

Simple model for a shipper to determine an optimal logistics outsourcing strategy¹

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Abstract: This white paper presents a simple model which shippers can use to determine whether they should outsource their logistic activities and, if so, what the best form of outsourcing is. The model identifies two main criteria for determining the optimal logistics outsourcing strategy: first, the degree of complexity (relatively standardized logistics in a limited chain or advanced logistics where there is a volatile demand pattern in a widespread network); and second, the degree of strategic importance of the logistics activities (is the focus mainly on cost-efficiency or does logistics contribute significantly to the creation of customer value and competitive advantage of the shipper?) Depending on the specific logistical circumstances, this leads to a shipper (as the purchaser) choosing one of the four archetypes of logistics outsourcing, namely: [1] not outsourcing (Do-It-Yourself); [2] outsourcing to the lowest-bidding logistics service provider (Price Buyer); [3] outsourcing to a specialist logistics service provider (Expertise Buyer); or [4] strategic collaboration with the logistics service provider (Partnership).

1. Introduction

One of the fundamental questions for a shipper is “should I handle the logistic activities myself or is it better to outsource these, and if I do outsource, what is the best way to do so?” Although a simple enough question, alas there is no unequivocal answer. Actually, the answer to this ‘outsourcing question’ will depend on many factors, including:

- The strategy of the organization, i.e. how are customer value and competitive advantage created and what is the role of logistics & supply chain in the organizational strategy;
- The product-market combination as different products and different markets require a different approach;
- The specific logistics activities such as haulage, stock holding, storage & handling, warehousing, value-added activities (such as assembly and repackaging, testing or customization), IT facilities or (various forms of) supply chain orchestration and taking care of the shipper’s needs;
- The availability of logistics service providers being able to perform the required activities at a value-for-money price.

This white paper discusses a simple model which shippers can use to determine the ‘optimal’ logistics outsourcing strategy while taking into account all specific circumstances and factors.

It should be noted here that logistics outsourcing indeed is a ‘strategy’ because it is a long-term decision; once the decision has been taken, it normally remains in place for a number

¹The model discussed in this white paper was devised jointly with Thomas van Vliet (DSV), Martijn Lofvers (Supply Chain Media) and Jack Pool (Districon). The discussed model was used as the basis for a free interactive web-based tool called ‘Supply Chain Satellite’; see the appendix to this white paper.

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of years as it is part of the supply chain design that is reused time and again in an operational sense. It is also for this reason that the outsourcing decision must fit in with the organization's long-term strategic objectives.

Although this white paper concerns the 'outsourcing strategy', keeping all logistics in-house is also an explicit decision alternative. In other words, a shipper handling the logistics itself is also considered to be a viable (outsourcing) strategy.

To avoid confusion, it is important to draw a distinction between the aforementioned strategic outsourcing decision and the day-to-day operations (which relate to operational decisions). This can be illustrated by the following example. Suppose a shipper chooses to purchase all haulage by using the 'spot market' (a portal which matches supply and demand). In that case the strategic decision is to outsource the haulage and the organization will not have its own drivers and trucks. Another example is a shipper who prefers to operate its own haulage and hires in additional haulage externally when it is really necessary to do so. In that case the strategic choice is not to outsource, even though from an operational perspective logistics services are sometimes used.

Of course, the adage 'it takes two to tango' applies to any case of outsourcing; i.e. there will always be interaction between the shipper and the provider of the logistics services³. Nevertheless, the model discussed in this paper is based only on the perspective of the shipper; it is about the 'optimal' choice for the shipper.

The remainder of this white paper is structured as follows. The next section provides a brief account of the reasons for outsourcing or not outsourcing logistics, after which section 3 considers the need for a logistics outsourcing strategy to be determined for each specific logistics circumstance (for a given product-market combination and a given type of logistics activity). Section 4 divides the decision criteria for the logistics outsourcing strategy into two categories, which together make up the most important input for the choice of a logistics outsourcing strategy. Section 5 presents the model which can be used to determine which of four 'archetypes' is the 'optimal' logistics outsourcing strategy. Finally, section 6 highlights some closing reflections on the model.

