CO³ TEST PROJECT:

CREATION OF AN ORCHESTRATED HORIZONTAL COLLABORATION FOR ROAD BUNDLING BETWEEN 2 SHIPPERS

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CO3

COLLABORATION CONCEPTS FOR CO-MODALITY

WP4

"THE LOGISTICS LABORATORY"

(Orchestration, application and validation)

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Executive Summary

This document describes the process of setting up the first test case within the CO3 project, namely the bundling of road transport flows between the manufacturing companies JSP and Hammerwerk. These two previously unrelated and independent shippers companies formed a horizontal collaboration community for the regular co-loading of their products from the Czech Republic to Germany. A neutral trustee, TRI-VIZOR, facilitated the collaboration process and used a 3-phase methodology to guide the companies towards structural logistics collaboration.

Phase 1: Identification

In the first phase of the CO3 methodology, the neutral trustee identifies different shippers who are open for horizontal collaboration and maps their structural freight flows. In case the shippers and their logistics flows are compatible, the trustee invites the shippers around the table to propose logistics collaboration and to set up a common project team and roadmap. The partners express their ambition to set up a collaboration project and outline a high level scope. Project stakeholders and champions with every participating shipper are identified. The potential benefits and expected barriers of transport bundling are documented. In a joint go/no-go decision, the embryonic community decides whether further elaboration of the project is worthwhile.

Phase 2: Preparation

As soon as the candidate partners in the shipper community are sufficiently open to accept the new concept of horizontal collaboration as a business strategy, the potential benefits need to be demonstrated in detail to further tackle internal scepticism and to build momentum for a physical implementation. In this phase, the neutral trustee collects relevant information from the shippers in order to build a solid business case. The trustee has no stake in the shippers' organisations but provides objective data analysis and synergy calculations from 3 perspectives: logistics cost savings (efficiency), reduction in greenhouse gas emissions (sustainability) and service level improvement (effectiveness). In this test case, TRI-VIZOR demonstrated that the bundling of product flows between JSP and Hammerwerk could result in double digit reductions in CO_2 emissions and transport costs. To build trust in the possibilities of horizontal collaboration and to demonstrate that that the co-loading was operationally feasible, a number of physical test shipments were organized.

Phase 3: Operation

As soon as the test shipments were concluded successfully, the horizontal collaboration was solidified. With support from the trustee, a fair mechanism for gain sharing was agreed upon, the business processes and procedures of the collaboration were documented, staff training took place and a suitable logistics service provider was selected by the shipper community. As a result, the co-loading between JSP and Hammerwerk is currently a viable operating strategy and bundled loads are being shipped on a regular basis.

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1. Introduction

1.1 Background

The EU-funded project CO3 (**Co**llaboration **Co**ncepts for **Co**-modality) aims to develop, professionalise and disseminate information on the business strategy of horizontal logistics collaboration in Europe. The goal of the project is to deliver a tangible 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 customer service level. The project will coordinate studies and expert group exchanges and build on existing methodologies to develop legal and operational frameworks for collaboration via logistics "bundling", i.e. consolidation and synchronization of freight flows, in Europe. Furthermore, the project consortium of knowledge institutes and specialised industry players will develop new business models for logistics collaboration. The developed tools, technologies and business models will be applied and validated in the market via test cases. Finally, the CO3 consortium will promote and facilitate matchmaking and knowledge-sharing through conferences and practical workshops to transfer knowledge and increase the market acceptance of collaboration.

The core of the CO3 project is what is referred to as the *applied research cycle*. This cycle has been set up as a continuous learning and feedback loop between the models and tools needed for supporting collaborations, the most suitable business models for groups of companies wanting to collaborate and finally the actual test cases for collaboration. These elements are developed under individual work packages as shown below.

