

rethinking your supply chain strategy

A FIRST DRAFT

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*To the next generation
of supply chain practitioners*

“the first draft of anything is (expletive)”

— Ernest Hemingway

introduction to the problem - and to our take on it

If you are a supply chain manager, you may already know from firsthand experience that a variety of events may make you wonder whether it is time to change your supply chain strategy. Be it internal changes, such as a revision of the company's business strategy or the launch of new products; or external changes, such as tighter regulations, disruptive technologies, or changes in the marketplace that disrupt the business environment; or even the simple progression of a product along its life cycle: all these are events that require you to stop and reevaluate your existing supply chain strategy, to ensure it is still sound.

However, rethinking a supply chain strategy is not a trivial problem. Supply chains tend to be rather complex entities. It follows that the act of thinking strategically about them, what we call supply chain strategizing, reflects this complexity. The absence of an established answer in the supply chain management literature regarding how to rethink a supply chain strategy further compounds what is already a daunting problem.

Since 2005, a team of researchers at MIT's Center for Transportation and Logistics (CTL) has been researching the problem of supply chain

strategizing, as part of a project called Supply Chain 2020. After eight years of research in collaboration with world-class organizations, significant progress has been made. Although some questions remain open, we feel it is time to share with the community of supply chain managers the insights we have derived so far.

That is the purpose of this book. Through it we share with you our way of thinking about supply chain strategy (what we call ‘our philosophy’), and present to you with our way of tackling the problem of supply chain strategizing (what we call ‘our framework’.)

The nature of the problem

Before we introduce you to our philosophy and our framework, let’s discuss the nature of the problem that supply chain strategizing presents to supply chain practitioners.

The basic challenges

The first thing we must recognize about the problem of rethinking a supply chain strategy is that it presents not one *single* challenge, but a set of interrelated challenges. After many years working on the subject, we are convinced that, regardless of what approach you follow to tackle the problem of rethinking your supply chain strategy, you will face at least three distinct basic challenges, outlined in Figure 1 and discussed below.

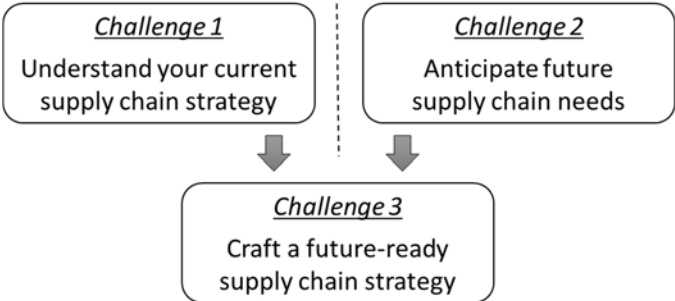


Figure 1. The basic challenges of rethinking a supply chain strategy.

Challenge 1: The first challenge is to *understand your current supply chain strategy*. By this we mean not only knowing what supply chain strategy you have in place *but* also recognizing its strengths and weaknesses. Understanding the current supply chain strategy of your company is fundamental, because whatever you have in place today will likely serve as the starting point for any subsequent supply chain improvement effort.

Understanding an existing supply chain strategy, however, is easier said than done, for two simple reasons. The first is that most supply chain strategies are not well defined: they are left tacit or poorly defined. The second reason is that often practitioners delude themselves into believing that their supply chains are doing today all sorts of nice things that they actually are not doing, all while ignoring the very real detrimental things that are actually taking place.

Challenge 2: The second challenge is to *anticipate the future supply chain needs* that the organization may encounter. These needs will depend on company-controlled factors, such as the organization's competitive strategy and any corporate strategy guidelines that the supply chain may be expected to follow. But they also depend on factors beyond the company's control, from the future market and the industry in which the company will compete.

The reason anticipating future needs is difficult is that understanding the factors underlying these needs is not trivial: if it is difficult to understand an organization's supply chain needs in the present, trying to anticipate what needs the future may bring is even harder. Yet, since strategy is crafted for the future, we need a way to improve our understanding of what the organization's supply chain needs may be in the future.

Challenge 3: The third challenge is to know what a new supply chain strategy should look like, given the anticipated future needs. The must support the expected future business strategy, and be able to function in the future business environment as we have envisioned it. At the same time, this new supply chain strategy should retain or improve all the good

features of the current supply chain strategy, while fixing as many of its weaknesses as possible. This two-fold goal, of fully supporting a new set of objectives while at the same time making as few changes as possible to the current supply chain strategy is a tall order. Due to the complexity of the challenge, it is very easy to create new problems as we try to fix existing ones.

It's complicated!

Another thing we must recognize about rethinking a supply chain strategy is that it is complicated! To be more specific, it is what we would call a complex problem, as opposed to a well-defined problem.¹ Let's see.

A *well-defined problem* is one where:

- we know exactly what our desired outcome looks like, and
- we have a set of well-defined criteria to evaluate the outcome;
- we know exactly all facts are relevant to the problem; and
- we know all the ways in which we can intervene, and can predict with precision all the consequences of each intervention.

Furthermore, a well-defined problem is usually limited to:

- problems that are static (e.g. that remain unchanged unless we intervene), and to
- problems that are relatively easy to comprehend.

On the other hand, a *complex problem* is one where:

- multiple goals – often at odds with each other – are pursued;
- the desired outcome is stated in relatively vague manner;
- we do not have clear-cut criteria to evaluate the desired outcome;
- we do not know all the facts that are relevant to the problem; and
- we cannot predict the outcome of every possible intervention.

Complex problems often include:

- problems that are dynamic (e.g. where things may change even if we do not intervene), and

¹ This section and the next are based on the influential ideas of Dietrich Dörner.

- problems that are relatively hard to comprehend.

Like most problems that matter in business (and in life), rethinking a supply chain strategy is nothing like a well-defined problem; instead, it has all the features that make it a complex problem, as outlined above.

Rethinking a supply chain strategy requires us to pursue multiple goals, on areas that are often entangled by trade-offs; goals that can seldom be stated in precise terms. We often lack specific criteria to evaluate whether the goals pursued by our supply chain strategy have been achieved. We certainly do not know all the facts that are relevant to the supply chain's future business environment, nor can we predict with certainty the outcome of every possible decision we make regarding it.

Due to the continuous changes that take place in the business environment, the problem of rethinking the supply chain is dynamic, not static: things will change in time, even if you do nothing to change them. Furthermore, since supply chains tend to be large in scale and complex in nature, supply chain strategies tend to be neither simple nor easy to comprehend, and we often have to make decisions based on incomplete, inexact and even incorrect information.

Since rethinking a supply chain strategy is a *complex problem*, in order to tackle it we must learn how to deal with complexity.

Complexity: Objective vs. Subjective

In order to better deal with complexity, we must distinguish between two types of complexity: *objective* and *subjective*. To illustrate the difference between the two, let's use an example from everyday life: a game of chess.

Imagine a chess master pondering her next move. In front of her is a board where the first moves have led to the Sicilian Najdorf. The Najdorf is widely regarded as one of the most complex openings in all of chess, because it can transpose into many other, wildly different systems. The intrinsic complexity of this chess position is what we would call ***objective*** complexity: it is inherent to the problem itself, and is proportional to the number of elements in the system, the number of their possible states, and

the number of relationships between elements and states. Objective complexity is *absolute*: it is independent of who is addressing the problem.

Now, imagine that our chess master looks to the adversary sitting in front of her. She knows this adversary from previous games: a young rookie from the local chess club, not particularly good in the Sicilian and with a reputation for making blunders under time pressure. "I can beat him easily," she thinks. Then our chess master looks at the chess clock ticking next to the board: she has more time left in the clock than her opponent has. "I also have a time advantage," she thinks. The relative complexity that the same chess position presents to each of the players, given their respective level of skill and the time they have left in the clock is what we would call *subjective* complexity: it is determined by the objective complexity of the problem, for sure, but not exclusively. It is also determined by the capacity of the person tackling the problem, by their ability to understand the system, and by the time pressure exerted upon them to make decisions and find a solution. Subjective complexity is relative: it depends on the problem *and* on who is addressing the problem.

Objective and subjective complexity are different in nature. The things we do in order to overcome them or *tame* them are also differently.

Prescriptions to tame complexity

When it comes to dealing with complexity, there are bad news and good news. The bad news is that we can't eliminate complexity. It is a fact of life and we have to learn to live with it. The good news is that, even though complexity cannot be eliminated, we can learn to tame it. We may even use it to our advantage: chess world champions Bobby Fischer and Gary Kasparov were assiduous players of the Sicilian Najdorf.

Complexity is like a lion: it will *always* be a wild animal, but it can be taught some manners and even be turned into an ally. Below we present seven prescriptions that will help you tame complexity, to render it manageable. The first three will help you reduce subjective complexity:

Rx #1: Reduce the objective complexity of the system.

Rx #2: Increase your ability to understand the system.

Rx #3: Reduce time pressure in decision making.

The next four prescriptions will help you define the problem better.

Rx #4: Clearly specify the desired end state.

Rx #5: Tend to conflicts between partial goals.

Rx #6: Increase your knowledge about the structure of the system.

Rx #7: Get more complete information about the system.

By the time you are done reading this book, you will have received instructions regarding how to apply each one of these seven prescriptions to deal with the complexity of supply chain strategizing. In the meantime, put a pin on them, and let's take a look at the ideas behind our approach to supply chain strategizing.

Our philosophy

Having described in broad terms the nature of the problem of supply chain strategy, we now move to outlining the ideas that drive our approach to this problem. An easy way to outline our philosophy is by pointing out some ideas that we reject and some ideas that we embrace.

Type-based vs Specific

We reject the idea that supply chain strategies can be described by means of *types*. For the last fifteen years, most research into supply chain strategies has been conducted based on the assumption that it makes sense to describe supply chain strategies using a limited number of clear-cut types: a responsive supply chain strategy, an efficient supply chain strategy, etc. A multitude of claims have been made using type-based approaches. Fisher's two-by-two matrix may be the most famous among these claims: a responsive supply chain strategy is a good match for innovative products, whereas an efficient supply chain strategy is a good match for functional products.

Such claims are very appealing, because they are intuitive and easy to grasp. However, empirical studies conducted to test their validity have

found that the reduction of supply chain strategies to a few mutually exclusive types is not realistic. Real supply chain strategies are richer, more nuanced and more complex than what a single type or label can express.

Our approach to supply chain strategy has a different take on the matter: we see each supply chain strategy as a complex, nuanced and distinct entity. Therefore, we strive to describe it and evaluate it in terms *specific* to its own features and context. Companies are so peculiar, their supply chains are so diverse, and their business environments are so particular, that when it comes to discussing a supply chain strategy it makes no sense to talk in general terms. We believe it is better to discuss things in terms specific to each situation: e.g. whether a specific supply chain strategy can support a specific business strategy within a specific business environment. Such an approach takes more time and effort, but is more realistic.

Best practices vs Tailored practices

When a given practice has produced good results in contexts A and B, there is a natural temptation to apply it also in context C. Practices that have produced good results in the past when applied by others are often called *best practices*, with the implication that if I were to apply them now, I would also get good results. Because what's sauce for the goose is sauce for the gander. Right? Wrong. We take the idea of *best practices* with a grain of salt, because we think the efficacy of a practice depends on a plethora of factors regarding the context in which the practice is applied.

