Expressing a firm's supply chain strategy: a framework and a method

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Abstract

Supply chain strategy is seldom stated explicitly, making it difficult to discuss a firm's supply chain strategy in a factual and meaningful manner. This paper presents a method to capture and express a firm's supply chain strategy, called the Functional Strategy Mapping Method. Examples from an actual deployment illustrate the steps, and show that the output – called the Functional Strategy Map – effectively communicates the supply chain strategy of a firm and serves as a meaningful starting point for its evaluation. The paper describes the process we followed to develop the FSM Method. An actionable protocol is provided in the Appendix.

Keywords: supply chain strategy; grounded mapping; strategy as practice; functional strategies; conceptualization and crystallization

1. INTRODUCTION

Many events may motivate a firm to rethink its supply chain strategy. Aitken, *et al.* (2003), for example, argue that changes to the supply chain strategy are necessary as a product proceeds through its life cycle, in order to maintain competitiveness. Other motivators may be changes inside the firm, like the arrival of new a CEO or a revised strategic vision for the company; or changes in the business environment, such as new regulations, new technologies, new competitors, and entry to new markets. Rethinking a supply chain strategy, however, is not a trivial problem and it has no clear answer in the extant supply chain management literature.

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1

The nature of the problem

Part of the difficulty involved with rethinking a firm's supply chain strategy may stem from the 'elusiveness' of strategy in general (Bakir & Bakir, 2006). It is remarkable that, a quarter century after strategy was described as one of the two faces of 'logistics' (the other one being operations) (Shapiro and Heskett, 1985), very basic questions such as how to characterize a supply chain strategy remain unanswered (Frohlich and Westbrook, 2001).

Compared to the progress in supply chain operations domain during the last decades, progress in supply chain strategy domain has been relatively slow. Even some of the most basic ideas in the supply chain strategy realm are still hotly contested. Take, for example, Fisher's (1997) widely cited matrix, which prescribes (1) efficient supply chains for functional products, and (2) responsive supply chains for innovative products. These two prescriptions have considerable intuitive appeal. Yet researchers trying to validate them empirically have run into contradictory findings. While Qi, Boyer and Zhao (2009) found support for both prescriptions, Lo and Power (2010) found support for neither one. While Selldin and Olhanger (2007) found support only for the first prescription and not for the second, Li and O'Brien (2001) found the exact opposite: support for the second and not for the first. Furthermore, Lo and Power (2010) found empirical evidence that undermines the characterization of products as either innovative or functional, and of supply chains as either responsive or efficient, suggesting instead that most products and supply chains could be better characterized as hybrids.

In addition to the difficulty of characterizing a supply chain strategy, or possibly as a result of it, supply chain strategies are often left tacit. An international survey by Harrison and New (2002, p. 264) found that more than half of the supply chain strategies in over 250 firms across diverse sectors "were either non-existent, patchily defined with poor definition, or had only some

elements defined and lacked detail". This makes their discussion more difficult and may explain why – as Hicks (1999, p. 27) laments – "it is often the case that high-level discussions of supply chain strategy are completely void of facts."

Our own analysis supports the view that supply chain strategy is seldom made explicit. We analyzed a pool of 20 publicly available case studies prepared in 2005 for a project on supply chain excellence at MIT's Center for Transportation and Logistics. Surprisingly, out of 20 cases, only 2 made explicit reference to the firm's supply chain strategy, despite the fact that the cases were focused on the supply chain practices of world-class firms. In comparison, 18 of the 20 cases explicitly stated the business strategy.

Subsequently, during direct interactions and projects with multiple firms, we have verified that this pattern holds: although most of the firms have an explicitly stated business strategy, they almost never have an explicit supply chain strategy in place, a fact they often admit openly.

Research objective

Our main research objective is to develop a method to express the supply chain strategy of a firm, in a way that is useful as an actionable starting point for evaluating and reformulating it.

Since expressing a supply chain strategy in an actionable manner requires – as we soon found – a working understanding of the nature of supply chain strategy, our research objective was expanded to include the development of a working framework to represent supply chain strategy.

Definitions

For the purpose of this research, a *supply chain* is defined as a group of entities directly involved in the flows of products, services, finances, and information from a source to a customer (Mentzer, *et al.*, 2001, p. 3-5). Additionally, for the purpose of this research, *supply chain strategy* is defined as the patterns of decisions related to supply chain activities, in

3

accordance with the overall corporate competitive strategy (Narasimhan, Kim, and Tan, 2008, p. 4). Included in these activities are the procurement of raw materials, the sourcing of products, capacity planning, demand management, and communication across the supply chain, as well as the activities related to the delivery of products and services, such as warehouse and inventory management, transportation and distribution.

2 LITERATURE REVIEW

A search in the supply chain management literature for methods to express a firm's supply chain strategy in an actionable manner yields scant results. We discuss three of the approaches found in the literature.

Arcs of integration

Frohlich and Westbrook (2001) envision supply chain strategies as arcs of integration and propose that "different supply chain strategies can be empirically classified into at least five valid types, defined by the direction (towards suppliers and/or customers) and degree of integration". Thus, for example, the supply chain strategy of a given firm could be characterized as having a narrow arc of integration with customers, and a broad arc of integration with suppliers.

A limitation of this approach is its focus on a single feature, namely integration, at the expense of all the other features of a given supply chain strategy. Additionally, it is not clear how the characterization as an *'arc of integration'* can be an actionable starting point for evaluating and reformulating the supply chain strategy, one of the objectives we seek to fulfill.

Segmentation tree

Brun and Castelli (2008), working on the problem of supply chain strategy in the fashion industry, propose a "framework model for SC strategy segmentation within a portfolio approach". This model, which they call a *'segmentation tree,'* is based upon the assumption that

4

three dimensions, namely product, brand and retail channel, suffice to get "a complete overview

of the fashion industry", and suggests that by stating how the segmentation takes place in these

three dimensions, and in what order, a supply chain strategy in the fashion industry would be

sufficiently defined. "[I]t can be supposed that the overall supply chain strategy of a company

could be described by a segmentation tree," Brun and Castelli state (2008, p.172.)

However, the *'segmentation tree'* may be – by definition – a limited tool when it comes to

describing the supply chain strategy of a firm. Just as the '*arcs of integration'* focus solely on

integration, at the expense of every other aspect of the supply chain strategy, the '*segmentation

tree'* focuses solely on segmentation, and is therefore largely blind to every other aspect of a

supply chain strategy. As a framework it may be useful in the fashion industry, yet when it

comes to other industries, or when more is required from a representational devise than just a

summary of how segmentation was done, the *'segmentation tree'* may not be enough.