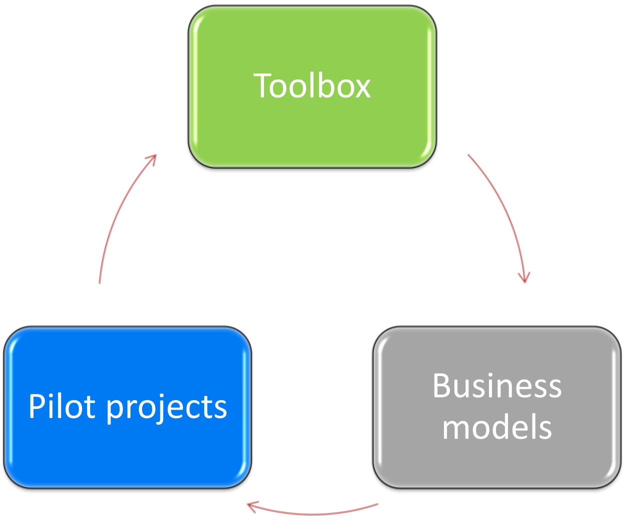


FIGURE 1: THE CO3 APPLIED RESEARCH CYCLE

1.2 Context of the road bundling test case

The first steps in this test case have been made possible largely through the efforts of JSP, whose supply chain managers are early believers in the concept of horizontal collaboration. Even before the launch of the CO3 project, JSP was already actively looking for potential bundling partners through specialized intermediaries such as TRI-VIZOR or in logistics associations such as ELUPEG. By screening the activities of their neighbouring companies, JSP itself was eventually able to find a possible match: the heavy product flows of the metal forgery HF-Czechforge next door to the JSP production plant in Cheb (see Picture 1) in the Czech Republic seemed like a promising match with their own lightweight product flows. This offered the starting point for this CO3 collaboration test project. Before diving into the project details, the different stakeholders in the project will briefly be introduced in the next paragraphs, followed by a description of the collaborative transport lane on which this road bundling test case is focused.

Picture 1: Neighbouring plants of JSP and HF-Czechforge in Cheb (CZ)

1.2.1 Stakeholders

i. JSP

JSP is a multinational company specialized in innovative lightweight plastic applications. It manufactures ARPRO®, an essential product for the automotive, packaging and consumer goods industries. ARPRO® is used in lightweight, energy absorbing, and structural applications delivering environmental and economic value. JSP has several production plants in Europe, one of which is located in Cheb in the Czech Republic. The transport characteristics of JSP products are that they are very light and voluminous, which prevents them from using the trucks to their maximal weight limit. The ARPRO® logistics flow in this test case consists of plastic beads which are transported in palletized "big bags".

ii. Hammerwerk/HF-Czechforge

HF-Czechforge is located next door to JSP in the industry park of Cheb and is a subsidiary of Hammerwerk Fridingen, a German manufacturer of advanced metal components for the automotive and aviation industry. Some of its products are for example brake discs, which are very heavy and dense to transport. This logistics flow makes it difficult for Hammerwerk to make maximal use of the available floor space in the truck. The Hammerwerk products in scope of this test case are transported in palletized metal crates or "gitterboxes".

iii. TRI-VIZOR

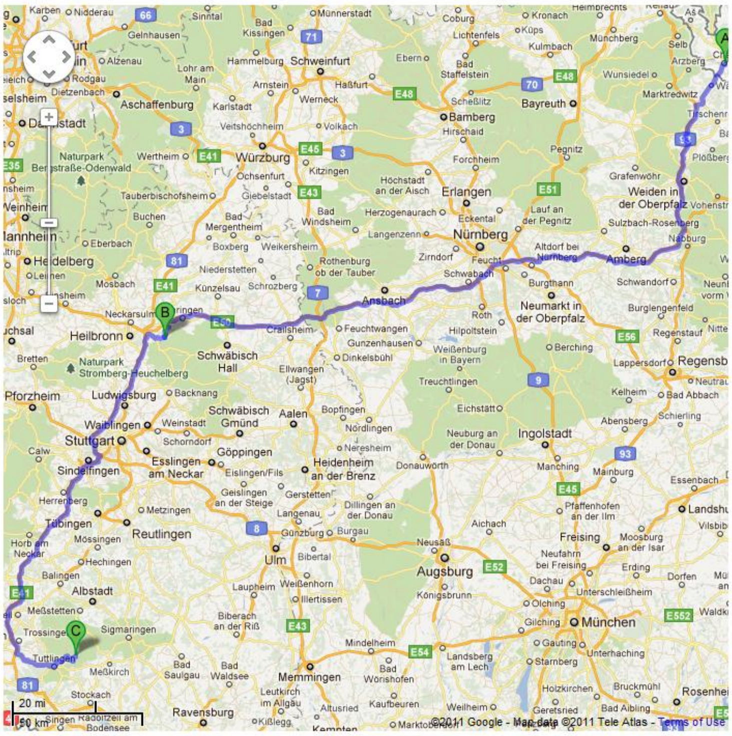
TRI-VIZOR, a Belgian company specialized in horizontal collaboration, acted as Cross Supply Chain Orchestrator® or neutral facilitator of the bundling test case on behalf of the CO3 Consortium. As a trustee and project manager, TRI-VIZOR brought JSP and Hammerwerk around the table, evaluated their potential logistics synergy, facilitated the integration process and helped the companies and their personnel to overcome various operational and mental barriers. Now that this horizontal collaboration test case between JSP and Hammerwerk has moved into a more stable state, TRI-VIZOR will continue to monitor the project as an off-line trustee, responsible for the periodic follow-up and evaluation of the collaboration.