Generalizing best practices, even within the same industry, is a perilous enterprise. Attention should be paid to the peculiarities of each company, including its strategy, its culture and its business environment. When it comes to supply chain strategizing, one size does not fit all. Instead of copying what others have done elsewhere, it makes more sense to tailor a company's practices to its particular situation: its culture, its strategy, its business environment. This is what we call *tailored practices*. The idea is not to ignore all the lessons of the past, reinvent everything from scratch: there is obvious value in learning from what others have

done. But whatever lessons we learn from others should be tailored to suit our own particular situation.

External and Internal Wisdom

An additional and related distinction we want to make is that between what we call *external* and *internal* wisdom. **External wisdom** refers to claims to knowledge that have been derived outside of our organization, either as the result of empirical studies or just as the expert opinion of respected practitioners. The following are examples of external wisdom:²

- Fisher's claim that innovative products are better served by supply chains focused on responsiveness, instead of focused on efficiency.
- McKone-Sweet and Lee's finding that companies whose facilities are geographically closer to each other tend to perform better.
- Lee's claim that a supply chain can be at the same time agile, adaptable and aligned, and that being so will result in better performance.

It would be foolish to ignore external wisdom: there is much we can learn from the experience of others, from their past successes and failures. However, it would also be foolish to accept claims from external wisdom without first asking what evidence is there to support the claims, and under what circumstances would the claim hold true.

Internal wisdom refers to the knowledge that an organization can distill from its own experience, from bringing its own experts together and discussing, with the help of neutral facilitators, the nature of the challenges and opportunities facing the organization and the relative merits of the options available.

Our approach to supply chain strategy is based largely on internal wisdom. Of course we advise that practitioners stay abreast of the latest findings in the field of supply chain management, so that they can learn from the external wisdom published by experts and researchers in the field. But most importantly, we advocate that organizations take advantage of their own internal wisdom at the time of rethinking their supply chain strategy.

² Note for Chris and Shardul: I am writing from memory here. I have to go to the original sources and confirm the exact nature of the claims.

Fundamental tasks

We have identified at least seven distinct, fundamental tasks that must take place in order to rethink the supply chain strategy of an organization. These tasks are outlined below, in a sequence that roughly follows the order in which they would be conducted.

Task #1: Scoping

The first of the fundamental tasks, **Scoping**, is about defining the boundaries of the supply chain whose strategy we will rethink. This boundaries are drawn along different axes of complexity, such as time horizon, geography, product types, supplier types, customer types, and channels.

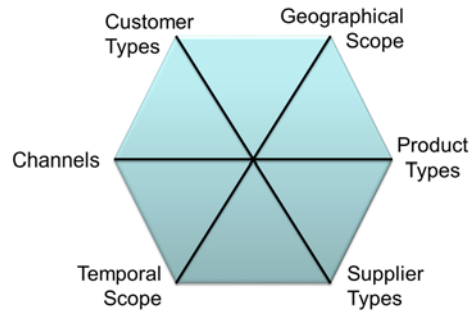


Figure 2: Axes of complexity

Scoping is a balancing act along the axes of complexity.

A *narrow* scope (i.e. only one product type, one customer type, one channel, one supplier type, a 1-year time horizon and a single geographical region) would be relatively easy to handle, but it would likely provide a rather poor representation of reality: it would be an oversimplification of a much richer problem.

A *wide* scope (i.e. all product types, all customer types, all channels, all supplier types, a 20-year time horizon and all geographical regions) would more accurately capture the richness of the real problem, but it would likely become intractable as a problem due to its complexity.

A *good* scope will balance simplicity and realism, result in a challenging yet manageable exercise that is both realistic and tractable as a problem.

Let's see an example. Imagine that Coca-Cola wanted to rethink its supply chain strategy. The first task is to scope the problem. Including all of Coca-Cola's products sold in all its channels, to all its customers, from all its suppliers, in all its regions and over a long time horizon, would make the problem very realistic but too complex to be manageable. Limiting the problem to the supply chain of caramel flavor used for caffeine-free diet Coke sold retail in convenience stores in the Boston area over a single year would make the problem too simplistic to be useful. A better scope would be to focus on the supply chain for carbonated beverages sold wholesale to the top three customer types in the New England area over a five-year period, including in the exercise only suppliers of strategic raw materials. Since we lack first-hand knowledge of Coca-Cola's supply chain, this example is only an educated guess to illustrate what scoping is about.

Task #2: Visioning

The second fundamental task, ***Visioning***, is particularly relevant if the time horizon that was chosen through scoping is large enough to allow for dramatic changes to take place in the industry or the marketplace. If the time horizon chosen for the reformulation exercise is long relative to the clockspeed³ of the industry where we operate, the future business environment may be substantially different from the present business environment. As time goes by, important changes may take place in the market, the industry and the world at large. We want our supply chain to be prepared for these changes. That is what visioning is about: envisioning the future business environment where our supply chain may have to operate, so that we can anticipate its future challenges and opportunities.

How visioning should be done will be discussed in Chapters 3 through 5. For now it is enough to say that visioning reduces the likelihood that a future change will take you by surprise and require you to react in haste.

³ Insert reference to Charlie Fine's book here.

Task #3: Specification

The third fundamental task, *Specification*, is about clearly stating the specific objectives that we expect our supply chain strategy will fulfill. Taken together, these specific objectives specify the desired outcome of our effort, and thus provide a definition of success for the supply chain strategy. In defining specific objectives, one should be careful not to wade into describing the means by which the objectives should be pursued. Specification is about stating the desired *ends*, not about prescribing the *means* that must be used to achieve them. Making an analogy with engineering, specification is equivalent to the definition of specs for a given product. The specifications do not tell you how to design the product down to the smallest details, but it tells you what expectations there are on the finished design. Specification defines success for you, but does not map your way to achieve it.

How specification should be done will be discussed in Chapter 8. For now, suffice it to say that specification should consider the output of the visioning task, since our definition of success in a given future will depend on what we anticipate the future will look like.

Task #4: Articulation

The fourth fundamental task, *Articulation*, is about expressing a given supply chain strategy in explicit terms. When rethinking the supply chain strategy of an organization, there are multiple supply chain strategies that may be articulated. For sure, we must articulate the current supply chain strategy of the organization. But articulation is not limited to the current supply chain strategy: we can also articulate the supply chain strategy of a competitor, or a new supply chain strategy that we are considering as an alternative to replace the current one.

One of the major contributions of the Supply Chain 2020 Project is an approach to articulating a supply chain strategy as a conceptual system, that is to say, as a group of ideas working together towards common goals. Our proposed method for supply chain strategy articulation will be discussed in detail in Chapter 3.

Task #5: Evaluation

The fifth fundamental task, *Evaluation*, is about assessing to what extent a given supply chain strategy works towards achieving a desired set of objectives. This requires us to know both what supply chain strategy we are evaluating and what are the objectives that it should fulfill, which makes both Articulation and Specification prerequisites for Evaluation. How Evaluation should be done will be discussed in Chapter 4, where we present a set of seven evaluation criteria that any supply chain strategy, or functional strategy for that matter, should satisfy. These evaluation criteria are another contribution of the Supply Chain 2020 Project.

Task #6: Generation

The sixth fundamental task is the *Generation* of new ideas regarding what is possible in terms of the strategy. This is when we bring innovative and creative thinking into the process. The purpose of Generation is to innovate: to propose as many new good ideas as possible regarding how to improve our supply chain strategy. Creativity, not selectivity, is the goal here. Generation requires us to know that areas need to be improved upon, which makes Evaluation a prerequisite. It also requires us to know what objectives we are shooting for, which makes Specification a prerequisite, too.

Task #7: Selection

The seventh fundamental task is the *Selection*, among all the possible good ideas generated in the previous task, of the best ideas for our new supply chain strategy. This is when we bring rigorous and selective thinking into the process. The purpose of Selection is to retain as many good features of the existing supply chain strategy as possible, while replacing all the weak ones with new features, in a manner that is internally consistent and strategically aligned with the business strategy. Since it builds upon each of the previous tasks, they are all prerequisites for Selection.

In our approach, *Generation* and *Selection* are conducted hand-in-hand. They are conducted using a systematic method for strategy elaboration, an original contribution of the SC2020 Project, presented in Chapter 9.

Next: Implementation

After these seven tasks, we can proceed to the *Implementation* of the new supply chain strategy. Implementation is about translating the new supply chain strategy into action. Implementation is not in itself part of the the process of *rethinking* the supply chain strategy and is therefore outside of the scope of this book. Nevertheless, we offer some thoughts on implementation in Chapter 10.

Connecting the dots

The seven fundamental tasks we have outlined above are our answer to the four basic challenges that rethinking a supply chain strategy presents to practitioners. Below we discuss how the seven tasks address the four challenges (see Table 1.)

	Challenge 1	Challenge 2	Challenge 3
Task #2		✓	
Task #3		✓	✓
Task #4	✓		
Task #5			✓
Task #6			✓
Task #7			✓

Table 1: How the tasks address the challenges

Challenge 1 is to understand the current supply chain strategy, its strengths and limitations. Our response to this challenge is twofold:

- First, we conduct a *capture* exercise (**Task #4**). We have developed in-house a method to explicitly articulate the current supply chain strategy of a firm (what we call *capture*) in the form of a conceptual map, thoroughly grounded on factual activities, and showing the relationships of activities with their immediate goals, and of these with more abstract goals. This method is presented in Chapter 3.

- Second, we conduct a strategy *evaluation* exercise (**Task #5**). We have developed in-house a set of seven evaluation criteria, which - since they address matters like support to the business strategy, internal consistency and blind spots - are applicable to the company irrespective of its industry. We have developed mechanisms to apply many of these evaluation criteria for the evaluation of the current supply chain strategy of the organization, identifying - for example - where it could fail to deliver on the future set of objectives. These criteria and methods are discussed in Chapter 4. The result of the evaluation is a diagnostic of the strengths and weaknesses of the current supply chain strategy, and a clear indication of what can be kept and what must be changed for the future.

The capture exercise provides a solid foundation for the subsequent evaluation of the current supply chain strategy. Both will then serve as starting point for the elaboration of a new and improved supply chain strategy more adequate to the future needs of the organization. Developing a factual understanding of what your supply chain strategy is today takes time and effort, but it is the only thing grounding the subsequent strategy reformulation into the company's reality.

We recommend conducting the capture and evaluation of the current supply chain strategy in parallel with identification of the future supply chain needs. They would be done by a separate team of people, so as to avoid biasing the results of either exercise: were they to be conducted by the same team the temptation to paint a flattering portrait of the current state may prove too strong. By having separate teams doing these tasks, in parallel, we avoid contaminating the results of one with the findings of the other.

Challenge 2 is knowing what future expectations we want to set for the supply chain strategy. Our response to this challenge is conducting a visioning exercise (**Task #2**). As you will see in Chapters 5 through 7, our tool of choice for visioning is a method for scenario planning that was tailored to supply chain strategizing. The philosophy behind our scenario

planning approach, presented in Chapter 5, has at its core the premise that it is possible to prepare for the effects of unpredictable future events. Our method calls for generating a set of mutually complementary and individually challenging, plausible and relevant scenarios (covered in Chapter 6) and then for the distillation of insights regarding implications different futures may bring for the supply chain (discussed in Chapter 7). These implications, some of them robust, others contingent on future developments, will be priceless in informing the supply chain strategy formulation later on.