Techniques-tools matrix

Cigolini, Cozzi, and Perona (2004) explicitly state the question of "how can [a supply chain

strategy] be operationally defined and represented?" They develop a partial catalog of techniques

that operate at the interface between companies, and then identify in the literature the supply

chain tools that support the implementation of these techniques. Cigolini, *et al.* propose creating

a *'techniques-tools matrix'*, namely a matrix listing the SC techniques as row headers and the SC

tools as column headers. The matrix contains a checkmark in each cell where a tool provides

support to a technique. Cigolini, *et al*. state that "perhaps the most promising usage of the

techniques-tools matrix is in its inherent ability to synthesize and represent supply chain

management techniques."

The *'techniques-tools matrix'* is a significant effort to operationally define and represent a

5

supply chain strategy. Nevertheless, it suffers from numerous limitations: (1) the matrix fails to capture how the supply chain techniques and tools relate to the firm's strategic imperatives; (2) by focusing exclusively on the interface between firms, it deliberately ignores the activities that take place inside the firm; (3) the matrix lacks the intuitive readability that should be expected from a representational device; (4) there is no provision for the tacit nature of supply chain strategy: it is not clear how the matrix is to be built and how the techniques and tools being used in the case of a particular firm are to be identified; (5) by relying on a catalog of supply chain techniques, the applicability of the matrix is restricted to areas currently covered by the catalog; (6) the matrix builder may be tempted to pick items from the catalog based on *social desirability* (e.g. because they sound good), as opposed to items that are grounded on the activities of the firm; and (7) even after the matrix has been built, it is not clear how it can be used as an actionable starting point for evaluating and reformulating a supply chain strategy.

3. DEVELOPING A FRAMEWORK OF SUPPLY CHAIN STRATEGY

Our research started with an effort to develop an early framework of supply chain strategy, what Yin (2003) calls a preliminary "understanding - or theory - of what is being studied."

Early inquiry. We conducted a series of five exploratory interviews with supply chain managers from several firms and different levels in the hierarchy, from VP to plant manager, to explore the view they had of supply chain strategy and its role in their firms. These interviews suggested that the purpose of the supply chain strategy was largely to make the business strategy '*happen*'. Later we confirmed this view through interviews with a VP and an EVP of supply chain strategy, from separate firms, who confirmed that, as heads of the supply chain function, they would receive the business strategy from the top, as a given *strategic imperative*, and were then asked to formulate and implement the supply chain strategy to support it.

6

The strategic imperative

Given the importance of *business strategy* as a main driver of the supply chain strategy, we worked to better understand how it is articulated when it is communicated to the supply chain function. For this, we resorted to theory generation tools from the grounded-theory tradition (Glaser and Strauss, 1967).

Grounded theory. Since our goal was to generate ideas inductively to better understand strategy articulation, research techniques from the qualitative toolkit were preferred (Easterby-Smith, Thorpe, and Lowe, 2002). Qualitative methods help the researcher keep assumptions in check and open thought process to emergent – and often unsuspected – findings that enrich the theory-generation effort (Gummesson, 2000; Eriksson and Kovalainen, 2008).

Data sources. Our data source for developing the preliminary framework was a pool of twenty publicly available case studies on supply chain excellence prepared in 2005 for the Center for Transportation and Logistics' Supply Chain 2020 Project.

Analysis. Techniques such as open and categorical coding, typically recommended for the analysis of qualitative data (Charmaz, 2006), were employed extensively to analyze passages of the cases that referred to the strategy of the firms. The purpose of using open coding was to stay close to the data, while categorical coding was used afterwards to help us identify the deeper concepts behind the text (Goulding, 2002). Discourse analysis was used to analyze particular passages of interest, and interpret the meaning behind the strategy discourse (Eriksson and Kovalainen, 2008). Other techniques for the analysis of qualitative data were applied as needed. For example, tables that summarize the evidence (Eisenhardt, 1998; Eisenhardt and Graebner, 2007) were used to compare and contrast some key features of the cases. Also, conceptual maps (Miles and Huberman, 1984) were used to summarize in a graphical form the framework that

7

emerged from the analysis.

The qualitative analysis of data from the 20 cases mentioned above suggested that the strategic imperative given to the supply chain function often includes two distinct elements:

- a *core strategy*, the central idea behind the strategy, and

- a few *strategic themes* that clarify and expand upon the core strategy and relate it to the business environment.

Revealing the Supply Chain Strategy

Although a supply chain strategy was not provided explicitly in 18 out of 20 cases, a careful examination of the data revealed a collection of loosely connected, reappearing ideas or themes related to the supply chain, whose stated purpose was to make the business strategy possible and successful.

To test whether these underlying themes were part of the supply chain strategy, we selected one of the case studies from the pool (Roy, 2005) and applied qualitative content analysis to its description of the supply chain activities. The result was a conceptual map connecting operations in the field with the business strategy through a series of intermediate layers or categories.

To explore whether a similar conceptual map could be created with primary data taken directly from the field, we engaged two firms in action research (AR) projects.

Action research. Harris (2007) defines action research as "an informed investigation into a real management issue … resulting in an actionable solution to the issue." Somekh (2008) states that "the outcomes of action research are both practical and theoretical," since "the knowledge it generates has a direct and ongoing impact on changing practice for participants and on a wider audience through its publications." Naslund (2002) makes the case for using action research to address research questions in the field of logistics: "action research case studies are especially

8

suited for an applied field such as logistics since they strive to advance both science and practice."

Projects. We conducted two action research projects. The first one was a two-year long project with Saflex, a business unit of Solutia, a specialty chemical manufacturer. It included 41 qualitative interviews, scheduled for one hour each, on the subject of the firm's activities. It also included five panel discussions, scheduled for four hour each, with a team of eight supply chain managers from the supply chain function of the firm. The second project, seven-month long, was conducted with a distribution company that we will call Libica[†]. It included 22 qualitative interviews, scheduled for one hour each, on the subject of the firm's activities. It also included three panel discussions, each scheduled for four hours, with a team of 24 managers from different functions in the firm.