iv. HS Line

HS Line, a locally owned and midsize transport company with headquarters in Cheb, was selected by JSP and Hammewerk after a number of test shipments had proven that the bundling concept was operationally feasible. As a joint transport service provider, HS Line today operates the bundled loads of Hammerwerk and JSP on a regular basis.

1.2.2 Lane identification, trajectory definition

After a kick-off meeting with JSP and Hammerwerk, TRI-VIZOR was assigned the role of trustee and authorized to collect high level lane data (“origin-destination” information only, no volumes yet) from both shippers to evaluate whether there could be transport collaboration potential on one or more lanes. This analysis showed that one trajectory in particular looked very promising: both JSP and Hammerwerk were shipping goods from Cheb to the state of Baden-Württenberg in the southeast of Germany. In this destination region, JSP has a plant in Eschenau and Hammerwerk has one in Fridingen (see picture 2). The product flows of both shippers are transported along the same highway and adding an extra stop in Eschenau would add less than 5 kilometres to the total trajectory distance, so this proved to be a near perfect match.



Picture 2: Trajectory for bundled transport between JSP and Hammerwerk in Cheb (A), JSP Eschenau (B) and Hammerwerk Fridingen (C)

2. Project phasing

2.1. High level quantification of collaboration potential

Once the initial contact between Hammerwerk and JSP had successfully been established and a suitable transport lane had been identified, TRI-VIZOR collected high level flow volumes from both shippers to evaluate whether horizontal collaboration could be beneficial on this particular trajectory.

After a positive first high level calculation, a project team meeting was organized mid November 2011 in the JSP offices in Cheb. All people that would be involved in the project, both from a managerial level as well as from both shippers' logistics and operational departments, were invited around the table for a "meet & greet". This meeting not only served as a moment to discuss the transport flow data, but was also an important first step in building trust: trust in the new concept of horizontal collaboration as well as trust in the people involved on both sides.

During the first part of this meeting, a brief tour of both plants in Cheb was organized to get a better understanding of each company's specific logistics needs and environment. Afterwards, TRI-VIZOR explained the concept of horizontal collaboration and introduced the CO3 project before going into the details of this specific case.

Based on the information provided by JSP, their ideal products to be included in this bundling test case would be two polymer components that were always shipped to Eschenau in palletized "big bags" and that did not have enough volume to fill a complete truck on a regular basis. The weekly transport capacity demand for these two products was on average 8,5 loading meters per week (see table 1) that were always sent as half of a double lorry truck (also known as “road rain” or “camion-remorque”). It appeared that JSP has the same customer lead times requirement (order day A for delivery day C) as Hammerwerk, but Hammerwerk ships more frequently. This suggested that mixing JSP’s flow of plastic bags with Hammerwerk’s flow of metal boxes could make it possible to increase JSP’s delivery frequency and customer service level, possibly without increasing the transport cost.

Product	# Bags	Bags/week	Est. LM/week
5195	436,4	8,7	4,5
5135-LS	383,4	7,7	4
Total	**819,8**	**16,4**	**8,5**

Table 1: Flow data for JSP products (annual and weekly). LM=loading meter

For horizontal collaboration to be successful, this weekly capacity demand of JSP would have to be (made) available on the more frequent Hammerwerk trucks to Fridingen. Analysis of the historical shipment data of Hammerwerk showed that the loading meter fill rate of their trucks was only 66% or lower, when calculated on a monthly basis (see table 2). This was due to the heavy nature of Hammerwerk metal freight. When zooming in to week level volumes for the first 9 months of 2011, it became clear that in most weeks – 33 out of 39 weeks – there would have been enough free loading meters available on the Hammerwerk trucks to absorb the extra JSP bag volumes (see picture 3).