Based on these implications, and given a specific and agreed-upon business strategy for the company, it is possible to articulate a set of strategic objectives for the supply chain (*Task #3*). These objectives are the answer to the question: what do we expect our supply chain to be able to do in the future? The process of defining the objectives is what we call specification, and its importance lies on the fact that - taken together - these strategic objectives for the supply chain represent the definition of success for a supply chain strategy: they should be able to support the organization's business strategy in the future context that was envisioned. Specification is discussed as part of Chapter 8.

Challenge 3 is to know what our supply chain strategy should look like, given our future expectations. Our response to this challenge is conducting a strategy elaboration exercise that generates new ideas (*Task #6*) and selects the best among them (*Task #7*). We have developed in-house a method to elaborate a comprehensive, consistent and supportive supply chain strategy. This method is presented in Chapter 8.

Even though implementation is beyond the scope of the formulation process, implementing a new supply chain strategy generated through our method is easier than implementing an out-of-the-blue strategy: since both the current and the new supply chain strategies are articulated in a similar manner, it is easy to identify areas that require change. Sequencing those changes in a logical manner allows the organization to develop a

roadmap for the implementation of the new supply chain strategy. Some ideas on implementation are presented in Chapter 9.

The seven fundamental tasks outlined before are also in line with the seven prescriptions we issued to deal with complexity (see Table 2.) We will save this discussion for the end of the book.

	Rx #1	Rx #2	Rx #3	Rx #4	Rx #5	Rx #6	Rx #7
Task #1	✓						
Task #2			✓			✓	
Task #3				✓			
Task #4		✓					✓
Task #5							✓
Task #6						✓	
Task #7					✓		

Table 2: Relationship between tasks and prescriptions

CHAPTER TWO

a model for rethinking a supply chain strategy

Before we can *rethink* a supply chain strategy, we need to learn how to *think* about it in the first place. Supply chain strategy is an abstract concept, whose definition can be the subject of endless academic discussion. We have little interest in such debates beyond what is necessary to have a grounded and useful conversation about the challenges that the subject presents to people like you: real supply chain managers.

A definition of supply chain strategy

Through our collaborative management research projects, we have developed and refined a pragmatic approach to rethinking a supply chain strategy. A key part of that approach is a working *definition* of what we mean when we talk about the *supply chain strategy* of a business:

“The supply chain strategy of a business can be defined as the collection of general and specific objectives set for the supply chain, and the choices made to fulfill these objectives, with the purpose of aligning the operational practices of the supply chain with the overall strategy of the business.”

This definition has proven a useful foundation to our efforts.

Dimensions of the supply chain strategy

Thinking about a supply chain strategy requires us to think along multiple dimensions.

Supply-demand. The first one is the most obvious: it runs from supplier to consumer. The concept of a *supply chain* (or *demand chain*, as it is also called) immediately invites us to think along the supply-demand dimension. The overall objective of a supply chain strategy along this dimension is to successfully connect demand with supply.

However, the working definition of supply chain strategy that we have presented above suggests that we should also think along two more dimensions.

Thematic range. A second dimension cuts across all the supply chain relevant functions of the business, along what we call the *thematic range*. The overall objective of a supply chain strategy along this dimension is to harmonize the efforts of all the supply chain relevant functions towards the fulfillment of the business strategy.

The term “supply chain relevant,” which we will use frequently in this text and will often abbreviate as SCR, refers to anything that has an effect on the supply chain itself, irrespective of whether it falls under the jurisdiction of the supply chain *function*. Thus, for example, policies regarding forecasting, procurement, production and sales may very well be *supply chain relevant*, even though they would likely fall under the jurisdiction of other functions of the organization, or even its supply chain partners.

Strategy-operations. The third dimension we must consider runs from the top down, from the business strategy to the operations in the supply chain, along what we call the *strategy-operations continuum*. The overall objective of a supply chain strategy along this dimension is to serve as a logical bridge between the overall business strategy and the operational practices of the supply chain.

Around these three dimensions, we have developed a working model of a supply chain strategy in its general context. This model has been tested and revised through multiple collaborative management research

projects. The working model considers the supply chain strategy and the context where it operates. It also serves as platform to connect diverse techniques used in our approach. The different elements of the working model are explained below, one by one.

Bridging the gap

As we stated before, the supply chain strategy serves as the logical bridge between the business strategy and the operational practices of a business. To understand how this bridging occurs, it is useful to think of the business strategy and the operational practices as found at opposite ends of the strategy-operations continuum, with a gap between them (Figure 3.)



Figure 3: Gap between strategy and operations

Now examine Figure 4. The business strategy – found near the top of the continuum – is composed of concepts that are more strategic in focus, more abstract in nature, wider in scope and mostly about purpose.

The operational practices – found near the bottom of the continuum – are composed of concepts that are more operational in focus, more concrete in nature, narrower in scope and mostly about practice.

Bridging the gap between the two along the continuum is the supply chain strategy. The supply chain strategy is composed of concepts that are more operational than those in the business strategy, yet more strategic than those in the operational practices; more concrete than those in the

business strategy, yet more abstract than those in the operational practices; narrower in scope than those in the business strategy, yet wider in scope than those in the operational practices; and more about practice than those in the business strategy, yet more about purpose than those in the operational practices.

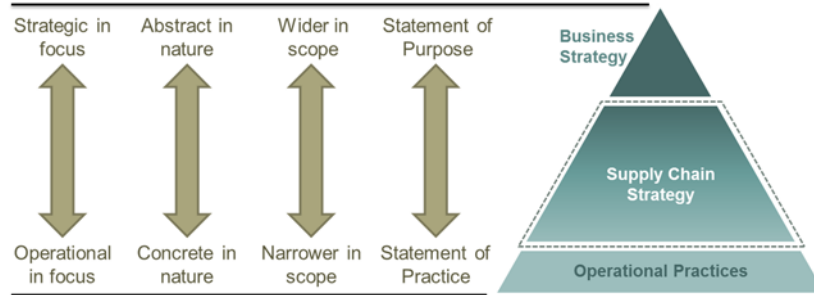


Figure 4: Supply chain strategy as a bridge across the gap

Adding granularity

In Figure 4 we talked about the business strategy and the supply chain strategy as single entities, we will now add granularity to them by slicing them into finer elements along the continuum.

The **business strategy** is typically articulated in the form of a short mission statement, which we call the strategy **Core**, and a set of four to five general statements of purpose, which we call the strategy **Pillars**. These two layers of elements, the Core and the Pillars, are easily found explicitly stated in most business strategies. In Figure 5, the letter C refers to the Core.



Figure 5: A business strategy decomposed into elements

The supply chain strategy, in turn, can also be sliced into finer layers of elements along the continuum, as shown in Figure 6: general objectives

for the supply chain (which we call **Principles**), specific objectives for the supply chain relevant functions (which we call **Imperatives**), and specific decisions made to support these objectives (which we call **Policies and Choices**.)

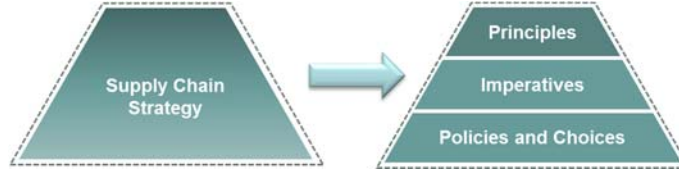


Figure 6: A supply chain strategy decomposed into elements

The Policies and Choices are then finally implemented in the form of **Operational Practices** throughout all the supply chain relevant functions, which lie at the lower end of the strategy operations-continuum.

The conceptual elements

The six layers of concepts we have introduced above, shown again in Figure 7, are what we call the **conceptual elements**, since they refer mostly to a collection of ideas, or *concepts*, that are under the business’s control.

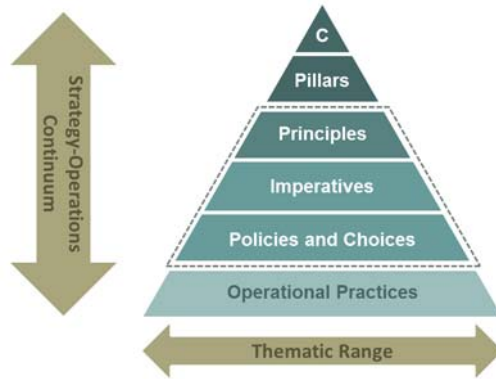


Figure 7: The six layers of conceptual elements

As shown in Figure 7, these layers of concepts follow a logical sequence along the strategy-operations continuum, from the strategy core to the operational practices.

The layers demarcated by the dotted polygon, namely the Principles, Imperatives, Policies and Choices, when taken as a whole, are what we call the supply chain strategy of a business.

The number of concepts multiplies as we move down the layers.

- There is one Core, but there are typically around three to five Pillars supporting it.
- Likewise, there are typically three to five times as many Principles as there are Pillars.
- Each Principle has under it between two and four Imperatives.
- Each Imperative will have under it between two to four Policies and Choices.

As they multiply, concepts also become more specific and concrete, covering a range of supply chain relevant themes, including multiple areas of interest, activity and decision for the supply chain. This fanning out of the ideas, which give the conceptual elements its characteristic pyramidal form, is what we call the *Thematic Range*.

The enabling elements

Providing a context to the conceptual elements we have the assets, culture and capabilities of the organization:

- **Assets**, *the things we have to do work*. Assets can be them material, human, financial, etc.
- **Culture**, *the way we do things*. Culture affects decisions, behaviors, and thus results.
- **Capabilities**, *the things we know how to do*. Capabilities refer to the ability to do a task.

Since their role is to enable and support the supply chain strategy, we call them ‘enabling elements’. In the long run, the enabling elements should adapt to its supply chain strategy, *not* the other way around. One thing the enabling elements have in common is that it takes time to change them: they have more *inertia* than the conceptual elements.

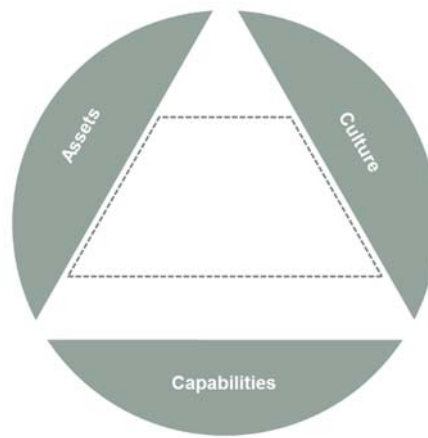


Figure 8: The enabling elements: assets, culture and capabilities.

The internal elements

Something the conceptual elements and the enabling elements have in common is that they all are within the control of the organization. In other words, the organization can change at will its business and supply chain strategy, and – with time- its assets, culture and capabilities. Together we call the **internal elements**, shown in Figure 9 inside a dotted circumference symbolizing what falls within the control of the organization.

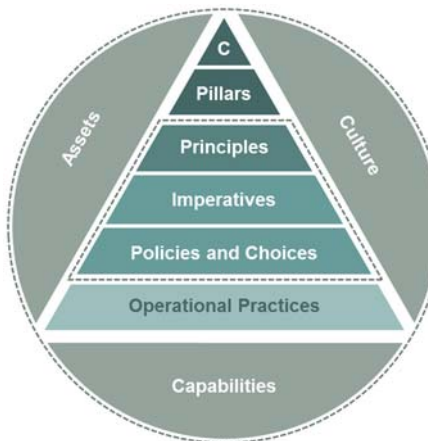


Figure 9: The internal elements: what the organization controls.