Building these conceptual maps from the data we developed an understanding of how the supply chain strategy, in the form of tacit knowledge about the supply chain activities, serves as link between the business imperatives that emanate from the boardroom and the actual operations that are taking place in the field. This is shown in Figure 1.
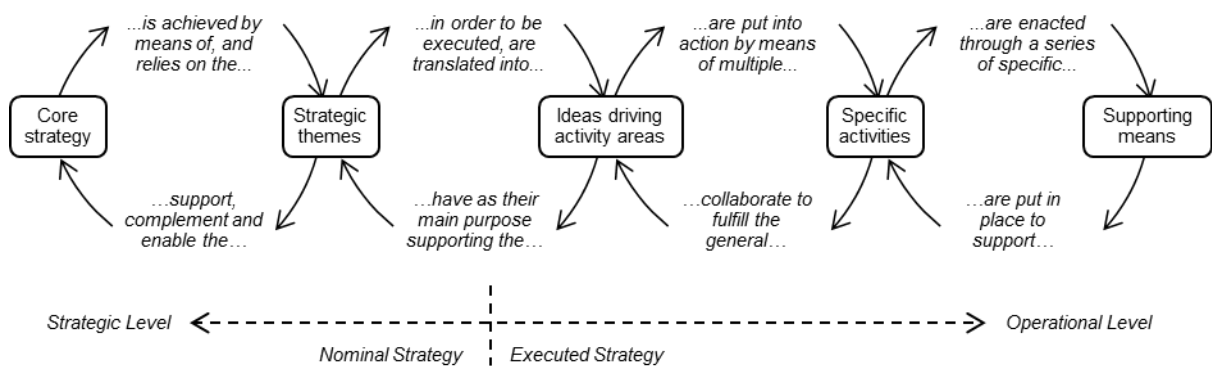

Figure 1: Tacit knowledge of activities connecting the boardroom and the field.

[†] The name of this company and other sensitive information have been disguised.

A working framework of supply chain strategy

We translated this understanding into a refined framework that positions functional strategies (including the supply chain strategy) as a bridge between business strategy and operations. This is in line with the proposition that supply chain strategy "could be viewed as part of a hierarchical chain of strategies," as a "cascading strategy" that "serves to integrate the supply chain processes with the overall direction of the enterprise" (Narasimhan, Kim, and Tan, 2008, p.5.)
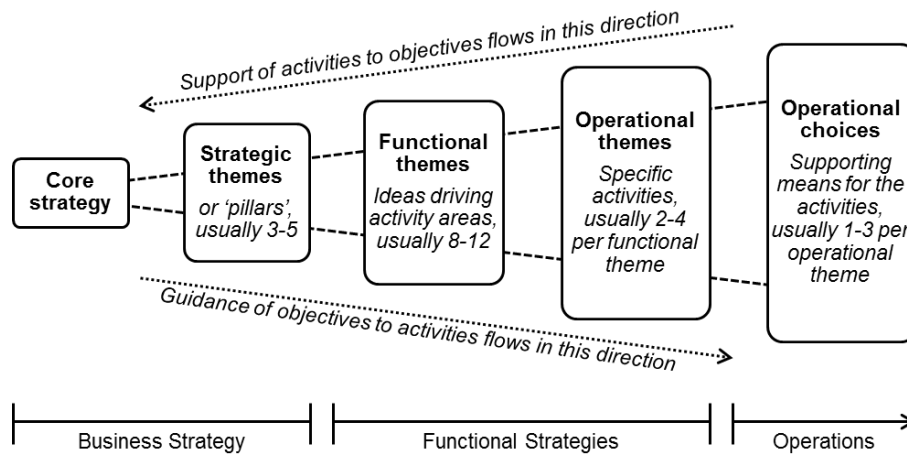

Figure 2: Working framework of the supply chain strategy

The refined framework, shown in Figure 2, includes five categories of concepts along a spectrum that goes from the strategic to the operational. The left end includes the Core Strategy, the driving force behind the strategy of the firm, which along with the Strategic Themes represent what we call the 'Business Strategy'. The right end of Figure 2 includes the list of activities that constitute firm's operations, dubbed Operational Choices. Bridging these two ends we have the Functional Themes and the Operational Themes, which together represent what we call the 'Functional Strategies.' Among these functional strategies is the subject of our interest, the supply chain strategy.

Despite its simple appearance, this working framework served as a solid platform to build a

10

method to express a supply chain strategy. Around it we developed, tested and refined the *Functional Strategy Mapping Method* (FSM Method) to reveal and capture an existing supply chain strategy into a *Functional Strategy Map* (FSM). As shown in the template of Figure 3, the structure of the map mirrors that of the framework we developed.
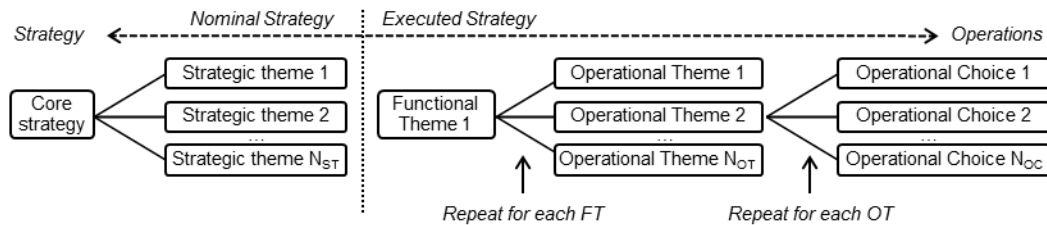

Figure 3: Template for building a 5-level Functional Strategy Map (FSM)

4. THEORETICAL FOUNDATION OF THE FSM METHOD

Besides the framework, the following four premises – firmly grounded in the existing literature – provide the FSM Method with a theoretical foundation.

Activities as the essence of strategy

The first premise is that, in order to know the actual strategy of a firm, we must know its activities. This idea is well rooted in the business and corporate strategy literature: Porter's "What is strategy?" (1996) states that "the essence of strategies is in the activities – choosing to perform activities differently or to perform different activities than rivals." Andrews (1987), in a section titled "What Strategy Is," states plainly that "strategy is the pattern of decisions in a company" that "reveals" its goals. Also in the supply chain management literature, Cigolini, *et al*. (2004) conclude – after conducting an extensive meta-analysis of over a hundred case studies in supply chain management – that "what companies actually did, rather than what they claimed their strategic intent to be, is the best clue to reveal their very supply chain management strategies" (p.12). A similar idea is also at the core of a relatively recent school of thought in the

11

strategy literature, known as *strategy as practice* school: "we cannot rely entirely on what managers have to say about their own practices," since "it can happen that they do not know that they know or, more bluntly, that they just do not know… and so they invent" (Baumard, 1999, p. 98).