Month	# transports	Total # of HF-boxes	# HF-boxes/truck	Fill rate (max: 21)
January	8	104	13,00	62%
February	9	125	13,89	66%
March	9	95	10,56	50%
April	12	99	8,25	39%
May	17	201	11,82	56%
June	16	204	12,75	61%
July	13	55	4,23	20%
August	13	91	7,00	33%
September	14	147	10,50	50%

Table 2: Monthly transport overview and truck utilisation rate for Hammerwerk. 21 Hammerwerk boxes fill a truck to maximum loading meter capacity. HF=Hammerwerk Fridingen

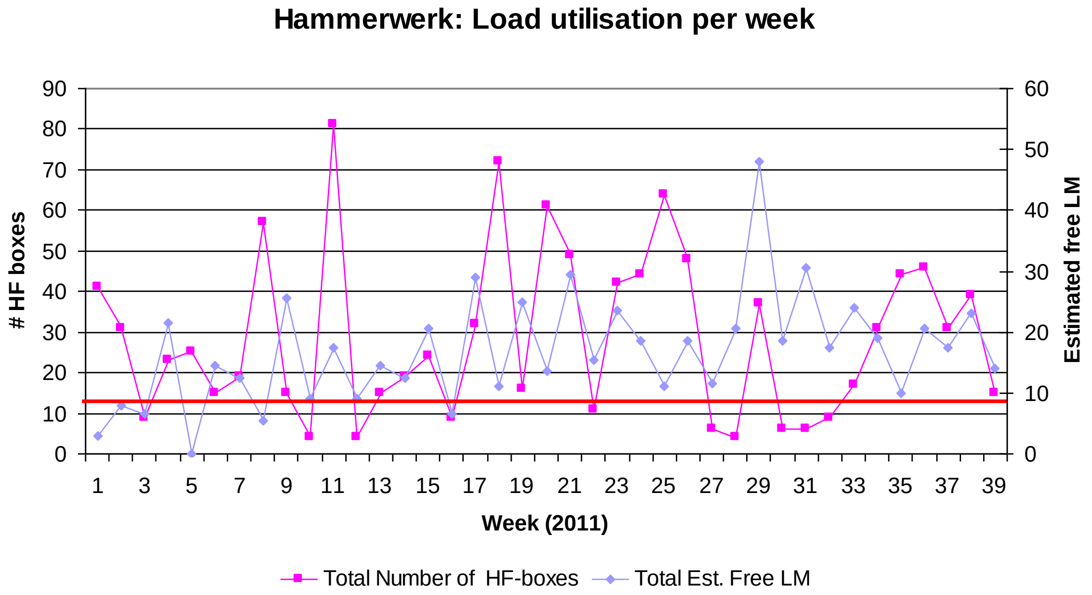


Figure 3: Hammerwerk load utilisation and free space, compared to JSP loading meter needs

Based on these numbers, the shippers decided to further explore the potential of horizontal collaboration, more specifically in two dimensions:

- Financial and sustainability gains: more detailed freight flow and cost data was to be gathered in order to calculate the possible transport cost savings and savings in carbon emissions of bundled transports.
- Operational feasibility: co-loading products with such different characteristics could present several obstacles in the logistics and transport operations in terms of load securing, weight balance and safety in the truck, etc. This was to be tested during one or more test shipments.

These two elements will be covered in more detail in the next two paragraphs of this report.

2.2. Detailed business case

Based on additional freight flow details and historical data that were provided on a weekly basis, the bundling potential became more tangible: just reactively combining the loads of both shippers when they already occurred in the same week – so they could be consolidated without active synchronization or service level flexibility – would already reduce the necessary number of transports by more than 20% (see Table 3).

Company	# transports current situation	# solo transports while bundling	Bundled transports
Hammerwerk	111	79	32
JSP	34	3	32
Total:	***145***	***114***	
	Difference:	***-21,38%***	

Table 3: Transport reduction potential through reactive bundling
(no proactive load optimization or synchronization)

To evaluate the impact of these reduced transport movements on CO_2 emissions, TRI-VIZOR used ADEME's Bilan Carbone method, which is a commonly accepted carbon footprint calculation standard in Europe. This method combines the emissions caused by diesel fuel consumption – in both the empty (E_{empty}) and fully loaded (E_{full}) trucks – with the fill rate or capacity utilisation of these truck as variable factor (P_{load}):

$$E_{vehicle} = E_{empty} + [(E_{full} - E_{empty})] * P_{load}$$

This formula basically means: the higher the fill rate of a truck, the less CO_2 it emits per transported freight unit. Using the available week level data, the calculations showed that bundling of loads from JSP and Hammerwerk could lead to double digit savings in carbon emissions (see table 4) in case of reactive (i.e. non-synchronized or optimized) bundling.

