making a mess of things. And the other party thinks exactly the same of course, albeit the other way round. If we are to break down this barrier of mutual incomprehension, we need to be able to discuss the true meaning of our key values.

12. Develop the necessary competences
New circumstances demand new solutions. If you want to keep abreast of developments, you need to keep developing yourself. A lifelong learning experience has become the new standard; a day without learning is a day wasted. For an organisation the only way to achieve a truly sustainable competitive advantage is to learn faster and learn more than the competition. This demands investments in time, money and energy as well as investments in people. Team skills are a key competence that we will need to develop. A good team will recognise that knowledge shared is knowledge doubled.

13. Work, think and act outside the box
The fact that we share a common target does not mean that we all have to think and act the same. On the contrary, to achieve our goal we need many different types of expertise and many different points of view. Look for different views, seek out arguments and set up debates. They will all help to improve your decisions. In other words, diversity leads to better performance. Scientific research shows for example that mixed-sex teams perform better, so there is good reason to start tearing down the male-dominated logistics stronghold. Collaboration in diversity may not always be easier, but it can lead to better solutions.

14. Persevere, and keep working on the previous thirteen items
Logistics transformation is not easy and demands a lot of perseverance. Many people have been inspired by the life and work of Nelson Mandela. One of his many great qualities was a combination of patience and stubborn perseverance. Anyone who spends 27 years in prison and yet still refuses to let go of a dream, doesn’t give up hope and refuses to be embittered by the lack of progress deserves to be seen as a shining example to us all, so perhaps we might just try to bring in a tiny bit of that spirit to work. It would probably make a world of difference. The implementation of SCM will not happen of its own accord; it will require lots of perseverance from you.

The future of SCM
We are now roughly 25 years onwards, and SCM is still in full development. We have many reasons to be positive about the future. First of all we have a number of front runners to lead the way. In the second place, whether driven
by the effects of the slipping economy or otherwise, an increasing number of organisations are starting to appreciate the fact that excellence in SCM can result in a major competitive lead, so SCM is increasingly being given a place at the board table. Thirdly, today’s IT developments make it increasingly easy – and necessary – to implement SCM. Easy because the on-line, real-time exchange of data considerably simplifies coordination, and necessary because the lack of chain transparency will disappear and render the old-fashioned way of thinking in terms of ‘knowledge is power’ untenable. In the fourth place, a growing group of supply chain managers will come into existence who will not only be intelligent and experienced, hard-working and able to think strategically, but also prepared to learn and explore day in, day out. In other words, there will be an increasing number of people equipped to lead their organisations into the future. And in the fifth place, unlike the generations currently in control, an increasing number of young people will have been brought up with the concept of SCM, in addition to having been trained to open their minds to communication, sharing and working as a group. If we manage to fire up these people and given them the support they need, the future of SCM certainly looks bright.
Summary

Supply chain collaboration is the idea that collaboration between all the chain parties leads to the best results for both the end users and all the collaborating chain parties (win-win). It is a major concept within Supply Chain Management (SCM). The article looks back on the sources and essence of SCM and the differences and similarities between SCM and logistics. It then discusses the current state of affairs regarding SCM and presents fourteen concrete points of interest for the implementation of SCM by shippers. The article concludes with a look at the future of SCM.

The first area of interest when implementing SCM concerns strategy. It is about defining and promoting a vision, mission and key values, about long-term relationships with chain partners and about achieving a sustainable competitive advantage. It focuses on the concept that a Supply Chain (including all the suppliers and the company’s own workforce) can be a major source of customer value.

The second area concerns infrastructure, the streamlining of integrated processes between organisations. This includes for instance the alignment of targets and incentives, the full sharing of relevant information, the coordination of decisions and the use of a dynamic business and distribution model. A third area of interest, mindset & behaviour, concerns the human factor. It involves such aspects as leadership, trust, team spirit and establishing a culture that makes people want to contribute and collaborate on the objectives of the organisation and the entire supply chain.

There are many reasons to be positive about the future of SCM. For instance, an increasing number of young people is being brought up with the concept of SCM, in addition to being trained to open their minds to communication, sharing and working as a group.
Structured approach

Partner selection and collaboration tool
Logistics collaboration between SMEs – intuitive or logically structured?

Intuition traditionally plays an important role in the haulage business. The same applies in case of collaboration with other businesses, in particular in SMEs. A healthy dose of intuition may get you very far. Acting fast, diving in at the right moment, making the right decision, choosing the right partners, in the past lots of businesses have shown how successful this can make you. Partly forced by circumstances, other businesses often follow a highly structured approach where logistics is concerned. The more complex the working environment, the greater the necessity to do so, and this includes such fields as collaboration. It’s no coincidence that chemical businesses and electronics manufacturers such as Philips pioneered the structured approach of collaboration issues, complete with extensive protocols and systematic gathering of management information. It is here that the complexity of the business processes is at its greatest, with plenty of opportunities for collaboration, so the choice of the right partner and the resultant networks will be crucial to the future of the company. Intuition and a structured approach, they would appear to be at odds, but can they go hand in hand as well?

The logistics manager as matchmaker
Logistics by definition demands a high degree of collaboration. Research on fashion logistics conducted in 2014 at the HAN University of Applied Sciences shows that a successful logistics manager needs to be able to bring together the various functions required to make the logistics chain perform well, externally as much as internally. Connecting with all the relevant responsible persons and players without oneself holding the limelight, seems to be the best tactic.

Collaboration, where would logistics be without it? At the same time, collaboration always involves the question to what extent you will need to relinquish direct control of logistics processes, and it makes you want to try and estimate the risk of leaving responsibility for part of the control over the entire logistics process to another party.

In the development of their networks with other businesses, logistics businesses tend to focus on hard facts such as optimisation calculations and cost benefits, with very little attention being spared for partner selection and the collaboration process. This is not without risk.

Tool
Some years ago, the HAN University of Applied Sciences, together with the Radboud University of Nijmegen and Buck Consultants International, designed

1 Consider for example the role of Prof. John Bell as the head of Strategy & Business Development of Philips Research.
a tool to provide logistics collaboration support, in particular for SMEs. This partner selection and collaboration tool comprises four separate parts:

- Process-focused 5-step plan to achieve collaboration,
- SWOT & Need for Partnership module,
- Partnership setup scan,
- Cooperation scan.

The tool is an example of a structured procedural approach. Guided by a description of the tool more in detail, this article discusses what the added value can be for businesses by following a structured approach in handling collaboration issues. We focus on the SME-company.

**Why build this tool?**

Collaboration is crucial in logistics. If we restrict ourselves to external collaboration, we find that the risks of collaboration with external parties are considerable. In practice, more than half of the collaboration initiatives with other businesses end in failure. The process side of the collaboration often turns out to be the bottleneck. Initiatives to bundle goods flows, share warehouse capacity, interconnect different modalities, set up a joint transport network, share planning resources, all of these regularly fail due to disruptions in the collaboration. In many cases the focus is on the underlying concept, or the potentials of the collaboration initiative, and or the reliability of the calculations underpinning the project’s feasibility and resulting efficiency, whereas the main problem often lies in getting the collaboration up and running and then maintaining it.

Careful design, implementation and maintenance of the collaboration determine whether the calculated potential financial benefits will materialise. We therefore considered that this might be exactly where something like intuition and a personal approach might complement a structured method.

We investigated what went wrong. Many businesses find it difficult to locate the right collaboration partner. Entrepreneurs are by definition strong driven persons, and if his drive focuses on content, choosing the right collaboration partner is often put on the back burner, with the entrepreneur’s own expertise receiving all his attention. If his drive is more commercial in nature, a collaboration partner is often quickly found, but the choice of partner will often be so intuitive that it isn’t until much later that the awareness dawns that the wrong kind of partner has been picked.

All too often the parties involved fail to discuss one another’s expectations prior to entering into the collaboration. Evaluation is another aspect in which the parties tend to fall short, with 80 percent of collaboration initiatives not getting evaluated afterwards. All in all there are more than enough reasons why collaboration is fraught with difficulty.

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4 See for example Ziggers, G.W. (2006) Europese netwerken: samenwerken in theorie en praktijk: Onderzoeksdeelrapport Radboud Universiteit, Nijmegen. Various figures are circulating, with most sources reporting a failure rate of sixty to eighty percent.
On the other hand, several large and very large businesses realize to work together very well and gain much from collaboration. Examples include Philips, Toyota, and various chemical concerns. These businesses use a structured approach, sometimes laid down in protocols, and they employ specialists for the task.\(^5\)

Overall, 60 to 80 percent of collaboration projects fail. On the other hand, successful collaboration can result in an efficiency increase of up to 400 percent.\(^6\) Here we have the dilemma of collaboration in a nutshell.

Being aware of this dilemma, we asked ourselves how we might help businesses prevent their collaboration ending in failure, in other words, what is it that makes a particular business able to collaborate successfully? In many cases SMEs lack the means, experience and knowledge to ensure that the collaboration process goes according to plan. We gained the impression that SMEs would be helped not only by having hard logistics calculations of the potential benefits of, say, cargo bundling to underpin their strategic decisions, but even more so by having a proper understanding of the collaboration as a process.

**Purpose of the tool**

With this in mind we designed a tool to help SMEs to find the right kind of partner and to properly set up and monitor the collaboration process, while keeping the required effort to a minimum. The basic idea was that a student-researcher should be able to run the tool for an SME and so support its management.

The intended purpose of the tool is not to help an SME blindly find the best available partner, but rather to help underpin and finalise choices and considerations for the entire selection and collaboration process. In concrete terms, the tool is to give structure and direction to finding collaboration partners and managing the expectations and results. At the same time, there should remain room for intuition, in particular when matching individuals and estimating such aspects as effects of company culture and personal motivation.

We had a tool in mind that would do the following for an SME:
1. **Provide insight into the steps that should be taken to achieve proper collaboration;**
2. **Provide support in selecting suitable collaboration partners;**
3. **Help to set up the collaboration process;**
4. **Help to monitor an existing collaboration, in order to detect potential issues early on.**

\(^5\) The former Alliance Office of Philips for example, or the current Strategy & Partnership department of Philips Research.

The tool

The English-language tool was developed in Microsoft Office Excel 2003 – SP3 and also works in Excel 2007. To achieve successful collaboration, four lines of approach can be relevant. These complement one another, depending on the development phase the business is in.

1. The plan

The plan helps an SME to outline the collaboration scheme, starting of course with the company strategy and objectives. It uses 20 questions to map five steps, see figure 1.

In some cases the answers to the questions are easy to formulate, but this is not always so, in which case the tool offers references in support, for example to help consider and explicitly state the company strategy.

![Figure 1. A plan in 5 steps](image)

Making the plan is a structured process, but it leaves sufficient room for interpretation. The tool helps its users to define arguments to underpin considerations, but in some instances the reason for not wanting a company on a long list or short list will of course stand out a mile.

2. Is collaboration necessary? Why?

The SWOT & Need for Partnership module helps SMEs to find out how much they really need a collaboration and what the conditions must be for one to happen. This concerns such aspects as what kind of collaboration the company should seek considering the company profile, customer demand, strengths and weaknesses, as well as the kind of party the company should be collaborating
with. This question seems obvious, but not seldom is not adequately addressed to. The analysis is made by means of mapping strengths, weaknesses, opportunities and threats (SWOT), focused on the company’s products, services, prices, means of delivery, etcetera. By setting out the strengths, weaknesses, opportunities and threats in a confrontation matrix, the SME can immediately see which items would benefit from collaboration.

Another feature of this part of the tool is its structured approach, although a modicum of intuition will help to fill in the details in no time. Some degree of intuition is in fact essential at this stage of the tool, for without it the module will be very hard to fill in.

3. Selecting partners
The third part of the tool is the Partnership Setup Scan. This helps an SME to assess the extent of strategic, commercial, technical, cultural and operational fit with the partner or potential partner. Filling in the answers to 32 questions asking for opinions, results in an immediate verdict on the amount of fit, as well as an indication of the strengths and risks of the collaboration. The scan can be used to check collaboration at the enterprise level, as well as at the personal level.
Answering the questions in this part of the tool is also a structured process, although there is room for opinion, and the process will help to qualify the intuitive impression.

4. Check: are we still going in the right direction?
Finally, the Cooperation Scan helps the SME to check an existing collaboration for potential risks and pitfalls. In 32 questions, the user takes stock of the current collaboration, which helps to quickly detect where the risk may lie and which aspects of the collaboration show room for improvement. The focus in this part is on managing the collaboration down to operational levels.

This part of the tool is of course structured, and is intended to help address issues in which intuition fails, or cannot be properly expressed.

**The partner selection and collaboration module in use**
In practice, the tool revealed the usefulness of having a structured instrument to help consider various aspects of collaboration. Enterprises often welcome input of know-how, in matters of collaboration as elsewhere, and are then
prepared to stand back from the operational process and not go by intuition alone. For SMEs at least, third-party support is necessary. Practical experience has shown that, in general, a tool like this does not lend itself to structured application by the enterprise on its own, as this raises too many issues, not just in terms of capacity. In particular when the driving forces are commercial in nature, there is a desire to finalise the collaboration as soon as possible, and the time and means are often lacking to look for the perfect collaboration partner one step at a time, so a partner is selected simply on the ground of involving few obstacles to collaborate.

The experience with practical projects also shows that, although there may be a high level of knowledge about a new concept, coupled with the will to implement it, the business strategy is not always clear, with various options being held open. Although this ensures that many potential partners will remain within reach, choosing between them becomes much more complex. In our experience, many initiatives would benefit from taking the time to work out the business strategy before considering collaboration and looking for suitable partners.

The organisation types also need to match. A small start-up may find it difficult to create a collaboration with a much larger business. Large businesses as a rule cannot change their operational methods from one moment to another, whereas small businesses are just that bit more flexible in this respect. So, small businesses will fit in more readily with other small or comparable businesses, which are flexible, share the same interests regarding collaboration and are also able to make the strong commitment necessary for collaboration. Of course, relative competitive positions also play a major role. At the same time, some businesses will tend to consolidate their position, whereas others may be inclined to secure a new position.

Start-ups turn out to expect a different kind of input from knowledge institutions than do existing businesses. Start-ups have a greater need for long-term answers to questions about details rather than for large, structured projects. They also require a great deal of flexibility in implementing a project because young, dynamic businesses often think in terms of specific, and often radical, operational solutions rather than support at the strategic level. Finally, rolling out and managing a collaboration requires a longer lead time in the case of start-ups than is usual for projects, and businesses often have a greater need for limited support in smaller projects over longer periods than large, short-term projects that demand a lot of organisational capacity.

As regards the practical use of the tool, in our experience an independent third party can play a useful role by creating some distance from the operational process. The tool we have presented here was made to fit in well with a students’ graduation thesis or internship for example, or projects supported by a knowledge institution or businesses consultant. Businesses can get access to the tool via any of the six Logistics Knowledge Distribution
Centres (‘KennisDC Logistiek’), which offer this and other tools to interested businesses. These centres were established by the six Dutch Universities of Applied Sciences having a logistics research department, together with EVO and TLN. The centres exchange knowledge and are available for consultation by businesses all over the country, regardless of where the expertise originated, whether their query concerns construction logistics, healthcare logistics, collaboration, or whatever. The purpose of these centres is to make knowledge more accessible to businesses, and to make the curriculum tie in more closely with the practical needs of the logistics industry.

Finally, the internal logic of the tool was tested. It certainly helps an SME to structure its business. As regards the question at which point of the process to deploy the tool, well that must remain a matter of intuition.
Summary

Collaboration is crucial in logistics. You cannot do without it internally, nor, in most cases, externally. If we restrict ourselves to external collaboration, we find that the risks of collaboration with external parties are considerable. More than half of the collaboration initiatives with other businesses end in failure. But, if successful, collaboration can offer tremendous profits.

The process side of the collaboration often turns out to be the bottleneck. Many businesses find it difficult to locate the right collaboration partner. All too often the parties involved fail to discuss one another’s expectations prior to entering into the collaboration. Evaluation is another aspect in which the parties tend to fall short. There are however businesses that work together very well and gain much from collaboration.

With this in mind a tool was designed to help SMEs find the right partner and properly set up and monitor the collaboration process, while keeping the required effort to a minimum. Our intention was to support adequate expressions of business intuition, in stead of mere replacing intuition by just structuring all relevant thoughts.

To achieve successful collaboration, four lines of approach can be relevant. (A) The plan helps an SME to outline the collaboration plan. (B) The SWOT & Need for Partnership module helps SMEs to find out how much they really need a collaboration and what the conditions must be for one to happen. (C) The Partnership Setup Scan helps an SME to assess the extent of strategic, commercial, technical, cultural and operational fit with the partner or potential partner. (D) The cooperation scan helps the SME to check an existing collaboration for potential risks and pitfalls.

In practical use the tool appears to benefit from the presence of an independent third party offering an open outsiders’ view. The tool was made to suit business and at the same time a students’ graduation thesis or internship environment. One of the six Knowledge Distribution Centre for Logistics may support businesses in applying this and other tools by students and researchers, combining business intuition with a well structured approach.
Partners

Everybody is contributing
Sustainability is not a solo effort

The history of Van Keulen Timber and Building Materials (Van Keulen Hout en Bouwmaterialen) is intertwined with the development of the city of Amsterdam, and is destined to remain so in the future. This is why Van Keulen takes pains to ensure that transport activities within the city and its environs have the least possible impact on the environment. Clean trucks, transport by water, and other smart solutions have not only considerably reduced the emission of noxious materials, they have also helped to minimise any inconvenience to local residents.

This is not something that Van Keulen could have achieved on its own, nor is there any need to take on all these environmental efforts single-handedly, for there are plenty of partners seeking collaboration to mitigate the environmental impact of their activities. Each partner contributes its own expertise, and they include truck manufacturers, fuel producers and logistics services providers. Customers also enter into the equation, for example by helping to achieve the clean and efficient disposal of waste flows from building sites. In 2013, Van Keulen received no fewer than three awards for its efforts to make its operations greener.

Construction cycle

Van Keulen started as a family business in Amsterdam in the early years of the twentieth century. The company has been expanding and rebuilding the city for over a hundred years, initially using horse and cart, and today running a fleet of state-of-the-art Euro 6 vehicles. A major phase of growth started shortly after the Second World War, when the company was able to acquire a number of surplus U.S. Army trucks. Investments in trucks fitted with their own loading cranes soon followed.

We now use truck-fitted cranes that can reach up to the seventh floor, and which can easily tilt up fully loaded pallets of timber and plaster at height. These certainly came in handy when construction peaked around the millennium. The company now runs a fleet of sixteen trucks and employs 52 people. Although Van Keulen still gets most of its turnover from the Amsterdam region, the share of the Rotterdam/The Hague region is increasing and future plans include the establishment of a local branch there.

Until a few years ago the company had two branches within the Amsterdam city limits, one of which needed to be moved. Therefore in 2011 a new site was occupied further north at the location of the former NDSM, and later ADM, shipyards. The site is located within the A10 ring road, on the river IJ, and features a spacious loading dock along the Cornelis Douwes Canal-West.

In 2006, Van Keulen was acquired by Saint-Gobain. A French multinational company based in Paris, Saint-Gobain initially grew to fame as a glazing factory, and has now greatly expanded its activities, employing over 200,000 worldwide.
In the Netherlands, Saint-Gobain includes several companies in the building materials and distribution industries, but within the conglomerate Van Keulen enjoys a more or less independent position, so new ideas can be explored and experimented with. For example, based on business cases, the company was able to follow its own preferences regarding fuel, the introduction of intermodal transport, and new services such as the Take-it Bag. There was no need for Van Keulen to explain its choices to Paris, because sustainability is a concept actively promoted by the French company, which seeks to reduce its environmental impact by adopting the principles of Sustainable Habitat, and provides clear guidelines for the behaviour and actions of all its employees. It also maintains a strict set of targets for the reduction of CO₂ emissions. To help achieve these targets, Environmental Health and Safety (EHS) managers as well as Socially Responsible Enterprise (SRE) coordinators have been appointed.

**Lean and Green**

In May 2013 Van Keulen received the Lean and Green Award. Lean and Green is an incentive programme for industries and public services. Organisations are stimulated to achieve higher levels of sustainability by taking actions that not only help to reduce costs, but also minimise environmental impact.

The Lean and Green programme is supervised by Connekt, an independent network of industries and public authorities connecting parties in order to collaborate in a sustainable drive for the improvement of mobility in the Netherlands. It was up to Connekt to monitor and benchmark the various activities initiated by Van Keulen. Unfortunately, the very nature of those activities meant that this was not so easy in practice.

An industry supplying a limited range of products, say soft drinks or foodstuffs, will have both finely meshed and coarsely meshed distribution networks. Consumption and turnover are known in advance, which makes fine-tuning a lot easier. Increased loading efficiency and optimised distribution networks will soon yield improved results. Van Keulen on the other hand has to provide support to large projects that run for a certain length of time. The renovation of the Amsterdam Rijksmuseum is a good example of such a highly specific project that lasts several years, never to come round again in the same way.

To some extent the same applies to projects that outwardly appear very similar, as when renovating old neighbourhoods. Reducing old houses to empty shells and then doing them up again is a process that doesn’t change between locations and in many cases even involves identical or similar materials. Even so, in its day-to-day business Van Keulen finds itself confronted by considerable variations. Contractors all have their own way of doing things. Construction flows will vary for different streets. On one occasion a whole house will be completely empty, another time it will be a single unit and still occupied. One contractor will order materials for dry or wet finishing, whereas another will order only rough building materials, or just a kitchen unit and ceramic tiles. These are all different types of materials, each with its own
specific distribution requirements. On top of that, the Van Keulen warehouse contains 6,500 different products (SKUs) from 170 different suppliers, catering for over 1,500 customers, all professionals, all with their own special requirements. A major contributor to our success is the fact that any order can be delivered within 3 hours and up to a height of 28 metres above ground level. This principle is a given and must not be jeopardised.

This makes it almost impossible to come up with a benchmark. It took a major effort on the part of Connekt to shoehorn the activities of Van Keulen into the available set of instruments to begin assessing our performance for the Lean and Green Award. In the end a number of parameters were defined that included the delivery locations, the volumes of materials delivered, the number of incoming and outgoing trips, the amount of fuel used, and the number of order items.