2. To outsource or not to outsource logistics?

Traditionally, logistics activities were always carried out by the shipper itself, with or without the aid of haulers. From the 1980s, increasing numbers of more specialist logistics service providers (LSPs) came onto the market and the outsourcing issue became ever more relevant. A major catalyst for outsourcing was the 'core business' philosophy. By having your organization specialize in, and concentrate on, what it was really good at, and by having everything else carried out by parties concentrating on and specializing in other activities, everyone benefits. It is this philosophy that has given an enormous boost to global productivity and that has led to longer and more complex global supply chains⁴.

³ In addition to rational considerations also other factors play a role here, see [Visser, 2010].

⁴ See for example [Friedman, 2005].

In a generic sense various arguments can be put forward for outsourcing logistics, such as:

- *Cost reduction*: because an LSP can combine activities for various customers, these can be carried out more efficiently (through economies of scale), thereby also lowering the cost for the shipper;
- *Cost variabilization*: when handling logistics itself, a shipper generally invests in fixed costs (i.e. capacity in terms of people and resources). Upon outsourcing, the shipper would mainly have variable costs; i.e. the more logistics services are used, the more is paid. From an accounting perspective outsourcing has the advantage that a shipper would not have to hold any assets on its balance sheet, so that cash is freed up to invest in other things, i.e. there is an improved liquidity and solvency⁵. The return on equity, an important metric of financial performance, will also improve. Moreover, variable costs usually are clearer and easier to control than fixed cost;
- *Spreading of risk*: since the LSP's production resources are used, part of the risk can also be laid off to the LSP. This specialist LSP will probably also be better able to manage the specific risks, thereby lowering the overall supply chain risk;
- *Expertise and quality*: the LSP knows the business like the back of his hand and can use the latest resources and methods. The shipper can take advantage of this without having to invest large sums itself. Especially where there are relatively many and/or major logistics innovations, it is attractive for shippers to use an LSP rather than having to invest a lot of money, time and energy in such innovations;
- *Volume flexibility*: particularly where there are sharp fluctuations in demand and supply, a shipper handling its own logistics will have to maintain overcapacity, allow longer delivery times or carry more stock⁶. Outsourcing logistics gives the shipper more flexibility without the above-mentioned disadvantages (or at least to a far lesser extent), for example because the LSP can combine various seasonal cycles;
- *Unburdening*: organizing logistics is an expertise in its own right and involves daily activities, particularly at the operating level. This can demand a great deal of management attention. Specifically if logistics is not considered to be a principal activity to the shipper, it can make sense to transfer it to others to obtain peace-of-mind in this area;
- *Supply chain coordination*: if there are a large number of customers and/or suppliers in a market, an LSP can take on the role of supply chain orchestrator. In construction logistics, for example, an LSP can coordinate all haulage movements to and from a construction project and thereby achieve better logistics performance (less nuisance, better availability, lower stocks) than individual shippers can.

Next to the advantages of logistics outsourcing, there are also disadvantages⁷, for example:

- *Interface management*: if the logistics is outsourced, there is automatically an interface between the shipper and the LSP. Obviously, that interface has to be managed. In addition to the fees charged by external advisers and lawyers, this can require a lot of management time and attention, for example in tendering, contract management and assessments.

⁵ A quantitative model for outsourcing based on this type of financial data is provided in [Baxendale, 2004].

⁶ This phenomenon is known as the "fundamental law of factory physics", see [Hopp & Spearman, 2011].

⁷ See for example [Cox, 2013].