Company	# transports	Est. CO2 emission in KG	Bundled flows (weekly)
Hammerwerk	111	54.791	
JSP	34	9.915	
Total CO2 emissions in Kg		*64.706*	*57.331*
		Delta	*-11,40%*

Table 4: Estimated CO_2 savings by reactive load consolidation
between JSP and Hammerwerk

The trustee and the shippers quickly realized that this savings potential could even be much higher if the flexibility in load planning increased and optimal load combinations would be constructed through proactive shipping date synchronization and volume optimization ("smart bundling"). It was decided to test and calculate this hypothesis in practice, by organizing a few pilot shipments (see paragraph 2.3).

With regard to the potential cost savings, it was considered best to use a conservative approach in a first phase: the Full Truck Load (FTL) cost for a Hammerwerk transport from Cheb to Fridingen was used as the baseline cost and an additional stop cost of 75 Euros (i.e. a conservative estimated stop cost based on market knowledge obtained in previous projects) was added for the extra loading and unloading at both JSP plants. The results from this calculation showed that not all JSP-Hammerwerk load combinations would result in costs savings, but that smart co-loading could result in total net savings up to almost 9% (see Table 5) of the baseline transport cost.

# HWK boxes	# bags JSP	% cost delta
1	24	37,65%
2	22	31,78%
3	21	25,38%
4	20	24,97%
5	20	1,03%
6	20	1,03%
7	19	3,66%
8	18	6,43%
9	17	9,35%
10	16	-4,10%
11	15	-1,73%
12	14	0,75%
13	13	3,37%
14	12	-8,73%
15	11	-6,59%
16	10	-4,35%
17	9	-2,00%
18	8	0,47%
19	7	3,07%
20	6	5,81%
21	4	11,74%

Table 5: Savings potential through "smart" bundling. Each line represents a maximally filled truck with product from JSP and Hammerwerk (HWK)

The theoretical case for simultaneous improvement in both environmental (CO_2 emission reduction) and financial (cost savings) areas strengthened the belief of both companies in horizontal collaboration. However, there still was a lot of disbelief and scepticism, especially in the operational departments of both companies.

2.3. Operational feasibility check for bundled transports

The most convincing way to tackle the existing doubts in the minds of the operational staff and to gain their support for moving this innovative concept forward was a straightforward one: just do it !

And so, after a few weeks of meetings, conference calls, analyses and calculations, both shippers agreed to organize a bundled test shipment together. There were some operational challenges to overcome, such as balancing the weight within the truck and securing the big bags and gitterboxes to prevent transport damage, but the first pilot truck was eventually loaded in the morning of November 28th in Cheb and delivered its goods the next day to the plants of Hammerwerk in Fridingen and JSP in Eschenau without any problems (see pictures 3 and 4 below).

Picture 3 and 4: Loading in Cheb and unloading in Eschenau

After this first pilot shipment, which was carried out by Hammerwerk's incumbent transport provider using a standard 13,6 meter trailer truck, a second collaborative transport soon followed. This second bundled load was executed by one of JSP's incumbent transport providers and this time a double lorry truck was used for the transport. Based on the actual co-loaded product quantities and the transport vehicle used, TRI-VIZOR re-calculated the CO_2 emission savings for these two pilot transports. As expected, the savings that could be achieved by proactively optimizing the bundled loads significantly exceeded the first theoretical simulations and it turned out that carbon footprint reductions of over 30% could be realized (see Table 6).

Truck	JSP Bags	HWK boxes	JSP Calc CO2 (g)	HWK Calc CO2	Total CO2 separate (g)	Total CO2 bundled (g)	CO2 savings in g	% CO2 savings
Pilot1	16	8	312.250	477.485	789.735	546.243	-243.492	-31%
Pilot2	18	12	320.091	507.072	827.164	542.486	-284.678	-34%

Table 6: Emission calculations for the pilot trucks (Bilan Carbone formula)

Thanks to the positive outcome of the pilot transports, all doubts and mental barriers were removed from the minds of management and operational staff in both companies. JSP and Hammerwerk decided to embed horizontal collaboration and co-loading as a structural option in their future logistics processes and strategy.