Supply chain strategy as a conceptual system

The second premise underpinning our approach is that a supply chain strategy can be represented as a conceptual system. Systems are commonly defined as "a set of interrelated components working together to accomplish a common purpose" (Oliver, Andary and Frisch, 2009, p. 1363). Recent literature in the systems engineering field has discussed the potential for "engineering the enterprise as a system" (i.e. Rouse, 2009). Rouse laments that, "despite their prevalence, enterprises are seldom considered to be systems" (p. 441). The same may be said of functional strategies.

Rouse includes the supply chain in his definition of enterprises, since it is "a goal-directed organization of resources... and activities", adding that "supply chains can be viewed as extended enterprises linking upstream and downstream providers of raw materials, components, products, services and so on" (2009, p. 441). The supply chain is frequently considered as a physical system. A physical system is one that is "made up of real components occupying space" (Blanchard, 2008, p. 5). Supply chain strategy, on the other hand (or any other group of interrelated functional strategies), is a conceptual system. A conceptual system is "an organization of ideas, a set of specifications and plans, a series of abstract concepts" (Ibid.)

Tapping into tacit knowledge

The third premise underpinning our approach is that tapping into the *tacit knowledge* of the organization is crucial to understand its actual practices. Tacit knowledge, a prominent concept

12

in the organizational literature (i.e. Baumard, 1999; Harrison, 2004; Tsoukas, 2005), is of paramount importance to our problem. Nonaka (1994), a foundational figure in popularizing the idea of *'tacit knowledge'*, states that it involves both cognitive and technical elements: among the cognitive elements are the individual's images of reality; and among the technical element of tacit knowledge is the concrete *know-how* of certain processes.

Actual practices, we are told, "can diverge greatly from official descriptions of these practices. … Nonetheless, through careful investigation, managers can often find gaps between official mandates… and the actual practices" (Harrison, 2004, p, 92). While some authors, (i.e. Baumard, 1999, p. 98) advocate "a long immersion in the organization being studied" of over half a year as the method of choice for investigating tacit knowledge, other authors (i.e. Harrison, 2004, p. 93) argue that "intensive interviews" are an equally valid means to access "the richest data on emergent practices." These interviews, to be useful, should be focused on specific activities: "Open or semi-structured interviews elicit the most useful and valid data when respondents provide explicit descriptions of how they act in a range of work situations, rather than giving generalizations or expressing attitudes" (Ibid.) This tactic of asking individuals about specific activities, as opposed to generalizations, became a cornerstone in our approach to the problem.

Another recommendation that became integral to our approach was 'triangulation' of our data gathering methods, by "seeking information from people with divergent roles and viewpoints" (Ibid.) It is important to remark here that our choice of research method fits the nature of the problem on both accounts, since action research helps "make explicit the tacit knowledge that guides … practice" (Somekh, 2008) and seeks to "include all stakeholders actively in [the] processes" (Docherty, 2006).

13

Conceptualization and crystallization

The fourth premise underpinning our approach is that there is value in creating a "dialogue between tacit and explicit knowledge" (Nonaka, 1994.) Recent literature exploring the link between organizational culture and supply chain strategy has suggested that supply chain strategy should be aligned with organizational culture for effective implementation (Roh, Hong and Park, 2008). Organizational culture includes, among other elements, espoused values (*"what ought to be"*) and artifacts (*"what is"*) (Schein, 1996).

Nonaka (1994) defines four different modes of knowledge conversion, two of which go across the tacit-explicit divide: the conversion of explicit knowledge into tacit knowledge is called *internalization*, while the conversion of tacit knowledge into explicit knowledge is called *externalization.* The latter is of particular importance since, according to Nonaka, the "articulation of tacit perspectives" is "a key factor in the creation of new knowledge." Externalization is valuable, since the "explicit knowledge represents a model within which contradictions are resolved and concepts become transferable" (Nonaka, 1994.) Nevertheless, externalization "is not well developed," in part because "theories of organizational learning have not given much attention [to it]" (Ibid.)

As extensions to the ideas of externalization and internalization, Nonaka presents the ideas of conceptualization and crystallization. In *'conceptualization'*, "tacit 'field-specific' perspectives are converted into explicit concepts that can be shared beyond the boundary of the team," while in *'crystallization'*, the knowledge created by the team is "crystallized into some concrete 'form'," such as a concept or system (Nonaka, 1994). Through crystallization, "various departments within the organization test the reality and applicability" of the concept or system created by a team. This is facilitated by "encouraging experimentation" and "usually leads to refinement of

14

the concept" (Ibid.)

The FSM Method is presented below in detail. It includes steps to facilitate both *conceptualization* and *crystallization* of knowledge regarding the supply chain strategy.

5. THE FSM METHOD

The FSM Method has ten steps. Step 1 is about scoping the project; Steps 2 through 7 deal with conceptualization, namely making the supply chain strategy explicit, as it is executed in the activities of the firm; Step 8 brings the strategic imperative into the picture; Step 9 links the nominal and executed strategies; Step 10 validates the Functional Strategy Map, and thus provides a first step towards crystalization. A brief summary of each step is provided below, while a detailed and actionable protocol is provided in the Appendix.

Step 1 - Scope the project

Define the scope of the project by identifying what areas of the firm will be addressed (i.e. a business unit). Then identify individuals within these areas to be interviewed, including some directly involved in crafting the strategic imperative, and some in the two levels that report to them.

Step 2 - Conduct qualitative interviews

The interviews start by asking the individuals about the activities they perform, and are later steered towards the supply chain activities of the firm. The individual serves as vehicle to tap into the firm's practices; specific activities serve as bridge to the tacit knowledge of supply chain strategy.

Step 3 – Identify areas of activity and specific activities

Listen to all the interviews, in order to identify tentative areas of activity. Inside each area, look for references to specific activities. For each activity, look for means or details that support

15

its factuality. Retain only the activities for which supporting means or details were found. Likewise, retain only the areas of activity for which well-supported specific activities were found. Prepare a hierarchical summary for each area of activity (see Table 2).

Step 4 – Translate each hierarchical summary into a partial map

The hierarchical summary for each area is translated into a partial map, which is a diagram showing concepts and the relationships between them (see Figure 4). Given the hierarchical structure of the summary prepared in Step 3, its translation into a partial map is a straightforward process.

Step 5 - Validate the partial maps through panel discussion

To confirm that the partial maps are a fair representation of what the firm's supply chain strategy does, they are presented to a panel of members of the firm possessing in-depth knowledge of the relevant areas. Based on their feedback, the partial maps are revised to improve their validity.

Step 6 - Combine the partial maps of strongly related areas

The group of partial maps is examined to find 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, with the objective of reducing the complexity of the final output.