During the survey it was found that optimising deliveries by means of follow-ups and pre-delivery checks helped to reduce the emission of CO₂. To begin with, unnecessary trips were dispensed with. We started calling customers just prior to delivery to make sure the correct materials had been loaded and to check whether the delivery was to go ahead as planned. This has the added bonus that it enables customers to add items to the existing order at no extra delivery cost. It also enables us to check the address and phone number we’ve been given.

One of the first actual environmental measures implemented at the new premises was the introduction of wind power. We were able to purchase wind power specifically from our power company, but we also have plans for building a number of wind turbines close to the site along the river IJ. Once these have been installed, Van Keulen will be able to draw power directly from them.

**New trucks**

The purchase of new trucks initially caused some problems. Van Keulen wanted to be able to meet the environmental standards, but replacing 17 trucks in one go is a bit of a challenge at any time, even more so given the particular modifications Van Keulen specifies for its vehicles. However, the company was more or less forced to buy new trucks. The establishment of the environmental zone in the Amsterdam city centre in 2007 meant that Van Keulen was faced with having to replace 17 trucks in one fell swoop. The city council allowed the replacement of the fleet to be spread out over a number of years. The requirement was for all vehicles to meet the Euro 5 emission standard. However, this was the period during which Euro 6 standard trucks were being introduced, albeit as yet unavailable with the specifications required by Van Keulen. Although trailer trucks were being manufactured, flat-bed bodies weren’t, and certainly not with such custom accessories as steered rear axles, heavy-duty axles and cranes. The company had been buying these for many years, most of them provided by DAF Trucks, so it stood to reason that Van Keulen wanted to put off the purchase of new trucks until the more environmentally friendly Euro 6 class vehicles would be available with the right
The implications for the city of Amsterdam were considerable, since each year Van Keulen services some 20,000 delivery addresses within the environmental zone. Unfortunately, talks with the council with a view to obtaining permission to keep the existing fleet of trucks running for another year, until a cleaner successor to the Euro 5 standard would be available, yielded no result. This was a disappointment on the one hand because the new Euro 6 engines would be much cleaner, and on the other hand because it meant having to go on running outdated vehicles for another eight years, which would hardly be in keeping with the principle of sustainability. Van Keulen found itself between a rock and a hard place, having to invest heavily in outdated transports with suboptimal environmental performance, while a much better alternative would soon be available, but out of reach for the moment.

At this point the importance of good supplier relationships was demonstrated. DAF Trucks introduced Van Keulen to Shell, who came up with a solution: Gas-To-Liquids (GTL), or diesel fuel produced from gas. It costs slightly more, but it is much cleaner than conventional diesel fuel. Using GTL fuel, Van Keulen would be able to reduce the emission of fine dust by up to 30 percent. This type of fuel makes particular sense in combination with ‘ageing’ engines and short city trips. In other words, it was the ideal solution for Van Keulen.

However, even these arguments appeared to be insufficient to convince the council that it would be better to wait until Euro 6 engines would become available. Discussions about specifications of combustion engines in general and diesel engines in particular didn’t yield any results either. However, as time passed, the municipality of Amsterdam eventually realised it would be better to give the company permission to wait for the introduction of Euro 6 engines. The first vehicles fitted with the new engines were delivered in the spring of 2014, so the Van Keulen fleet is currently running cleaner than Euro 5 trucks would have done. Van Keulen has also established its own local filling station, an on-site home base with a capacity of 10,000 litres of diesel fuel.

It’s obvious that Shell has been a major driving force behind the implementation of GTL. Shell offered excellent support by helping us to convince the council, by providing the necessary information about the use of GTL, by installing our home base, and by supervising the introduction of the new fuel. Even today Shell has shown a continuing interest in the project. An example of this is the extension of our maintenance intervals based on Shell research showing that the use of GTL slows down the build-up of contaminants in lubricants.

**Inland waterways**

The use of inland waterways for transport is another case in point. The process was started by a newspaper article in which Annemarie Jorritsma, chair of the Royal Masters’ Association, Schuttevaer, asserted that supplies for the entire
city of Amsterdam could be handled by transport over water. ‘Everything could come into town by ship’, the article stated. At Van Keulen, we didn’t exactly agree. How about starting with getting transport to the city perimeter fixed? Although the new premises of Van Keulen offered the necessary physical means including a loading dock, the local Port Authority would not allow any loading or unloading work to take place, on the curious grounds that such activities would endanger shipping traffic.

Arguments abounded to challenge the port authorities’ standpoint. The location was eminently suitable, the city of Amsterdam was clamouring for a change, roads all over the place were becoming congested, and the townspeople were simply gasping for fresh air. And, at its previous location, Van Keulen had always received its supplies of bulk goods such as sand, gravel and lime by water. There are still plenty of options for transport by water. Brick for example, since most brick kilns are located along our river banks. Sand is currently transferred across the water at the neighbouring sand merchant’s facilities, J. van Vliet. But, the cargo best suited to delivery by water has to be plasterboard. This product is supplied by Saint-Gobain Gyproc of Antwerp, also located on a river.

From the point of view of logistics there was no pressing need for Van Keulen to see if transport by water was a viable option. Every day, some thirty heavy goods vehicles were arriving at our premises, and everything was running smoothly. Nor was there any need to look for change from a cost point of view. However, the company decided that environmental considerations should be taken into account. The questions to be answered were whether inland shipping was possible, who would be able to take on the job, and whether there were any businesses looking for this kind of work. An article duly appeared in the Schuttevaer periodical in which Van Keulen called on inland waterway masters to put their money where their mouth was.

Pragmatic
So, the local ban on loading and unloading operations lacked all logic. We received support from Walter Ploos van Amstel and from the inland navigation promotion agency Bureau Voorlichting Binnenvaart (BVB). Walter Ploos van Amstel is the author of a number of books on logistics and distribution, and a lecturer and professor at several universities. He is considered to be the foremost Dutch expert on logistics, but above all he is known for his views regarding the need for sustainable inner-city distribution of building materials, which includes Van Keulen. It was he who kick-started the process via social media.

At the same time, we were contacted by Miranda Volker of BVB, who explained that they understood the problem and offered to help find a practical solution. BVB then called in the various service providers that were needed to move the goods flow from road to water, including Jogo Shipping (who provided expertise on loading and unloading river barges using fork-lift trucks) and
PTC (who provided the right type of vessel in the form of Pandora, with Gerrit Hagenaar as master).

Following new, useful and productive talks with the Port Authority, the necessary permits were obtained and Van Keulen received full cooperation. Early in 2014 a loading dock was fitted out with the full support of the Port Authority, which was responsible for inspecting the part of the dock above the waterline, with Van Keulen hiring a diving company for the underwater inspection. We then invested in a heavy, pile-supported platform on the quayside, a rolling gate to secure the premises, and additional dockside mooring bollards, all of which has resulted in a facility where building materials can be transferred efficiently, safely, rapidly, and above all, sustainably.

The initial tests with transport by ship proved to be a logistics success, so it was decided that Gyproc plaster products would henceforth be brought in by water. With every trip by barge, Van Keulen avoids sending 35 trailers onto the ring road around Amsterdam, while reducing CO₂ emissions by 35 percent compared with transport by road. The benefits go further still than environmental and economical considerations, however important they may be, for there is also a process advantage. The goods from Gyproc are delivered on Saturdays and arrive as a single load. This is a major improvement over delivery by truck. The warehouse employees no longer have to interrupt their work at inconvenient moments to unload trucks, which makes for a smoother work flow and means that their focus can be directed towards order picking and business processes, which in turn help to improve safety. Processes are speeded up, and delivery times reduced. Goods transported by ship can also be supplied in plastic wrappings, so packing no longer needs to be done at Van Keulen. Lots of minor benefits that all add up to a major improvement.

Gyproc also benefitted from the change, because Antwerp is a major collecting point for FGD gypsum produced by power stations. The raw gypsum can be brought in by ship, and the finished plasterboards can be taken on by the same ship.

If a ship had to ply the inlands waterways only to serve Van Keulen, there would not be sufficient cargo in addition to bricks, sand, gravel and plaster to make up the volume that would justify the use of a barge. But who says that Van Keulen needs to be the only customer? Van Keulen holds the view that collaboration with other parties is far from out of the question. It might even offer new opportunities, but as before, there is no pressing need for Van Keulen to delve deeper at this point. Perhaps the inland navigation industry could again play a useful role.

Mokum Mariteam
Transport by water also offers opportunities for delivery to inner-city locations. In collaboration with Mokum Mariteam (Mokum is the local moniker for Amsterdam), Van Keulen on several occasion delivered building supplies to a
project site using an electrically driven canal barge. Mokum Mariteam has set up a fine-meshed network for the distribution and collection by water of goods in the historic centre of Amsterdam. Their barge is powered by a clean and silent electric motor and is fitted with its own loading crane.

These pilot projects showed that the transport itself was cost neutral, although on one occasion Van Keulen was given flowers by the neighbours, who were delighted that they didn’t have to put up with the recurrent nuisance of noisy trucks spreading diesel fumes, shaking ancient foundations and blocking the road. Instead there was just a quiet barge in the water that wasn’t in anybody’s way.

There are many benefits to be had here. The council could require clean transport by water as part of a tendering process. This would have to be specified in advance, but it is something that certainly merits closer attention, in particular in Amsterdam, where traffic problems are rife and opportunities abound for shifting transport from road to water. Just look at Venice, where all transport goes by water.

Take-it-bag
Taking waste materials in return has also become a major success story for Van Keulen. Big Bags or FIBCs have been around for some time – Van Keulen has been selling them for the past thirty years – but the real potential has always been underestimated. Most building waste simply ends up being tipped into a skip, which is a waste. So, Van Keulen came up with the Take-it-Bag. Whenever building materials are delivered to a construction site, Van Keulen takes any building waste in return using Take-it-Bags.

At the request of the customer our driver will even lift the bulk bag to higher-floor window levels, suspended from the tines of the pallet hook, held wide open and ready for use. Customers save time and money because they no longer have to walk up and down stairs to tip waste materials into large, expensive skips parked in the street. Full bag? Just ring Van Keulen and the waste will be collected with the next delivery of building materials.

Our partner in this enterprise is the Icova company, which collects and recycles waste flows. Their philosophy is that we can make more from waste. Of all the materials brought in by Take-it-Bag, 80 percent gets usefully recycled. Van Keulen has a large container parked on its site in which the bags are collected, and which is picked up at regular intervals by Icova. The main advantage lies in the reduced number of empty trucks kilometres. We no longer have empty trucks coming back from town, and Icova can come into town less often. It is so simple, and as far as Van Keulen is concerned it will be the standard way of doing things in a few years’ time.

The Take-it-Bag has become a success beyond our wildest expectations. Many customers prefer the bag over climbing up and down stairs with loads of building waste, or putting up a dump chute. The latter may not even be
possible, for example in cases where the skip needs to be parked across the street, or if the street is too narrow. The aggravation caused by having a skip take up expensive parking space has also become a thing of the past. Customers are also clearly doing their maths and working out how much time and work this solution saves and how much they stand to gain.

The efforts by Van Keulen have not gone unnoticed, as shown by the fact that the company won the Sustainability Award for Amsterdam North in May 2013, followed a week later by the Lean and Green Award, as well as third place in June of the same year at the DAM Gala, on which occasion the Districts of Amsterdam promote and reward sustainable enterprise. That same evening, Van Keulen also won the Public’s Choice Award.

Van Keulen will continue to cultivate an inquiring mind where intermodal transport is concerned. Van Keulen was one of the participants in a research project by TNO in which a cluster of eight companies from the construction and logistics industry, united under the name DBA (Duurzame Bouwlogistiek Amsterdam, Sustainable Building Logistics Amsterdam), looked into the possible beneficial effects for participating businesses, clients and the Amsterdam city centre. Van Keulen currently also participates in a Green Deal with several companies including Bouwend Nederland, Dura Vermeer, TBI BAM, RWS, Workx, Rensa, Rotim, BrinkXL and DHL. The Van Keulen credo is that SRE requires active support. Many companies talk the talk, Van Keulen walks the walk!
Summary

Van Keulen Timber and Building Materials acts as supplier to both professional and private customers in Amsterdam and the surrounding region. The company offers a wide range of timber and other construction materials, and focuses on quality and speed of delivery. With a current annual tally of 20,000 deliveries in the city and region of Amsterdam alone, Van Keulen is a major player when the aim is to reduce environmental impact and to make transport greener.

Van Keulen intends to achieve a reduction in CO₂ emissions from external and internal transport activities of at least 20 percent by 2016. Actual measures to hit this target include:

- Reducing fuel consumption by means of vehicle speed limiters, regular tyre pressure checks, the use of on-board computers, and training drivers to adapt their driving style.
- Using Shell GTL clean fuel to run the vehicle fleet of Van Keulen.
- Having supplies delivered to Van Keulen by water. At regular intervals the company dock receives a barge bringing in 700 pallets of plasterboard, the equivalent of 35 trailer loads.
- Collecting building waste from customers in Take-it-Bags. The waste is stored at Van Keulen and picked up by our partner, Icova. The end result is that both parties managed to reduce the number of ‘empty’ kilometres travelled by their respective truck fleets.

Clearly Van Keulen cannot realise these ambitions by going it alone, and so we are actively collaborating with a wide circle of partners in a number of industries, from fuel to inland shipping. Together with our partners we are developing clusters and networks that can make environmentally friendly transport a reality through consultation and collaboration. This article highlights the various fields of collaboration as well as the partners involved.
Construction
Learning to cooperate
Chain integration in the building industry

This article offers a general view of the building industry as I have come to know it over the past 25 years. There are of course many successful examples to be found in the current industry, and the traditional types of collaboration have also had their share of success. However, in this article I will be picturing the industry’s issues in black and white in order to highlight the discrepancies.

The building industry is characterised by its project-focused work methods. This has been carried through to the extreme. All the parties involved, consultants as well as builders, are contracted for each project. Also, the construction process is highly fragmented. The development and construction of a building involves lots of different parties. The building industry is also characterised by a high level of hierarchy. This is a stepped hierarchy, from the principal to his consultants and builder, and from the builder to the subcontractors.

Unfortunately, in recent years the building industry has gained a bad reputation due to large-scale malversation, as a result of which any non-standard form of collaboration between a principal and the builder tends to be met with distrust. Partly due to the facts that the building industry is far from transparent by nature and construction companies themselves aren’t particularly adept at benchmarking, it is very difficult to gain insight into performance levels and the benefits of different forms of collaboration. It is unusual to measure collaboration performance. There are customer satisfaction surveys of course, and there are measurements, most of which are performed by the customers themselves, for example web sites presenting completion milestones and customer surveys. However, the true performance of the collaboration between the principal, his consultants, the builder and his subcontractors is rarely measured, let alone that such information is made public. This tends to foster mutual distrust during the contracting stages, which ultimately results in additional costs for employing consultant inspectors.

All in all, the project-focused collaborations, fragmentation and innate hierarchies have made the building industry into a sector that hardly innovates and in which the parties involved fail to jointly draw lessons from the experience gained within projects. After all, what’s the use if a collaboration is a on-off experience with little room for initiatives from the work floor? Local optimisations within the chain do occur, but there is no such thing as optimisation of the chain as a whole. The building industry is characterised by a lack of transparency and by collaborations based on distrust.

Defining the problem

Failure to learn and failure to collaborate respectfully have combined with
the utter lack of transparency in the building chain to make the development and construction process unpredictable. A booming economy drives up construction prices, because prices rise throughout the chain. The chain is reluctant or simply refuses to be bought at the lowest price. During a slump however, the lowest bidder gets the deal and parties are played off against each other. As the chain lacks innovation, purchasing at the lowest price does not get compensated by innovation. This often results in a project being completed at a loss, causing businesses to go bankrupt in the process. The effect for all the parties in the building chain is that time and price become unpredictable.

Who make up the building chain?

Who make up the building chain? Good question, and hard to answer without a definition. So I will define the building chain as the initiator as well as all the first-line and second-line businesses involved in the design, development and construction of a building.

The building chain can certainly be viewed in a broader light, since buildings must also be financed and managed. A building must be furnished, and gardens will need to be laid out. In other words, there are additional chains that come before and after the actual development and construction process. These chains also affect the construction process in a major way. One might even go so far as to pinpoint the construction process as a single incident in the process of managing real estate. After all, expanding a real estate portfolio or developing real estate to be sold is a well-defined process along the time line. Exceptions aside, developing and building the average project takes between 2 and 4 years.

In most cases the initiator is the principal in the chain and is therefore in at its beginning. The principal traditionally has a chain of businesses to give advice about development. The architect translates the principal’s intentions into a building. Then there is a whole series of consultants to provide expert advice on specific matters such as noise abatement, building physics, environmental issues, soil conditions, construction management, etc. The principal also selects a construction company, either by himself or through the architect or the construction management office.

The construction company has its own chain, consisting of the construction specialists. They include the piling company, the supplier of door and window frames, suppliers of building materials, the bricklayer, the plumber, the electrician, the heating supplier, the tiler and plasterer, etc. This group is the second-line chain from the principal’s point of view, and these parties tend to be contracted by the construction company rather than directly by the principal.
Visualising the chain

Of course, several of the parties in the second line also have a chain of suppliers. The chain of the window frame supplier in its turn has a chain behind it to supply timber, paint and paint systems, glazing and fittings. This is the third-line chain from the point of view of the principal, which I will not be discussing.

The chain in numbers
If you start counting the businesses involved, you arrive at the following figures. The principal usually controls a chain of approximately 10 parties. This can vary widely of course, depending on the type of project. The chain for a large office block will not be the same as the one for a housing project. This has nothing to do with the complexity, by the way. The nature of the businesses involved can vary considerably.

The builder controls a chain of about 60 parties. In housing construction projects this number tends to be greater than when a single large building is involved.

We can assume that the construction of a building involves between, say, 50 and 100 parties active in the first and second lines for the principal and builder. These 50 to 100 parties are controlled by two parties that carry responsibility at different moments in the process. The principal or his delegate controls the chain up to the start of construction. During construction, the construction company takes over to control the chain of construction specialists.

The number of parties and the change in responsibility also give an indication of the complexity of the chain, since all these parties together must work together to satisfy the principal’s requirements.
Types of collaboration and contract
There are different types of collaboration in the building industry. Each form has its own advantages and drawbacks for the different parties. Although many more variants can of course be found, I shall restrict myself to listing four types with essential differences. These are:

- Contracting
- Construction team
- Design & Construct
- Economically most advantageous tender (EMVI)

Finally, I will compare chain integration with these four types of collaboration.

Contracting
Contracting is the most traditional form of collaboration in the building industry. The principal collaborates on a project with an architect and consultants to prepare a set of construction documents. When the contract for the project is awarded, these documents also form the contract set.

When preparing these documents, the principal and his consultants continuously reach decisions, on matters technical and legal. To the principal it is important that the contract set becomes a “watertight” document, because he will not want to be confronted with nasty surprises after the contract has been awarded. To ensure that the documents are indeed watertight, legal experts will often also take a look at the contents of the general sections, as these will refer to applicable laws and regulations. The contracted price received by the builder after winning the contract can only be increased in the event the principal adds requirements after contracting, or if discrepancies are found in the contract set. All the risks are carried by the builder and his subcontractors.

Experience shows that on average, the principal pays 12 percent over the price set at the time the contract was awarded.

Construction team
A construction team collaboration between principal and builder works differently. The parties enter into a contract with each other once a preliminary design has been made and the principal knows what he wants and what the available budget is. The contract is a construction team agreement, which stipulates that if the parties involved fail to reach agreement about the content and/or the price, the principal can say farewell to the builder at no extra cost. The advantage to both parties over contracting is that the builder has a say in making the decisions that affect technical issues. As a result the contract set prepared for contracting will be more closely suited to the construction method and so fewer changes will have to be budgeted for. The builder forms part of the development process. On the other hand, risks do get transferred to the builder as well.

Design & Construct
Design & Construct involves the principal defining his requirements by means
of performances and frameworks. It is then up to the tendering parties to realise the performances required by the principal within the given frameworks. The tendering parties select their own architect and consultants, and design a building within the frameworks set out by the principal.

The design that best fits the principal’s requirements is selected by the principal. The contract set is then drawn up in mutual consultation. Although the risks are still carried by the builder, the builder himself has a major say in mitigating these risks.

In some cases the principal’s requirements will include maintenance for a long term of operation. This enriches the requirement as it enables the tenderer to include in the cost calculation the type of investments that will positively affect the quality and reduce the cost of maintenance. This is impossible in all the other types of collaboration.

**MEAT**

The Dutch term for Most Economically Advantageous Tender (MEAT) is *Economisch Meest Voordelige Inschrijving (EMVI)*. The principal’s tender questionnaire can take many forms. However, when assessing the answers, rather than just looking at the price, other aspects are also taken into account. These may include for example sustainability or energy performance, but also funding or building method. This type of questionnaire gives the tenderers more opportunities for bringing their know-how and expertise to bear.

The following table lists some salient points of these four types of collaboration and contracting.

<table>
<thead>
<tr>
<th></th>
<th>Contracting</th>
<th>Construction Team</th>
<th>Design &amp; Construct</th>
<th>MEAT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Selection criterion</strong></td>
<td>Lowest price</td>
<td>Selection</td>
<td>Value for money</td>
<td>Weighted selection</td>
</tr>
<tr>
<td><strong>Risks</strong></td>
<td>Builder</td>
<td>Jointly, after awarding contract</td>
<td>Tenderer</td>
<td></td>
</tr>
<tr>
<td><strong>Interests</strong></td>
<td>Own interest</td>
<td>Common interest and own interest</td>
<td>Common interest</td>
<td>Own interest/ common interest</td>
</tr>
<tr>
<td><strong>Attitude</strong></td>
<td>Protectionist</td>
<td>Protectionist</td>
<td>Involved</td>
<td>Involved</td>
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</tbody>
</table>

*Figure 2: Collaboration and contract types in the building industry.*

**Risks**

In most types of collaboration much of the risk is transferred to the construction party, which will then attempt to offload the risk as much as possible further down the chain, in other words, onto the subcontractors. Risks generally get taken into account in the calculations for the tender. Even if they do not, experience gained over the years will generally ensure that much of the cost for risks will have ‘crept’ into the standards. After all, we have all had experience with a number of different projects.
Risks can be used to make money in the event of a closed contract, i.e. when the contract price is the final price. If risks have been taken into account for e.g. price increases and the price increases fail to materialise, the builder has a windfall. The same applies to costs included to make up for any stoppage. If the frost doesn’t come, the builder will not have to pay out the additional cost he budgeted for.