2.4. Creating a structural horizontal collaboration

As soon as the concept of horizontal collaboration had proven its potential value thanks to the pilot shipments, the next challenge was to create a more structural framework in which the partnership between JSP and Hammerwerk could be solidified. The three following steps were taken:

- Selecting a suitable transport provider
- Integrating and documenting the operational process
- Choosing an appropriate gain sharing and contractual framework

With regard to selecting the most suitable logistics service provider to execute the bundled transports on a regular basis and also to confirm the estimated cost saving potential, JSP and Hammerwerk decided to put this question to the market through a Request For Quotation (RFQ). TRI-VIZOR facilitated this RFQ process by drawing up the necessary supporting documents, evaluating the received quotations and setting up meetings and conference calls with the candidate carriers. The main evaluation criteria for selecting the joint transport provider were: quality of service (e.g. with regard to safety and load securing), guaranteed capacity availability (own fleet of vehicles), flexibility/responsiveness (geographical proximity), sustainability and transport costs. Also, the "mental acceptance" of the horizontal collaboration concept and the role of a neutral trustee in a shipper transport community on the part of the logistics service providers was tested.

This RFQ was sent to a dozen logistics service providers, varying from incumbent service providers of both JSP and Hammerwerk and local transport SME's in the Czech Republic to large multinational logistics service providers. Based on the RFQ responses received and the evaluation of the various offerings, JSP and Hammerwerk selected in April 2012 a local transport company – HS Line, also based in Cheb – to operate their future combined transport flows.

This deal offered several positive elements for all parties involved:

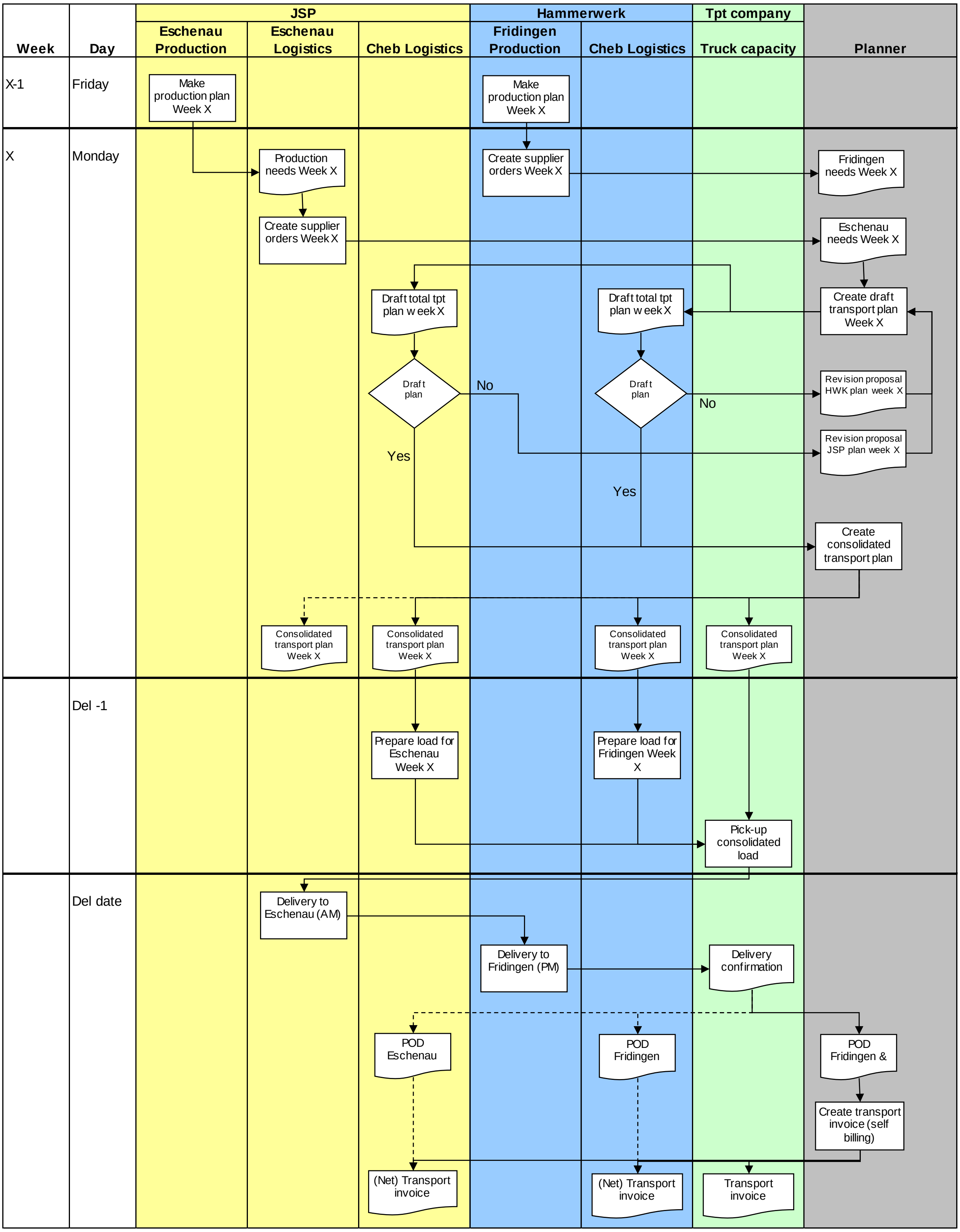
- Transport company HS Line was able to secure a stable and consistent transport volume with local shippers, thus avoiding any empty running before loading the goods. HS Line trucks would be utilized to optimal capacity based on both weight and volume.
- The shippers JSP and Hammerwerk had direct access to a nearby transport provider they knew and trusted. The geographical proximity of HS Line and the availability of an own fleet guaranteed the necessary flexibility, speed of response and capacity availability. HS Line literally spoke "the language of the customers" and was a firm believer in the environmental and financial benefits of horizontal collaboration and the added value of a trustee.
- The significant transport savings of the collaboration were not achieved by "jointly squeezing the carrier" but by intelligently "removing air" (empty loading and cubic meters) from the shared transport capacity.