Step 7 - Add a layer of subareas when needed for simplicity

Whenever needed to keep the number of items in the top two layers within a reasonable range, a new layer of sub-areas can be added between the first layer (areas) and the next layer (activities). In it, each sub-area would combine the ideas behind the activities grouped under it.

Step 8 - Create an abstract of the stated business strategy

Negotiate access to written documents stating the firm's core strategy and its espoused

strategic themes. Identify both the central strategy statement of the firm (the 'core strategy') and its supporting strategic objectives (the 'strategic themes'), and map them conceptually.

Step 9 - Assemble the Functional Strategy Map

Assemble the FSM out of the elements prepared thus far. Following the template shown in Figure 7, place on the left hand the nominal map prepared in Step 8, and on the right hand the first two layers of the partial maps prepared in Steps 2 through 7.

Step 10 - Validate the FSM through panel discussion

To validate the FSM, ask individuals whether, in their opinion, it is an accurate representation of what the firm does. The feedback of individuals, while kept anonymous, is then discussed in a panel discussion. The FSM is revised as needed to improve its validity.

Testing and refining the method

The same two action research projects that allowed us to refine the framework of supply chain strategy helped us test and refine the FSM Method as well. The first action research project, conducted with Saflex, served to test for the first time with a real firm the early version of the FSM Method we had developed based on the secondary case studies. The second action research project, conducted with Libica, served to test the revised FSM Method and, most importantly, to document its steps in an actionable protocol (shown in the Appendix.)

An illustrative application

In this section we illustrate the FSM Method with examples taken from our action research project with Libica, with all sensitive information duly disguised.

Our team was approached by the Executive Vice President of Operations of Libica to help rethink their supply chain strategy. The firm's business model had changed in the recent past and formed the motivation behind this inquiry. After becoming acquainted with our method, he

decided to engage us in capturing and evaluating Libica's supply chain strategy.

It was decided the project would focus on the 'Distribution' business unit of Libica **(Step 1)**. 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 1.

Level 1 *(7 individuals)*	Level 2 *(7 individuals)*	Level 3 *(8 individuals)*
Executive VP of Strategic Sourcing	VP of Operations - West Region	Director of Inventory Optimization
Senior VP of Marketing / Retail Sales	VP of Operations - East Region	Director of Operations
Senior VP of Operational Excellence	VP of Operations - Central Region	Director of Operations
Senior VP of Customer Service	VP of Specialty Sales	Director of Retail Sales
Senior VP of Strategy & Business Dev.	VP of IT	Director of Consumer Products
Executive VP of Operations & SC	VP of Strategic Planning / Execution	Director of Retail Sales
Senior VP of National Chain Accounts	VP of Operational Excellence	Manager of Performance Cons.
		Director of Marketing & Product Dv.

Table 1: Final list of respondents from Libica

A total of 22 interviews were conducted over 29 days (Step 2). 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.

Through the analysis of the interviews, as described in the protocol, areas of activity and specific activities were identified **(Step 3).** 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

18

activities under it: *'Help independent retailers be more competitive.'* The summary for this area

of activity is shown in Table 2.

- 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 independents find missed opportunities in previous orders and 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 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 them, 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

Table 2: Hierarchical summary for area "Help independent retailers be more competitive"

A partial map was prepared for each area of activity **(Step 4)**. As an example, the partial map

of the area discussed above is presented in Figure 4.

The partial maps were validated through individual feedback and panel discussion **(Step 5)**.

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, and changes were made to the partial maps as needed.

Partial maps of strongly related areas were combined **(Step 6)**. 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
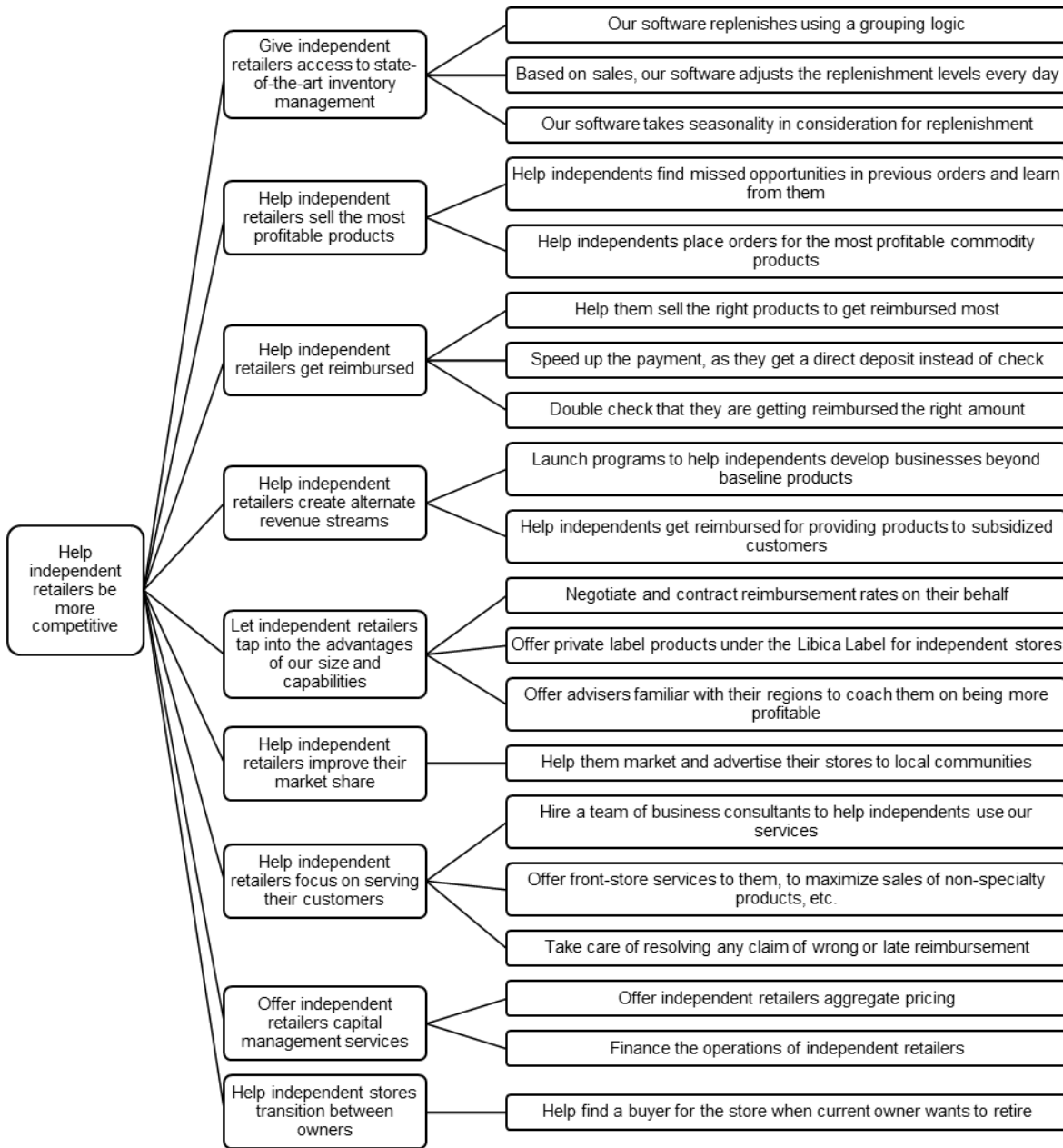logistics.