**Interests**
The playing field for the interests game is set by the selection criterion and the way in which risks are taken into account. If selection was guided by the lowest price, the builder will also select his subcontractors according to lowest price. Conflicts about discrepancies between contract and execution will then arise between the subcontractor and the builder. If the complaint stands, the main contractor will then transfer these conflicts to the principal. This creates a conflict between the principal and the builder. Each of the parties will seek to protect its own interests. Selection on lowest price automatically brings out the need to protect one’s own interests.

**Attitude and behaviour**
The attitude and behaviour of most of the players is determined by the way in which the contract has been awarded. They are in fact equally affected by their interests, with each player’s attitude and behaviour being guided by the extent to which he is left to defend his own interests.

**Chain integration**
In 2008, H. de Jonge of TU Delft and M. Noordhuis of Deloitte organised meetings with a number of large construction companies and housing corporations, including the Havensteder housing corporation in Rotterdam. At these meetings the conclusions outlined above were formulated and discussed, culminating in the introduction of the chain integration concept, a form of collaboration that had already been highly successful in other industries, including the automotive and aircraft industries.

As a result of this, the Com-wonen housing corporation (currently Havensteder) and Dura Vermeer Construction Industry Rotterdam (currently Dura Vermeer Construction Industry South West) took up the challenge of coming up with a different form of collaboration. The process was supported by Ruben Vrijhoef of TU Delft and Marcel Noordhuis of Deloitte. The representatives of Com-wonen and Dura Vermeer were Babette van het Ancker and the author (André Klouwen).

The purpose of chain integration in the building industry is to be able to work faster, better and cheaper. We do so in a respectful and transparent way, based on trust, in order to make the development and construction process more predictable and to enable the building industry to learn and innovate. Another component, ‘nicer’, is often added, based on the premise that good collaboration between people will help to improve the work atmosphere, which in turn will improve people’s motivation.
Objectives

- **Time**
  Predictability of time, shorter lead times of the development and construction process.
- **Money**
  Lower construction costs (all the costs it takes to realise a project).
- **Quality**
  Improved customer and neighbourhood satisfaction.
- **Nicer**
  Team performance and team satisfaction.

Principles

A series of meetings has resulted in a set of principles that are intended to drastically change the collaboration. All these principles concern issues associated with the soft side of the collaboration. They have nothing to do with chain integration and can be incorporated into any type of collaboration. However, chain integration is impossible without these principles.

- **Transparency**
  The collaboration must be based on full transparency by both parties.
- **Trust**
  We decided to collaborate on a basis of professionally validated trust.
- **Respect**
  The collaboration is based on mutual business respect.

Ambitions

In addition to the objectives, a set of ambitions have been named that are to serve as examples throughout the building industry and real estate domain of how a different way of collaborating can contribute to realising the objectives.

- **Predictability**
  Make to process smoother and so introduce predictability.
- **Learning**
  The building industry must start to learn in order to improve the performance of the chain.
- **Innovation**
  Both process and product innovation must be given a place in the building chain.

The customer

Somewhere among the points listed above sits customer satisfaction. This is of course incorrect, as a satisfied customer should be the main objective. Satisfied with the product, but also with the way the product was realised in consultation with the customer. The customer may also be the principal’s customer, for example somebody renting a house from a housing corporation. The builder works for the corporation, but the tenant must be at least as satisfied as the corporation.
A satisfied customer is an ambassador for the companies that did the work. This can result in repeat purchases.

**Alternative: non project-focused**

It was decided to realise the objectives outlined above in a non project-focused collaboration for a period of five years during which a ground-floor, single-family type of house suitable for both private ownership and corporate lease would be developed and built to enable a clearly defined measurement to take place.

The non project-focused collaboration cannot be restricted to the collaboration between principal and builder. Non project-focused collaboration must cover the entire chain, including consultants and construction specialists. Only then will the learning effect be maximised.

The chain integration must be measured so as to obtain a clear picture of its performance regarding each of the objectives. To be able to compare the measured values and use them as a basis for policy and improvement programmes, the measurements must all be performed in the same manner and using the same means. This turns out to be rather difficult in practice, as it is simply not ingrained in our culture.

In collaboration with TU Delft a measuring programme was developed to measure the quality of the collaboration. In addition there are measuring instruments developed by Deloitte to measure the objectives of co-making.

**The future**

There are major process changes to come in the near future. Induced by the fiscal changes in the housing corporations, the experience gained with other forms of collaboration and the introduction of BIM 3-D modelling, a shifting of tasks will occur. If we look at other industries, this would appear to be only normal.

I predict that responsibility and control will be transferred to the production party earlier on in the process. There are several reasons for this:

- By working on the basis of concepts, it will be possible to give price guarantees earlier on. This will make budgeting more predictable for the principal.
- The questionnaires will increasingly be focused on performance requirements rather than construction documents. This leaves open the possibility for the market to introduce innovative solutions.
- The engineering work will be done by the production party. This may seem obvious, but it is still highly unusual in the traditional type of process, in which the engineering is done by the architect when preparing the construction drawings and the supplying businesses then having to engineer their products on the basis of these drawings.
BIM 3-D modelling
When using BIM (Building Information Model) and 3-D product modelling, certain choices need to be made at the very earliest of stages, since the 3-D model of the building must be gradually pieced together in a joint effort, which requires an exact definition of the specifications. One step further involves the supplying industry controlling his machinery based on the BIM and 3-D model. This means that the 3-D BIM controls the engineering of both the semi-finished products and the end product. This type of engineering is under the control of the builder.

Building industry
This different approach implies far-reaching consequences for the traditional organisation of the building industry. The planners who currently coordinate the engineering from roughly three months ahead of the commencement of any physical building activity will in future be involved in the process from the very start.

Principal
Awarding the contract, i.e. agreeing on the design, the specification and the price, will be concluded much earlier on in the process, since the engineering part will be done within the framework of the design, the specification and performance requirements, and setting the price.

Suppliers
The supplying industry will enter into permanent collaborations with builders and as such will be involved in the process at a much earlier stage. In addition, well-defined, non project-focused agreements will have to be made with these parties, and investments will have to be made in the continuous development of the semi-finished products with regard to engineering. Standardisation of technical solutions and connections will progress much further for a wider range of products. This will result in shorter lead times and a considerable reduction of costs.

Architects
The role of the architect will also change. The architect will of course remain responsible for the visual design, choice of materials and colour. In addition the architect has the task of placing the design in its environment and coordinating the procedures for obtaining the necessary planning permissions. The architect is also the party designing the structural solutions. However, a major part of this latter task will concern the development of concepts, and this will take place in close collaboration with the suppliers.

The architect will spend less time completing designs in BIM models, unless his firm specialises in BIM design and enters into non project-focused collaborations with production companies.
Projects
As mentioned above, the collaboration with the Havensteder housing corporation in Rotterdam started in April 2008. The collaboration, under the name ‘Chain Integration in the Building Industry, Better, Faster, Cheaper’ is still active. In 2011 it received a national award, one of the reasons given for which was that this was the first time in the Netherlands that collaboration had taken place in the building industry on the basis of chain integration.

In 2010 a collaboration was launched with the Ymere housing corporation in Amsterdam, under the name ‘Co-making, Better, Faster, Cheaper and Nicer’. This is also still active. Both programmes are supported by Dura Vermeer in the person of the author.
Summary

The building chain comprises the initiator and all the first-line and second-line businesses involved in the design, development and construction of a building. The building industry is characterised by its lack of transparency and by collaborations based on distrust. Project-focused collaborations, fragmentation and the existing hierarchies make the building industry a sector lacking innovation and in which the experience gained from projects does not result in a joint learning experience. Although parts of the chain get optimised, there is no such thing as optimisation of the chain as a whole.

In 2008 TU Delft and Deloitte organised meetings with a number of large construction companies and housing corporations. At these meetings the concept of chain integration was introduced, a form of collaboration that had proved successful in a number of other industries. As a result, the Com•wonen housing corporation (currently Havenstede) and the Dura Vermeer Construction Industry Rotterdam (currently Dura Vermeer Construction Industry South West) took up the challenge of finding a different form of collaboration.

Objectives, principles and ambitions were defined. A non project-focused collaboration was chosen in which to realise these. With the aid of TU Delft a measuring programme was developed to determine the quality of the collaboration. In addition there are measuring instruments developed by Deloitte to evaluate the objectives of co-making. Two collaboration projects are currently active, one in Rotterdam and one in Amsterdam. In 2011 the efforts received recognition in the form of a national award.
Customs

Efficient use of expertise and information
Where industry meets agency

The Dutch Customs Authority levies duties on imports, protects the European Union against harmful goods and facilitates legitimate trade, all the while keeping logistics delays to a minimum. In executing its tasks, the Customs Authority has traditionally collaborated with the industries involved, e.g. through EVO, and increasingly with other enforcement agencies concerning health and safety, the economy and the environment. Efficient use of each other’s expertise and information can prevent duplicate checks and will help to reduce the administrative workload for bona fide enterprises. In doing so we also help to maintain and reinforce the excellent reputation of Dutch logistics as a spearhead industry. This article, which was written from a Customs perspective, takes a look at the various collaborations.

International perspective

World Customs Organisation: Coordinated Border Management
Working towards improved collaboration between enforcement bodies starts at a global level. The World Customs Organisation (WCO) promotes awareness on the subject in the guise of Coordinated Border Management (CBM), the purpose of which is to facilitate collaboration between cross-border traffic surveillance agencies by means of improved international information exchange and enhanced coordination of surveillance activities and checks.

Within this concept, a major role is played by policy makers, who will have to realise the importance of the need to implement changes in policy and organisation in order to avoid undue delays in international logistics flows and remove structural impediments.

As part of CBM, the Dutch Customs Authority also participates in WDO workshops to establish best practices regarding the collaboration with other enforcement agencies, for example with the authorities responsible for air freight safety.

In the CBM concept, the World Customs Organisation assumes that the customs authorities will have a coordinating (directing) role on the surveillance activities. This is based on the presence of customs officers at logistics hotspots all over the world as well as the high level of expertise of customs services regarding international commercial logistics.

European Union: EU risk management strategy
The European Union has made the improvement of collaboration between enforcement agencies one of the spearheads of its new risk management strategy, which is aimed at protecting the EU’s interests, reinforcing EU safety and security, and facilitating the legitimate flow of trade in order to improve the competitiveness of the European Union. The incorporation in EU customs law
of the concept of an Authorised Economic Operator (AEO), a market player certified by the customs authorities, is a major step forward in this respect.

In collaboration with the EU customs authorities, various enforcement agencies from EU member states and a number of European logistics industry organisations (including the European Shippers’ Council, ESC, and the European association of freight forwarders and logistics service providers, Clecat), the European Commission has launched a series of projects aimed at improving the collaboration between enforcement agencies. For example, the air freight safety criteria of the AEO programme have already been compared with other certification programmes regarding safety in the air freight industry, ‘Regulated Agent’ and ‘Known Consignor’. These statuses can be acquired by air freight shippers (regulated agent) and businesses (known consignor) that meet certain criteria specifically addressing the safety aspects throughout the logistics flow of outgoing air freight.

Concrete proposals have been made by the EU project group to further integrate customs legislation and air freight legislation through mutual recognition of certifications, which will help unify the document issuing and checking processes of both enforcement agencies, reducing the industry’s administrative load and cost.

The Commission is also investigating the overlap of the AEO safety criteria with the certification requirements for the International Ship and Port Security Programme regarding maritime safety, based on EU legislation. As part of a joint preliminary enquiry undertaken by the Dutch and Belgian customs authorities, it has already been found that the AEO safety criteria largely echo the safety criteria for the ISPS code, which concerns the security of shipping and port sites and businesses. The risk analyses regarding the security of port sites and businesses that need to be carried out for the ISPS programme to a great extent coincide with the requirements set for the AEO security status.

In 2014 the Commission will launch a new project to look at ways to improve collaboration between the responsible enforcement agencies in the field of AEO certification and the issuing of permits for Dual Use goods, which in some cases are subject to export restrictions because they can also be used for purposes of repression.

The Dutch Customs Authority is currently participating in all these EU projects, sharing previous experience gained in the Netherlands in order to constructively contribute to the improvement of collaboration between customs authorities and other enforcement agencies, both cross-border and at home. The intended outcome is that customs authorities will be able to work more efficiently while minimising the logistics delays for legitimate international trade, which is of crucial importance for Dutch trade and the competitiveness of the Dutch logistics industry as a whole.
The Netherlands – collaboration between customs and industries

Customs-Industries Consultation Platform
The Dutch Customs Authority is actively promoting the improvement of the logistics trade chain and the facilitation of legitimate goods flows. The objective is to find the right balance between the ostensibly incompatible interests of logistics and society as a whole, all in consultation with the industries involved. We are actively seeking a dialogue with the industry, and creating new collaborative efforts.

The Custom-Industries Consultation Platform (Overleg Douane Bedrijfsleven, ODB) is a unique exponent of such a collaboration effort. In addition to the Customs Authority, the members of the ODB include umbrella organisations which together represent every link in the goods chain, e.g. shippers, exporters, importers, carriers, logistics service providers, the entire air freight industry, stevedores, ship brokers and ship owners. EVO too participates in the ODB. In this setting, the Customs authorities explain new legislation and regulations while keeping in touch with industry developments. The Customs Authority also regularly attends the information events organised by the ODB for the umbrella organisations’ member enterprises.

The collaboration within the folds of the ODB extends to other fields as well. Significant joint initiatives at the present time seek to address IT issues and reduce inspection loads in day-to-day practice.

Addressing IT issues
In many cases it is hard to pinpoint the cause of bottlenecks in international logistics. A clear example can be found in today’s IT communication technology. The consequences of such issues are invariably experienced by the end users, i.e. the company employee who has to daily file customs papers, or the customs officer charged with assessing the submissions. The question is however, what causes the issue, and what can be done about it? An electronic message sent from submitter to assessor will pass through many different entities: the company’s own IT network, an internet provider, a web host here or abroad, a central government portal for message traffic, a Customs data centre, etc. Only if all the parties involved join forces to address the bottleneck will the action be effective. This is exactly what the ODB seeks to achieve and is actively enacting in a joint platform including software providers, industry end users, the customs authorities, and information management experts.

Work in Progress
A special initiative of the ODB is an improvement programme called Work in Progress. The parties involved have compiled a list of the industry’s wishes and requirements that would help to make customs surveillance smarter and more efficient so the logistics process would be even less affected. Broadly speaking they consist of four main categories: Process and quality assurance in the
surveillance chain, Collaboration with other enforcement partners, Optimisation of chain contact, and Miscellaneous.

Recommendations given to the Customs Authority as part of the Work in Progress programme include:

• improve communication regarding physical checks;
• harmonise the work distribution points;
• improve the knowledge of customs staff;
• make better use of checks performed by companies themselves;
• synchronise checks with pauses in the logistics process;
• give feedback regarding deficiencies so companies can learn from their errors and work on long-term improvement;
• make better use of information from other enforcement agencies so companies need only supply additional data;
• get the AEO status recognised by other enforcement agencies.

These wishes and requirements were translated into concrete aims and actions, together with an implementation schedule. Where possible the actions dovetail with already running projects and pilots within the Customs organisation, e.g. the Customs Surveillance Modernisation (Modernisering Toezicht Douane) programme, the Continued Development of Declaration Processing (Doorontwikkeling Aangiftebehandeling) project, the Surveillance Chain Professionalisation (Professionalisering Toezichtketen) project, and the Declaration System (Aangiftesysteem, AGS) project. New processes have been developed for certain specific wishes and requirements. Every quarter, the Customs Authority prepares a report on the progress and results achieved for each action. Three of these reports have already been discussed in the ODB Surveillance & Enforcement working group.

The Work in Progress programme currently forms the guideline for joint action by the Customs Authority and the industry, thus giving substance to the motto, ‘Surveillance is a joint effort’. The intended result is to achieve a noticeable effect for Dutch industry in the form of permanently improved Customs service levels. In addition to collaboration, risk-focused actions and trust, service is one of the four cornerstones of customs surveillance. With a view to continuous optimisation of its processes, the Customs Authority seeks to understand the effects its actions have in the administrative and logistics chain of the industry.

**Dutch Customs: improving surveillance efficiency**

**Customs Surveillance Modernisation**

As mentioned above, the Work in Progress programme has much common ground with the Customs Surveillance Modernisation programme, which was launched earlier. Within several subsidiary projects of this programme, we are gaining experience with more differentiated, smarter and bundled checks, the re-use of data, and surveillance using tailored instruments. In this way
we are contributing towards the realisation of the Horizontal Surveillance view described by the Customs Authority and the industry back in 2008, the so-called ‘dot on the horizon’. In this ideal situation, surveillance on cross-border traffic is based on inspection mechanisms, certification, quality and safety systems within companies, groups of companies, industries and chains, with the authorities ‘looking over the shoulders’ of the industry rather than intervening in current processes. This will enable goods from safe and secure market parties to cross borders without hindrance whenever possible.

**Continued Development of Declaration Processing**

The purpose of the Continued Development of Declaration Processing project, with is also closely linked to the Work in Progress programme, is to improve and reinforce customs declarations as part of the enforcement chain. By addressing issues as part of a centralised, concerted effort, the Customs Authority seeks to find a more effective solution for processing declarations. Relevant issues include improving the process covering the steps from declaration processing to physical surveillance and feedback of results, the possibility of differentiated methods and moments of verification and analysis of declarations for AEO companies, and the reshaping of the Automated Periodical Declaration (Geautomatiseerde Periodieke Aangifte) process. The Customs Authority has opted for investing in normal declaration processing, which is being continuously developed, step by step. Progress is discussed with the industry, mainly in the context of the ODB, but also elsewhere.

**Single Window for Trade and Transport**

The Customs Authority will be able to improve surveillance partly through internal action, for example by training staff, by defining unambiguous work arrangements and by harmonising procedures and methods. On the other hand, many of the aims described in the context of the Work in Progress programme can only be achieved through extensive collaboration with other inspection services involved in the cross-border transport of goods. Exchanging information, utilising each other’s capacity and combining checks is therefore a pure necessity.

One development that plays a major role in this respect is what is known as the Single Window. In a Single Window environment, authorities streamline their processes in order to better integrate with the requirements dictated by the market. The interaction between the authority and the market passes though a single interface, a digital portal through which data need only be submitted once. From this single window, the data can then be used by a number of different government processes. In other words, single submission, multiple use. Also, market parties are able to request an integrated status report of their transactions with the authorities at any given moment.

The single digital portal has already been realised in the Netherlands, where it’s known as the Digiport. To achieve the other aims, the Dutch authorities have gone even further by intensifying the collaboration with the industry through
the Single Window for Trade and Transport programme. In this programme, the authorities involved in the surveillance of international goods flows have agreed to improve their joint service level, e.g. by means of coordinated risk selection and efficient calculation and processing of import duties. This will eventually result in the one-stop shop concept, and consequently less red tape: physical customs, environmental and veterinary checks on goods will take place simultaneously.

The Single Window for Trade & Transport is being created in stages from the following three components:
- Goods transport (Supd@x)
- Maritime Single Window (MSW)
- Inland Navigation Single Window (BSW).

This project will run until mid-2015, after which additional development to other work areas can take place.

**NLIP**

Logistics has been designated a spearhead industry of the Dutch economy by the government. The re-use of information throughout the logistics industry and between the industry and the authorities could make the logistics industry even more efficient and competitive. We are currently working on such an intelligent conduit for information, which would mean that data would only have to be submitted once to be available for maximum re-use. Within this Neutral Logistics Information Platform (NLIP) various existing information platforms set up by the market, such as Cargonaut and Portbase, and by the authorities, i.e. the logistics part of Digiport, will work together, augmented by new industry platforms. The aim is to exchange data between all these platforms within the NLIP, which will then available for re-use in various applications in use by the market and government parties involved. The NLIP is a prime example of close collaboration between industry and authorities.

**Updating surveillance**

In addition to making preparations for the establishment of Single Window for Trade & Transport and the Neutral Logistics Information Platform, a wide section of the authorities has spent recent years working on updating maritime surveillance to increase its effect and reduce its burden. This is what the Updating Surveillance (Vernieuwing Toezicht) programme is all about, with the increased collaboration levels by the surveillance authorities being extended to inland navigation and the sea ports (cargo, sea-going vessels, port safety and integrity). The surveillance parties are increasingly operating as a single enforcing agency. Not only is this more efficient, it also reduces the surveillance load for the industry. It helps prevent duplicate checks. By sharing inspection results, surveillance authorities get to know the bad apples in the cart. Risk analyses can also be used to set priorities. Businesses that have all their documentation in order will be inspected less often. To achieve this, the collaborating surveillance parties compile an annual Transport by Water Surveillance Plan which is published on the internet, another great example of efficient and modern surveillance.
Summary

The Dutch Customs Authority has always collaborated with the industries involved, e.g. through EVO, and increasingly with other enforcement agencies concerning health and safety, the economy and the environment as part of its task of levying import duties, protecting the European Union against harmful goods, and facilitating legitimate trade, all the while keeping any logistics delays to a minimum.

Efficient use of each other’s expertise and information can prevent duplicate checks and will help to reduce the administrative workload for bona fide enterprises. In doing so we also help to maintain and reinforce the excellent reputation of Dutch logistics as a spearhead industry.

This article, written from a Customs perspective, takes a look at the various collaborations, partners in which include the World Customs Organisation, the European Commission and the EU customs authorities, the European Shippers’ Council (ESC) and the European association of freight forwarders and logistics service providers (Clecat).

In the Netherlands, the Custom-Industries Consultation Platform is a unique collaboration with the industry, focusing on making surveillance more efficient. This is done by such means as updating customs surveillance, continuously developing declarations processing, and a single window for trade and transport. In addition, the Neutral Logistics Information Platform (NLIP) will enable various existing information platforms run by the market, such as Cargonaut and Portbase, and by the authorities, i.e. the logistics section of Digiport, to work together, augmented by any new platforms the industries may set up.
Floriculture

The DAVINC$^3$I project
Developing and implementing innovative logistics concepts in floriculture trade networks

The floriculture sector in the Netherlands is of world-class quality, and serves as the main trading hub for Europe. The sector as a whole has a huge impact on the Dutch economy, being the largest exporter of fresh products in Europe and the third largest exporter in the world, with still significant opportunities for further growth. Despite its current leading position, the sector needs to look forward and innovate to stay in the lead.