- *Loss of control*: however good the agreements are, inevitably outsourcing implies that the shipper loses control to some extent. After all, the shipper can no longer prescribe exactly what the LSP must do. This can be a constraint on a shipper, particularly if the LSP underperforms. Furthermore, while the shipper cannot influence all the risks borne by an LSP, it can still be affected by situations in which the LSP fails to perform (even when the LSP is not to blame for this);
- *Hidden costs*: experience shows that changing or unexpected circumstances can lead to situations for which no prior allowance was made. For example, if the volume of logistics services has grown higher than expected, it is possible that substantial additional costs will have to be paid, over and above the contractual agreements. Conflicts may also arise because in such situations the LSP's interests are not always the same as the shipper's;
- *Transitional problems*: outsourcing a primary activity such as logistics is often associated with major changes. Processes have to be redefined, systems have to be aligned and transitional arrangements have to be made for the staff. Such changes often prove difficult and can harm the atmosphere in the company, customer relations and the company's reputation⁸;
- *Less customer contact*: logistics often constitutes a direct link between a shipper and its customers. The outsourcing of logistics removes this direct link and may therefore deprive the shipper of important insight into its customer's processes and requirements;
- *Lower innovation potential*: innovations can take place in all kinds of areas. If the logistics has been outsourced, an organization often has less scope to initiate innovations in logistics. That is particularly true at the current time, with highly relevant logistics innovations such as platooning, 3D printing, drones, robotics, the Internet of Things and all kinds of other IT innovations;
- *Spill-over*: the information and knowledge supplied by the shipper could potentially be used by the LSP not only to provide good services to the shipper but also for its own purposes and/or for services for the shipper's competitor⁹. This could potentially harm the shipper's competitive position;
- *Lock-in*: outsourcing the logistics services may make the shipper highly dependent on the LSP. There may then be a danger of the LSP using its power position to vary the financial and other terms of the contract.

Opponents of outsourcing, including logistics outsourcing, also point to the fact that some of the cited benefits only apply to a limited extent. For example, an organization can obtain a very clear idea of its own logistics costs, if required, by applying the principles of value-based costing. They warn¹⁰ against a 'headlong rush' and argue that prior to outsourcing the company should put its 'own house in order' before the actual advantages of outsourcing become clear.

⁸ Such risks are discussed extensively in [Shi, 2007].

⁹ This is sometimes also referred to as 'poaching', see for example [Aron et al., 2005].

¹⁰ See for example [Verhoeven & Van Weele, 1998].

3. Choice specific to product-market combination and logistics activity type

The preceding section shows that there are various reasons for outsourcing or not outsourcing logistics. The conclusion must therefore be that neither logistics outsourcing nor handling logistics in-house will be the right choice under all circumstances; the choice depends on the circumstances and on how the shipper wants to compete. The next section therefore discusses two important criteria on the basis of which a shipper can choose a specific logistics outsourcing strategy. However, before examining these two criteria, it is important to determine which product-market combination and which logistics activities the outsourcing strategy relates to. The reason why this must first be established is that different product-market combinations and different activities entail different situations, which consequently require different logistics outsourcing strategies. Two examples are given below to clarify this point further.

The first example concerns the specific product-market combination for which a logistics outsourcing strategy has to be determined. Here a distinction can be drawn between functional and innovative products. *Functional products* come relatively late in the product life cycle, are not particularly distinctive, have a relatively low contribution margin and demand is readily predictable; in short, they have the characteristics of commodities. Examples are all kinds of consumer goods, such as milk in supermarkets, pans in household goods, black socks in clothing, et cetera. On the other hand, there are *innovative products*. These come relatively early in the product life cycle, are still being developed, demand is difficult to predict and the margins are relatively high. Typical examples are computers, smart-phones and fashion goods. The aforementioned two types of products should have totally different supply chains¹¹. In the case of functional products there needs to be an 'efficient supply chain' with cost optimization as the main driver. Innovative products require a 'responsive supply chain' that can react fast and flexibly to volatile customer demand. Different types of supply chains naturally also require different approaches to the logistics outsourcing strategy. Moreover, different markets can be situated in different parts of the world where different cultures, different distribution chains and different kinds of infrastructure play a role¹². In summary, it can be concluded that different types of product-market combination typically would require different logistics outsourcing strategies.

The second example concerns the specific logistics activity itself. The so-called *Kraljic Matrix* is often used to determine the 'optimal' purchasing strategy for products and services¹³. This matrix draws a distinction based, first, on the financial impact of the service to be purchased and, second, on the extent to which specific services are available in the market. According to the Kraljic Matrix, if there are many suppliers able to supply the service, it is advisable to conduct regular tenders based on price as the principal award criterion. The idea behind it is that the purchaser (in this case the shipper) has a certain 'market power', and since there are no significant differences between the suppliers (the LSPs), 'price' should be the main assessment criterion. A typical example of such a logistics activity is 'no-frills haulage'. On the other hand, however, if there are only a few specialist providers who can supply the service, then (according to the Kraljic Matrix) a 'partnership' should be formed. The rationale for this is that such a service provider is too important for the organization to lose. An

¹¹ See [Fisher, 1997].