As the RFQ process progressed, it even turned out that the initially calculated savings potential (see paragraph 2.2) was a very viable, even conservative estimate. If the bundled freight flows of JSP and Hammerwerk could be planned and co-loaded intelligently, the actual total savings generated by horizontal collaboration would result in double digit percentage savings (see Table 7).

HWK boxes	Max bags JSP	% delta
1	24	32,36%
2	22	26,71%
3	21	20,56%
4	20	20,16%
5	20	-2,85%
6	20	-2,85%
7	19	-0,33%
8	18	2,34%
9	17	5,14%
10	16	-7,79%
11	15	-5,51%
12	14	-3,12%
13	13	-0,61%
14	12	-12,24%
15	11	-10,19%
16	10	-8,03%
17	9	-5,77%
18	8	-3,39%
19	7	-0,89%
20	6	1,74%
21	4	7,45%

Table 7: Actual total transport savings in case of "smart" bundling

Next to the selection of an appropriate logistics service provider for the horizontal collaboration between JSP and Hammerwerk, it was also necessary to streamline and document the operational processes (see picture 5 for the master process flow chart) to avoid a future breakdown of the collaboration as a result of human factors (e.g. a logistics planner moving on to another job).



Picture 5: Master flow chart of the daily collaboration process

The final elements to be agreed upon between JSP and Hammerwerk were the selection of an appropriate **gain sharing mechanism** to assign a correct portion of the total transport savings to each shipper and the elaboration of a **formal agreement** to make the collaboration sustainable in the long term. Conform the best practices for horizontal collaboration as developed and promoted by the CO3

Consortium, the mathematical "Shapley value" was proposed by TRI-VIZOR as the reference point for sharing the financial gains. A multilateral legal contract was also suggested to the shippers as a solid long-term foundation for the collaboration.

In a collaborative coalition, the Shapley formula attributes a portion of the total cost saving to all partners in function of their relative contribution to the total gain. In case of 3 or more partners, each partner will usually receive a variable portion of the total profit. However, in a coalition with only 2 members, the Shapley formula will automatically result in a 50-50% split of the gain. This means that, when following the standard Shapley rule, JSP and Hammerwerk would have to divide the total transport savings in half.

Upon review of this gain sharing method, the community decided to take a number of additional aspects into consideration. First of all, for the load combinations that created the maximum total synergy, there existed a big difference between the original individual transport tariffs of JSP and Hammerwerk (note: these individual tariffs cannot be disclosed in this report due to confidentiality reasons). This meant that a 50-50% split of the total synergy savings would result in a far greater relative gain for JSP than it would for Hammerwerk: percentage wise, in the Shapley scenario, JSP would gain almost 3 times as much as Hammerwerk. This was not perceived by the community as a fair deal for Hammerwerk. As such, JSP suggested to "give back" a portion of its financial transport savings to Hammerwerk as an incentive to start the collaboration. This "collaborative negotiation" process eventually resulted in a situation where the same percentage of total cost savings was applied to the individual baseline cost of each shipper.