Today, most flowers physically pass through the auction houses on their fixed routes from national and international growers to customers here and abroad to allow for physical inspection, quality control and break bulk activities. However, several developments, such as new markets in Eastern Europe and increased virtualisation, are stimulating the chain to become an efficient floriculture hub-based network in which cut flowers, plants and other products are delivered to customers taking different, direct routes and using different logistics concepts. Cross-dock centers and hubs are being set-up in Europe to link local and global flows, and the sector is searching for efficient coordination and control mechanisms for the complete logistics network to consolidate flows and fulfil market demands. This is not an easy task as the sector is characterised by a large number of independent SMEs (many growers, traders, and small LSPs) and a large cooperative auction system, each with their own objectives and views on roles and functions of parties in the supply chain network.

The Dutch sector wants to continue to be the physical and virtual floriculture trading hub of Europe, and has therefore initiated the DAVINC3I project. DAVINC3I stands for Dutch Agricultural Virtualised International Network with Coordination, Consolidation, Collaboration and Information availability (see www.davinc3i.com). The project researches (1) the opportunities for new logistics coordination, consolidation and collaboration concepts in extended international tradeparc networks, and (2) the possibilities for making chain information available directly and in real time to support the decision-making processes of all the partners in the floriculture network.

The following sections will discuss (2) sector characteristics and specific industry dynamics and needs, (3) increasing virtualisation of trade networks and related information management challenges, (4) logistics research challenges, (5) steps toward a logistics information platform, and (6) change management issues on how to get relevant stakeholders involved using a case example.

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Sector characteristics and industry needs

Actors in the supply chain
The Netherlands forms the heart of the international floriculture sector. It has an intricate and high-quality network of companies, ranging from breeders and growers to sales experts and export firms, representing every aspect of the business. The supply chain network consists of the following links: growers, auctions, traders, logistics service providers and outlets (Figure 1).

The FloraHolland flower auction runs six auction centers for trading in cut flowers (about 70 percent of turnover) and ornamental plants (about 30 percent), a national intermediary organisation (FloraHolland Connect) and an internationally active import department. Veiling Rhein-Maas (Herongen, Germany) is a joint venture between FloraHolland and Landgard. FloraHolland is a primary cooperative: the business is owned by its roughly 5,000 members, mainly growers in the Netherlands, but also abroad.

The traders can be split up into three groups: wholesalers, exporters and importers. Sometimes these overlap, when a Dutch wholesaler also acts as exporter. There are about 1,200 Dutch traders with many customers here and abroad. Most important import countries are Kenya, Ethiopia, Israel, Ecuador and Germany. The most important export countries are Germany, the United Kingdom, France, Italy and Belgium. In many cases the transport between two chain stages is outsourced to one of the over 70 logistics service providers. In some cases the providers execute extra activities like quality control, handling and packaging. On average there are 20,000 truck movements per day, with about 1,800 daily truck movements between the marketplaces of FloraHolland.

Different sales channels can be identified in the national and international market places. We can divide them into retail, i.e. unspecialised shops where floriculture products are a by-product (supermarkets, garden centres, DIY centres, etc.), and detail, i.e. specialised shops focused on floriculture products (self-employed garden centres, flower shops, street markets, etc.). The supply chain networks of retail and detail shops are not the same. For example, there are a large number of specialised flower shops that carry a wide variety of products, as opposed to a small number of DIY markets offering a limited range. Retail outlets order large quantities well in advance, while street markets want to order products in small quantities today, to be sold today. Furthermore, flower shops demand a high-quality product, whereas supermarkets just want to be able to guarantee a vase life of seven days.
Industry dynamics and needs
Using expert interviews and chain process analysis, we identified multiple types of supply chains in the complete network as well as specific floriculture industry dynamics and needs (Table 1). Summarised and simplified, we can say that the sector is characterised by a diversity of products, actors and market outlets, all with their own specific demands, including logistics. More specifically,

- the cut flower detail chain is a supply-driven chain with small but highly perishable product flows to geographically dispersed detail shops, which is also where the main inventory is. The cut flower retail chain is a growing demand-driven chain with large product flows and customising processes such as bouquet-making, labelling and packaging, at locations one to three days' travelling distance away from customers;
- the potted plant detail chain is a relatively small chain which resembles the flower detail chain but offers more slack in lead times in production and distribution due to the less perishable nature of the product. The potted plant retail chain is a rather predictable pull chain with large product flows and customising processes at locations one to three days’ travelling distance away from customers, with products being sold as single items. In the world of ornamental plants the role of garden and DIY centres is stronger than it is in cut flower chains. This leads to direct deals between retailers and growers with much higher volumes.
Industry Dynamics | Industry Needs

**Supply chain partners**

Traders order increasingly frequent, increasingly smaller amounts. Current logistics don’t fit this pattern.

Very limited supply chain visibility causes suboptimal internal processes at traders.

Virtualization is the buzzword, but content and logistical consequences are unclear.

Sourcing area gets smaller, as most growers can’t provide products for same day delivery over long distances.

No worries logistics.

Sharing real-time information and supply chain transparency in the supply chain for all parties.

Coordination concepts including:

- Increased service and flexibility
- Higher profits per kilometre
- Free choice of logistics service provider
- Administrative clarity and relief

**Logistics service providers**

Multiple logistics service providers at the growers on the same day.

Fragmented transportation market. Therefore few possibilities for consolidation of volume.

Transport between market places by regional transporters, national transporters and self-transporting growers.

Faster transport between the market places:

- One by one arrival
- Prioritising different volumes
- Guaranteed product quality

**Communication and IT**

Lack of transparency in logistical costs.

Many possibilities for information exchange in the supply chain, but inefficient use of them.

Many ICT systems available in sector.

Much personal/phone communication.

Neutral, reliable, sustainable, independent coordination platform.

Compatibility with any ICT system.

| Table 1: Industry dynamics and needs (Van Veen and Van der Vorst, 2011) |

### Virtualization of trade networks

Floriculture trade networks are increasingly being digitised and virtualised in response to challenges posed by the markets and the opportunities offered by today’s affordable new technologies (Van der Vorst et al., 2012a; Verdouw et al., 2012). In such virtual supply chains, planning, orchestration and coordination are based on virtual representations of physical products and resources, enabled by new information and communication technologies.

The actors responsible for planning, orchestration and coordination are not necessarily the ones handling and observing these physical objects. They can be at different locations. As a consequence, virtualised networks enable the decentralisation or decoupling of physical flows from (centralised) planning, orchestration, and coordination taking place in other locations and by other partners. As a result, future chains might by-pass current actors and aim for shorter, more responsive routes from grower to end consumer.

### Internet of Things

The key driver of virtualisation is the emergence of new and affordable information and communication technologies in particular the Internet of Things and the Internet of Services. In the *Internet of Services (IoS)*, software
applications are packaged as interoperable web services. Web services are autonomous, re-usable software components that are based on XML message technology that can be described, published and invoked over the network (typically Internet) using open standards (Wolfert et al. 2010). In the Internet of Things (IoT), not only can software be accessed via the internet, but physical objects can be connected in real time using embedded systems, RFID, sensors and actuators. In the IoT, physical entities have digital counterparts and virtual representation; things become context aware and they can sense, communicate, act, interact, and exchange data, information and knowledge (Guillemin and Friess, 2009).

In the flowers and plants sector, much progress has been made in recent years in the virtualisation of transactions by the implementation of market information systems, in particular for B2B trade (web shops, virtual auctioning). The logistics process is also increasingly being virtualised, e.g. by the introduction of logistics information hubs. One of the key projects in the Netherlands in this area is HubWays, which we will use as a case in point later in this chapter to show the steps taken to involve stakeholders.

Challenges in the Virtualization of Trade Networks
For the Dutch floriculture industry to be able to be at the center of a global virtualised network for plants and flowers, it is crucial to have modern information systems available. Such systems are considered a key enabler. For this reason, DAVINCI is actively researching what such systems should facilitate and be capable of in general terms. Looking at the current state of ICT in the industry, the focus has been predominantly technical and oriented towards addressing short-term bottlenecks (Verdouw & Beulens, 2012b). These bottlenecks mainly concerned the exchange of data: standardisation of messages and product/service characteristics. The use of such data for intelligent decision support in the industry is however fairly uncommon, despite its potential benefits. Such benefits may include supply chain process improvements. In doing so, the aim of virtualisation should not only be to virtualise existing processes, but also to contribute to designing future supply chain processes (see figure 2). This requires the floriculture industry to focus on end users and the value they attribute to the product. However, at present there is a strong focus on costs and cost reduction. In addition, virtualisation is often considered to be a technical IT problem rather than a new approach that may contribute to a renewed focus on the end user.

In addition to the logistics intelligence challenges outlined above there are more practical challenges at the level of logistics connectivity. These are:
• the ability to use data, which depends on the extent to which people are able to understand and use the data – standardisation is crucial in this respect. Although various standards are available in floriculture, there is still significant scope for further standardisation;
• design of chain information systems. Existing models are often based on a data warehouse concept. This brings about questions on business models
often needed to support the system. Companies are making data available that is to some extent private, and need to be assured such data will not be used without permission;

- interoperability with enterprise management systems. Integration between the chain information systems and enterprise management systems needs to be smooth (i.e. without human intervention or additional actions) to make sharing easy and to ensure that benefits are easily generated and experienced. As in other industries, companies often use multiple systems requiring interoperability;

- data security and access authorisation, which are also recurring topics for intercompany systems.

In this respect the structure of the industry, with many small and medium-sized companies and only a few larger ones, needs to be borne in mind. With respect to the implementation of ICTs, it is not so much the technological basis that is lacking strength, but rather the open network structure of the industry and diversity in existing supply/value chains that creates issues for implementation. One solution is to be found in ICT systems that can be easily implemented, integrated and disconnected. Such flexibility will allows ICT to remain relevant in different circumstances and scenarios. Having said that, however, the crucial link in implementation is the user. And while the generic and joint benefits are often clear, the business case for individual parties in the industry is often less evident.

**Logistics research challenges**

In addition to the information management challenges, the specific developments and sector characteristics result in research challenges on the level of design and management of logistics processes. Based on desk research and stakeholder interviews, we have identified the following issues:

(4.1) a need for robust and flexible quality-driven logistics concepts,

(4.2) a
need for differentiated logistics concepts in demand-driven supply chains, (4.3) an opportunity for innovative, collaborative distribution strategies, and (4.4) a need for collaborative logistics.

**Need for robust and flexible quality-driven concepts**

One of the main logistics challenges for the sector is to deal with strong dynamics and uncertainty in supply and demand, both regarding fresh product quality and the timely availability of sufficient volume in a specific place. The sector is characterised by last-minute changes and rush orders. Very specific is the difficulty to predict the exact quality of fresh produce before it has been harvested. The prediction of these quality changes is even more difficult during the trade, transport and storage processes (resulting in potentially large product losses if logistics is not organised adequately). At the same time there is a trade-off between expensive measures that can prolong the vase life of flowers and the use of slower and cheaper transport modalities, often with lower carbon emissions. Typically, apart from biological variations, the quality of flowers and plants is determined by time and environmental conditions such as temperature and humidity during transport. Environmental conditions may be influenced by, for example, the type of packaging, way of loading and the availability of temperature-controlled transport and warehouses. Customers demand guarantees on quality specifications, leading to strict requirements on the logistics network concepts used in the sector. As a consequence, the required prediction and planning concept and accompanying logistics system need to be very flexible, enabling last-minute changes and reallocations, as well as enabling robust planning (in view of the many rush orders and transports at any given moment). More specific, it should allow for advanced logistics decision-making processes, taking real-time information on product quality behaviour into account, to enable the delivery of the right product to the right outlet in time, a concept called “Quality Controlled Logistics” by Van der Vorst et al. (2011b).

**Need for differentiated demand-driven concepts**

The DAVINC'I project differentiates between three types of marketing channels: retail (including supermarkets, garden centres and DIY outlets), detail (specialist shops) and e-tail (web shops). Retail industry has seen significant consolidation and concentration, which has led to domination of the market by large retailers. Retail sells flowers and plants as a by-product and aims for large volumes of specific products guaranteed via long-term (preferred supplier relationship) contracts and fixed prices. Specialist shops often gain their competitive advantage due to a wide product range (and hence small volumes per individual product) and a focus on high-quality products. They market value-added products via small-scale shops using day-to-day prices and available volumes. Web shops are relatively new to the sector and the result of increasing digitisation and virtualisation. It is not clear yet how this channel will develop further and what kind of assortment will be offered, nor which order fulfilment strategies will be applied. Major research concerns the last mile solutions, inventory strategies and fulfilment centres. In all channels, vase
life is one of the most important product attributes (currently about 7 days for flowers). As a result, order lead times are continuously being reduced and there is a trend towards smaller order batch sizes. Retail and e-tail chains will be mostly demand driven, whereas detail chains may remain mostly supply driven (using the virtual auction clock). Obviously, there is a need for differentiated logistics concepts to fulfil the specific requirements of all market segments.

**Chance for innovative collaborative distribution strategies**

The horticulture sector is thus increasingly being confronted with last-minute orders, so ways will have to be found to address this issue and create more efficient and responsive logistics processes. In order to be responsive, a supply chain can make use of multiple delivery modes in which the slower and cheaper modes are employed for shipments under normal planning (push process) to enjoy the economies of scale and contribute to cleaner transport by reducing carbon emissions (lean and green), while the faster and more expensive delivery modes are used for rapid last-minute replenishments driven by market demand (pull process) (Chan and Chan, 2010). Multimodal and synchromodal transport options are receives increased attention in this sector. Rail and sea transport using conditioned containers instead of fast air transport has already proven to be a successful technology (Greenrail, 2010). This holds true especially for import flows, as these containers usually contain large volumes of the same flower or plant type. In export flows, multiple types of flowers or plants have to be distributed together, but they each respond differently to specific conditions. If these new conditioned technologies can be used to transport products over long distances, it could also provide us with opportunities to keep inventories at strategic locations within the network, i.e. at international distribution hubs. This shows that it is relevant to research the optimal temperature when facing different quality decay profiles for different products. Also, given the demand for multiple products, we will need to know which products can be combined in e.g. flexible containers transported by rail, road, water or air.

**Need for collaborative logistics**

The floriculture sector is characterised by intensive cooperation between all the actors in the network. However, from a supply chain perspective many logistics flows from source to sink are still managed independently by chain actors, resulting in less efficient transport flows. This becomes more and more difficult due to increasing end customer demands and a growing political pressure to reduce logistics movements. Flowers and plants are sourced internationally and in future, rather than being routed through the market places in the Netherlands, might be distributed directly to regional customers via a European logistics hub network. These regional customers require value-added products packed and delivered as part of a complete assortment, with specific logistics service constraints. Additional logistics collaboration between different actors in the chain, vertical as well as horizontal, may improve the efficiency of processes such as harvesting and transport, and reduce product waste. Key issue is that in a virtualised network, opportunities arise for different tradeparc
network configurations as well as for route and process configurations of supply chains through the network (e.g. where to assemble and pack).

**To summarize**
We conclude that the developments and industry needs as discussed in the previous section result in the following research challenges:

- Increased possibilities for demand driven logistics concepts, linking growers in different international sourcing areas directly to customers, thereby enabling new collaborative supply and logistics management concepts – while considering the continuous need for supply driven concepts (using the virtual auction clock);
- Coordinated logistics control concepts with emphasis on responsiveness and guaranteed product availability and quality to customers, i.e. Quality Controlled Logistics (see Van der Vorst et al., 2011);
- Dynamic configurations of logistics routes in effective tradeparc networks from source to sink (including the use of conditioned containers and multi-modal transport), with redefined locations for specific processing activities;
- Dynamic configurations of information systems, advanced information exchanges and transparency to facilitate virtual trade and advanced coordination and collaboration concepts.

**Towards a logistics information platform**
In recent years a lot of work has been done to improve information standardisation and exchange in the supply chain. Although major steps have been taken, improvements are still needed. For example, many transport orders are communicated very late, resulting in rush activities and reduced efficiency. Furthermore, there is a lack of transport status information, resulting in telephone calls to growers about the whereabouts of their product – something they have no insight in. And although growers invest heavily in production automation, investments in digitisation and management decision support systems are less easily done.

The key driver of virtualisation is the emergence of new and affordable information and communication technologies, in particular the Internet of Things. However, at the same time the dynamic nature of virtual networks imposes stringent demands on these information systems. They should facilitate the dynamic construction of temporary supply chains and the real-time and network-wide transparency of the products and resources that are needed to achieve true value.

In a demand-driven virtualised trade network, physical product flows are separated from information and commercial transaction flows. There is a need for transparent information about partners, products, resources and logistics operations in order to effectively trade and operate. Clear definition of roles in the supply chain as well as more advanced information exchanges and collaboration concepts are needed to match supply and demand. It requires,
for example, the formal description of a specific flower or plant and its dynamic features such as its “quality”.

To be able to support decision making and the execution of tasks in the logistics network, a new ICT infrastructure is needed to provide a knowledge base (“Greenbase”) that can be used to get the proper information system functionality for configured processes and to get the right information in the right place at the right time (the vision for Greenbase shares features with the existing Portbase). The envisaged Greenbase focuses on the continuous logging and communication of the identity, location and state (dynamic properties) of many horticulture products and logistic resources, the transparency of this information in horticultural logistics networks (Logistics Connectivity) and the use of the shared information for intelligent analysis and reporting (Logistics Intelligence). For these functional domains, a Greenbase may include the following capabilities (Figure 3):

1. **A repository of the application services needed for Dynamic Virtual Representation, Logistics Connectivity and Logistics Intelligence in the horticultural logistics networks (business app store);**
2. **The design of reference information architectures, including business process models, product models, semantic data models and ontologies, and information integration standards, e.g. eBusiness messages, web service standards, RFID protocols, coding standards, etc. (unified architecture);**
3. **An internet platform that can easily invoke, integrate and execute the defined application services that can be located all over the world (collaborative space);**
4. **Methods and tools for the configuration of run-time information systems from the repository of application services based on reference information architectures and instantiated on the internet platform (implementation and configuration support tools).**

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**Figure 3 High-level Greenbase information architecture based on an Internet of Things approach**

(Verdouw et al. 2013)
How to get (all) stakeholders involved?

As the DAVINC3I project continues and the proposed information systems are not yet ready to be implemented, we will focus on the HubWays project (in which the same supply chain actors are involved) as a case in point to discuss the process applied to get all the relevant stakeholders in this sector involved.

Based on the potential of virtualisation the HubWays project was initiated in September 2010. The project focuses on enhancing digitisation and collaboration in transport and logistics. HubWays aims to provide the ICT infrastructure for a logistics information platform which will connect the entire sector using a single standard logistical language. Key is to have all domestic transport orders in the sector captured by, and made available via, the platform in electronic form, which will then enable collaboration and other improvements in operations management. The current status is that platform requirements have been defined and an ICT provider to set up and build the information platform has been selected. The next step is to get as many supply chain actors as possible involved in order to materialise the proposed benefits for all the actors in the chain.

A collective initiative like this can only be realised if the individual parties embrace the shared ambition. The different interests, patterns, ways of working, existing partnerships and personal communication all discourage change. Participants in a sector-wide project such as HubWays will therefore have different views on the way to develop a platform. Shippers, carriers and logistics service providers are all working towards collaborative logistics. The potential benefit to the sector as a whole exceeds the sum of the individual benefits. Therefore, organisations and individuals need to feel the urge for change. The collective goal, exceeding any party’s individual interests, will therefore not happen without a mind shift. The challenge of creating a mind shift towards a platform on which competitors can join forces is one of the main activities in this sector-wide development.

Towards early believers involvement

Through a bottom-up approach, the HubWays project got individual stakeholders involved and committed to a shared ambition. In addition to this, a steering group was formed with key representatives from all the stakeholders. This board was chaired by an independent academic to facilitate the process and objectivise discussions. It was by this board that key decisions were jointly taken, often after lengthy discussions, to take the next step in the process.

Based on the value proposition of coordination and cooperation in floriculture transport, twenty-five SMEs joined the project. In both quantitative and qualitative analyses, the supply chain was thoroughly examined on current processes, transport flows and the use of logistics means in the network of market places. A detailed network analysis (using process analysis and interviews) and modelling study was conducted to capture all product flows between the market places in a specific time period. It became clear that
approximately 1,800 transport movements take place daily in this sector and that great improvements in efficiency could be achieved if transport were to be coordinated. By using the network of market places and the locations of individual stakeholders as efficiently as possible, significant improvements might be realised, see Table 2.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Reduction for sector as a whole (including collection at suppliers)</th>
<th>Reduction of transport between market places</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport distance</td>
<td>23% = 22 million km/year</td>
<td>24% = 12 million km/year</td>
</tr>
<tr>
<td>Transport time</td>
<td>13% = 395,000 hours/year</td>
<td>13% = 192,000 hours/year</td>
</tr>
<tr>
<td>CO₂ emissions</td>
<td>19% = 15 million tonnes CO₂/year</td>
<td>20% = 8 million tonnes CO₂/year</td>
</tr>
<tr>
<td>Transport costs</td>
<td>14% = € 26 million/year</td>
<td>14% = € 13 million/year</td>
</tr>
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</table>

Table 2. Estimated improvement potential of HubWays (Van Veen and Van der Vorst, 2011)

With this modeling exercise the benefits for individual stakeholders and for the sector as a whole could be identified. Key actors in the supply chain, such as the larger LSPs, growers and traders responsible for most transport movements, were involved in creating the platform. They participated in workshops and a series of follow-up interviews to review and evaluate the constant flow of new material together.

To get more insight in the views and attitudes of non-active stakeholders regarding the HubWays ambitions and strategy, we addressed all 10,000 floriculture stakeholders with a web-based survey. The response rate was about 19 percent. Although it became clear that actors had different reasons to support or reject the information platform, the sector as a whole proved to be positively inclined towards the further development of the platform.

In the process of building the functional IT platform infrastructure, qualitative and quantitative models, cases studies, process flows and analyses were used to list the requirements for success. For each logistics scenario, a beta group of stakeholders evaluated and edited the requirements and functional specifications of the platform’s User Interface. This resulted in a mockup of both web-based and mobile applications. These mockups were used in demonstrations for the steering board, individual stakeholders and conferences to show the impact on the platform, and the ability to use it, in the day-to-day processes of the sector. As a result, the HubWays entity was established to implement the platform.