The external elements

Many things that matter for rethinking a supply chain strategy are beyond the control of the organization. We refer to these as *external elements*. In our model, they are represented outside the dotted circumference. As shown in Figure 10, we identify three types of external elements that should be considered when rethinking the supply chain strategy.

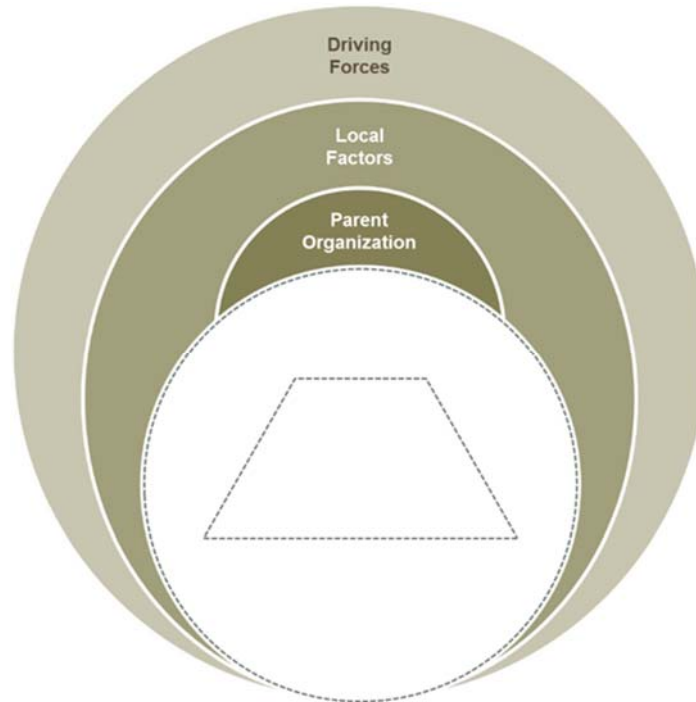


Figure 10: The external elements: beyond the organization's control.

The most immediate of the external elements are the expectations of a *parent organization*, if there is one. Not all organizations happen to belong to an even larger organization. But many do. For example:

- BASF's Animal Nutrition business unit, when rethinking its supply chain strategy, must to consider the corporate expectations of its par-

ent organization, the BASF Corporation: its corporate strategy, values, policies, guidelines, etc. Since these corporate expectations are not controlled by the business unit, they are considered external to it.

- The United Nations Peacekeeping's Department of Field Support (DFS), when rethinking its supply chain strategy, must consider the expectations of its parent organization, the United Nations: its values, policies, guidelines, etc. Since the expectations of the UN are not controlled by DFS, they are considered external to DFS.

Beyond the realm of the parent organization, there are a multitude of variables that have a significant effect on the organization and its supply chain, and that are beyond its control. We classify these variables based on whether the organization can have any influence on them, as follows:

- The variables that are beyond control, but *not beyond the influence*, of the organization, are called **local factors**. In the case of a business unit, local factors refer mostly to variables from the market and industry where the business unit operates, that can be influenced by the business unit.
- The variables that are beyond both the control and the influence of the organization, and still have a significant effect on the organization and its supply chain, are called **driving forces**. These come from the surrounding environment and the world at large, and include things like demographics, geography, climate change, etc.

Our approach to Visioning, by the way, focuses on the driving forces and local factors. In a scenario planning exercise, for example, the industry and larger business environment of a business is explored to identify major driving forces that are changing, while the market is scanned to identify local factors that may be either changing on their own or may be impacted by the driving forces. By considering multiple plausible yet challenging combinations of the variations in driving forces and local factors, a set of scenarios can be concocted. More on this in later chapters.

The complete picture

When we combine the external and the internal elements, the complete picture of our working model emerges. It is shown in Figure 11.

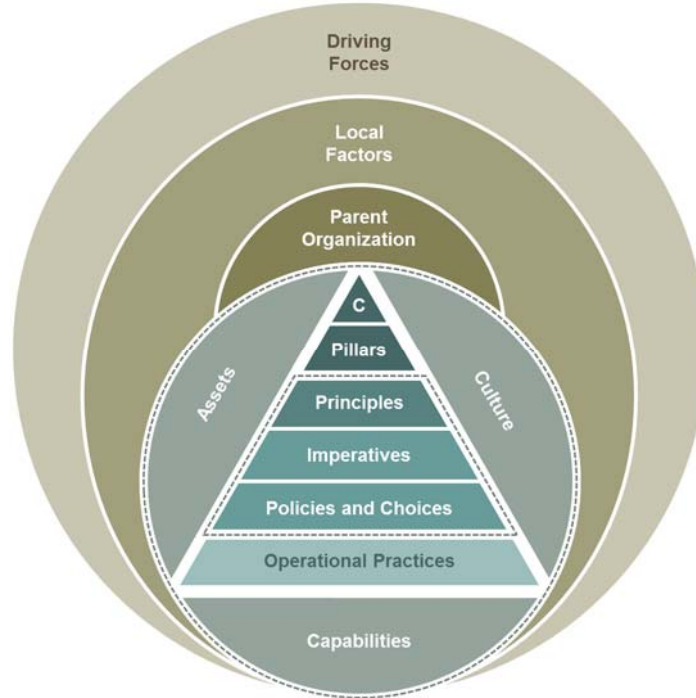


Figure 11: A working model for rethinking a supply chain strategy

The supply chain strategy – demarcated by the dotted polygon – lies in the center of the conceptual elements, bridging the business strategy and the supply chain operations. Around them are the enabling elements: assets, culture and capabilities. All these fall inside the dotted circumference, because they are within our control. Beyond our control are the external elements: guidelines from the parent organization, local factors and driving forces.

This working model, as presented above, provides a structure to our approach to rethinking the supply chain strategy of a business, and will be used as a reference throughout the rest of this book.

CHAPTER THREE

capturing your current
supply chain strategy

Back in Chapter 1, we listed four distinct basic challenges that we believe you will face if you want to rethink your supply chain strategy, regardless of what approach you follow. The first one of these challenges – and possibly the most neglected one – is to know your current supply chain strategy. Understanding what you have in place today is fundamental, since it is the starting point for all subsequent improvement efforts.

Later in Chapter 1 we listed several fundamental tasks that are completed to rethink your supply chain strategy. One of these tasks, which we called “Articulation,” is about expressing a given supply chain strategy in explicit terms. As part of Supply Chain 2020, we developed an approach to articulate the current supply chain strategy of an organization. In this chapter we present this approach.

Categorization vs Articulation

You may also recall from Chapter 1 that we consider supply chain strategies rich, nuanced and complex entities, which we do not believe can be accurately characterized by means of a simple “types.” Most scholarship on the subject relies heavily on the use of types to characterize supply chain strategies – an approach we call *categorization*. Examples of categorization of supply chain strategies over the last fifteen years are plentiful, from Fisher’s (1997) two types to Perez’s (2013) six types.

We reject *categorization* as an approach to characterize a supply chain strategy, on two accounts. The first is that multiple efforts, based on real-world data, have failed to reliably validate or replicate these categories. The second is that – based on our own experience with rethinking supply chain strategies – supply chains are so peculiar and their contexts so diverse, that discussing a supply chain strategy in terms of general types seems like making the subject a disservice.

Instead, we strive to describe each supply chain strategy in terms of its own particular features – an approach we call *articulation*. Articulation is to categorization what a portrait photo is to a smiley emoticon. Whereas categorization simplifies the features in order to find commonality, articulation seeks to represent each feature with sufficient detail. It follows that articulation takes much more time and effort than categorization, but it is also more realistic, and – as we will see in later chapters – much more useful a starting point for evaluation and reformulation.

Just as there are many ways to ‘capture’ a human face (i.e. a photo, a pencil sketch, an oil portrait, an X-ray of the skull, etc.), we imagine there are many ways to articulate a supply chain strategy. Our approach treats each supply chain strategy as a conceptual system, that is to say, as a group of interrelated ideas working together to achieve common goals. Our approach to articulation represents these conceptual systems by means of conceptual maps, that is to say, as a map of interrelated ideas.

This may sound complicated now, but rest assured that the basic ideas are very simple and powerful. Making a conceptual map – albeit time-consuming – is not a difficult task, as will be shown in the following pages.

Mapping concepts 101

What follows is a simple example of how to make a small conceptual map, based on some passages from a 2005 case study about Dell's supply chain:⁴

In many cases Dell directly deals with tier-2 suppliers. Dell negotiates on behalf of its tier-1 suppliers to aggregate volume and leverage its own buying power. The main objective of Dell in doing so is to ensure continuity of supply and reduce procurement costs further.

Let's start with take the first sentence and a half. From it, the following idea is evident: **Negotiate directly with tier-2 suppliers on behalf of tier-1 suppliers**. Notice we have reworded it to start with a verb, so it suggests an activity or a purpose. Let's put that idea inside a box:

Negotiate directly with
tier-2 suppliers on behalf
of tier-1 suppliers.

Once an idea has been worded to start with a verb, and framed inside a box, it has become what we call a *concept*. Concepts like these are the blocks for building conceptual maps that will allow us to articulate our supply chain strategy. Let's keep reading the passage above to identify additional concepts. The second half of the second sentence yields these two ideas: **aggregate volume in procurement orders** and **leverage Dell's buying power**. Notice we reworded a bit where clarity required it. We box them.

Aggregate volume of
procurement orders

Leverage Dell's
buying power

Based on the passage, there is a relationship between the first idea and the two new ones: the former is done in order to achieve the latter. Let's use

⁴ Passage taken from section 5.2.1.2 of S. Roy's 2005 master thesis at MIT: *World Class Supply Chains in the Computer Industry*. The 2nd and 3rd sentences were swapped.

lines to indicate a purposeful link between concepts. Let's also arrange the concepts vertically so that those beneath are done with the purpose of supporting those above them. Then, the three concepts – and the relationship of purpose among them – would be represented as shown below:

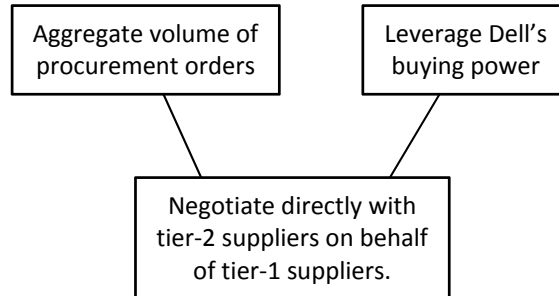


Figure 12: A tiny conceptual map

Look at Figure 12. It's simple, right? Well, these three boxes with text and two lines connecting them actually constitute a **conceptual map**, a map of ideas and the relationships of purpose between them.

If you look at the map in Figure 12 from the top down, you will notice that it has two *levels*: on the higher level, the one near the top of the page, there are two concepts, while on the lower level, the one near the bottom of the page, there is one concept. Maps don't have to be limited to two levels, though. As we add new concepts, they may fall into higher or lower levels. Given any concept, there is a surefire way to add concepts to the level **beneath** it: all we have to do is ask "**How?**" as in *How is this achieved?* For example: given the concept "*Leverage Dell's buying power*", if we want to add concepts to a level beneath it, all we have to do is answer the question "How?" e.g. how is this buying power leveraged?