Figure 4: Initial partial map for area "Help independent retailers be more competitive"

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

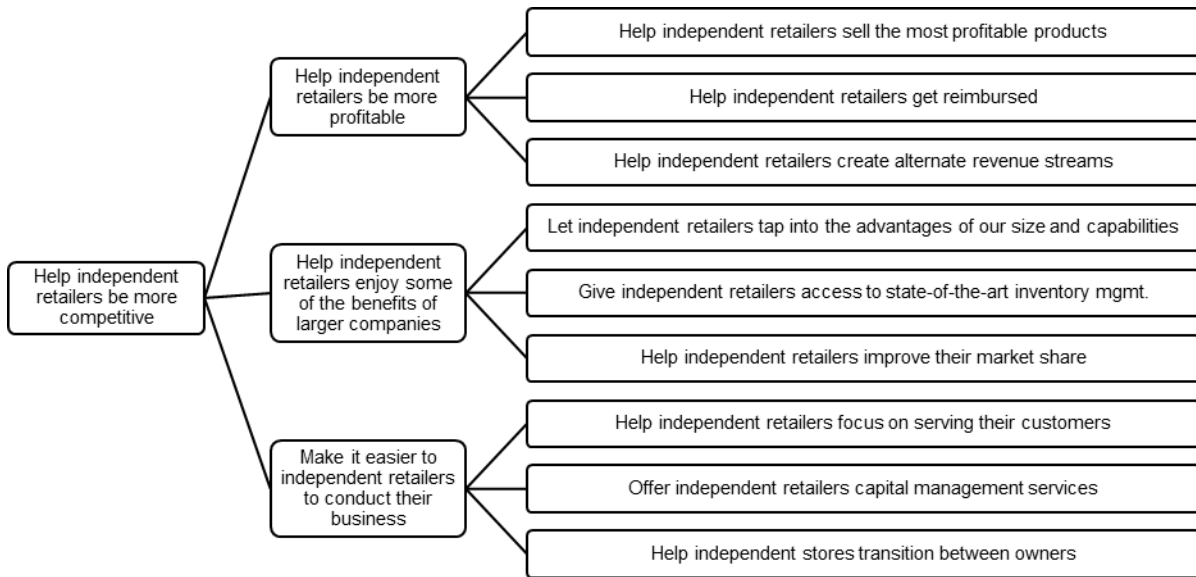and means that were now encompassed under this new area.

Figure 5: Revised partial map for area "Help independent retailers be more competitive"

To keep the number of items in the second layer of the partial map within the desired range,

activities were grouped into subareas **(Step 7)**. 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 5. Notice that, to keep the figure simple, we

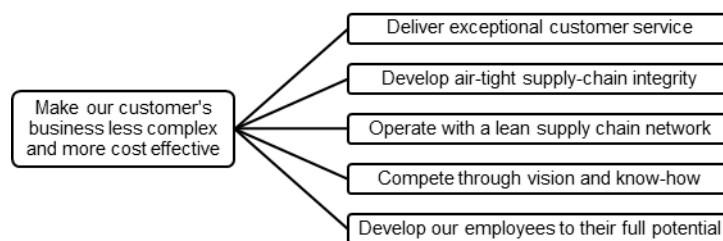do not show the layer of supporting means.

Figure 6: Mapped nominal strategy of Libica

We then created an abstract of Libica's business strategy **(Step 8)**. 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.

21

After validating these elements with our sponsor, we prepared the conceptual map shown in Figure 6.

We then assembled an FSM out of the elements prepared thus far **(Step 9)**. Following the template shown in Figure 7, 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.
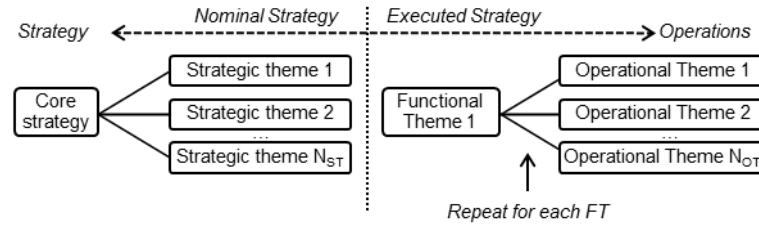

Figure 7: Suggested template for a briefer, 4 level Functional Strategy Map

Finally, the FSM was validated through panel discussion **(Step 10)**. Individual 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 8. The boundary between the nominal and executed strategies is denoted by a dotted line.

6. DISCUSSION

Our action research projects with Saflex and Libica allowed us to field-test the *Functional Strategy Mapping Method* (FSM Method) as a mechanism to capture and express the supply chain strategy. Success could be judged on two criteria: the first is whether the FSM Method managed to tap into the tacit knowledge of the firm to reveal the supply chain strategy; the second is whether the output, namely the *Functional Strategy Map* (FSM), is an actionable conceptualization of the supply chain strategy.

First criteria

That the FSM Method managed to tap deep into the tacit knowledge of members of the

organization became evident during the validation of the partial maps and the final map.

Figure 8: Validated 4-level Functional Strategy Map for Libica

Across the table, while the team was discussing the evolving map, it was a common occurrence to hear a question like: "*Do we actually do this?*" Sometimes the answer would be *"Yes,"* other times it would be *"No,"* and in yet others it would be *"Well, kind of…"* But it was almost always followed by a rich, nuanced conversation on what the firm actually does, and why. The ideas and purposes behind the activities, as well as the factuality of the activities themselves, were the subject of clarifying discussion – precisely the reason why we pursued the FSM Method.