Towards a sector broad involvement
The next step is to involve all the supply chain actors, not just the early believers. In our approach to involve these stakeholders (the moderates and non-believers) we employ five steps to achieve a mind shift. Each of these steps will now be discussed in more detail.
Step 1. Defining the content through stakeholder groups
Frequent interaction with a representative group of stakeholders is the cornerstone of the strategy for defining the content of the development in a bottom-up approach. This smoothens the implementation and supports the required mind shift.

Step 2. Launching networks of believers & pilots
The strategy for implementing the platform should focus on ‘launching networks.’ Logistics and commercial interactions in the floriculture sector are largely based on trust, which facilitates collaboration and cooperation.

Step 3. Start pilots within the organisations in these launching networks
The launching networks are the showcases; they will increase the sense of pride these front runners have. The pilot supply chains (networks) should involve partners from the mix of stakeholders, prolonging the feeling of a shared and solid content definition.

Step 4. Create a snowball effect using sector ambassadors focused on the process of going from understanding to persuading to eventually using
In essence, everyone has to appreciate that the objective of the projects exceeds their individual competitive advantages. A three-step program can be used to promote a mind shift (Adriaanse and Van Dijk, 2013): (1) Understanding: what is the development about, what can I use it for, what are the advantages, what is the bigger cause? (2) Persuading: not just understand the goal, but also be convinced of the improvement and added value it will bring, (3) Using: stimulate sector-wide use by subscribing to the platform or system.

In any collaboration, the company investing is not necessarily the one directly experiencing the benefits. The grower is at the beginning of the supply chain and often has to initiate the product flows. Traders and Logistics Service Providers often benefit from these actions. As companies from across the entire supply chain need to believe in the bigger cause, traders and LSPs need to become the ambassadors of the development. Traders and LSPs need to understand the platform to be persuaded to use the platform, after which they can persuade their own clients (growers in the first place) through workshops. Traders and LSPs will therefore be given the tools and methods to become ambassadors.

Step 5. Valorisation inside and outside the sector through demonstrators
Valorisation of the platform in the sector will also be done by using demonstrators. Examples are software prototypes and a supply chain game. Both illustrate, in a pragmatic and practical manner, the potential of the platform, what the bigger cause is, and what kind of benefits supply chain partners can experience in the new way of working. The demonstrators could easily be used for valorisation in other sectors or by universities and institutions. The demonstrator can be a tool to use in education programs,
cases and training schemes to help understand the complexity of change and mind shift of an entire sector.

**Conclusion**

This chapter presented new developments and research challenges in the floriculture sector. It is clear that due to these developments, innovations need to take place in order to maintain our current international leading position. Most of these innovations require joint action, which is not easy in a sector characterised by a high proportion of SMEs and a high level of differentiation. We have given insight in the development of a national logistics information platform, and discussed our approach to get the relevant stakeholders involved. Although many steps have already been taken and a successful definition of the platform has been achieved, it is clear that there is still a long road ahead to get everyone on board and to fully realise the calculated potential for improvement.

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Summary

Today, most flowers physically pass through the auction houses on their fixed routes from national and international growers to customers here and abroad. Their physical presence is necessary to allow for physical inspection, quality control and break bulk activities. Several developments, such as increased internationalisation and virtualisation, are stimulating the chain to develop an efficient hub-based distribution network in which cut flowers, plants and other products are delivered to detail, retail and e-tail (web shop) customers using different logistics concepts.

The purpose of the DAVINC3I project is to strengthen the internationally leading competitive position of the Dutch horticulture sector in a global, virtualised trade network by researching (1) the opportunities for new logistics coordination, consolidation and collaboration concepts in extended international tradeparc networks, and (2) the possibilities for making chain information available directly and in real time to support the decision-making processes of all the partners in the horticultural network.

The HubWays project focuses on enhancing digitisation and collaboration in transport and logistics. HubWays aims to provide the ICT infrastructure for a logistics information platform which will connect the entire sector using a single standard logistical language. Key is to have all domestic transport orders in the sector captured by, and made available via, the platform in electronic form, which will then enable collaboration and other improvements in operations management.

This chapter presents the background and setup of the projects. We characterise the sector and discuss the main sector developments regarding supply and demand. We identify industry needs and present the main logistics research challenges in this sector with specific emphasis on advanced information management. Finally, we use a case example to discuss change management issues on how to get relevant actors in the floriculture network involved in a new logistics information platform.
Working smarter and better
Bundling in the supply chain – pitfalls and failure factors

Coen Faber and Bram van Schijndel, Pure Birds

Today's many challenges demand that supply chains and logistics be made smarter and optimised. The trick is to get businesses and individuals within the chain to collaborate more closely. The challenges include creating fair and sustainable food chains with fewer losses, delivering better quality products to consumers even faster; improving the living environment and cleaning up city centres by reducing road transport traffic while at the same time getting products to shops, restaurants and kiosks. And there are plenty more challenges to choose from. It is also about the millions and millions of euros that could be saved or made by setting up smarter and better supply chains and logistics, in particular by promoting collaboration.

But then, similar challenges and opportunities for businesses to increase their profit have also existed in decades past. Then too, the need to collaborate kept being emphasised, and still the chains so often fail to collaborate, or if they do, things still end in failure.

How come “fail to collaborate”?
The concepts of ideal supply chains and logistics, what they look like and how they function in an ideal economy and society, have frequently been explored in theoretical publications and at many conferences, and optimised and integrated supply chain structures have been described for various specific supply chains, with calculations showing considerably improved efficiency for all the parties involved. Unfortunately the object of these appealing concepts and calculations often fails to materialise, and day-to-day practice reveals that the various supply chains and the logistics and organisation of many industries are still a long way removed from their targets.

Entrepreneurs and managers find insufficient stimulus and support in these theoretical and quantitative analyses to start taking the necessary steps towards improving their own organisation to demonstrate the beneficial effects, let alone to engage others in the chain to make a concerted move towards the desired ideal situation.

How come “end in failure”? The failure to achieve the desired concrete optimisation of supply chains and logistics results in many unnecessary negative effects on the economy and our society as a whole. In today's world, and certainly in a future economy and society, these are no longer realistic or tolerated, and must therefore be avoided. These negative effects include the waste of materials and products within the chain (losses), the waste of fuel and energy on empty trips, the inefficient use of logistics capacity (space in distribution centres, trucks, ships etc.) and of infrastructure, and the waste of human resources doing
unnecessary work without having the time to add value. And all this in spite of the capacity problems and quality level challenges in logistics that loom ahead.

Most of all, the positive effects on our economy and society are too often left untapped, leaving too many new business cases unrealised in too many chains. These positive effects include new business cases that would bring better and faster service for consumers in today’s world of e-commerce and social media, controlled by big data and with highly responsive chains, development of product chains into circular and closed-loop supply chains, and the application of bio-based solutions. These offer opportunities to save many millions in costs, and above all, new opportunities to cash in on. However, over and over again most of the opportunities and prognoses are left unused.

Fortunately there are many in the supply chains and in logistics who do take up the challenge and who do have the will to collaborate in order to achieve substantial improvements. Many positive examples and initiatives can be found in various chains.

**Pitfalls**

So what are the pitfalls we tend to create on the path towards better and new collaborations? By way of illustration we shall give a few concise examples of pitfalls we have observed, and still observe, in day-to-day practice. They create a wide gap between the desired optimised supply chain and logistics chain, with profitable businesses on the one hand, and the all too common daily experiences in which initiatives and improvements fall by the roadside or aren’t even picked up in the first place. Businesses and individuals simply fail to join efforts to create the desired improvements.

Don’t talk about; talk with
From good intentions to good results
Red tape stifles trust and action

Don’t talk about; talk with
Why does ‘talking about’ never result in collaboration?

Talking about the other party never leads to the right action. Collaboration hinges on connecting at the right level and with the right person. Nonetheless, in 90 percent of cases people tend to talk about the person or organisation that ought to change the situation.

In sessions, publications and in practical situation that seek to optimise supply chains, a recurring practice is to talk about the organisations involved and the people in the supply chains. This creates a preconceived image of each party and its role within the supply chain and the logistics process. Those actually responsible are often left out of the discussion. In most cases these sessions are too remote from the actual operations, so nobody talks with the persons actually involved in running the day-to-day business in the various links of
the chain, let alone that the responsible persons on the spot get involved in a session to jointly define common objectives and opportunities for improvement that could result in a better supply chain.

All too often such sessions fail to produce any understanding or mutual exchange between the various links in the chain, which have become all too accustomed to meeting each other only occasionally, and then from a negotiating position. This kind of culture and preconception on the part of the persons in the various chain links makes it all too easy to talk about each other rather than with each other, as would be necessary to reach the insight that the various parties have much more in common than they believe and that they share a much greater willingness to achieve a desired solution that might benefit everybody.

Having these preconceptions and acting from a negotiating position is driven by thought processes that work in terms of power politics. Somebody will always assume the role of the largest party laying down the rules within the chain or during negotiations, creating an atmosphere of distrust. Such destructive processes hinder the development of the common insights that are the basis of successful collaboration.

There is another reason why thinking in terms of power politics doesn’t work. You soon find yourself back at your own level and looking out from your own perspective as ‘one of the many’. The fact that a major Dutch retailer is considered to be a powerful party by the chain parties results in others feeling small. Nonetheless, the same retailer is only one of many retailers within Europe (not to mention the world).

The use of power politics is most apparent in purchase and sales situations. A culture has come to exist that continuously dictates the need to the chain to achieve efficiency targets set by purchase and sales departments. These targets are often at odds with the development of the supply chain and the continuity of operational activities that are needed to achieve them. In practice this means that potentially successful joint optimisation initiatives fail to reach maturity, that initiatives once launched and gaining momentum are suddenly reversed, that the chain links continue to grow further apart, and that everyone sticks to their own way of doing things and tries to achieve some measure of optimisation within their own organisation.

From good intentions to good results
How can the gap between good intentions and good results be bridged?

The optimisations and profits gained by collaborating in supply chains and logistics are constantly being advertised by businesses and industry organisations. The result is that various initiatives in chains develop into promising plans. These plans often outline the good intentions, sketching an image of the ideal chain and enumerating the profits to be had by the participants.
However, these plans often lack a description of the steps that need to be taken by the parties involved in order to achieve concrete objectives and results, steps that help to explain the actual commitment required from each individual and business taking part.

In many cases, much effort goes into uniting a group of parties, often at the instigation of an industry or research organisation, to launch a project in order to explore collaboration and optimisation within the chain. This then results in analyses of opportunities and optimistic good intentions to achieve improvements, with everybody in agreement. Unfortunately, this kind of project often lacks the step in which clear objectives are set for each participating business and agreements are made to achieve a clearly defined result. Each of the parties then continues to contribute its commitment and input without anyone achieving any clear results, and in most cases there is a third party actively trying to achieve some sort of progress.

These well-intentioned initiatives to achieve sustainable and fair chains and supply chains often involve individuals and organisations that simply don’t have the right incentive and motivation to achieve real results. Based on quite different reasons and arguments, often with historic backgrounds, initiatives get launched for these individuals and organisations. To realise concrete changes with individuals and organisations that really want to collaborate, it would be better to look for individuals and organisations that dare to lead the pack in that respect and show real entrepreneurship to jointly take the steps needed to achieve real improvements in the long term.

**Red tape stifles trust and action**

Why do leading organisation methods fail to stimulate collaboration?

Organisations and chains are being organised on an increasingly formal and bureaucratic basis. These may well improve efficiency, but they are a major obstacle to collaboration. Procedures and structures often are so deeply embedded in organisations and functions that it becomes difficult to introduce change within one’s own organisation, let alone in another one. The intended efficiency benefits often fail to materialise, often costing more than hoped for, since to achieve changes and improvements within such formal and procedural organisations, major investments need to be made in terms of man hours, system modifications, etc.

To actually create a successful collaboration, each participating business needs to transcend its own shadow. Letting go of the well-trodden paths and familiar structures is very difficult, and many times an organisation or individual tends to fall back to their own procedures and agreements.

Chains and organisations are organised along strong lines of control and audit, which results in actions based on a formally defined structure with functions and matching formal procedures for communicating within organisations and
between links in the chain. These are often supported by ICT systems such as ERP to make sure that agreements are met. This development follows from the desire to achieve the intended efficiency, to control risks, and to create a smaller and more effective organisation. This leads to increasingly remote and impersonal organisation methods that fail to promote the insights and shared analyses for improvements to the organisation and the chain. Also, the responsible persons and companies are not given sufficient leeway and trust to achieve improvements together with partners in other links of chain.

Collaboration initiatives often use ICT as a leading principle for the solution, because ICT offers a remote means of defining efficiency benefits and procedures. ICT also fits in most easily with the procedural methods used by the organisations. However, in these initiatives the incremental improvements and new control principles that need to be adopted by organisations and individuals are not made on the basis of ICT.

And finally, the leading principles within organisations and chains have become those of purchase and sales. This has boiled down to tendering procedures and formal or remote negotiating behaviour based on targets, lacking any will to reach mutual understanding or common ground. The persons within the operation who might bring about the collaboration are increasingly often left out of the procedures to do with tendering and targets, so the real opportunities and feasibilities are not, or insufficiently, recognised, nor are the possible actions for improvement.

**A step in the right direction: ‘Duplo’ and ‘Retail Collaboration’**

We have listed a few pitfalls that can cause organisations to fail to achieve a good and successful collaboration. The time has now come to show how it can be done. We will demonstrate two examples of chain collaboration with shippers, a logistics service provider and retailers, called “Duplo” and “Retail Collaboration”. We do not wish to pretend that these examples are the only way to achieve results, since this process also has its moments that can suddenly cause the collaboration to take a very different direction, or even cease to exist. The idea is to create a fundamentally different mind set about how collaboration is launched, implemented and made to mature.

**Background**

These two examples were initiated by Nabuurs, the logistics service provider, with producers HJ Heinz, SCA, Hero, FrieslandCampina and Refresco in order to jointly make the logistics chain more sustainable. Together they started the so-called ‘GROEI-netwerk’ including wholesale, retail, out-of-home, and industrial partners for creating a more sustainable food supply chain.

The first example called ‘DUPLO’ is a collaboration of Nabuurs, HJ Heinz, FrieslandCampina, SCA Hygiene Products, Hero Benelux and Refresco with Jumbo supermarkets in creating a more efficient and sustainable logistic chain.
And the second example ‘Retail Collaboration’ was initiated by HJ Heinz, SCA, Hero and Nabuurs between wholesaler Sligro and supermarket chains EMTÉ and PLUS to create a more responsive, efficient and sustainable supply chain with the first step synchronising order and delivery dates.

We shortly summarize the first results of the ‘DUPLO’ case because this has been operationalized and scaled up. The ‘Retail Collaboration’ case is still under development and in progress.

The ‘Duplo’ case collaboration resulted in an important first step and project, consolidated ordering. This is a process in which the transport flows of the various shippers involved are bundled. Jumbo can now order a full truck every day, and it can carry over 50 percent more products thanks to stackable pallets.

The new way of operating resulted from the first DUPLO project (named after the preschool version of Lego bricks), under the supervision of Pure Birds. Since Jumbo has started its bundled ordering process, each week Nabuurs can deliver five rather than three combined loads from the participating shippers to Jumbo's Woerden distribution centre. In addition, 48-hour delivery has been speeded up to 24-hour delivery. And all the while, thanks to the considerably increased loading efficiency due to combined stacking, the number of kilometres travelled has decreased. The results are lower stock levels for Jumbo, increased responsiveness for the participating producers, and considerably reduced CO₂ emissions.

The ‘Retail Collaboration’ case the process of collaboration resulted in defining three themes with projects together for the first year; bundling of good flows, maximizing the shelf availability, and reducing the number of empty kilometres. And the first step and project is started of synchronising order and delivery dates by Sligro, EMTÉ and PLUS.

Process
Pure Birds supervised both cases, from initiative right up to consolidation. In order to achieve the right implementation of breakthroughs in the chain, Pure Birds used its IMPACT method, the elements of which are described below.

I(nitiate)
Collaboration starts with the person or organisation that brings other parties together. It’s all about connecting the individuals and businesses who really want to go ahead. In other words, who takes the initiative?

Nabuurs took the initiative to connect its customers at the strategic level with retailers, JUMBO, Sligro, EMTE supermarkets and PLUS supermarkets, which resulted in the Duplo case and the Retail Collaboration case.

M(ission)
Sharing vision, objectives and processes has resulted in a joint ambition to
make the chain more sustainable. Both cases started with a strategy session. By ensuring that the individuals, i.e. the responsible managers of the various businesses, shared one another’s ambitions and objectives, the parties were able to define a common ambition and objective. By doggedly pursuing this ambition, the parties managed to avoid being bogged down in a discussion about prices or operational obstacles. The projects were defined from a WIN-WIN-WIN perspective, with the first Duplo project being selected as the real showcase.

\textbf{P(lan)}

Ambition needs to be converted into concrete action. At the end of the first workshops an action plan was drafted to make the Duplo and Retail Collaboration cases a success.

An action plan needs to be as concrete as possible for all those involved. What is the objective? What are the prerequisites? What are the KPIs and how are they measured? What are the main activities? What is the output? What is in scope and what out of scope? What are the main success factors? Who are the sponsors, project leader and team members?

\textbf{A(ction)}

However concrete the plan may be, when the moment comes to actually implement it, operational obstacles often crop up. By designating the first Duplo project as a showcase, it was also agreed to identify and resolve any bottlenecks. Below is a list of obstacles of this first Duplo project and how they were overcome.

From 48-hour to 24-hour: difficult to schedule for Nabuurs, in particular because the stacking process was manual rather than standard.

Solution: by involving the entire workforce in the objectives and process of the showcase right from the start, everybody was highly motivated to make the project a success.

Pallet stacking: not always desirable under the current contracts and procedures.

Solution: the showcase was also a test case to see which products could be stacked and which couldn’t. It is a tribute to the process that no form of damage whatsoever was found in ten weeks of showcase measurements.

Synching order details and number of pallets: this can throw up many many issues, such as an impact on the service level and possible stock level amplification effects.

Solution: service level issues were resolved by adapting the system. The amplification effect was prevented by closely monitoring stock levels. These showed a reduction in excess of 40 percent, which proved that there was no negative effect on stock levels.
(Consolidate & Communicate)
A showcase isn’t a showcase unless it is truly consolidated within the organisation. In collaborations it is also important to communicate to the outside world as a single group. Once the Duplo project had been evaluated, the results were recorded and jointly made public in the form of a video and a press release. The project has now been consolidated in the operational process, and the plans scaling up the operations for other Jumbo warehouses have already been implemented.

(Togetherness)
The ultimate form of collaboration is to succeed in a major achievement as a group based on trust, credit and ambition. The network collaboration with Jumbo continues intensively and is set to make new breakthroughs.

The growing trust within the collaboration of the GROEI-network resulted in the started retail collaboration between Sligro, EMTÉ and PLUS. This opens up for the possibility of more parties to be involved and wanting to join forces with the same ambition, credit and trust.

Together we work towards sustainable growth.

Results Duplo
Both hard and soft results can be listed for the Duplo project. To start with, here are the hard figures showing the results for the period spanning 16 September 2013 to 16 November 2013:
• 40 percent stock level reduction at the Jumbo Woerden DC
• 40 percent fewer goods receipts at the Jumbo Woerden DC
• 30 percent higher loading levels.
• 35 percent fewer trip kilometres.
• 35 percent less CO₂ emission

The next step in the ‘Duplo’ case has already been taken: the trucks are now being loaded using a single VMI (Vendor Management Inventory). In addition, the project has been scaled up to include the Jumbo warehouse at Beilen.

Perhaps even more important are the ‘soft’ results:

Karel de Jong, supply chain director, Jumbo Supermarkets
“This way of working has been a game changer for us.”

“The unmistakable benefit is that we have started talking again to each other to improve the chain; I think that might well be where the major profit lies”.

Tjebbe Nabuurs, operations director, Nabuurs
“As a logistics service provider we are continuously looking for ways to add value for our customers and at the same time contribute towards more sustainable logistics.”
“By starting from a shared ambition with our customers and interacting with Jumbo at the right level, we managed to make this enterprise a success.”

Tom Tillemans, head of logistics excellence, H.J. Heinz
“This is all about common interests: better customer service, improved sustainability, efficiency. This requires a long-term strategy rather than short-term thinking.”

“We have already taken the next step, that of loading the trucks with a single VMI, Vendor Management Inventory.”

Edward Brons, supply chain manager, Hero
“The most important result is that we are now talking with Jumbo to achieve structural improvements in the logistics chain.”

Harry Bloemen, supply chain manager, Refresco
“The challenge is to create a smart planning that will help to reduce the number of empty trips so at the end of the day we can all complete the deliveries to Jumbo at a lower cost and with reduced CO₂ emissions.”

Cindy Hendriks, logistics account manager, FrieslandCampina
“This has proved to be of major benefit to us and the other players”.

Gretta Schoonderbeek, customer logistics manager, SCA Hygiene Products
“When you embark on a project like this, the thing not to do is to ask, what’s in it for me? The central goal must be paramount for everybody involved. In our case, it is to improve service to the customer, reduce CO₂ emissions, and deliver products more efficiently.”

Results Retail Collaboration
It is to early for this collaboration to share the first results, but the intention and drive to make this a success is one to mention.

Kees de Rooij, director logistics operation, Sligro Food Group
“We are convinced that it is necessary to intensify collaboration in the chain to better serve the consumer. We don’t expect significant cost-reductions on the short term, because we are starting in uncultivated area. First we have to explore the paths for development, and with a collaboration with the partners in the chain this will not success if the question about costs will be on the table from the beginning.”

Rowell Versleijen, director logistics, PLUS
“Big chances start to arise when parties in the chain will collaborate. That we as two retailers are mutually cooperating, can be seen as a breakthrough. This retail collaboration has been discussed for over ten years, but it did not really start.”
Ard Nabuurs, commercial director, Nabuurs

"More and more FMCG-producers are developing a sustainable and cost-effective strategy in logistics, creating collaboration among each other. But the real impact will arise when the retailer joins this process. Totally unique is the joint collaboration of two retailers in this process."

The next step
The GROEI-network is now also looking for opportunities to deepen the cases with retailers, to spread into new initiatives and to explore options with other parties in the chain. The process is always about starting small, and using ambition, trust and credit to take the next step together. After that it’s time to offer other retailers, logistics service providers and producers an opportunity to join the initiative, or perhaps the other parties will themselves take up the challenge and start up a project in their own industry and chain.