Likewise, given any concept, there is a surefire way to add concepts to the level **above** it: all we have to do is ask "**Why?**" as in *Why do we want to do this?* For example, given the concept "*Leverage Dell's buying power*", if we want to add concepts to a level above it, all we have to do is answer the question "Why?" e.g. why do we want to leverage Dell's buying power? The answer, as seen in the last sentence of the passage from the case, is

twofold: we do so, because we want to *ensure continuity of supply* and *reduce procurement costs further*. See the added level in Figure 13 below.

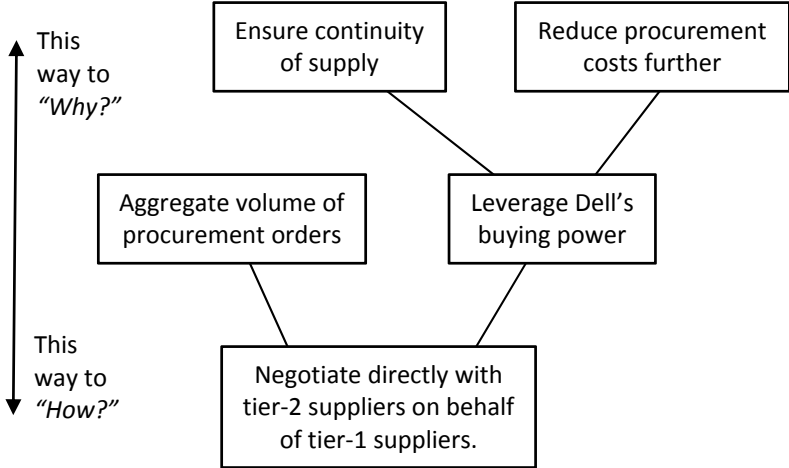


Figure 13: Our conceptual map has a new level on top

Let's see how to read the map, with an example. Take one concept, "Leverage Dell's buying power," for example, and use it as your starting point. Other concepts linked to it through lines are deemed as related:

- Linked concepts above it are the answer the question "Why?", thus providing a reason for it, a purpose. Thus, for example, one reason to leverage Dell's buying power is to reduce procurement costs further.
- Linked concepts beneath it are the answer to the question "How?", thus providing a means or ways to achieve it. Thus, for example, a way to leverage Dell's buying power is to negotiate directly with tier-2 suppliers on behalf of tier-1 suppliers.

After reading the map like this, you can appreciate the advantage of wording the concepts in a short, concise way and starting with a verb. Even though the conceptual map we just made is a small one, the same simple steps we used to make it are the same steps we will use to make much larger conceptual maps required to articulate an entire supply chain strategy. At the risk of oversimplification, the steps can be stated thus:

1. Identify the concepts and word them clearly
2. Identify *why* and *how* relationships between concepts
3. Display the concepts and their relationships graphically

The strategy-operations continuum

Take a look at Figure 13, and think about what the vertical axis: what does it mean here for a concept to be higher or lower along the vertical axis? The higher a concept is along the vertical axis, the more it is about 'why' we do things, that is to say, the more it is a statement of purpose. The lower a concept is along the vertical axis, the more it is about 'how' we do things, that is to say, the more it is a statement of practice.

We call this vertical axis the '*strategy-operations continuum*', which we introduced back in Chapter 1. As indicated in Figure 4, concepts higher in the continuum are more strategic in focus, more abstract in nature, and wider in scope; whereas concepts lower in the continuum are more operational in focus, more concrete in nature, and narrower in scope. Now, after building your first conceptual map, you can see the reason for this: the higher a concept lies in the vertical axis, the more it is about 'why,' about purpose, about *strategy*; and – by the same token – the lower it is in the vertical axis, the more it is about 'how,' about practice, about the *operations* in the supply chain.

You may notice our working model for rethinking a supply chain strategy distinguishes six levels of conceptual elements along the vertical axis. This is seen, for example, in Figure 7. These discrete levels will be very handy to *craft a new* supply chain strategy, as you will see in Chapter 9. However, when the objective is to *capture* your *current* supply chain strategy by building a conceptual map, I invite you to think about the vertical axis not as sequence of discrete levels but instead as a *continuum*. When you are building a conceptual map, place each concept vertically where you feel it belong, based on its 'how' and 'why' relationship with other concepts. Until the map is populated, do not worry about layers.

The thematic range

The small conceptual map shown in Figure 13 was built based on a single short passage from a case study about Dell. The theme of that passage was – broadly speaking – procurement. The case study has more to say about Dell's approach to procurement, but it also has more to say about other supply-chain relevant topics besides procurement, such as inventory, assembly, sales, etc. If we were to continue mapping these other passages of the case study, we would end up with a much wider conceptual map that would address a multitude of subjects, not only procurement. Consider Figure 14, a conceptual map prepared by Roberto Perez-Franco back in 2007– using precisely Roy's (2005) case study on Dell as a source.

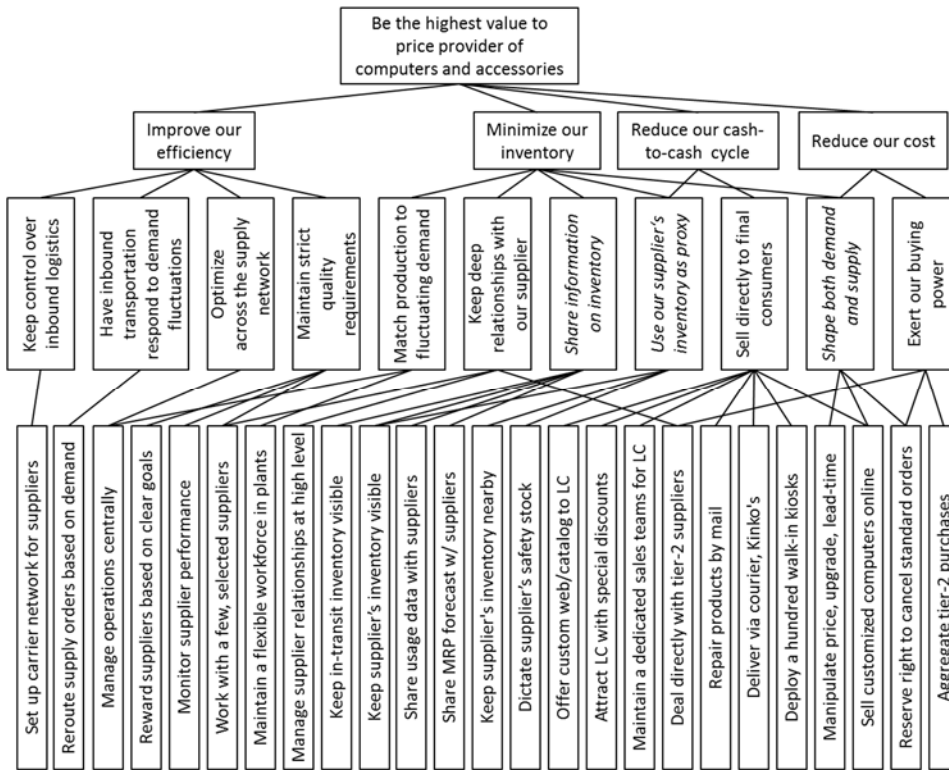


Figure 14: A conceptual map based on Roy's (2005) case on Dell

Admittedly, this map is rather rudimentary: it was done as homework for doctoral class, with the sole purpose of exploring the feasibility of using a conceptual map to articulate a supply chain strategy. By reading the concepts in the map of Figure 14 from left to right (or right to left – it doesn't matter, as long as it is horizontally), you will clearly sense that a variety of themes that are addressed: inbound transportation, centralization of operations, incentives for suppliers, workforce flexibility, inventory visibility, are – among many others – supply-chain relevant subjects that are covered in this specific conceptual map.

Since the supply chain of an organization is by definition a cross-functional entity, it follows that – when capturing a supply chain strategy – we will discuss a wide *range* of supply-chain relevant *themes*, from suppliers to customers, from planning to fulfillment, from inventory to service, from cost to innovation. In the conceptual map, this diversity of subjects is reflected along the horizontal axis, in the form of what we call the '*thematic range*' of the conceptual map, an idea we presented back in Chapter 1 and illustrated in Figure 7. As we will see in Chapter 8 when we discuss the criteria of '*coverage*', finding omissions in the thematic range of a well-done conceptual map is a sign of blind-spots in a supply chain strategy.

Now that we have discussed the vertical and horizontal axes, we can rewrite the steps to build a conceptual map, as follows:

1. Identify the concepts. Make sure to word them clearly and concisely, starting with a verb, and put them inside boxes.
2. Identify the *why* and *how* relationships between concepts, and represent them graphically as lines connecting the boxes.
3. Sort the concepts vertically using the logic of the strategy-operations continuum.
4. Arrange the concepts horizontally according to theme or subject.

Save judgment for later

When a team from an organization sets out to map their current supply chain strategy, it should stay focused on the task at hand: mapping the practices and purposes of the supply chain along the strategy-operations continuum. The temptation to start evaluating the results of the current

strategy will be strong, but it should be resisted: articulation is about capturing the practices of the supply chain and the purposes behind them, not judging the results of these practices. All judgment about the outcome of the strategy should be noted and put aside until the evaluation stage.

It is important to point this out because, since companies usually do not articulate the current state of things, as soon as the map of the current strategy starts to emerge, some members will be eager to have the record reflect that some things went wrong with the strategy. Let me illustrate this with a real example, taken from one of our projects.

A company decided to centralize their customer service operations, with the purpose of improving the quality of their service. However, the centralization of the operations actually resulted in a deterioration of the quality of customer service, the opposite of what was intended.

As we articulate the current supply chain strategy of an organization, it is paramount to stay focused on capturing practices and their purposes. In the example above, for example, we can identify this factual concept of practice: “Centralize the customer service operations.” Likewise, we can identify a concept from the reason this was done (its ‘Why?’): “Improve the quality of service.” The fact that the decision backfired is not part of the strategy, but a result of it, so they are not part of the articulation. If the comment is made, we make a note of it and save it for the evaluation.

Nominal and Executed

It is useful to differentiate between high-level strategic statements, which we call the **nominal strategy**, and mid-level statements of practice and purpose, which we call the executed strategy. In practice, the nominal strategy is often identical to the business strategy, while the executed strategy is what we identify as the current supply chain strategy. A useful approach to building a map of the current supply chain strategy of an organization is to map the nominal strategy from the **top-down**, and to map the executed strategy from the **bottom-up**. Let’s see an example.