Second criteria

That the resulting FSM is actionable, in the sense that further action can be taken based on it, became clear when we used the FSM of both Saflex and Libica as the starting point for the evaluation of their respective supply chain strategies. The details of this evaluation will be discussed in another paper, yet let us cite here the reaction to the findings.

Of the findings obtained through analysis based on Saflex's FSM, their VP of Supply Chain said: "You've hit the nail in the head … This is a very good crystallization of things." He said the resulting report "highlights the key issues" and "managed to find the key conflicts," and added: "Your system seems to be able to single out and capture the fundamental issues we're struggling with … I think we have a foundation for moving forward."

Likewise, commenting on the findings obtained through analysis based on Libica's FSM, their EVP of Operations and Supply Chain described his reaction to being faced with the main finding as an epiphany: "To me, it was like a light bulb went off…," he said, adding that the cause of the problem "was clear from the material."

These reactions to the findings of the evaluation that was done using the FSM as starting point, reveal the extent to which such a map is an actionable device, in that it serves as

24

foundation to conduct further analysis that can produce useful, grounded insights on the supply chain strategy of a firm.

Transportability of the FSM Method

To test the transportability of the FSM Method, we made its protocol (provided in the Appendix) available to a team of consultants and a doctoral student, for their use in projects of their own.

A team of three consultants in Bogota, not involved in the process of developing the FSM Method but aware of it, requested a copy of the protocol to apply it in several of their projects. Through occasional meetings with them we followed their progress and provided some general guidance. On the protocol, one of them commented: "The method is well defined, clear and easy to follow." The SC Director of the target firm commented that the partial maps managed to "capture in a clear form concepts that we are not capable of explaining inside the company" and described the maps as "a useful tool to communicate across areas." He also expressed surprise that, "through such simple interviews it was possible to capture in a clear manner what the organization does and how it is done." As the project is still ongoing, we have no comments yet on the resulting FSM.

A doctoral student in Portugal, not involved with developing the FSM Method but aware of it, is in the process of applying the protocol in several projects. Although we provided her no significant guidance, she has successfully completed the FSM for her first project, and intends to apply the FSM Method in five more cases.

Ease of use of the FSM Method

Our experience from teaching the FSM Method to students suggests that learning to build a *Functional Strategy Map* takes a relatively short time. For example, students in a graduate level

25

course taught in the U.S. on the subject of supply chain strategy were assigned the task of building a FSM as homework, after attending a one-hour lecture on the subject. They were provided a summary of the FSM Method and were given a data-rich description of the strategic activities of a firm. The students worked in groups of three, and were given one week to complete the assignment. Out of a total of eight groups, seven completed the task without any guidance from the class instructors, while one group required a one-hour clarification session in order to complete it.

Another example comes from a seminar taught in Latin America to students in a graduate certificate program on supply chain management. The students were given three hours of instruction on the capture method. This time the assignment was more ambitious: students were instructed to select a firm, either from a list of preselected case studies or from their own work experience, and to build for it a FSM. The students were given the protocol of the FSM Method, and two weeks to complete the task. Nine students worked in groups of three each, while two students formed a group on their own and one student worked individually. Of the delivered assignments, three dealt with firms from case studies while the other three were firms outside of the list of cases, chosen by the students. All groups completed the FSM satisfactorily without any guidance from the instructors.

Applicability of the FSM

The main application of the FSM is to serve as a tool for discussion and as the starting point for the evaluation and reformulation of the supply chain strategies. Actionable methods for evaluation and reformulation of a supply chain strategy using the FSM as starting point will be presented in upcoming papers.

It is worth mentioning, additionally, that the FSM can also be used as a starting point to build

26

the "techniques-tools matrix" proposed by Cigolini, *et al.* (2004). Figure 9 shows a "techniques-tools matrix" that was built on the basis of Saflex's FSM. To build it, the *m* Functional Themes from the FSM were arranged as row headers and the *n* Operational Themes from the FSM were arranged as column headers, to form an *m* x *n* matrix. For every instance where the team of experts from Saflex agreed an Operational Theme provided support to a Functional Themes, a checkmark was added to the matrix. The only substantial difference between the resulting matrix and the one shown in Cigolini, *et al.*'s (2004, p.20) is that the latter is limited – by choice – to concepts in the interface between firms, whereas the former is not.

	OT1	OT2	OT3	OT4	OT5	OT6	OT7	OT8	OT9	OT10	OT11	OT12	OT13	OT14	OT15	OT16	OT17	OT18	OT19	OT20	OT21	OT22	OT23	OT24	OT25	OT26	OT27	OT28	OT29	OT30	OT31
FT1	✓																														
FT2				✓																											
FT3								✓	✓	✓																					
FT4		✓		✓	✓		✓	✓				✓	✓		✓			✓				✓	✓		✓	✓				✓	
FT5								✓											✓	✓	✓		✓								
FT6								✓													✓		✓								
FT7								✓									✓								✓	✓	✓			✓	
FT8							✓	✓			✓																			✓	✓

Figure 9: A 'techniques-tools' matrix built on the basis of a Functional Strategy Map

It is interesting to compare the FSM, which is largely built *'from the ground up'* based on the knowledge of specific activities of the firm, against Schnetzler, *et al.*'s (2007) graphical depiction of a *'decomposed'* supply chain strategy, which is entirely developed *'from the top down'* based on the objectives of the supply chain. One is factual; the other, aspirational. Both share a tree-like structure, yet the latter uses fixed, predetermined categories for the 'branches', whereas the former allows these categories to emerge from the data collected in the interviews.

Looking outwards

The interviews conducted as part of the FSM Method revolve around supply chain activities, and therefore, by definition, are concerned with outside suppliers and customers. Nevertheless,

27

there was some concern that the FSM may be too introspective and miss, perhaps, the larger picture of the external environment that surrounds the firm beyond its own functions.

This concern was assuaged, at least in part, by an interesting and fortuitous learning during an exercise we conducted with Saflex to validate the findings of the evaluation exercise conducted using the FSM as basis. We discovered that for almost every conflict, a participant would volunteer a mechanism to improve the situation. The fact that this would happen spontaneously, almost as a natural consequence of being faced with the conflict, was not expected. The recommendations would go along the lines of: "You know, about this problem… if we could improve our collaboration with our suppliers, then we could make this better", or "If we could convince our buyers that it is in their best interest to provide us with accurate information on this, then this situation would improve", etc. Many, if not most, conflicts had a flip-side, in the form of an '*if'* clause involving very frequently an improved collaboration with other members of the supply chain.