What makes the Duplo & the Retail Collaboration cases unique?
The unique thing about Duplo is the way it started with a joint ambition that was doggedly pursued as the projects were implemented. The ambition was that of a profitable and efficient, sustainable chain, with an equal opportunities approach for all the businesses involved. The result of this ambition is proof that real results can be achieved to create a more sustainable chain, with less use of energy, fewer empty trip kilometres and better use of resources, both human and otherwise.

This may sound simple, but in actual practice it can be a real challenge. Lego’s preschool Duplo bricks work by starting with one little step at a time. Likewise, the Duplo project helped each organisation to start with a simple step, i.e. consolidated ordering, rather than immediately go for the big prize and bring on a high-tech ICT solution (compare Lego Technic).

In the retail collaboration of Sligro, EMTE and PLUS the biggest challenge was to manage all involved stakeholders internally and externally to start the collaboration among retailers. By having commitment of all parties involved on a directors’ level and start the relatively simple first project “synchronising the order and delivery date”, a first step is made for these companies and a large step in challenging the retail market to really start collaborating.

Final remarks – Call to Action
Today more than ever both the need and the opportunities for making the good intentions of smart, profitable and sustainable supply chains and logistics meet. The objective is to create better inner-city living environments as well as a sustainable economy and society. The available knowledge and human resources in logistics and supply chain can finally start to contribute to solving the challenges that exist in so many chains. Examples are setting up sustainable food chains, smarter and valuable circular production chains for the construction and contracting industries, and also in such chains as carpeting and packaging.
The challenge for businesses and individuals within the supply chains and logistics is to gradually realise results that help to bring the desired situation to life. This situation can only be achieved by entrepreneurs and individuals who are committed to collaboration.

We think we have given some examples of major pitfalls as well as an example of collaboration development that achieved concrete results by taking steps that ultimately result in optimised, sustainable and more profitable chains.

We have not attempted to be exhaustive, and no doubt there are many more obstacles as well as good examples to be found in other chains. Our primary aim is to promote discussion within the chains and the logistics industry about the real issues at stake and about the obstacles that are preventing a change for the better. Above all, we want to stimulate the motivation of both businesses and individuals to demonstrate how more structural results can be achieved.

We need to start talk with each other! Who’s ready to believe in taking steps among equals to create optimised, efficient supply chains that add sustainable value?
Summary

Today more than ever both the need and the opportunities for making the good intentions of smart, profitable and sustainable supply chains and logistics meet. The available knowledge and human resources in logistics and supply chain can contribute to solving the challenges that exist in so many chains. Examples are setting up sustainable food chains, smarter and valuable circular production chains for the construction and contracting industries, and also in such chains as carpeting and packaging.

There are however numerous pitfalls on the path towards better and new collaborations. They create a wide gap between the desired optimised supply chain and logistics chain, with profitable businesses on the one hand, and the all too common daily experiences in which initiatives and improvements fall by the roadside or aren’t even picked up in the first place. Businesses and individuals simply fail to join efforts to create the desired improvements.

A successful example of chain collaboration with shippers, a logistics service provider and a retailer, is a project called “Duplo”. The network included wholesale, retail, out-of-home, and industrial partners. The first step was consolidated ordering. As a result, the frequency and speed of the deliveries was increased as was the loading efficiency of the trucks involved, with the numbers of kilometres travelled decreasing.

Another example is the retail collaboration of Sligro, EMTE and PLUS. By having commitment of all parties involved on directors level and start a relatively simple first project “synchronising the order and delivery date”, the first step is made for these companies and a large step in challenging the market to really start collaborating.

The ultimate form of collaboration is reached when you succeed in a major achievement as a group based on trust, credit and ambition. The GROEI-network collaboration with retailer Jumbo and with wholesaler Sligro and retailers EMTE and PLUS continues intensively and is set to make new breakthroughs.

Now is the time for other parties to join and together work towards sustainable growth.
Planning

Step-by-step collaboration
The collaboration process: key elements, pitfalls and supporting arguments1

Collaboration is the current buzzword in the world of logistics. Various models are doing the rounds, and everybody has their own opinion on the subject. As a result it has become difficult to obtain a general view of all the available options for collaboration. Other issues concern the possible pitfalls and complications that may lie along the way.

For example, which steps should a business take in order to achieve a fruitful level of collaboration? Although the target may be clear, i.e. a form of collaboration that benefits all those involved, identifying the first step to take may be a problem. Does collaboration lend itself to an informal agreement, or does it take all sorts of legally binding contracts? What is the best governance structure, and what is the best time to start looking into it? How will it affect your service level and costs?

This article takes a step-by-step approach to look into the various aspects of collaboration, with the aim of outlining the structure of the process as a whole. A proper general view of all these steps should enable the participants in a collaboration project to establish their rate of progress, to identify possible snags, and to define issues that need to be addressed before continuing.

The article is based on the assumption that a collaboration operation should always commence with the shipper. Third parties such as port authorities and trade organisations may initiate the process, but they can never fully realise the collaboration itself. If the shipper refuses to cooperate, the project is doomed. The strength to achieve collaboration must be found in the true intentions of the shipper.

An impression of Tata Steel

Tata Steel is one of the world’s largest producers of steel. The Tata Group numbers seven separate industrial divisions, employing some 425,000 people worldwide. The annual steel production of the company, whose main offices are in Bombay, India, totals 27 million tonnes.

In Europe, Tata Steel ranks second on the list of largest steel producers. The IJmuiden plant, which was acquired in 2007, is Europe’s largest. Other subsidiaries can be found in the United Kingdom, Germany, France and Belgium. Each year, the European factories produce close to 18 million tonnes of high-quality steel products. Products and services are supplied to 35 countries, and the company employs 33,500 people in Europe.

1 This article was written in close collaboration with Edwin Wenink, Supply Chain Development Manager at FloraHolland.
Steel is supplied to a wide variety of markets ranging from heavy, construction and automotive industries to packaging, infrastructure, energy and consumer goods. Tata ships its products as rolls and plates, i.e. break bulk cargo. Occasionally, for special destinations, the steel is loaded in a container. The average weight of a roll of steel is 16 tonnes. The favourable location of the IJmuiden plant, with direct access to water, road and railway links, allows practically any transport mode to be used, affording great flexibility in the network as well as opportunities for the effective use of synchromodal transport.

The currently used transport modalities are road, rail, inland waterways, deep sea, short sea, and containers. The choice of modality depends on the intended purpose. Our aim is to minimise transport by road, but this is not always possible, as in the case of customers without any water or rail links. Other factors that affect the choice of modality include cost, environmental impact and congestion.

Such considerations play a role when deciding on the right kind of transport to the Ruhr Area, for example, which could take the form of train, truck or barge. Much of this kind of transport takes place by inland waterways because for these routes this is the modality offering the lowest cost. Barges specially adapted to carry rolls of steel guarantee fast delivery and the highest possible level of safety during shipping.

The aim of Tata Steel’s supply chain is to meet the customer’s expectations and where possible exceed them, thus setting a benchmark for professional steel logistics. The methods to achieve this aim include the implementation of clear standards, robust review processes and the continuous improvement of safety, service, operations and cost management.

A major ingredient of the concept is the Control Tower, an IT platform that monitors each modality in real time. At any given moment, we can review the processes, the times at which they are carried out, and their cost. The constant monitoring of the goods flows is essential to help identify deviations from our planning, including costs. This renders the network transparent and readily optimised.

Information flows are essential if collaboration with any third party is to be achieved. There is no way to success without proper insight into the flows and costs. As part of the collaboration, logistics information can be shared with other parties in order to establish a common network.

We like to instil a sense of collaboration into our logistics service providers, and we demand from them that they give feedback on the efficiency of our logistics as well as suggestions for improvement, e.g. by indicating the available options for return loads. A next step will include collaboration with other shippers. To prepare for this phase, we provide an overview of the various steps involved in supply chain collaboration.
Opportunities are plentiful
Supply chain collaboration can provide benefits to all the parties involved, for example:
• improved service through higher frequency by thickening flows;
• modality switch/new services on existing routes;
• reduced costs due to higher volumes;
• innovation by cooperating (horizontal & vertical) within or across supply chains;
• exchange of people and knowledge;
• corporate citizenship: reducing CO₂ emission by increasing payloads;
• reduced stocks;
• reduced operational risk (finance & operations).

The reasoning behind all this is simple. Transporting goods by train, truck or barge gets cheaper as empty space gets filled. Innovation lets you learn from others. Stocks are reduced, as can be the emission of CO₂, and risks are spread across multiple parties.

This is why opportunities are plentiful. Another example: large numbers of trucks on Europe’s roads are completely or partly empty because they are do not have a full load to deliver or are returning home empty. If we can improve loading levels, we can make more money. This means that collaboration can be useful and worthwhile for everybody. If this increases the transport frequency, the service level can also be improved. Fatter volumes mean leaner costs.

There are challenges, of course. If you want to collaborate with others, you will have to keep an eye on a number of issues, including:
• governance structure;
• gain sharing;
• lack of sense of (financial) urgency;
• distrust;
• cultural fit;
• mental shift;
• priority setting;
• unmotivated partners;
• neglecting sales & customers;
• LSP selection;
• ICT (e.g. connectivity).

These are serious matters that can make or break a collaboration. One of the issues that needs to be settled in advance is the governance structure. You need to agree on who is to control operations, and who is to intervene when anything goes wrong. Of course this also involves legal issues.

Trust and cultural fit are extremely important. The logistics manager needs to change his way of thinking and working, otherwise the collaboration will be doomed from the start. You may have to rethink your priorities, and
communicate the result within the company. In fact it’s all about a mental shift at every level of the organisation. This means that you will need to change your way of looking at the world around you.

It could be that two shippers each cater for a totally different range of products. If you start combining products, you may have to start looking out for new locations, new transport modalities, or new carriers. Or perhaps a new service provider. You will no longer be able to plan everything the way you were used to. Every little change will require mutual consultation. You need to look at the options together.

In het next part, aspects such as these will be discussed in more detail and given their proper place within the total collaboration process.

**The collaboration process**

The challenge is to market your collaboration in the best way you can. You will always need to start by asking yourself the question, where did I come from? What is my starting point? In the supply chain the starting point in most cases is the well-known iron triangle, with resources occupying the centre position. Using these resources, three issues need to be resolved, i.e. improved service level, innovation, and reduction of cost and working capital.

It is very difficult to achieve these all at the same time, as service costs money, and if you want to lower costs this will be at the expense of service. Innovation also costs money. Eventually it will provide a positive contribution to service, but this will take time. At the centre are resources and capital, which is where a balance will need to be struck.

As a supplier, you want to provide the best possible service, keep the working capital as low as feasible, and create a sustainable supply chain that will not cease to exist if any action fails to be carried out. You want a chain with proper safeguards that will still be as useful some distance into the future.

It is perfectly possible to optimise a chain through collaboration, but the project will have to be about combining cargo or creating backloads as in, say, one party transporting goods into Poland, while the other imports goods from Poland. This is a case where trucks or trains could easily be combined.

The collaboration process consists of four steps:

- identification,
- scoping,
- preparation,
- execution.

Each step in turn consists of three phases, for each of which we can identify the key elements, the potential pitfalls and the supporting arguments. This provides us with a simple schematic of the entire process.
Step 1: Identification

The first step in any collaboration process is to identify your prospective partner. You will need to find a partner that fits in with your own company, and you will need to make sure certain special domains match pretty well, Health and Safety for example.

Question number one is whether you will be looking for a single partner or several. Once this has been cleared up, the next question is whether you want an identical partner, which in the case of Tata Steel would be another steel company, or would be willing to accept any type of shipper. If you want the same type of shipper, you could be taking on a competitor. This requires careful consideration, since in doing so you might be providing your competitors with certain production information you would rather keep to yourself. However, this need not always be the case. It is clearly a matter for internal discussion.

If you are looking for a different type of shipper, there will of course have to be some similarities, for example the type of rolling stock used. You might also want to opt for the time-honoured collaboration model in which one party ships out a full load on a train that is then used by the other party to carry their own cargo on the return trip.

Do not be afraid to consider unexpected combinations. We conducted a thought experiment with Flora Holland to see whether the combination of steel and flowers might provide opportunities. This is not as strange as it sounds, because steel is a high-mass product whereas flowers take up a lot of volume with little weight. Unfortunately problems arose due to trip frequencies and choice of modality, since flowers mostly travel by road.
The size of the partners also plays a role. Are you looking for collaboration with a large partner, or a small one? If the cultural fit is lacking, or the company values clash, it is also time to pause for thought. The same goes for personalities; it is hard to collaborate with people you don’t like. There are many examples out there of collaborations failing because certain people just couldn’t get on with each other.

For a steel company like ours there are additional prerequisites such as safety. Anybody who chooses to ignore health and safety rules will not be doing business with us.

There must be a good business case, although this may look very different on the two sides of the collaboration. It may be necessary for one of the partners to change logistics service providers. The transport conditions also affect matters. In the case of steel for example, temperature and humidity affect the load. Then there are business conditions. Your partner needs to be in good health, for if one of you goes bust, this won’t help the collaboration either.

This automatically brings us to the pitfalls you may encounter. The list goes on forever, but it’s no use getting obsessed by it, because there comes a time when both partners need to feel they simply have to go for it. The thing to keep in mind is to maintain momentum. The selection process must not take too long, or the initial enthusiasm will ebb away. Keep matters simple and don’t hook up with partners if their corporate structure is overly complicated.

Make sure that in both companies it is not just the departments directly involved in the supply chain that are happy with the collaboration; your senior management needs to be happy too. The companies will have to commit themselves at the highest level.

Positive examples abound, such as the European CO$^2$ project which stimulates horizontal collaboration in logistics operations. The internet too is full of examples of successful collaborations that might provide inspiration and serve as a model. Such examples can also be used to promote the collaboration within your company itself.
Step 2: Scoping

During the second step, called scoping, the actual pieces of the collaboration get filled in. Both partners prepare an analysis of their goods flows and discuss the results with each other. This will help determine the focus to be used and will identify the matching points of the companies. These could take the form of transport to certain destinations, or preferences for certain transport modalities. Each company has its own KPIs, so these will have to be geared to one another. The partners will also have to agree on the desired service level. And finally, the result will have to be put in the correct legal context, and contracts concluded with the logistics service providers. It is essential to agree in advance about the ways in which the collaboration can be ended if necessary, so providing a clean exit.

One of the major pitfalls which has been mentioned before is of course that of confidentiality. Another may be that goods need to be transported under specific conditions. Then there are such matters as Incoterms, trade agreements between shipper, recipient and carrier. It is essential that the logistics service provider be prepared and able to fully collaborate with the project, or the collaboration will fall at the first hurdle. Again, the examples from the CO3 project can serve as a guide.

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**Figure 2: Scoping, in which the collaboration’s boundaries are established.**

<table>
<thead>
<tr>
<th>Key elements / steps</th>
<th>Potential pitfalls</th>
<th>Support</th>
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<tbody>
<tr>
<td>Flow fit</td>
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<tr>
<td>Agree scope: Similar region(s)</td>
<td>Confidentiality: Product type</td>
<td>CO3 network and database: Argus I</td>
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<td>Product type</td>
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<td>Modality type</td>
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<td>Service level</td>
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<td>Make business case</td>
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<td>Ideal outcome</td>
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<td>Agreed KPI’s</td>
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<tr>
<td>Investment in time and money</td>
<td>Wrong KPI’s: Conflicting focus</td>
<td>Companies own focus and activity: Include top management &amp; commercial</td>
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<tr>
<td>Agreement</td>
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<tr>
<td>Legal aspects</td>
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<tr>
<td>Align with current LSP: Select mutual LSP (4PL)</td>
<td>Insufficient LSP support / knowledge: Involve sales and/or customer</td>
<td>Names of trustees: Governance structure</td>
</tr>
<tr>
<td>Process and RACI agreed: Entry and exit agreements</td>
<td></td>
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</tbody>
</table>

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Step 3: Preparation

Once both parties have agreed to collaborate and have defined the scope of the collaboration in mutual consultation, the moment has come to start the actual preparations. This is where practical issues crop up. How will you go about controlling, sharing and timing activities? Who controls what and when, and who will be watching? Will you be needing a trustee, an independent third party to advise regarding methods and profit shares?

As far as timing is concerned, you could be facing problems with seasonality, peaks in production or transport. You will need to consider whether the best time to start collaborating is during peak time or off-peak time. The wrong choice here can have severe repercussions for the success of the project. Starting during peak times means a better chance of success, whereas volumes will be much smaller during off-peak times. Since collaboration often starts with volume, it is better to step in on a peak. On the other hand you might find yourself in a situation where you want to supplement off-peak volumes with someone else’s cargo.

You will need to agree on the deployment of your resources. If one partner puts six employees on the collaboration while the other puts on only one, there’s no particular reason this shouldn’t work, as long as the arrangements are perfectly clear to all. The question is simply whether the right balance has been struck between the contributions from the parties involved. Also, the KPIs need to be clear. Don’t overlook such obvious pitfalls as holiday dates, which will be different for everyone.

At this juncture, concrete agreements about gain sharing will also need to be made. It may well be the case that the collaboration benefits one party, whereas the other party finds it has to make sacrifices. If the positive result
prevails, you could decide to share it. There needs to be a certain level of equality. On the other hand, at Tata we are very much aware of the fact that we are a very large shipper and that other parties may well profit from that. Good, there’s nothing wrong with that. It’s even better if both parties can profit together. Profit need not always take the form of an actual reduction of logistics costs. Potential benefits may also be found in a reduction of working capital or an improvement in service levels.

Step 4: Execution

During the fourth, implementation, phase, the collaboration gets started up. A stable starting period is crucial. Do not launch your collaboration during a holiday, during a period when production varies, or at a point when for whatever reason you are facing a shortage of carriers. Proper communication is especially important during this phase, not just between the collaboration partners, but also, perhaps even more so, with the logistics service provider. And don’t overlook the other departments within your own organisation, such as sales and marketing. Before the project is launched, prepare a full list of all the stakeholders that need to be informed.

Keeping track of performance figures is essential. Draw up a baseline document and after a certain time see whether the costs have really gone down, whether the service level has really been improved, and what the situation is regarding such issues as possible damage and any environmental impact, e.g. CO₂ emissions. This is also the time for an initial evaluation. Based on the question whether the business case has really been realised, both parties will have to decide whether to continue on the same route, or abandon the collaboration.
Keys to success
There are countless ways in which a collaboration project can fail, however promising it may have looked to begin with. Conflicts may arise regarding operational matters, the starting moment may have been ill-chosen, perhaps one of the partners didn’t stick to the agreement, or the collaboration project has failed to catch the organisation’s imagination. One of the prime causes for failing collaborations is a lack of communication, whether within your own organisation, with the partnering organisation, or with the logistics service provider. Late or inadequate communication can rapidly prove fatal to any collaboration.

Collaboration is something for which all the parties involve need to take their time. This is also why the first steps need to be taken by the shippers themselves, for you shouldn’t embark on such a venture if you cannot see the added value. Even so, nothing ventured, nothing gained. Occasional failure is part of the price. You gain experience in the process, which increases your chances of success next time around.

There is no guarantee of eventual success. Tata Steel has on numerous occasions indicated to the market its willingness to collaborate, but the response so far has been disappointing. In many cases, practical issues prove to be insurmountable. One of our spearhead policies is to reduce the volume of road transport, but the problem is that the prices of trucks are often so low that the price of a full trainload simply cannot compete. Nonetheless, Tata Steel will continue to search, and I am convinced that sooner or later we will find one or more partners to suit us.

An important principle for success is to keep it small and simple. Don’t go overboard with a large and complicated partner. Find yourself a partner prepared to start out in a limited fashion and willing to expand the collaboration gradually. This enables you to gain experience and learn from your mistakes. Having to sit around the table with too many partners unnecessarily complicates matters. Before you know it, you’ll be stuck with problems like incompatible information systems and overly complicated goods flows.

Real collaboration means building up a strategic partnership. It involves sharing networks and establishing a new and more efficient network. In any case, we now have the basis for a model that can serve to argue the underlying concepts of the collaboration.
Summary

This article outlines a basic model for collaboration in the supply chain between shippers. The purpose of the model is to provide support to parties that are looking for ways to implement the process of collaboration and that wish to establish their position during the process and the preparatory stages. It takes a step-by-step approach to finding the right partner, defining the scope of the collaboration in mutual consultation, deciding on the actual implementation of the collaboration, and identifying the key factors to monitor once the collaboration is underway.

In each of these four steps, various phases are distinguished, and the basic prerequisites, potential pitfalls and available successful examples are discussed, enabling partners to keep track of their progress throughout the collaboration process and to establish what needs to be done in order to ensure the continued success of the operation.

The model clearly identifies a number of key factors that can make or break a collaboration. Paramount is the choice of a partner that proves a match regarding size, volume and logistics policy. The cooperation of the logistics service provider is essential. It is also very important to establish good flows of information and communication, both between partners and within companies. Clear agreements established on an unambiguous legal basis are another vital ingredient.

Even if the intentions are good on all sides and everybody involved invests all the time they need in an effort to make the collaboration succeed, success is never a given. Sometimes the timing is simply off, or the market refuses to cooperate. Even then it will have been worthwhile making the effort, because the learning experience will increase the chances of success at the next attempt.
Exchange of empty containers
Cooperation benefits both shippers and LSDs

Promoting environmentally friendly transport is great, but collaboration goes further than that. SABIC, based in Bergen op Zoom, has shifted transport to inland waterways, but on top of that an entirely new concept has been created in collaboration with other shippers and a logistics service provider in which the most important visible result is that a great deal of the empty containers flows have disappeared. The concept of re-use has now been adopted by various worldwide affiliated locations.

In 2013 alone, SABIC managed to move 1.6 million container transport kilometres (the number of containers shipped multiplied by the average distance from Bergen op Zoom to the port terminals and vice versa) off the road and onto inland shipping barges, reducing CO₂ emissions by 1,400 tonnes. The MCT terminal at Bergen op Zoom currently achieves a re-use rate of import containers for export in excess of 75 percent.

Saudi Basic Industries Corporation (SABIC) is one of the largest petrochemical enterprises in the world. The company is a world leader in the field of polyethene, polypropene, advanced thermoplastic synthetics, glycols, methanol and artificial fertilisers.

SABIC consists of the following business groups: Chemicals, Polymers, Performance Chemicals, Fertilisers, Metals, and Innovative Plastics. The company is active in over 40 countries worldwide, employing some 40,000 people. SABIC has world-class production facilities in Saudi Arabia, North and South America, Europe and the Pacific Rim.