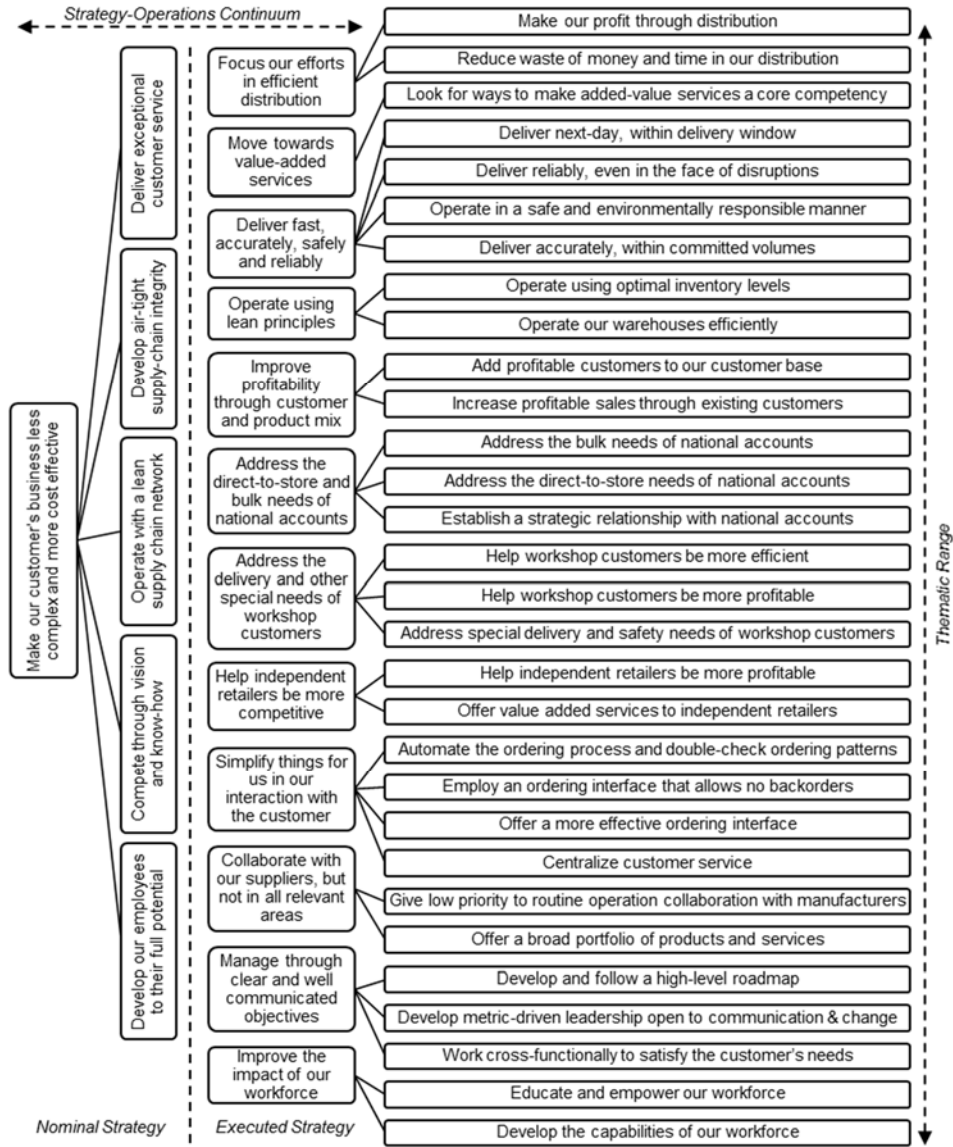


Figure 15: Conceptual map of Libica's supply chain strategy

Figure 15 shows a conceptual map that articulates the current supply chain strategy (as of 2009) of a company we will call Libica.

So that it would fit in the page, the map has been rotated. It was done by mapping Libica's nominal strategy from the top down, and Libica's executed strategy from the bottom up. This was done as described below.

The nominal strategy

Libica's *nominal strategy* was mapped from the **top-down**, based on information provided to us by their Senior VP of Supply Chain. Libica's strategy **core**, the single statement that captures the gist of its strategic mission, is: "*Make our customer's business less complex and more cost effective.*" The core is placed as a concept right on top, at the high end of the strategy-operations continuum. Then come Libica's strategy **pillars**, the general statements of purpose that answer the question: 'How will we achieve the core?' As shown in Figure 15, there are five pillars in Libica's nominal strategy:

- *Deliver exceptional customer service*
- *Develop air-tight supply-chain integrity*
- *Operate with a lean supply chain network*
- *Compete through vision and know-how*
- *Develop our employees to their full potential*

These concepts are boxed and placed right beneath the strategy core concept. This is shown on the left side of Figure 15.

The executed strategy

Libica's *executed strategy* was mapped from the **bottom-up**, based on information collected in twenty interviews with different VPs and Directors from supply chain related functions within Libica. The interviews, about an hour long and conducted over the phone, sought to identify Libica's actual practices, policies and choices in all supply chain related areas, and to identify the underlying ideas behind them. For each supply chain practice we identified, we asked 'Why do you do this? What is the purpose?' This allowed us to identify new concepts higher in the strategy-operations continuum. We asked 'Why?' several times for each concept. The resulting map is shown on the right side of Figure 15.

The final conceptual map

At the end, we had two half-maps: one for the *nominal strategy* and the one for the *executed strategy*. Following the logic of the strategy-operations continuum, we placed the nominal strategy map on top of the executed strategy map. The resulting conceptual map, showing only the top-most four conceptual levels - and rotated for the sake of printing space - is provided in Figure 15.

You may remember the working model we presented before. If you don't, take another look at Figure 11. The four levels shown in the conceptual map of Figure 15 correspond to the top four levels of conceptual elements in our working model. To help you visualize this correspondence, see Figure 16, where we have rotated the model's levels accordingly.

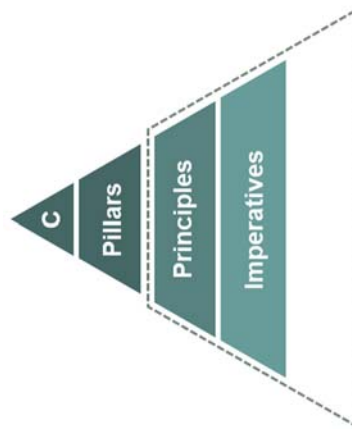


Figure 16: The four levels in the model that correspond to Figure 15

Such an articulation of the supply chain strategy of an organization, like the one shown in Figure 15, can now serve as starting point for the evaluation, which will be discussed in Chapter 4 and will also inform our elaboration of a new strategy, as we will discuss in Chapter 8.

More details regarding how Libica's conceptual map was developed – in case you are curious – are presented in a case study later in the book. First let us present a detailed protocol to capture a supply chain strategy.

PROTOCOL: CAPTURE

steps to capture a supply chain strategy

What follows is a detailed, actionable protocol – written with managers like you in mind - presenting our method to capture the supply chain strategy of an organization and to express it in the form of a conceptual map. We call this resulting map a Functional Strategy Map (FSM). The method itself we call the *FSM Method*. We divide it in ten steps. It may be difficult to read this protocol on its own, so in the next section we present a user-friendly case study that presents each step with examples.

Step 1 - Scope

The first step is to define the scope of the project by identifying the functional areas of the organization to be addressed: will we include sales, procurement, operations, finance, etc.? The resulting short list of relevant

functional areas is not meant to be final: the facilitator should remain open to adding new areas as needed during the course of the project.

Once the list of relevant areas is prepared, the facilitator proceeds to identify individuals within these areas to be interviewed. For each area, there are three levels of the organizational hierarchy from which respondents should be chosen in roughly equal numbers:

1. Level 1 is composed of individuals at the lowest hierarchical level directly involved in the process of crafting the business strategy of the organization.
2. Level 2 is composed of individuals that report to Level 1 individuals. By definition, they do not participate directly in crafting the strategy, although they might provide input through their supervisors.
3. Level 3 is composed of individuals that report to Level 2 individuals.

The facilitator should allow for '*snowball sampling*', e.g. be willing to add new respondents based on what is being heard in the interviews.

Step 2 - Conduct qualitative interviews

The purpose of the interviews is to find out about the tacit supply chain strategy of the organization. For obvious reasons, the questions during these interviews cannot be framed in these terms. Instead we ask about the activities that individuals perform. The individual serves as a proxy to tap into the organization. Similarly, the specific activities serve as proxy to the tacit knowledge of the supply chain strategy. This means that, even though the interviews start by asking about the activities of an individual, the conversation should be steered as soon as possible towards the supply chain activities of the organization.

The interviews required by the FSM Method are qualitative. A vast literature exists on this type of interviews; for general details on qualitative interviewing, the reader is invited to consult the extant literature. Nevertheless, there are some specific recommendations on how to conduct the interviews as required by the FSM Method; these are provided below.

Recording and confidentiality. A one hour time slot is recommended for each interview. The respondent and the interviewer should be the only two people participating in, and with access to, the interview. The interview should be recorded, with permission, to facilitate its analysis afterward. The interviewer should manage the recorded interviews and the data thus obtained with the utmost respect for confidentiality for the individual and the organization. No piece of information from an interview should be ever linked to the name of a specific respondent.

Structure of the interview. A suggested structure for the interviews is as follows: Introduction (~4 min), placement questions (~3 min), open questions (~35 min), semi-open questions (~15 min), wrap-up (~3 min). Obviously, you can play with these structure and adjust it to your personal preference.

Introduction. During the introduction, the interviewer will greet the respondent, introduce himself/herself and explain in general terms the purpose of the interview and the reason for the selection of the respondent, as well as the expected length of the interview. During the introduction, the interviewer will also inform the respondent of his/her rights, request permission to record the interview and clarify any doubts from the respondent may have.

Placement questions. The interviewer then proceeds to present a series of three placement questions: (1) "What is the name of your current position?" (2) "Who do you report directly to?" and (3) "Do you participate directly in crafting the business strategy of your firm?" The answer to these questions will help the interviewer place the respondent in one of the three levels described above, which will determine some of the questions that will be asked later.

Open Questions

The open questions are the most important part of the interview, especially in the early ones. Some research has indicated that those involved in crafting a strategy tend to have a different perception of it than those

who were not involved. For this reason, during our interviews, respondents that participate directly in crafting the business strategy (namely, Level 1 respondent) will be presented with a slightly different set of questions than those who do not (namely, Level 2 and 3 respondents).

When interviewing a Level 2 or 3 individual, the open question section starts with the following question: *"What would you say are the main activities of your position?"* Some respondents will begin answering this question right away. Others may ask for clarification: *"What do you mean?"* The interviewer can then expand: *"Think of a typical week or month. What are the things that take most of your time and attention?"*

On the other hand, when we interview a Level 1 individual, we will frame the question under different terms: instead of asking the individual to report his/her own activities, we will ask him/her to report on the activities of those individuals under his/her supervision. This recommendation is based on our experience interviewing people involved in crafting the strategy: they tend to mix stated business objectives with their factual execution, and even when asked to discuss specific activities they easily drift into expressing desired results as opposed to actual facts.

Thus, when we are interviewing a Level 1 individual, we use the following strategy: find out first who reports directly to him/her: *"Could you tell me which positions report directly to you?"* We care more about the positions of these subordinates than their actual names. As the respondent lists these positions, we write them down. Then, for each one of them, we will ask: *"What would you say are the key activities of such-and-such position?"*

Some recommendations for conducting the open questions of any level are given below.

Stay factual. The open questions segment of the interview is the most important. Rich and grounded answers here will provide superior data for later analysis. As one tries to move the discussion from the individuals to the organization, and from action to tacit knowledge, one has to make a conscious effort to keep the conversation anchored on concrete activities (*'what'*). As a way to validate the factuality of each specific activity, one

should ask for the means or details of its execution ('*how*'). To understand its purpose whenever it is not evident, one also can ask for clarification on the ideas behind these activities ('*why*'). These “what, how and why” are the main source of information during the data analysis. The interviewer should remember, every time s/he hears about a '*what*', to ask about its corresponding '*how*'s, namely the supporting means or the details of its execution, and to ask about the respective '*why*', namely the overarching purpose of the activity.