¹² See also [Weidenbaum, 2005].

¹³ According to the purchase portfolio model as published in the renowned article [Kraljic, 1983].

example of such a logistics service could be 'door-to-door temperature-controlled transport'. In summary, the choice of a particular logistics outsourcing strategy typically would depend on the specific logistics activity involved.

As stated above, the model discussed in this white paper is only applicable to a specific product-market combination and a specific logistics activity. In the remainder of this white paper this will be referred to simply as the '*specific logistical circumstances*' (SLCs). Of course, a shipper may simultaneously have different product-market combinations and/or different logistics activities, i.e. different SLCs. This is not a problem, however, because the model can be used on several situations, i.e. for each SLC separately. It may turn out, for example, that some logistics activities are outsourced for certain product-market combinations but others are not. Such a result is not unusual in itself; strategy should not be a matter of 'one size fits all'.

4. Criteria for decisions on logistics outsourcing

This section discusses the two important criteria¹⁴ on the basis of which the logistics outsourcing strategy can be determined for a given SLC.

The first criterion is '*the strategic importance of logistics*'. This means the extent to which logistics plays an important role in the organization with regard to creating competitive advantage and customer value. For example, if logistics is an important means of providing customers with unique, tailored services, the strategic importance is 'high'. If the main purpose of the logistics is to deliver a given basic quality at the lowest possible cost, the strategic importance is 'low'.

More specifically, determining the strategic importance of logistics requires the following assessments for a given SLC:

- The frequency with which logistics and supply chain issues arise on the agenda of the directors/board/management team (the more often, the more strategic);
- The extent to which innovation and continuous improvement of logistics processes influence the organization's competitive position (the greater the influence, the more strategic);
- The extent to which the quality and flexibility of the logistics service directly impacts perceived customer value (the greater the perceived impact, the more strategic);
- Demands made by customers in terms of delivery time (the higher the demands, i.e. the faster the required delivery, the more strategic);
- The importance of a short time-to-market in product launches (the more important, the more strategic);
- The extent to which the reliability and dependability of the logistics directly influences the customer's primary processes (the greater the influence, the more strategic);
- The degree of strategic importance of 'operational excellence' (the greater the importance, the more strategic);

¹⁴ In a certain sense a high degree of simplification is introduced by placing all the advantages and disadvantages as discussed in section 2 in just two main criteria, hence the term 'simple model'. In the academic literature there are also 'more complex' methods for determining a logistics outsourcing strategy in which multiple criteria can be weighed against each other more explicitly, see for example [Grewal et al., 2008].

- The importance of variable costs for pricing and profitability of the products (the greater the importance, the more strategic);
- The level of logistics costs as a percentage of revenues (the higher, the more strategic);
- The degree of transparency and visibility which customers demand in the logistics processes (the higher the transparency requirements, the more strategic).

The second criterion on the basis of which the logistics outsourcing strategy can be determined concerns the '*complexity of the logistics*'. If the logistics mainly comprises a large number of frequent, relatively simple actions which could be carried out by many LSPs, the complexity is 'low'. If it concerns specific, infrequent activities linking very many different suppliers and customers, responding fast and flexibly to constantly changing requirements, the complexity is 'high'.