SABIC, whose main offices are in Riyadh, was established in 1976 when the Saudi government decided to use the hydrocarbons released as part of the oil production process as the primary raw material for the production of various chemicals, polymers and fertilisers. The Saudi government now owns 70 percent of SABIC stock. The remaining 30 percent are owned by private investors in Saudi Arabia and other countries of the Gulf Cooperation Council. Having started as a state-owned company in the mid-1970s, from producing plastics and other materials from oil production residue gas the company has grown into a chemical company covering a wide range of products.

In 2002 SABIC acquired the polymer division of DSM, with its main office in Sittard and the production location in Geleen. This was the first step towards SABIC’s internationalisation. Five years later the worldwide plastics division of General Electric was taken over, which has its European main office and a major production facility at Bergen op Zoom. The new name for this division is Innovative Plastics.
The Bergen op Zoom plant of SABIC produces Engineering Plastics, mainly polycarbonate. In addition to chemical facilities, the site is also the home of several compounding factories in which SABIC produces custom-made plastics. End products based on polycarbonate include DVDs, water bottles, telephone and PC components, and parts for the automotive industry, such as headlamp units. Polycarbonate is an excellent replacement for glass, and sheets of it are used as roofing material in stadiums, for example. The Olympic stadium in the Chinese capital Beijing is covered with polycarbonate sheeting made in Bergen op Zoom.

**Export flows**

SABIC supplies its end product in the form of plastic granulate and powder. In addition to bulk consignments, packaging options include mainly octabins, big bags and plastic bags. In addition to road and intermodal transport, a considerable percentage of the production is exported by sea to destinations in Europe and all over the world. SABIC uses the services of several deep sea and short sea shipping companies. Bergen op Zoom lies exactly halfway between Antwerp and Rotterdam, and the SABIC plant is located right on the busy Scheldt-Rhine Canal. We use both sea ports, with the choice depending on the services required and the wishes of the customer. Only six years ago all our shipments were still transported to and from the sea ports by road. Although the idea of switching to transport by water had been at the back of our minds for a long time, a practical solution didn’t exist until about 2007, when an inland shipping container terminal was constructed in the Theodorus Dock at Bergen op Zoom.

The seed for the construction of the terminal had been sown on the occasion of the presentation by SABIC of the “Logistics Service provider of the Year” to logistics service provider, Meeus. The discussion at the time focused on the question why nobody was using inland waterways for transport, and with Bergen op Zoom being the ideal location. Together with SABIC and Lamb Weston, a producer of deep-frozen potato products with its premises on the same industrial estate, the Meeus Group then took the initiative to shift cargo to inland waterways. More shippers soon followed.

The construction of the new Markizaat Container Terminal (MCT) by the Meeus Group constituted an expansion of its transport and logistics services. Since its establishment, the terminal, which focuses on the processing of sea containers, has grown explosively and is now gradually approaching its maximum capacity. Plans have already been mentioned for a completely new, larger and state-of-the-art terminal to be built in the Buitenhaven of Bergen op Zoom. The terminal has the great advantage of being located close to the main inland shipping artery between Antwerp and Rotterdam, which forms a direct link between the Scheldt and Rhine rivers. The number of barges leaving for the two ports has already increased to several every day.
High cost
The first thing to notice is that in this case the initiative to start something new was taken by the shippers and the logistics service provider together. Partly due to its origins, the project resulted in relationships between shipper and carrier which differed from the usual pattern. This time, it wasn’t just a case of a shipper looking for an inland shipping service provider or a logistics service provider offering new services.

As it was, things didn’t get rolling of their own accord, and all the parties involved had to cope with a rather steep learning curve. Each of the parties had to face the question of how to go about this new business. Inland shipping is ‘greener’, but the bottom line was that it also had to be – and stay – an economically viable solution. It was clear to all those involved that simply competing with road transport by counting the cost of moving containers to and from the sea ports, i.e. purely based on trip price, would not be the way to go about it. On top of this comes the fact that Meeus had a high cost of investment, which it also needed to recuperate. The same does not apply as much to road transport. The greener concept in itself will not tip the balance either if it turns out to be more expensive in the long run.

The difference had to be found by doing things differently and by developing processes and advantages where road transport suffers from drawbacks. One property of transport by road is that empty trips need to be avoided. If unloading is not immediately followed by loading, this is solved by unhitching the trailer (drop and swap). This results in a relatively large number of containers being left on trailers, in particular when, like SABIC, you’re running a 24/7 operation. This constitutes a large item on the cost side. The terminal has already invested in storage space, which means it can achieve much lower costs in this respect. All you need is a couple of trailers to shuttle the short distance between the locations. That was our first cost-saving item.

CO₂ boost
We then took a closer look at the container flow itself. How could we make our transport more economical as well as greener? The solution was to avoid making empty trips, in particular trips with empty containers. This could be achieved by re-using containers, also know as a match-back operation. The principle is that rather than returning an importer’s empty container to the port after unloading, it immediately gets loaded by the exporter and only then, with a new load, gets returned to port. The advantage was that we were able to save a full container-port round trip, as the exporter didn’t have to supply an empty container, while the importer didn’t have to send back an empty container. This is actually were the real CO₂ boost lies. Barges are already much more efficient where CO₂ emissions are concerned, but now we were also actually reducing the number of kilometres travelled.

It was necessary to generate a sufficiently large import flow, since both Lamb Weston and SABIC are exporters. This problem was solved by Ricoh, a
producer of printers and copiers, among other equipment. Bergen op Zoom is where Ricoh has its European distribution centre, which gets supplied from Asia. The great thing about it was that we were already using the same shipping companies, so a match could quickly be established at the outset to provide a basis for the future. There is a small problem here, since all the parties involved submit tenders periodically. This means that the list of available shipping companies is liable to change, which is only as it should be, given the fluctuations in price, which are still relatively high. In order to ensure that the percentage of re-use remains high, new shippers need to be constantly added to increase the established base.

This could also be done using road transport, although it would be harder to achieve (read higher costs), in particular if a match cannot immediately be found. In a terminal environment there is no need for the flows to match exactly from day to day, and you can use the flexibility in the no-cost free time to make a match. If the container terminal receives ten empty containers that aren’t required yet, they simply get held back until they are. This is much more difficult to plan for trucks, and on top of that trailers cannot be stacked, whereas empty containers can. As an added benefit, the parking space that’s been freed up can now be used again for cars.

Literature has revealed a number of attempts at re-use, but none of them managed to achieve a percentage higher than 25, and most of them didn’t last very long. This was caused mainly by the fact that all the results (read savings) benefitted only one of the parties. So, our next major step was to tackle this problem.

**Round table**

We eventually ended up naming our solution “the round table”, because the parties in the collaboration are all equal in stature. The focus is on collaboration and on the vision that ultimately the long-term result will be of more benefit to everybody than a few euros would be in the short term. This meant that each party had to ensure that all the other parties would also be able to reap the benefits. Everybody had to profit, or the whole thing simply would not work. One issue for example was that although the total transport costs were reduced, MCT had to increase its number of handlings per container, so costs at the terminal were actually rising.

We even consulted a university to see if we could find a model for gain sharing. The problem was that all of them were rather complicated. We then came up some additional options ourselves. Finally, as a “round table” we looked at the available methods together. In the end we opted for the simplest and most transparent method by simply dividing the recorded profit by three, with one third going to the importer, one third to the logistics service provider and one third to the exporter. This did require that the costs involved be calculated jointly and openly. By now we have long since become accustomed to 75 per cent re-use at MCT. When we look at the results from our literature sources, it would appear that we have made the right decision.
As everybody could see how the whole arrangement benefitted us all, additional ideas and improvements were launched that helped us all to not only achieve, but maintain such high percentage. Since MCT as a service provider makes more money on re-used containers than on regular ones, they have started looking for ways to do so more efficiently. Their IT system for example has been adapted to facilitate and simplify re-use. As a shipper, you tend to look at which carriers will become available or necessary at the terminal, and then you look whether you can use any of those. Ultimately, the success of the scheme has resulted in several importers and exporters making use of the terminal.

The trick is to look beyond your own business and your own short-term profit. That is easier said than done, however. The whole scheme revolves around trust and appreciating each other’s contribution, as well as personal commitment. Because we were up front about matters and made it perfectly clear what the cost would be, we had a foundation we could build on. It was the only way to create a true win-win situation, with all the parties involved ending up by gaining more than we thought we would when we started.

Other parties
It is equally important for shipping companies to collaborate. Firstly, they need to adapt their approach to individual price negotiations to recognise the importance of transport to and from Bergen op Zoom, and to commit themselves to it. Secondly, the concept will also benefit themselves, as they will save the loading and unloading costs of their depots, and their containers will have a shorter turnaround time. Thirdly, they should facilitate the exchange of containers without having received them in their depot, which demands additional administrative flexibility from them.

In order to make the collaboration complete, we also entered into talks with the shipping companies. They considered it an interesting concept, but even so it took some effort to convert the idea into actual active collaboration. We managed to convince them that it would be to their advantage to make the concept work. It has to be said though that the volume shipped by Ricoh, Lamb Weston and SABIC enabled us to conduct these talks at the right level. Currently there is some kind of depot agreement with every major shipping company. This usually means that the shipping company from now on receives and issues the containers from MCT in a virtual manner, without the actual containers physically arriving at the company’s own depot. MCT has set up their IT operations so this does not take any extra effort. To support the scheme, the terminal has concluded agreements with the shipping companies about the conditions under which they can receive and issue containers. To make this work, a third party has been found to check the containers, after which a certificate is issued. The cleaning operations take place at the terminal itself.

Another spin-off is that we were able to tackle the problem of gas in containers at a relatively early stage. The customs authorities require a gas-free certificate
before any physical check. We managed to solve this issue relatively simply because the party checking our containers also operates a mobile laboratory for inspecting containers, so we now have the ability to check containers on site. There is also an installation to provide forced ventilation of containers.

In addition, MCT handles the registration and statistics to support decision-making processes for measurements. We managed to make this happen by doing it together. If we hadn’t done so, each of our companies would have had to find a solution individually, all of which would certainly have cost a lot more, in terms of either time or money.

Eventually, collaborations sprang up between the container terminals that had not been envisaged beforehand, but which greatly benefit the parties involved. The terminals realised that together they could cut costs by exchanging containers and container transport. They are located relatively close together, and they frequent the same port. Again a match would appear to be obvious. And again a prerequisite for collaboration is that you need to be open about it and realise that sometimes one plus one does make three.

**Japan and the US**

We are happy to have found in a logistics service provider like Meeus a partner with a vision that transcends their original core business, which was in road transport and storage. The company took the trouble to try out other modalities, in this case inland shipping, and have shown themselves prepared to think about it in terms that go beyond seeing it as just another way of moving stuff. They have dared to transform ideas into reality.

A Japanese subsidiary of SABIC has taken up the idea and found a good neighbour to collaborate with and exchange containers moving to and from the port. The company even received a Japanese government reward for its environmental considerations. At SABIC in America the matchback concept is now being applied in the form of collaboration with other importers, exporters and logistics service providers.
Summary

SABIC is one of the world’s largest petrochemical companies, and a world leader in polycarbonate, a plastic with application fields that include the electronics, automotive and construction industries. The Bergen op Zoom plant ships a major part of its production volume to European and other destinations all over the world in sea containers.

Until a few years ago, SABIC transported practically all of its export volume to the ports by road. The establishment of a nearby container terminal made it possible to consider inland navigation, which in addition to being a greener alternative could also offer cost benefits. In collaboration with the logistics service provider and two other local shippers a concept was created that offered benefits to all parties by facilitating the exchange of empty containers. Where once these would have been returned empty by a shipper, another shipper now fills them before sending them on.

In 2013 alone, SABIC managed to move 1.6 million container transport kilometres (the number of containers shipped multiplied by the average distance from Bergen op Zoom to the port terminals and vice versa) off the road and onto inland shipping barges, reducing CO₂ emissions by 1,400 tonnes. The MCT terminal at Bergen op Zoom currently achieves a re-use rate of import containers for export in excess of 75 percent.

This ground breaking concept required mutual trust and close collaboration, both between shippers and with the logistics service provider. It also required the cooperation of the shipping companies. This article explains how the collaboration was achieved and what its spin-offs are.
CO³

Freight flow bundling
Collaboration concepts for co-modality

Silvia Rossi Tafuri, Cranfield School of Management

The EU-funded CO³ project (Collaboration Concepts for Co-modality – 7FP) aims to develop, professionalise and disseminate information on the business strategy of logistics horizontal collaboration in Europe. The goal of the project is to deliver a concrete contribution to increasing vehicle load factors, reducing empty movements and stimulate co-modality, through collaboration between industry partners, thereby reducing cost and transport externalities such as congestion and greenhouse gas emissions without compromising the service level. The project coordinates studies and expert group exchanges and builds on existing methodologies to develop legal and operational frameworks for collaboration via freight flow bundling in Europe.

The CO³ project aims at supporting co-modality projects that are made possible by the increased economies of scale created by means of horizontal collaboration between companies, being either logistics service providers or shippers. Individually these companies might not have the scale to make the shift from road to rail, inland navigation or short sea shipping, but the idea is that by bundling companies can accumulate enough transport volume to fill a train, ship or barge, thereby reducing cost and decreasing total emissions of the transport industry in Europe.

The main factors driving inefficiency in the road transport industry in Europe are the high percentage of empty running and the low load factors. The first one is mainly due to geographical trade imbalances and the lack of scale at carrier companies described in the previous subsection. The low load factors are mainly due to order fragmentation at shippers following just in time production and working capital reduction policies. In addition, planning capabilities at both shippers and logistics service providers could be improved to better utilizing available transport capacity. By closely cooperating logistics shippers and service providers can reduce their inefficiency, something that is very much called for. In the period of 2001-2010 between 18.0 percent and 20.4 percent of freight kilometres driven in the European Union (27 countries) are conducted by empty vehicles. Another disturbing fact is that the average loading rate of the other reaming, i.e. loaded vehicles is only about 56 percent in terms of weight. Together these two observations result in an overall efficiency score of European road transport of around 45 percent. The total cost burden of road freight transport inefficiency is enormous. It increases from around €120 billion in 2001 to around €160 billion in 2010, having a peak of €170 billion in 2008.

The CO³ methodology

The CO³ project aims to develop, describe and implement the ideal setup of a logistics collaboration project. This should be generic enough to fit most practical cases. It explicitly does not ambition to guide all individual cases
in their development process towards true collaboration. That is impossible because there are just too many possible routes towards this, which depend on the specifics of the companies involved, the pace of development, impact etc. It is however very important to stick to a structured development process, for example including all legal contracts required.

CO³ uses a straightforward, 3-phased methodology to identify, prepare and operate collaborative test cases from scratch with real market actors and logistics flows. Specific ICT tools are being tested and validated in each of the 3 phases.

Phase 1: Identification
In the first phase of the CO³ methodology, the neutral trustee identifies different companies and networks that are open for horizontal collaboration. The structural freight flow data of these companies are collected and analysed. In this phase, the added value of ICT will come from automated freight flow data visualization, “Big Data” analytical capability and matchmaking.

Phase 2: Preparation
In the preparation phase of the CO³ methodology, the neutral trustee will help the candidate partner companies to build profitable business cases and to quantify the benefits of the collaboration scenarios from three perspectives: total logistics cost savings (efficiency), reduction in greenhouse gas emissions (sustainability) and service level improvement (effectiveness). In this phase, the added value of ICT can come from various decision support tools that help to evaluate the logistics synergy potential, apply fair gain sharing mechanisms such as the Shapley value, calculate carbon footprint savings, etc.

Phase 3: Operation
In the operational phase of the CO³ methodology, the neutral trustee coordinates and synchronizes the actions and shipments of the collaborating supply chains in real-time. In this phase, the added value of ICT comes in the shape of a “collaborative control tower” and various social network tools that facilitate the community communication processes.

The role of the Trustee
There is a need for a specialized entity to setup, manage and develop a collaboration. If such a neutral, transparent and trusted party is not present, there is a severe risk that not all parties will efficiently work together in the long run on a fair give and take basis. Typically, there are two separate types of collaboration support activities carried out by a trustee. We categorize these types as ‘offline’ and ‘online’ activities. The main keywords for both the online and the offline functions of a trustee are neutrality, transparency and safeguarded confidentiality of data provided. These can never be compromised
in any of the tasks performed by the trustee. In addition, the trustee will take responsibility for the legal foundations of the collaboration, making sure that for example the necessary contracts are in place, the collaboration satisfies competition law and the shared data remain strictly confidential. Given the importance of a trustee, the final key message of CO³ states that in a well-designed horizontal collaboration project, a neutral trustee must be in place to avoid anti-trust and establish a sustainable collaboration between the parties.

**Legal agreement and Benefit sharing**

The CO³ project has developed a legal framework which exists of three model agreements. One of the assumptions of the CO³ consortium is that a neutral, independent and trusted third party is needed to facilitate the collaboration between the shippers. The model service agreement between the shippers and this trustee however, forms an additional contractual layer between the collaboration agreement between the shippers on the one hand and the carriage contracts between the shippers and the logistic services providers (‘LSP’s’) on the other hand. Important aspects that need to be covered by the collaboration are gain sharing, rules with respect to volume variation, entry and exit clauses and competition law aspects. CO³ adopts the Shapley Value as well-defined, fair and understandable formula to divide the gains (costs reductions) generated through the collaboration among the shippers. In fact, a consortium is only economically viable if enough synergy exists among it. Whether between competitors or non-competitors, a fair gain sharing mechanism is essential. Therefore, fair gain sharing is one of the key messages of CO³.

**Collaborative Business Model**

Those characteristics that can contribute to a successful collaborative business model have been defined as part of the CO³ project. They focus specifically on the cultural, philosophical and operational aspects of companies who currently collaborate horizontally in one form or another, as opposed to companies who have yet to consider, or have rejected, this approach.

From the research there was no clear definitive model of a successful collaboration because all companies behave differently. However, there were certain elements that had to be in place to make a successful outcome more likely. Two characteristics that stood out were transparency and trust. All the literature and the vast majority of companies interviewed stated that trust was paramount. There had to be a belief that all the companies in a partnership would work as a team and that they are together for the benefit of each other in the concept of mutuality and solidarity. Companies in a collaboration needed a similar culture, similar business objectives and a desire to make collaboration work. For many of the companies interviewed Corporate Social Responsibility (CSR) and the environment are key pillars of their mission statement and those that are likely to collaborate will have targets for CO₂ reduction. The increasing competitive environment will force companies to find efficiency improvements and the main drivers are cost reduction, customer demands and the need to maintain or improve service levels.
If these drivers are present in the company then the main driving force behind horizontal collaboration are key people within a company. If these individuals have many years of logistics experience, know their operations extremely well, take an active part in external logistics events, and there is clear support from top management, then the chances of achieving a successful collaboration with a partner are greater. One of the main barriers to collaboration was finding the right partners. Many companies relied on logistics service providers to suggest partners or ad hoc opportunities, and others attended various “speed dating” meetings, with varying levels of success.

**Description of a test case: Nestlé and PepsiCo**

An example of Fast Moving Consumer Goods (FMCG) companies that are often faced with the problem of frequent LTL deliveries to retail distribution centres, are manufacturers of fresh and chilled food products (2-4°C). These goods are transported under temperature control from producer warehouses to retail distribution centres in small quantities to avoid expiration. In this market, there are a number of big companies with several brands of fresh and chilled goods in their portfolios. Due to the specific needs of the retailers and the limited amount of possible combinations within one company’s own portfolio, LTL deliveries are often the only option. This is one of the reasons why logistical costs of fresh and chilled products are a key cost driver with great variability, making these flows a big source of uncertainty in FMCG companies’ cost calculations. On request of a number of its members, BABM (Belgilux Association of Branded products Manufacturers) started to explore possible synergies in five big Belgian networks of fresh & chilled (2-4°C) goods and decided to collaborate with TRI-VIZOR as neutral trustee for the analysis of the synergy possibilities, business case calculation and eventually, the implementation of a structural horizontal collaboration between the different shippers.

In this test case, only two (Nestlé and PepsiCo) out of the five manufacturers who initially planned to join the collaborative network did in reality move forward with the implementation of the collaboration in a daily operational context. The test case still demonstrated that by bringing a number of overlapping manufacturer distribution networks together, double digit cost reductions could be realized. The case also illustrated that among some LSPs there exists still a defensive attitude towards horizontal collaboration. A continuous “mental shift” among both shippers and LSPs will be needed to further enhance the success and adoption of collaborating networks. One of the most important conditions to successfully establish a collaborative community, is the commitment of the logistics management as well as all other members of the community. This commitment is a key building block for creating sustainable collaborating networks. People management is also key for the success of the collaboration. Last but not least, solid, neutral project management is needed to guarantee a fluent community building process.

Previous CO³ test cases have already shown that other key enablers of horizontal collaboration are trust and openness. This was again experienced
during the creation of this collaborative community between PepsiCo and Nestlé. As a facilitator of the horizontal collaboration process, the neutral trustee plays a vital role in building trust between the companies. In this test case, two trustees were involved (BABM and TRI-VIZOR) who had mostly an offline role. STEF plays the role of online trustee as it enables ad hoc load synchronization. In addition, also a legal expert played a role, as not only trust but also anti-trust was a major factor given the fact that a number of competing manufacturers were involved.

At a practical level, it should be clear that a trustee must add tangible value to the collaboration.

Some success factors of the pooling solution were:

- a clear definition of entrance and exit rules from the pooling solution;
- a certain volume commitment (with sufficient margin for uncertainty);
- standardized and easy to implement ICT systems and connections (WMS, TMS);
- an experienced project team and an experienced team leader to guide the project towards a sustainable collaboration;
- willingness of the partners to redefine delivery days, drop sizes and delivery windows;
- implementing a joint continuous improvement process; and
- recurrent involvement of the neutral trustee to check the accuracy of LSP invoicing and gain sharing.

**Conclusions**

The test cases and the overall results from the CO³ demonstrate that neutrally orchestrated horizontal communities for synchronized and balanced unimodal or intermodal transport can work very successfully. They can create a high degree of efficiency, effectiveness and sustainability in the transport market, where a sufficient level of critical mass can be brought together. The communities must be supported by the right methodology, tools and technology to let participants equally share the risk and rewards of collaboration. The CO³ proposed business model represents an evolution from the traditional ‘groupage’ made by the logistics service providers at their own risk.