Find the sweet spot. The objective is to keep the discussion focused on the tacit knowledge on the supply chain strategy, which – in terms of the narrative of the conversation – lie in a 'sweet spot' between strategy and activities. The interviewer should pay close attention to what the respondent says, and pursue interesting areas that emerge during the conversation, always pondering: "*Is what I'm listening right now helping me understand the tacit ideas that underpin the way they do things ?*" Every time the answer is “no”, a course correction is needed.

- If the discussion is becoming too strategic, the interviewer should make it more factual by asking about the execution. Probe questions that can be used to correct the course here are: "*How do you implement this? How is this actually done? How do you ensure this happens?*"
- If the discussion is getting bogged down into operational detail, it should be moved to a higher level of abstraction. Probes that are useful here include: "*What is the idea behind this? What is the purpose of this? What results have you achieved through this?*", etc.

Explore further. The interviewer should listen carefully to the answer, taking notes of the activities that are mentioned. For each answer, the interviewer will ask for further details. Every time the respondent mentions something of interest, the interviewer should make a note of it and, at the first opportunity, ask for further details: "*You mentioned before something that caught my attention. (Mention it here). Can you tell me more about this?*" To keep the conversation clear, the interviewer should move to clar-

ify things every time the respondent becomes too vague in his / her answers, by asking: "What do you mean by this? Can you give me an example?", etc.

The interviewer should allow the open question conversation to run for as long as it has momentum, even if it consumes the rest of the hour. Particularly among the early interviews, when the facilitator is just learning about the organization's activities, letting the open question discussion run its own course is a practical way to collect good qualitative data on the organization's tacit knowledge of its supply chain strategy.

However, there comes a time when the interviewer wants to present the respondent with some more structured questions, either because the open discussion has lost steam or because it is just treading territory that has already been covered in previous interviews to the point of repetition. In these cases, the interviewer is advised to move to the next section: using semi-open questions.

Semi-open questions

As you proceed through the interviews, semi-open questions become more important. Semi-open questions can serve two purposes. One is to rekindle a dwindling discussion. The other is to explore a particular area of interest about which the interviewer has heard previously and which deserves further exploration. The interviewer should be careful, however, not to mention the name of any previous respondent.

The interviewer should keep at hand a short list of general purpose semi-structured questions. Each one of them should be considered optional, in the sense that the interviewer should only ask those questions that seem relevant to the respondent and that have not been answered before during the course of the present interview. Semi-structured questions that we have used recently include the following: (1) "What would you say is the biggest opportunity facing you today?" (2) "What would you say is the biggest challenge facing your function today?" (3) "What would you say is your business?" Sometimes this question requires clarification: "In other words, what is it that you sell? What do you provide the customer? What is your

value proposition?" (4) "Who is your customer?" (5) "What are the needs of these customers? And how do you satisfy these needs?"

Wrap-up. Some minutes before the hour is over, or when the interviewer judges the interview has come to an end, the interviewer will wrap-up the interview, thanking the respondent and leaving the door open for further contact if necessary.

Step 3 – Identify areas and activities

For extracting the activity data from the interviews, the facilitator will listen to all the interviews, one by one, and conduct the six tasks explained below.

Task 1: Identify tentative areas of activity

Listening to the interviews, the facilitator will look for references to broad areas of activity, as they are described by the respondents. An area of activity, in general terms, is a '*kind of thing*' the organization does. Once identified, the facilitator should write it down, in the form of an imperative statement.

Task 2: Identify activities within each area

Each new tentative area is an empty category. As the interviewer continues listening to the interviews, s/he will try to find specific activities that can be classified under each area. If the interview was conducted attentively, the interviewer should have probed further every time the respondent mentioned a new area of activity. Obviously, not all activities in an area will be captured, but at least the most salient ones should be listed, by writing them down under the respective area. We recommend these activities be written in the form of imperative statements.

Task 3: Look for means that support each activity

Each specific activity written down should be grounded in actual practices of the organization. For this, the interviewer should examine what means, if any, the organization has in place to support each activity listed. One should also look for additional details that may indicate the activity

is actually taking place. For this, the interviewer should listen to the interviews and ponder: *"How is this activity being implemented? How is it being achieved in the field? What is being done to make it happen?"*

The activity and its supporting means may or may not be found in a single interview. The interviewer should remain attentive when analyzing the data of additional interviews, so that new means can be added to activities identified previously; and new activities added to areas identified previously.

Task 4: Check validity and wording of activities

For an activity to be considered valid there has to be enough evidence of supporting means or details about it in the interviews. Consequently, whenever supporting means or details for a given activity cannot be found, the validity of the activity should be questioned and it should be discarded from further consideration. Only activities for which supporting means and details can be determined should remain in the list. Their original wording, however, may change. As supporting means and additional details are added for a given activity, its wording and description may change.

Task 5: Check validity and wording of areas

The same logic used to verify the validity of activities is applied to verify the validity of areas. Areas for which specific activities are found should be retained. The specific wording of their description may be revised. As new activities are added to an existing area, the wording used to describe the area may be revised. The interviewer may benefit from the help of another person to verify the validity and wording of areas with fresh eyes.

Task 6: Prepare a hierarchical summary for each area

A summary should be prepared for each area of activity. We recommend building each summary using a hierarchical structure.

Step 4 – Build partial maps

Partial maps are a graphical representation of each hierarchical summary prepared in the previous step. For each area, the hierarchical summary is translated into a conceptual map, e.g. a diagram composed of text located inside boxes, which are then connected through lines showing the relationship between them. Given the hierarchical structure of the summary prepared in the previous step, its translation into a partial map is a very straightforward process.

Step 5 - Validate the partial maps

The objective of this step is to confirm that the information used to build the partial maps, which was collected in the interviews about areas, activities and means, is an accurate representation of the organization's knowledge of its supply chain strategy. This validation involves presenting all the partial maps, one at a time to a team from the organization, including representatives from the relevant areas. The team is asked to provide feedback, as a group, on whether what is articulated by the maps correspond to what the organization does. Based on the group's input, the partial maps are revised to improve their validity. The scheduled time for the meeting should allow for enough time for discussion. In our experience, a session of 4 hours should suffice.

Step 6 - Combine related partial maps

The group of partial maps is examined to find whether some of the maps cover strongly related areas. Every time two or more partial maps deal with strongly related areas, an attempt should be made to combine them into a single partial map. The objective of this merging of partial maps is to reduce the complexity of the final output: the functional strategy map is easier to use if closely related areas are grouped under common headings.

The amount of efforts invested in combining areas of activity depends, to some extent, on the total number of areas. As a rule of thumb, we suggest no more than a dozen areas of activity.

Step 7 – Simplify as needed

Upon examining the partial maps, three distinct layers can be identified: the first layer is the areas of activity, the second layer consists of activities *per se*, and the third layer lists supporting means. For the final strategy map, the facilitator may choose to display only the first two layers to keep the map's size manageable.

Based on our experience, it is important to balance diversity and simplicity. We recommend keeping the number of items in the top two layers within a reasonable range. As a rule of thumb, we recommend that each item in the first layer should have between two and four 'children.' A new layer of sub-areas can be added between the areas and the activities, where each sub-area combines the ideas behind several activities.

Step 8 – Map nominal strategy

The analysis now moves to the nominal strategy of the organization. This step, aims to identify both the central strategy statement of the organization (the '*core strategy*') and its supporting strategic objectives (the '*strategic themes*'), and then map them conceptually.

Through the sponsor of the project, the facilitator should negotiate access to written documents stating the organization's core strategy and its espoused strategic themes. "*Documents and declarations about the firm that are meant for broad distribution*", even internally, "*can provide useful insights into the image of the firm that the authors seek to project*" (Harrison, 2004, p.93) to their audience – in this case the employees of the organization. In these documents, the core strategy and the strategic themes are usually easy to identify: they tend to feature prominently in the organization's stated strategy.

Step 9 - Assemble the FSM

The complete Functional Strategy Map (FSM) includes the five conceptual categories shown in Figure 4 of the paper. Since the fifth layer will typically contain a large number of items, we recommend omitting it and displaying only the first four layers, as suggested by the template shown in Figure 5 of the paper.

Assembling a four-level Functional Strategy Map out of the elements prepared thus far is rather straightforward. Following the template, one can place on the left hand the nominal map prepared in Step 8, and on the right the first two layers of the partial maps prepared in Steps 2 through 7.

The resulting Functional Strategy Map features two distinct halves. The left half of the map shows a conceptualization of the nominal strategy of the organization. The right half of the map shows a conceptualization of the executed strategy.

Step 10 - Validate FSM

The validation of the Functional Strategy Map takes place in two steps: individual feedback, and collective feedback. In our experience, these can be conducted effectively through discussion with members of the team either remotely by means of the Internet, for example or in a physical meeting.

First round: Individual feedback

In the first round, the Functional Strategy Map assembled in Step 9 can be individually presented to each member of the target firm that was interviewed, along with the question: *'In your opinion, is this abstraction an accurate representation of what the organization does, in general terms?'* Individuals are asked to send their feedback directly to the facilitator.

By now, the facilitator will have sufficient knowledge of the organization's activities, both from the interviews and the validation session, to

judge the merits of the feedback. The facilitator should retain, on a tentative basis, feedback that seems to be based on fact, for further discussion with the group. The facilitator should, nevertheless, disregard pressure to embellish the map by removing unflattering features that are grounded in fact.

Second round: Collective feedback

The individual feedback is discussed with the group in a physical meeting. In our experience, a two hours' time slot will suffice. All members of the group are provided a copy of the revised strategy map, showing whatever tentative modifications were made on the map based on the individual feedback.

It is the facilitator's task to balance two factors: keeping the map faithful to the activities on the ground, and allowing the team to express the ideas in terms that are familiar to them. It is important, after all, that the team members identify the map as an accurate representation of what they actually do, according to the knowledge – tacit or explicit – that they possess.

After this collective feedback session has concluded, and all the recommended changes have been done to the FSM, the final version is distributed to the members of the team.

In the next section we show how these steps are applied in a real case.

CASE STUDY: CAPTURE

capturing Libica's current supply chain strategy

This case study illustrates the FSM Method using as example our project with a \$100B company that we will call Libica.⁵ Throughout this case, references are made to the steps as presented in the protocol.

When Libica approached CTL, its business model had just been modified to adapt to an evolving marketplace. The Executive Vice President of Operations of Libica decided to ask for our help in rethinking their supply chain strategy. We started by capturing their supply chain strategy.

Step 1. It was decided the project would focus on the 'Distribution' business unit of Libica. Areas that were deemed relevant to the supply chain included operations, marketing, sales, strategy, procurement, and customer service. The list of respondents is shown in Table 2.

⁵ All sensitive information has been duly disguised.