On a more detailed basis, the degree of complexity of the logistics in the SLC can be determined on the basis of the following assessments:

- The extent to which the demand for products is seasonal (the more so and the greater the fluctuations within a particular year, the higher the complexity);
- The degree of volatility¹⁵ (variability, turbulence, uncertainty) of demand (the more volatile, the higher the complexity);
- The number of different SKUs (the more SKUs, the higher the complexity);
- The extent to which the size of different customers varies (the more variation in size, the higher the complexity);
- The extent to which customers operate in different sectors (the more sectors, the higher the complexity);
- The size and diversity of the pool of suppliers of raw materials, components and products (the bigger the pool, the higher the complexity);
- The percentage of international customers (the higher the percentage, the higher the complexity);
- The extent to which the various goods require 'customer clearance' (the more required, the greater the complexity);
- The extent to which suitable LSPs are available (the fewer available, the greater the complexity);
- The extent to which expertise in the specific sector or for the specific product is important in the hiring of logistics and supply chain professionals (the more important the expertise, the higher the complexity).

In order to determine the 'optimal' logistics outsourcing strategy for a specific SLC, it is first necessary to determine the strategic importance and the complexity of the respective SLC (using the above assessments). With these data, it is then possible to use the model discussed in the next section to determine which of four possible archetypes of logistics outsourcing strategy best suits the SLC.

¹⁵ In some cases 'volatility' is seen as a separate third criterion alongside strategic importance and complexity; see for example [Pandey & Bansal, 2008].

5. Model for logistics outsourcing

When a shipper has been specified how a given SLC should be assessed with regard to the extent of ‘strategic importance’ and the degree of ‘complexity’, it with the aid of figure 1 it is possible to determine which of the four ‘archetypes’ of logistics outsourcing is most suitable. The four archetypes and their characteristics are discussed briefly below.

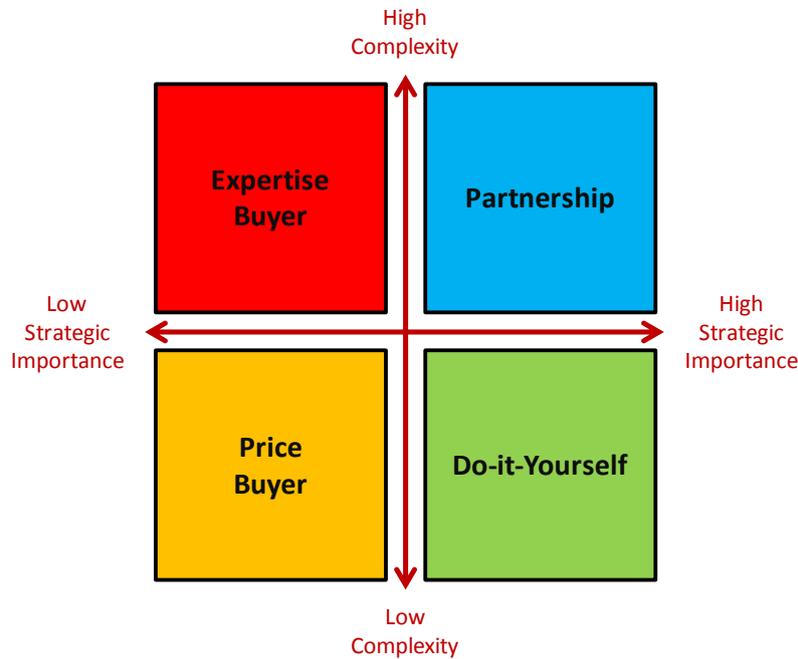


Figure 1: Model for determining the best logistics outsourcing strategy

Do-it-Yourself

The shipper opts to carry out the logistics activities falling within the SLC itself, and therefore does not use an LSP or does so only occasionally. The shipper invests in people and resources to carry out the relevant logistics activities. The most important consideration in under this strategy is the optimal functioning and continuous improvement of the current working methods.

Possible reasons for choosing Do-it-Yourself are that customers can be offered customized logistics services, enabling the company to stand out from the competition. In addition, the logistics activities concerned are not so complex that external expertise is really necessary. In short, in the assessment discussed in section 2, Do-it-Yourself is clearly preferable to (various forms of) logistics outsourcing.

Price Buyer

The logistics is outsourced and ‘lowest price’ is the most important assessment criterion when selecting the ‘best’ LSP. Such a strategy can be fulfilled by entering into a fixed-term contract for which various LSPs are invited to tender by submitting a bid (essentially the price charged if the contract is won). It is also possible to use digital or other markets in which demand and supply are matched by price-setting mechanisms.