Thus, an unexpected learning of the exercise, originally focused on the internal coherence of a firm's supply chain strategy, was that improving the internal conflicts often requires the strengthening of external relationships, through collaboration and partnership. A similar experience occurred with Libica, where many of the conclusions pointed to the need to improve collaboration with both suppliers and customers.

The reason this assuages – at least partly – the concern about the FSM being *'introspective'* is that it demonstrated the ability of the FSM to serve a foundation for grounded discussion that can generate insights about the interactions of the firm with the outside. The discussion was by no means constrained to the boundaries of the organization.

Limitations of the FSM Method

Our experience with the FSM Method suggests two instances where the protocol, in its current form, presents the facilitator with particular challenges.

The first is in dealing with the tensions that exist around burning areas of unresolved conflict in the organization, which we call 'grievances,' whose effect can be felt in the discourse of respondents: different members of the organization may have very different and strong views about these areas, which are not easy to reconcile and to conceptualize in a form that can be accepted by the group as a factual statement.

A second challenge, related in its nature to the first, is how to capture in the FSM the activities of an organization that are undergoing a significant transformation. A firm that has already launched important changes to its activities, changes whose deployment has not been completed yet, will also reflect in its tacit knowledge a similar tension: some members of the organization will resist depicting it as an accomplished change, while others will resist depicting it as an unfinished change.

As we continue to apply the FSM Method to new projects, we are bound to further refine them and to learn how to deal with, or overcome, the limitations that we have identified above, namely expressing activities around *grievances* or ongoing transformation.

Further research is also needed to assess how well the FSM is accounting for the external environment of the firm. If it were to be found wanting, then one should explore how it could be coupled with a compatible representation of the external environment, for the sake of subsequent evaluation and reformulation efforts.

Finally, the applicability of the FSM Method to areas beyond supply chain management is still unexplored. A supply chain strategy is a particular selection of functional strategies that

addresses a particular problem. Whether the FSM Method will be equally useful to other groups of functional strategies that are not related to the supply chain remains to be seen. However, since the FSM Method is not biased towards supply chain management, we anticipate that it could be applied to other realms within management and strategy.

7. CONCLUSIONS

The framework discussed in this paper provides a working understanding of supply chain strategy, describing it as a logical bridge between operations in the field and the strategic imperative of the supply chain. This framework, although still a work in progress, may be considered in its own right a contribution to the existing supply chain management literature. The multilayered, pyramidal structure of the refined framework, spanning from the highest strategic imperative (the 'core strategy') to the actual operational choices in the field, is reminiscent of the proposition by Narasimhan, Kim, and Tan (2008) that supply chain strategy "could be viewed as part of a hierarchical chain of strategies," as a "cascading strategy" that "serves to integrate the supply chain processes with the overall direction of the enterprise." The fact that our framework, which was developed independently, came to resemble the proposition of Narasimhan, *et al.* should contribute to its validity.

Motivated by this framework and four premises grounded in the literature, we proposed an approach to capture and express a firm's supply chain strategy, that we have called the Functional Strategy Mapping Method (FSM Method). By allowing practitioners to reveal and express the supply chain strategy explicitly and in realistic terms, we expect the FSM Method will encourage and facilitate the discussion of a firm's supply chain strategy in a factual and meaningful manner. In this sense, the FSM Method may be considered also a contribution in itself, relevant to practitioners engaged in the strategic aspects of supply chain management.

30

The FSM Method was tested by us in two action research projects. The resulting *Functional Strategy Maps* were deemed by the target firms as fair and accurate representations of their supply chain strategies. Furthermore, they served as starting point to conduct thorough evaluation exercises, which yielded important insights into these two firms' supply chain strategies. These insights were described by the heads of SC in these firms as both accurate and revealing, lending further weight to the validity to the FSM Method.

The favorable outcome of these exercises suggests that the four premises underpinning the method may be of interest to other researchers in supply chain strategy: (1) that, in order to know the actual strategy of a firm, we must know its activities; (2) that a supply chain strategy can be represented as a conceptual system, e.g. as an organization of ideas; (3) that tapping into the tacit knowledge of the organization is crucial to understand its actual practices; and (4) that there is value in creating a dialogue between tacit and explicit knowledge within the supply chain. There may be value in exploring the applicability and implications of these four premises in other instances.

In its current form, the FSM Method is not without limitations. There is a challenge in describing areas that are suffering from ongoing transformation within the organization, or in knowing to what extent the process is blind to factors that lie on the outside of the organization. Even as these limitations will be subject to further research, we consider it is clear by now that there are benefits to the self-knowledge the firm derives from creating a *Functional Strategy Map*, both as a device to communicate their supply chain strategy and as a meaningful starting point for its evaluation and improvement efforts.

APPENDIX

Protocol of the FSM Method

The following is a detailed, actionable protocol of the FSM Method that practitioners can use to capture the supply chain strategy of a firm and express it in a Functional Strategy Map.

Step 1 - Scope

The first step is to define the scope of the project by identifying the functional areas of the firm to be addressed. 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 firm.

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'* (Patton, 2001), 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 firm. 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

32

tap into the firm. 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 firm.

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 (i.e. Rubin and Rubin, 2004; Weiss, 1995.) 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 firm. 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).

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 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

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 (Collier, Fishwick and Floyd, 2004). 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 firm, 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 clarify 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 firm's activities, letting the open question discussion run its own course is a practical way to collect good qualitative data on the firm'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

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.

37

<center>**Step 3 – Identify areas of activity and specific activities**</center>

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 firm 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 firm. For this, the interviewer should examine what means, if any, the firm 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 – Translate each hierarchical summary into a partial map

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 through panel discussion

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 firm's knowledge of its supply chain strategy. This validation involves presenting all the partial maps, one at a time to a team from the firm, 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 firm 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 the partial maps of strongly related areas

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 - Add a layer of subareas when needed for simplicity

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 - Create an abstract of the business strategy

The analysis now moves to the nominal strategy of the firm. This step, aims to identify both the central strategy statement of the firm (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 firm'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 firm. In these documents, the core strategy and the strategic themes are usually easy to identify: they tend to feature prominently in the firm's stated strategy.

Step 9 - Assemble the Functional Strategy Map

The complete Functional Strategy Map (FSM) includes the five conceptual categories shown in Figure 3. 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 of Figure 7.

[------ Insert Figure 7 approximately here ------]

41

Assembling a four-level Functional Strategy Map out of the elements prepared thus far is rather straightforward. Following the template shown in Figure 7, 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 firm. The right half of the map shows a conceptualization of the executed strategy.

Step 10 - Validate final map through panel discussion

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 firm 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 firm'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.

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