Level 1 (7 individuals)
Executive VP of Strategic Sourcing Senior VP of Marketing and Retail Sales Senior VP of Operational Excellence Senior VP of Customer Service Senior VP of Strategy and Business Development Executive VP of Operations and Supply Chain Senior VP of National Chain Accounts
Level 2 (7 individuals)
VP of Operations - West Region VP of Operations - East Region VP of Operations - Central Region VP of Specialty Sales VP of Information Technology VP of Strategic Planning and Execution VP of Operational Excellence
Level 3 (8 individuals)
Director of Inventory Optimization Director of Operations (x2) Director of Retail Sales (x2) Director of Consumer Products Manager of Performance Cons. Director of Marketing & Product Development

Table 3: List of respondents from Libica

Step 2. A total of 22 interviews were conducted over 29 days. Although some of them were as short as 25 minutes, and others as long as 70 minutes, most were around 55 minutes. They were conducted over the phone, recorded digitally with permission, and encrypted immediately after completion.

Step 3. Through the analysis of the interviews, as described in the protocol, areas of activity and specific activities were identified. The following example illustrates this point. A respondent told us that Libica offers solutions to small retailers to "make their store more efficient ... make them as efficient as a big chain." As a tentative area of activity, we write down 'Help independent retailers be more efficient.' Looking for specific

activities that fall under that tentative area, we found in the same interview that Libica ‘provides independent retailers with access to an inventory management system’. Additional details on the capabilities of the inventory solution were provided to us in subsequent interviews, with other respondents. Having found evidence supporting this activity, we retained it. Similarly, having found activities supporting the tentative area, it was kept, with revised the wording to reflect all the identified activities under it: *‘Help independent retailers be more competitive.’* The summary for this area of activity is shown in the itemized list below:

- *Give independent retailers access to state-of-the-art inventory management*
 - *Our software replenishes using a grouping logic*
 - *Based on sales, our software adjusts the replenishment levels every day*
 - *Our software takes seasonality in consideration for replenishment*
- *Help independent retailers sell the most profitable products*
 - *Help independent retailers to find missed opportunities in their previous orders and to learn from them*
 - *Help independents place orders for the most profitable commodity products*
- *Help independent retailers get reimbursed*
 - *Help them sell the right products to get reimbursed most*
 - *Speed up the payment, as they get a direct deposit instead of check*
 - *Double check that they are getting reimbursed the right amount*
- *Help independent retailers create alternate revenue streams*
 - *Launch programs to help independents develop businesses beyond baseline products*
 - *Help independents get reimbursed for providing products to subsidized customers*
- *Let independent retailers tap into the advantages of our size and capabilities*
 - *Negotiate and contract reimbursement rates on their behalf*
 - *Offer private label products under the Libica Label for independent stores*
 - *Offer independent retailers the help of advisers familiar with their regions to coach them on being more profitable*
- *Help independent retailers improve their market share*

- *Help them market and advertise their stores to local communities*
- *Help independent retailers focus on serving their customers*
 - *Hire a team of business consultants to help independents use our services*
 - *Offer front-store services to independent retailers, to maximize sales of non-specialty products, etc.*
 - *Take care of resolving any claim of wrong or late reimbursement*
- *Offer independent retailers capital management services*
 - *Offer them aggregate pricing*
 - *Finance their operations*
- *Help independent stores transition between owners*
 - *Help find a buyer for the store when current owner wants to retire*

Step 4. A partial map was prepared for each area of activity. Consider for example the partial map shown in Figure 17, which corresponds to the the area discussed: *'Help independent retailers be more competitive.'* Compare the structure of the map and the hierarchical summary above.

Step 5. The partial maps were validated through individual feedback and panel discussion. As individuals first, and then as a panel, 20 members of Libica were asked to consider whether the partial map was a fair summary of the activities the firm performs. Extensive notes were taken on the group's feedback. Changes were made to the partial maps as needed.

Step 6. Partial maps of strongly related areas were combined. For example, among the areas of activity we had identified were the following two: (a) *'Deliver exactly what was ordered, within committed volumes'*, and (b) *'Deliver daily, fast, reliably and predictably.'* We combined the contents of these two areas into a single new area, given their shared focus on delivery logistics. To these we also added some activities dealing with *'Increase the speed of our delivery to the market'* that had been misplaced in another area. Analyzing the activities and means of all these three sources, we decided that the resulting single area of activity would be labeled *'Deliver fast, accurately and reliably,'* since this statement seemed to reflect the idea behind

all the activities and means that were now encompassed under this new area.

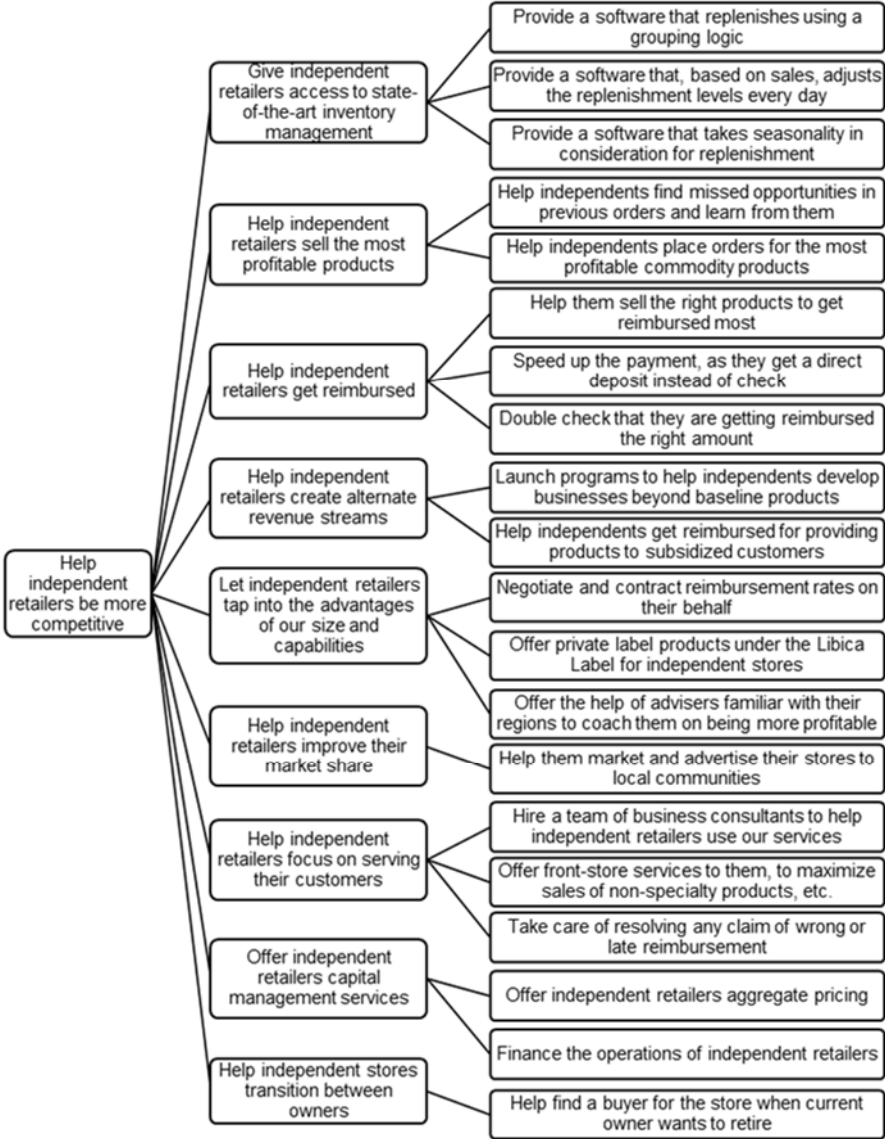


Figure 17: Initial partial map for area “Help independent retailers be more competitive”

Step 7. To keep the number of items in the second layer of the partial map within the desired range, activities were grouped into subareas. These subareas were given a name that reflected the activities under it. An example of a revised partial map with a new layer of sub-areas connecting areas and activities is provided in Figure 18. Notice that, to keep the figure simple, we do not show the layer of supporting means.

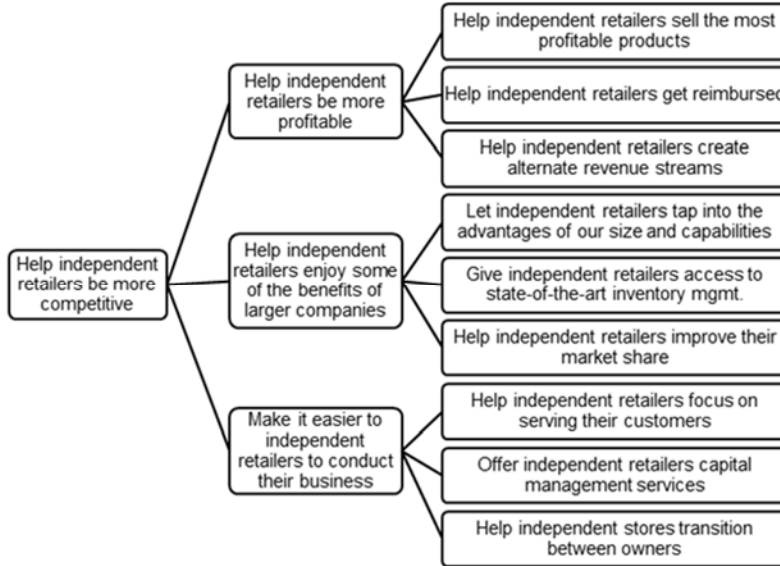


Figure 18: Revised partial map for area “Help independent retailers be more competitive”

Step 8. We then created an abstract of Libica’s business strategy. When asked about their stated strategy, our sponsor - Libica’s EVP of Operations and Supply Chain – gave us access to strategic documents where we identified the core strategy and the strategic themes of Libica. After validating these elements with our sponsor, we prepared the conceptual map shown in Figure 19.

Step 9. We then assembled an FSM out of the elements prepared thus far. Following the template shown in Figure 4 of the paper, we placed on

the left hand the nominal map prepared in Step 8, and on the right hand the first two layers of all the partial maps prepared in Steps 2 through 7.

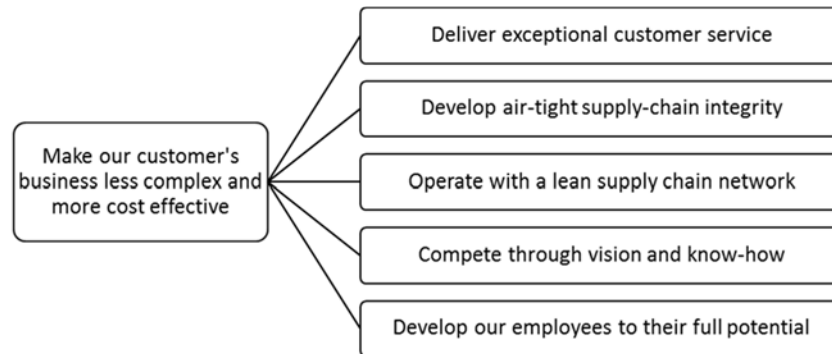


Figure 19: Mapped nominal strategy of Libica.

Step 10. Finally, the FSM was validated through panel discussion. Individuals were asked whether, in their opinion, the FSM was an accurate representation of what the firm does. The feedback of individuals, while kept anonymous, was then discussed in a panel discussion. The map was revised as needed. The resulting FSM is shown in Figure 15, back in Chapter 3. The boundary between the nominal and executed strategies is denoted by a dotted line.