If there are contracts with LSPs, these are entered into for a relatively short period. The Price Buyer outsourcing strategy is therefore fairly operational in nature. The relationship between the shipper and the LSP is relatively superficial; one issues instructions and the other fulfils them to the best of its ability. Price Buyer contracts are often very detailed with

all kinds of specifications and there are generally extensive inspections and controls to ensure that the LSP actually adheres to the agreed terms¹⁶.

The Price Buyer outsourcing strategy suits a situation in which logistics is not given any distinctive character and the main aim is to carry it out at the lowest possible cost. This may be the case, for example, if the logistics department in the organization is a cost centre. Because the logistics is relatively simple, there are many potential suppliers and the shipper can take advantage of this wide offering by changing LSP relatively frequently and choosing the cheapest each time¹⁷.

Expertise Buyer

In the case of Expertise Buyer, the (highly complex) logistics activities are outsourced to an LSP who can be seen as an 'expert' in that field. The LSP is therefore selected for his knowledge and formal qualifications¹⁸, for the use of state-of-the-art technology and the acquired experience that is applicable to the SLC.

Expertise Buyer suits a situation in which there are complex logistics activities which a shipper does not wish to handle himself but where 'costs' are the main performance metric. In other words, the main aim in expertise purchase is that the complex logistics activities are carried out to a high standard (something which only a genuine expert is able to do), but within that overall precondition cost reduction is the most important objective.

The Expertise Buyer strategy involves an entirely different process than the Price Buyer strategy, for example because the shipper's role changes from being an 'instructing expert' to being a party 'recognizing an LSP as an expert' and from 'retrospective supervision' to finding the 'most suitable expert' in the preparatory phase. In that sense the Expertise Buyer method is closely linked to the ideas underlying 'best value procurement'¹⁹. In the case of Expertise Buyer, the agreements with the LSP are for the long term and collaboration takes place on a program of continuous improvement in cost reduction.

Partnership

In a Partnership the shipper and the LSP pursue synergy-based collaboration from which both parties benefit (win-win) in terms of competitive advantage, customer value, learning capacity, market development, sustainability and profitability. In a Partnership both parties invest in each other and the logistics and other processes between them are improved continuously. Collaboration also takes place on innovations. Partnerships have a long-term perspective and are based on mutual trust²⁰. In a certain sense there is also a high level of interdependence.

When looking for a 'good' partner²¹ it is important for a shipper to ensure that there is a 'structural and cultural fit'. The formation of a Partnership is not simply a question of signing a contract. It takes time and energy to get to know each other better, to understand each other's strategic goals and build on mutual trust.

¹⁶ The term 'contract management' is used, however, in this context.

¹⁷ Such an approach may also have downsides if this 'purchasing power' is abused.

¹⁸ Certificates, accreditations et cetera.

¹⁹ See for example [Kashiwagi, 2004].

²⁰ A workable definition of trust is "belief in the other person's competence, honesty and will to do good".

²¹ If, unexpectedly, such a strategic partner cannot be found, this may be a reason for 'insourcing' such activities, i.e. to start carrying out the logistic activities within the organization itself, see [Gottfredson et al. 2005].

The situation in which a Partnership is the best outsourcing strategy is characterized by a combination of high strategic importance and high complexity. As stated earlier, the establishment and maintenance of a Partnership requires a lot of effort and therefore only makes sense if it can make a genuine difference (i.e. if there is high strategic importance) and if the partner can add something which the shipper himself does not have (i.e. expertise in the complex logistics activities concerned).

6. Discussion and conclusions

By using the simple model discussed in the previous section, a shipper can apply two criteria (high complexity and extent of strategic importance, see section 4) to determine which of the four archetypes of logistics outsourcing is 'optimal' for each SLC (Specific Logistical Circumstance, see section 3). Below this white paper concludes with some final thoughts on the model and its use.

Although of a strategic nature, the outsourcing strategy will have to be evaluated regularly. Organizations often adhere to a particular outsourcing strategy because they have become so accustomed to it, whereas the circumstances, the SLCs, have actually changed²². And, as argued above, a different (or a change in an) SLC typically requires a different outsourcing strategy.