For example: a bundled load of 15 Hammerwerk boxes and 11 JSP big bags would create 10,19% costs savings compared to the companies' individual shipment costs (see Table 7), so each company's share in the transport cost is their original transport costs for 15 boxes and 11 big bags respectively, reduced by 10,19%. This customized gain sharing solution offered enough incentive for each shipper to plan as many optimised co-loadings as possible, at the same time enabling the envisaged sustainability (carbon footprint) gains for the community as a whole.

As soon as the working principles of the horizontal collaboration and the gain sharing solution had been agreed and tested, JSP and Hammerwerk together with TRI-VIZOR and the CO3 partners discussed whether these could be embedded in a legally binding multilateral contract. The use of such a contract is a best practice for horizontal collaboration and as such a strong recommendation of the CO3 consortium. Although the community agreed that a multilateral legal framework is a crucial element of structural collaboration, it was decided that the magnitude of this JSP-Hammerwerk test case was not large enough to justify the legal cost of implementing such a contract. In addition, the Czech Republic was not originally in scope as one of the priority jurisdictions of CO3. As such, the CO3 consortium decided to save the legal effort and budget for future, larger test cases and communities.

After going through the above steps, JSP and Hammerwerk started organizing bundled transports on a structural basis in the second quarter of 2012. The day-to-day operational planning and synchronization is being handled by their logistics departments in Cheb, in direct contact with the destination plants in Germany and the transport company HS Line. The project will be followed up and evaluated on a regular basis by TRI-VIZOR, acting as off-line trustee on behalf of the CO3 Consortium.

3. Conclusions

The concept of horizontal collaboration to create road transport bundling seems deceivingly straightforward and simple: identify compatible products and common transport lanes and all should work itself out. The business reality on the other hand, demonstrates that it takes several crucial elements to create a successful horizontal collaboration project as was also shown in setting up this first test case within the CO^3 project.

The first – and maybe the most important – element are people: the starting point of a successful horizontal collaboration is the presence of one or more "champions" within the management of at least one of the shippers involved. These champions are true believers of the power of horizontal collaboration and they are necessary to create a first mental breakthrough within the organisations of the (potential) collaborating shippers. In this particular case, the champions within the JSP organisation – Andrew Coles and Ivan Nagy – were the catalysts to get everybody around the table to start exploring the possibilities of horizontal collaboration between JSP and Hammerwerk, through its Czech subsidiary HF-Czechforge.

Once the minds of the managers in the shippers' organisations become open to accept the new business concept of horizontal collaboration, the potential benefits need to be clearly demonstrated to tackle any remaining scepticism. To convince the people within all partner organisations, it is advisable to work with a neutral facilitator or trustee in this phase of the project. The trustee has no stake in either of the shippers' organisations and can provide thorough and objective data analysis and gain calculations on both greenhouse gas emission and cost reduction possibilities. In this project, on behalf of the CO3 consortium, TRI-VIZOR acted as neutral trustee and facilitator for JSP and Hammerwerk. The calculations by TRI-VIZOR showed that co-loading between JSP and Hammerwerk would result in double digit reductions in CO_2 emissions and transport costs.

The final step towards acceptance of and trust in the possibilities of horizontal collaboration in both organisations was proving that load bundling was operationally feasible. The organisation of two physically bundled test shipments, using two different vehicle types, was the ideal way to gain the trust of the last sceptics in the potential benefits of this horizontal collaboration.

It is one thing set up a successful test shipment for horizontal collaboration, but it takes far more effort to solidify the horizontal collaboration: a fair mechanism to share the costs and benefits needs to be agreed upon, the shared processes of the horizontal collaboration community need to be designed and documented and training needs to take place. Last but not least, a suitable transport provider must be selected to operate the bundled loads on a daily basis. TRI-VIZOR assisted JSP and Hammerwerk in all of the above steps of the process.

A multilateral contract between JSP, Hammerwerk and HS-Line is not part of this test case. Although it is the ambition of CO3 to develop and test such innovative legal frameworks in practice, due to the limited freight flow volume of this community and the fact that the Czech Republic is not a core jurisdiction for CO3, it was decided to save this effort for later test cases.

JSP and Hammerwerk recognize the fact that it would have been very hard to get this bundling project up and running without external support. They are very thankful for the support of the CO3 project to realize this innovative breakthrough project.

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