**The CO³ consortium**

The driving force behind CO³ is a consortium of 18 European partners. The project will run until September 2014 and will work with a large network of European enterprises and knowledge centres. Consortium participants are: Holland International Distribution Council, Cranfield University, Zaragoza Logistics Center, Procter & Gamble, Heriot Watt University, TRI-VIZOR, ArgusI, Kneppelhout & Korthals Lawyers, Technical University Eindhoven, ITENE, D’Appolonia, DINALOG, Mines Paris Tech, Pastu Consult, Giventis, ELUPEG, and Lindholmen Science Park AB.
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Summary

CO³ (Collaboration Concepts for Co-modality – 7FP) is an EU-funded project aiming at supporting co-modality projects that are made possible by the increased economies of scale created by means of horizontal collaboration between companies, being either logistics service providers or shippers. By bundling freight companies can accumulate enough transport volume to fill a train, ship or barge, thereby reducing cost and decreasing total emissions of the transport industry in Europe.

The CO³ project is intended to develop, describe and implement the ideal setup of a logistics collaboration project. This should be generic enough to fit most practical cases. The project uses a straightforward, 3-phased methodology to identify, prepare and operate collaborative test cases from scratch with real market actors and logistics flows. Specific ICT tools are being tested and validated in each of the three phases: Identification, Preparation and Operation.

In a test case, two (Nestlé and PepsiCo) manufacturers moved forward with the implementation of the collaboration in a daily operational context. The test case demonstrated that by bringing a number of overlapping manufacturer distribution networks together, double digit cost reductions could be realized. However, it also illustrated that among some LSPs there exists still a defensive attitude towards horizontal collaboration. A continuous “mental shift” among both shippers and LSPs will be needed to further enhance the success and adoption of collaborating networks.

The overall results from the CO³ demonstrate that neutrally orchestrated horizontal communities for synchronized and balanced uni-modal or intermodal transport can work very successfully. The communities must be supported by the right methodology, tools and technology to let participants equally share the risk and rewards of collaboration.
Innovation

Focus on logistic services
Innovation in the logistics sector: the role of organisation innovation and horizontal collaboration

Introduction – Logistics, an industry behind the times?
In 2011 the Ministry of Economic Affairs launched the Spearhead Industries scheme, naming nine Spearhead Industries, one of which is Logistics. Innovation contracts were drawn up for each of the industries. Since the scheme started, the Spearhead Industries have often been compared with each other regarding their level of innovation. According to various polls and rankings, in this respect logistics is lagging behind the other industries (Lofvers, 2011; Reijn, 2012; Dijkhuizen, 2012; Syntens, 2013). However, many of these comparisons tend to be based mostly on product innovation. Collaboration within the sector is not as explicitly discussed in these documents.

In addition to product innovation, this article also looks at process innovation, organisation innovation, market innovation and transaction innovation. Innovation in logistics mainly concerns organisation innovation. Organisation innovation may be in-house, chain-focused, or supra-chain. At the network (supra-chain) level in particular, challenges are to be found. Horizontal collaboration is a form of network collaboration that will be discussed in more detail in this article after we have given a general impression of innovation in the logistics industry. The article links results from student research at the Amsterdam University of Applied Sciences to results from three research efforts jointly conducted by ABN, TLN and Fenex. The results demonstrate the importance of such human factors as emotion, behaviour and identity where collaboration is concerned. This is illustrated by a case study.

Five forms of innovation
Joseph Schumpeter (1934) distinguished five different forms of innovation for a business: introducing a new product or changing the quality of an existing product; introducing a new production method; entering a new market; adopting new sources of raw materials or semi-finished products; and introducing new forms of organisation in an industry. These forms have since been referred to as product innovation, process innovation, market innovation, materials innovation and organisation innovation. According to Schumpeter, materials innovation occurs when a new source or supply line of raw materials or semi-finished products is adopted. In practice this often involves collaboration with a new supplier. In this article such collaboration is considered to be part of organisation innovation, and so materials innovation will not be included in this article. Another form of innovation will be included though, which is transaction innovation. This will be explained in more detail below.
**Product innovation** results in new products, new concepts for existing products (as in the electrically driven bicycle), or incremental improvements in existing products (Jacobs & Snijders, 2008). In addition to products, new services may also be involved. In fact, a logistics service provider does not create a physical product; the product on offer is a service.

**Process innovations** are innovations that increase the production productivity of goods and services. They focus on the implementation of new methods for manufacturing products and providing services. Purely organisational changes are not part of these processes.

**Market innovation** is concerned with finding a new target audience for an existing product or an existing service. Such a target audience can take the form of a new geographical market, but it could also be a demographically delineated market.

**Transaction innovation** is a form of innovation not often found in literature. A chain or network includes flows of goods, information and money. Money flows are gaining importance, but rarely feature in existing literature. Transaction innovations are changes that make economic transactions proceed more smoothly.

**Organisation innovation** is the fifth form of innovation. There is no single definition of this concept, as the definitions vary according to the parties involved in the innovation process. The latter might involve an in-house change, e.g. a new style of management or departments handling collaboration in a different manner. On the other hand, it might also involve a new form of collaboration within the chain with the supplier or customer. In addition, the same might also occur with parties outside the chain. These three levels will be discussed in more detail in the following sections.

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**Figure 1: Examples of five different forms of innovation**

Figure 1 shows a diagram of what occurs in the different types of innovation. The figure shows a series of actions or chain steps that result in a certain product. For each type of innovation, an example is shown of how the
innovation can affect the end product, the chain steps or the flows. Product innovation results in a new product (see product D, which after innovation becomes product E). Process innovation involves a change in production technique (see production C, which becomes F). Organisation innovation can change something within the organisation of the business, the chain or the network. In this figure this is shown as a change in the chain because raw material supplier B has become superfluous. In market innovation the same product or the same service is now offered to several markets. The lines running between A, B and C represent goods, information and/or money flows. Transaction innovation changes the money flow, which is why in the figure the lines between A, B and C have been changed into dotted lines.

**Three levels of organisation innovation**

Organisation innovation can take place in-house, at the enterprise level. Externally, it involves a change in collaboration with suppliers and/or customers, at the chain level. At the network level, the change occurs in collaboration with enterprises and/or organisations outside the chain.

![Figure 2: Enterprise level](image)

Organisation innovation at the enterprise level can take any of many forms. It might concern a new absenteeism policy or a new style of management. It might also specifically concern an improved collaboration between different departments, for example by introducing new ways of communication between purchasing and marketing.

![Figure 3: Chain level](image)
In decades past, much innovation has taken place at the chain level. In an increasing number of chains, ICT systems of different business were made compatible in order to share information within the chain. In addition, an increasing number of businesses are sharing scheduling processes and stock level forecasts. A chain consists of at least three links and two interfaces. The interfaces define the relationships between the links. See figure 3 for the simplest form of logistics chain.

In a chain, vertical relations exist, i.e. from consumer to producer. A network exists at the supra-chain level. A horizontal relationship exists at the network level. This involves a relationship between two parties that make up the same step in two different chains. Diagonal relationships may also exist within a network, i.e. connections between two parties that are not in the same chain, nor at the same step within a chain. Finally, extra-firm networks should be mentioned, relationships between businesses and parties that are not business entities, such as governments or knowledge and research institutions (Yeung, 2005).

Forms of innovation affecting logistics
To gain more insight into the importance of the innovation forms outlined above, we looked at which of the five mostly frequently occur in the logistics sector. Data were obtained from the “Airport Seaport Logistics” minor for students in their third year of Logistics and Technical Transport Science and related studies at the Amsterdam University of Applied Sciences. The students do their research at companies, and report about possible improvements for logistics processes. In addition to the company itself, in most cases the chain and the network of which the companies forms part are also studied. A total of 22 reports were compiled between September 2009 and September 2013, in groups of 3 to 5 students. The companies they researched included shippers and carriers, and to a lesser extent, retailers.

A qualitative analysis of these 22 reports was carried out regarding both the ‘role in innovation’ and the ‘need for innovation’ in order to distinguish between what businesses are already doing in the way of innovation (role) and what their future requirements will be (need). This has been done not only for the
companies featuring in the research, but also for other parties in the chain and the network in which the companies operate.

Figures 5 and 6 show which types of innovation feature most in the 22 student reports, regarding both role and need.

<table>
<thead>
<tr>
<th>Role in innovation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product innovation</td>
<td>3</td>
</tr>
<tr>
<td>Process innovation</td>
<td>5</td>
</tr>
<tr>
<td>Organisation innovation</td>
<td>11</td>
</tr>
<tr>
<td>Market innovation</td>
<td>2</td>
</tr>
<tr>
<td>Transaction innovation</td>
<td>0</td>
</tr>
<tr>
<td>Not applicable*</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Need for innovation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product innovation</td>
<td>0</td>
</tr>
<tr>
<td>Process innovation</td>
<td>6</td>
</tr>
<tr>
<td>Organisation innovation</td>
<td>16</td>
</tr>
<tr>
<td>Market innovation</td>
<td>0</td>
</tr>
<tr>
<td>Transaction innovation</td>
<td>0</td>
</tr>
<tr>
<td>Not applicable*</td>
<td>0</td>
</tr>
</tbody>
</table>

* The report does not lend itself to drawing conclusions.

Few instances of product, transaction and market innovations were found. The lack of product innovation appears to be a clear cause for the low performance of logistics in polls and rankings. In logistics, product innovation is about new services. An example from the student reports is Basicfreight, a concept developed by logistics service provider CTS Group in collaboration with TNO. The concept offers customers a certain amount of $CO_2$ compensation per trip. Its stands out for its performance regarding cost and sustainability. The reports show that logistics companies focus mainly on goods flows and information flows, not on money flows. No businesses were found that played a major role in, or expressed a major need for, transaction innovation.

The businesses that showed a need for market innovation show a clear split between large companies on the one side and SMEs on the other. The large companies want market innovation to increase their share of the market by expanding in new growth markets in Africa and Asia. SMEs are looking for new customers and markets in order to be less dependent on a few large customers and so become less vulnerable. In many cases, process innovation provides support for organisation innovation. A fast chain of well-synchronised companies requires high-quality information systems. Such improved information systems tend to be the focus of the businesses analysed as far as process innovation is concerned. Other examples are track & trace applications, e-freight for air freight, and facilities to keep the chain refrigerated for perishables.

**Organisation innovation – network level and horizontal collaboration are lagging behind**

Figures 5 and 6 show that organisation innovation in particular is important, both as companies’ role and need. At the enterprise level the forms of organisation innovation found are concerned with improving collaboration
between different departments. A recurring problem in the reports for example is that the purchase and logistics departments are poorly synchronised. The purchasing department will lay in a lot of stock, because buying in bulk gets them a discount. At the same time the logistics department runs into problems due to the high stock levels.

Externally the focus is mainly on shorter and more efficient chains with shorter lead times. Developments such as the sharing of forecast data with chain partners to increase warehousing efficiency are already underway at many companies. Some chains extend integration even further, for example by adopting a Vendor Managed Inventory system, a concept in which the supplier is solely responsible for managing the customer’s stocks. Shortening the chain is done mainly to cut costs. A lot of different companies have already made much progress in recent years, but there is still much need for further development in this respect. Improving communication between different chain steps is important. As with innovation at the enterprise level, the right ICT technology will be essential.

Chain integration is mentioned in many of the reports. The same does not apply for network integration. An example of a network concept that does get described in different reports is the possibility of bundling with competitors. In order to fill a container more quickly, goods from a number of different competitors can be bundled together. At the same time, carriers can also collaborate. By engaging in such a horizontal collaboration, two competing carriers can offer their producer more options and flexibility. The main bottleneck is trust, however. Both carriers and producers tend to want to avoid giving their competitors insight into their own product ranges and volumes. As a result, the reports show little actual need for horizontal collaboration.

**Horizontal collaboration**

Unlike the results from the student reports, joint research by ABN, TLN and Fenex (2013) shows that most (64 percent) of the logistics service providers form part of a horizontal collaboration. However, in this case the definition of horizontal collaboration differs from the definition given earlier in this article. In the research by ABN, TLN and Fenex, a horizontal collaboration is a collaboration between logistics service providers, which may therefore also include one between a carrier and a shipper. The definition given in this article defines it as a collaboration between two businesses occupying identical chain steps in two different chains, i.e. a collaboration between two carriers, or between two shippers. In defence of the ABN/TLN/Fenex definition it can be argued that an increasing number of businesses have integrated the carrier and shipper functions in their business activities.

The research by ABN, TLN and Fenex has resulted in three consecutive reports, with the first report discussing relationships within the chain (2013), the second report dealing specifically with horizontal collaboration (2013), and the third report with the importance of human factors in both types of collaboration (2014). The second report clearly shows results regarding the implementation of a horizontal
collaboration.\(^1\) It discusses different forms of horizontal collaboration. It is important whether the collaboration is of a formal nature or not. This is the case in 60 percent of the collaborations, with 36 percent of the collaborations being noncommittal. A contract stating the extent and nature of the collaboration would therefore not appear something to be taken for granted. Slightly more than half the horizontal collaborations (51 percent) are recognisable by a separate name.

Figure 7 shows what the focus of horizontal collaborations tends to be. It also shows the difference between formal and noncommittal collaborations. The figure shows that most collaboration tends to focus on such traditional aspects as complementary services, geographical coverage and cargo exchanges. Strategic and tactical objectives such as mission, vision, acquisition and joint IT investments are less prevalent, in particular when the collaboration is noncommittal.

The purported benefits of horizontal collaboration include costs (57 percent) of course, but even more often improved services to clients (95 percent) and a more complete range of network offerings (91 percent). The logistics service providers were also asked which factors determined the success of a collaboration. In spite of the fact that 36 percent of the collaborations are of a noncommittal nature, the most widely mentioned factor for success is a collaboration contract and clearly defined arrangements (mentioned by 18 percent). It is striking that in addition to many human, ‘soft’ factors such as ‘flexibility and a partner’s ability to adapt’, ‘openness and transparency’, ‘people (shareholders/management)’, ‘trust’ and ‘equality’ were mentioned.

For the selection of partners, quality of service is the criterion mentioned most often. In addition to quality of service, many human factors are mentioned, including ‘reliability’, ‘company culture’, ‘equality’, ‘reputation’ and ‘compatibility’.

\(^1\) Data from a survey held among carriers and shippers, with the collaboration of Panteia (2013).
The role of human, ‘soft’ factors in collaboration

As the previous paragraphs show, human factors are important in horizontal collaborations. Figure 8 shows what logistics service providers consider to be the points for improvement within a collaboration. In this case, all of the top four points for improvement are human, ‘soft’ factors.

![Figure 8: Points for improvement in a collaboration](image)


It is no surprise that issues such as transparency and trust can be bottlenecks in logistics collaborations. According to the third report by ABN, TLN and Fenex (2014), the human factors of emotion, behaviour and mindset play major roles in this respect. The importance of these factors still receives little emphasis in the logistics sector, with its hands-on culture. It is remarkable for example that only 27 percent of formal collaborations embark on joint purchasing (see figure 7). The report remarks on the high emotional value attributed to traditional methods as well as brands, which causes problems when joint purchasing is attempted. The following quotation from a logistics service provider is telling:

“I drive DAF or Scania trucks. My grandfather did so before me, and so did my father, and so that’s what I do!” (In: ABN, TLN and Fenex, 2014).

Because of such cherished traditions, it becomes very hard to abandon outdated methods in a collaboration, whereas collaboration often requires highly flexible behaviour and changes in procedures. Collaboration mandates the learning of new habits and the development of a different mentality in order to make new, different decisions. This is a particular challenge for businesses with a long history and a pronounced organisation culture. The logistics industry is full of businesses that fit this profile (ABN, TLN and Fenex, 2013).

What can make the collaboration complex is the role of identity. In most collaborations, companies do not relinquish their own identities, whereas a new identity is in fact being created, that of the collaboration. This is something that can lead to complications both within a company and outside it, i.e. between different businesses. The third report (2014) states that it is important for managers to clearly communicate the identity of their own company relative
to the collaboration in order to secure the commitment of the company’s own employees. The manager needs to make it clear what concrete behaviour is expected from employees, and what the employees’ interests are in this respect. Externally it is about managing differences in character between separate businesses. At the start of a collaboration in particular, companies will all have their own agenda if joint interests have not been made sufficiently clear.

**Case study: DailyFresh Logistics**

One example of horizontal collaboration in the logistics sector is DailyFresh Logistics. This is a collaboration of Visbeen Transport, Post-Kogeko and Norfolkline (now DFDS) which originated about fifteen years ago. The three companies are in competition, but they have found one another in a specific product/market combination, the transport of fruit and vegetables from the Netherlands to Great Britain. The collaboration came about when Norfolkline won a contract that was too large for the company to handle on its own, so they contacted Visbeen. Together they involved Post-Kogeko in order to increase the levels of synergy they might achieve. The three partners established a joint organisation to present a common exterior to the world for this product-market combination, so shippers conclude their contracts with DailyFresh. DailyFresh is then bound to contract the carrier business out to the three partners, in proportion to their contribution to DailyFresh. Since its acquisition by DFDS, Norfolkline no longer provides transport for the collaboration, but an account of its relationship with the ferry company it retains its importance for the success of DailyFresh.

The collaboration has become a success over the past years, says Aad van der Hoeven, financial director of Visbeen Transport. Working for Visbeen he has been involved in Dailyfresh from the very beginning. Every day, some hundred DailyFresh trucks cross the Channel to the UK. Visbeen and Post-Kogeko have also started collaborating in other fields by exploiting one another’s strengths, for example in the fields of ICT and HRM. The benefits of the collaboration are evident:

"With DailyFresh we can offer better service to our customers by bundling cargo and increasing the drop density. The joint purchase of fuel, ferry services and equipment has also created synergy in the form of reduced costs. And because we present ourselves to the world as a single entity, we managed to gain access to larger market parties in the retail business."

Major points that made this collaboration a success include trust and transparency. Van der Hoeven:

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2 The case is based on an interview with Aad van der Hoeven, financial director of Visbeen Transport.
“At the start the required mind shift was considerable. Each of the three companies had to surrender part of its own identity and start to work with the competition.”

The three stakeholders had to push hard within their own organisations to secure faith in DailyFresh and so ensure that the potential benefits of collaboration could actually be achieved. A major plus in this respect was the fact that it was possible to demonstrate in advance that the collaboration would result in a win-win situation. Also, the three partners were able to retain part of their own identities because the collaboration extends only to a single product-market combination. Since in spite of the collaboration the three companies have remained competitors, the conditions have been properly laid down in a contract:

“By laying down everything in advance we avoided unpleasant discussions as the project progressed. The contract also regulates volume distribution, pricing and profit claims. The separate volumes contributed by the partners determine how much of the transport work goes to each of them. Even though the volumes we contribute vary, we all have an equal say in DailyFresh”.

Collaboration is also something that partners need to invest in, requiring a constant effort. The partners therefore meet on a regular basis to make sure the interests of DailyFresh don’t clash with the individual interest of the partners. Over the years, attempts have been made to extend the collaboration to new markets, but this did not meet with success:

“We found that we couldn’t really create synergy by collaborating, and if you don’t get a win-win situation, there’s little point in pursuing the collaboration, because it will start to conflict too much with your own interests”.

The case of DailyFresh in many ways confirms the results from the research by ABN, TLN and Fenex. On the one hand it proves the importance of hard factors such as a clear business case and a proper contract in which everything is laid down in advance. A major part of the success of DailyFresh was due to the fact that it was always made clear what the benefits of collaboration were and that all the parties involved would benefit more or less equally. In addition to the hard factors there are the human, ‘soft’ factors that play a role. The mutual relationship needs to be constantly worked on to maintain sufficient trust. When in a collaboration such as this one, companies have to sacrifice part of their own identity, and creating the right levels of trust within each company is equally important. Each company’s own workforce must be equally convinced of the benefits the collaboration has to offer.

**Conclusion**

The general perception of logistics is of an industry lacking in innovation. However, the level of innovation depends on the way in which innovation is evaluated. The industry displays little in the way of product innovation, it is
true. Nonetheless, organisation innovation does take place, and it is also the type that is most in demand with the businesses involved.

A further analysis of the parties involved in innovation reveals that three levels of organisation innovation can be distinguished: enterprise level, chain level and network level. In the past decades, much has been achieved in the arenas of enterprise and chain levels, although organisation innovation at the network level is still limited. Nonetheless, this is the level on which the logistics spearhead industry is focused. Most of the themes in the innovation contract of the spearhead industry, such as 4C, Synchromodality and the Neutral Logistics Information Platform, require an approach at the enterprise and supra-chain levels. This is why the distinction between the three levels mentioned is relevant for logistics policies. Literature on innovation literature rarely mentions this distinction, and so this type of literature offers very few handles to help achieve desired innovations, in particular innovations at the network level.

At the same time, the logistics industry faces enough challenges as it is before it will be able to reach this network level. This article emphasises horizontal collaboration. Horizontal collaboration often focuses on geographic coverage, complementary services and the exchange of cargo. The case of DailyFresh demonstrates that businesses can also benefit from collaboration in other fields, such as joint acquisition and purchasing. On the one hand this requires hard factors such as a proper contract and a clear business case. On the other hand, human factors are also important, and the relationship will need to be constantly worked on to maintain the necessary level of trust. Collaboration under a single name can offer great benefits for joint acquisition. However, when a new organisation with a new name is created, this also means that a new identity is created, that of the collaboration. Part of the old identity of the individual companies will have to be sacrificed. This is why it is also important to convince a company’s own workforce of the importance of the collaboration, and to communicate explicitly how employees will be expected to behave.

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Summary

According to many polls and rankings, logistics as an industry lacks innovation. However, these publications tend to focus on product innovation, offering little insight into the kind of innovation that is actually present or required in logistics. This article looks also at other forms of innovation, and organisation innovation in particular.

In organisation innovation, three levels may be distinguished, with reference to the parties involved in the innovation: enterprise level, chain level and network level. In the past few decades, much progress has been made at the enterprise and chain levels, but the network level lags behind, although this level is in fact the focus of logistics as a spearhead industry.

The article zooms in on horizontal collaboration between logistics service providers at the network level. It finds that on the one hand hard factors are important, such as a properly defined contract. On the other hand, soft, human factors are also important to create trust both between the collaborating enterprises and within them.

By looking not only at product innovation, but also at other forms of innovation, this paper seeks to establish a more balanced view of innovation in the logistics industry and to provide a basis for policies to match. In addition, it includes a case history and other information to help logistics service providers decide how they could benefit from collaboration.
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