The presented model contains only four archetypes of logistics outsourcing. Of course, in practice all kinds of hybrid forms may arise. That would even be a 'good' choice in the case of average scores on the 'strategic importance' and 'complexity' axes. In other words, the model features a 'hard' transition from one logistics outsourcing strategy to another, but in practice that boundary will not be easy to define.

As stated above, a shipper must choose a logistics outsourcing strategy for each SLC separately. However, such an approach can give rise to problems when a shipper has a lot of different SLCs, each requiring a different approach. In such a situation a shipper may find the logistics outsourcing too complicated; which would be a reason for clustering SLCs, even if that does not produce the best choice for all individual SLCs. When making such choices, the importance of maintaining control of logistics activities must be weighed against the importance of the two criteria in the model.

A similar model with the same type of underlying logic with regard to the criteria of complexity and strategic importance can also be used for the outsourcing of other activities, such as IT, cleaning and security. For such instances, of course, a different, specific form of outsourcing must be implemented to meet the underlying requirements determining the position on the two axes.

²² See for example [Venkatesan, 1992].

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Appendix: Supply Chain Satellite²³

The model for determining an optimal logistics outsourcing strategy as described in this white paper has been operational through a free-of-charge interactive web-based tool called the ‘Supply Chain Satellite’ which can be found on www.supplychainsatellite.com. Upon opening the tool, you will see the start screen as in Figure A1.



Figure A1. Supply Chain Satellite start screen

By filling out several sets of questions (which in total takes approximately 15 minutes), the tool interactively shows your *perceived* optimal logistics outsourcing strategy, your *actual* (used, AsIs) logistics outsourcing and your *optimal* logistics outsourcing strategy (ToBe according to the model introduced in this white paper), see Figure A2.

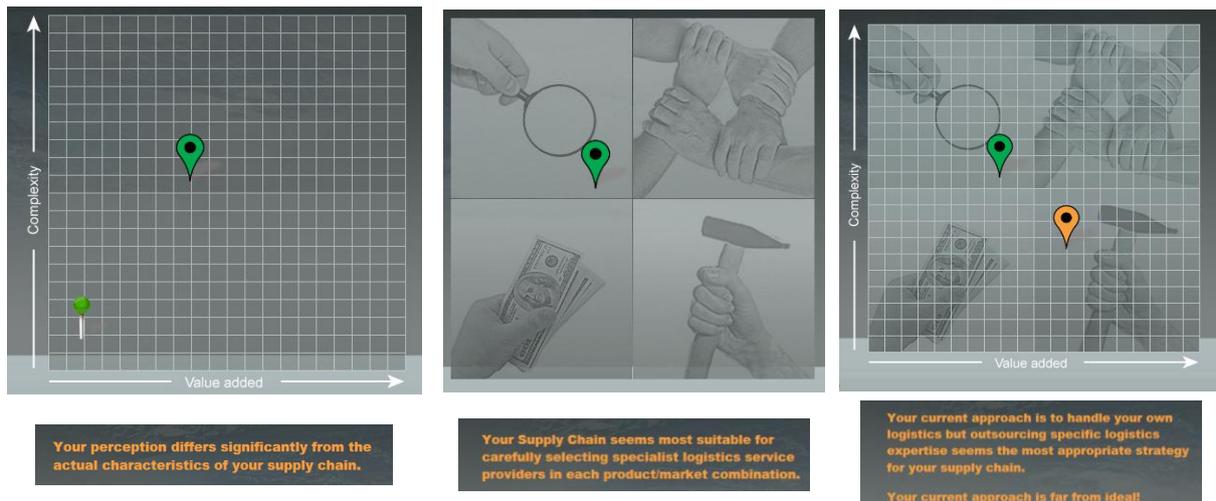


Figure A2: Example of results from Supply Chain Satellite; green pin is Perception, green drop is Optimal (ToBe) and orange drop is the Actually used (AsIs) logistics outsourcing strategy.

²³ The Supply Chain Satellite is a joint initiative of Districon, Supply Chain Movement, DSV and Nyenrode Business Universiteit.