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ABSTRACT

Purpose: The purpose of this paper is to present a framework to describe the supply chain strategy of a business unit, and to propose a method that can be used to express this strategy in the form of grounded actionable conceptual map.

Approach: The framework was developed through an inductive theory generation approach. The method was developed through collaborative management research projects and validated in projects by third parties.

Findings: The supply chain strategy is described as a logical bridge between a firm's business strategy and its supply chain operations, composed by a series of layers on a continuum between the strategic to the operational. The proposed method, called the Functional Strategy Mapping Method, was used to reveal and express the supply chain strategy of a business unit in a total of nine projects.

Research limitations: The scalability of the method beyond a single business unit is limited. The method is may be less useful when the significant, fast changes are already ongoing in the supply chain. Both the framework and the method are a work in progress and should be further tested and refined by third parties.

Originality: The paper proposes a novel framework of a business unit's supply chain strategy, and an original method that can be easily followed by practitioners and academics to express the supply chain strategy of a business unit. Both the framework and the method are based entirely on original research.

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

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changes in the business environment, such as new regulations, new technologies, new competitors, and entry to new markets. However, rethinking a supply chain strategy is not a trivial problem and it has no clear answer in the extant supply chain management literature.

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 of a century after strategy was described as one of the two faces of 'logistics' (the other one being operations – Shapiro and Heskett, 1985) fundamental questions, such as how to characterize a supply chain strategy, remain unanswered (Fröhlich and Westbrook, 2001).

Compared to the progress in the supply chain operations domain during the last decades, progress in the supply chain strategy domain has been relatively slow. Even some of the most cited ideas in the supply chain strategy realm are still hotly contested. For example, consider the attempts to validate Fisher's (1997) ideas empirically in Qi, Boyer and Zhao (2009), Selldin and Olhanger (2007), and Li and O'Brien (2001), and the rebuttal presented in Lo and Power (2010).

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 (The role of coherent supply chain strategy and performance management in achieving competitive advantage: an international survey, 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) laments – "it is often the case that high-level discussions of supply chain strategy are completely void of facts" (p. 27).

Our own analysis supports the view that the supply chain strategy of firms 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 [name of Research Center will be included after peer review]. 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 firm's business strategy.

Subsequently, during direct interactions and projects with multiple firms, we have verified that this pattern holds true: 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 research objective was to develop an approach to express the supply chain strategy of a firm in a way that is useful as an actionable starting point for its evaluation and reformulation.

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

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 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 below three approaches we 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. Another limitation is that it fails to capture how the supply chain strategy relates to the firm's strategic objectives or to the operations in the field. Additionally, it is not clear how the characterization as an arc of integration can serve as 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 [supply chain] strategy segmentation within a portfolio approach", which they call a *'segmentation tree.'* This model is based upon the assumption that three elements, namely product, brand and retail channel, suffice to get "a complete overview of the fashion industry". By *segmentation*, the authors refer to whether a firm applies "the same strategy to all its business segments" or instead "segment its strategy depending on [any of] the three proposed elements." The authors suggest that a supply chain strategy in the fashion industry would be sufficiently defined by knowing how this *segmentation* takes place on the basis of the three elements, and in what order the elements were prioritized,: "it 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 is – 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 largely blind to other aspects of a supply chain strategy. An additional limitation is that it also it fails to capture how the supply chain strategy relates to the strategic objectives or to the operations. 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 carried out, the *'segmentation tree'* approach 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. The authors propose creating a *'techniques-tools matrix'*, namely a matrix listing the supply chain techniques as row headers and the supply chain 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 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; (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 readability 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 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 (6) 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

Our research started with an effort to develop what Yin (2003) calls a preliminary "understanding - or theory - of what is being studied," which we refer to as a working framework of supply chain strategy. The effort included a series of four stages: (1) early exploratory interviews, (2) the analysis of a pool of existing case studies, (3) the development of an early framework through a first collaborative management research (CMR) project, and (4) testing and refinement of the framework through a second CMR project.

Stage 1: Early exploratory interviews

We conducted a series of five exploratory interviews with supply chain managers from multiple firms in different industries and from different levels in the hierarchy, from vice-

president (VP) to plant manager, to explore the view they had of supply chain strategy and its role in their firms. Their answers suggested that the purpose of the supply chain strategy was largely to make the business strategy '*happen'*. Later we confirmed this view through two additional interviews with a VP and an executive VP (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 execute the supply chain strategy to support it.

Stage 2: Analysis of existing case studies

Seeking to better understand how – if at all – the supply chain strategy and the business strategy are expressed in the setting of a supply chain function, we analyzed a pool of twenty existing, publicly available case studies on the subject of supply chain excellence, prepared in 2005 at [name of University Research Center will be included after peer review].

To develop an understanding of supply chain strategy and business strategy articulation, we followed an inductive approach, borrowing heavily from the qualitative toolkit (Easterby-Smith, Thorpe, and Lowe, 2002), in particular from the grounded theory tradition (Glaser and Strauss, 1967). The rationale for choosing qualitative methods is that they help the researcher keep personal assumptions in check and maintain an open thought process to emergent – and often unsuspected – findings (Gummesson, 2000; Eriksson and Kovalainen, 2008).

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. Open coding was used in a first pass, in an effort to stay close to the data, while categorical coding was used afterwards to help us identify 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, 1989; 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 emerged from the analysis. The details about this analysis are extensively presented in the doctoral dissertation of the X1 (2010, full citation withheld to protect the double-blind peer

review).

Business strategy. The analysis revealed that in 18 out of 20 cases, an explicit business strategy was provided. In the remaining two cases, although a business strategy was not stated explicitly, it could be inferred from the text. A qualitative analysis of the business strategy statements presented in these cases suggests that when the business strategy is given to the supply chain function as a strategic imperative, it includes concepts of two types: (i) a brief statement of the central idea of the business strategy, which we call the ***Strategy Core***, and (ii) several (typically 3-5) statements that expand and elaborate upon the Core, which we call ***Strategy Pillars***. These concepts, the Strategic Core and Strategic Pillars, were logically connected. Arranging them in hierarchical layers renders a business strategy amenable to being expressed as a logical tree or cascade of concepts, with the Strategic Core at the top. We extended this idea to the supply chain strategy, as discussed below.

Supply chain strategy. Only two out of the 20 cases in the pool made any reference to a supply chain strategy. However, a careful examination of the text of the remaining 18 cases revealed that – in the description of how a supply chain operates (namely the description of its activities, choices, policies, processes, etc.) several interconnected, recurrent *themes* could be found regarding the supply chain and related functions, whose stated purpose was to make the business strategy possible and successful. We applied a battery of qualitative data analysis techniques to descriptions of the supply chain activities, and obtained a conceptual map showing how general statements about the business strategy related to specific statements about operations in the field, by means of a logical tree or cascade of intermediate concepts. An additional two layers of concepts were identified: (iii) guiding principles driving the functions, which we call ***Functional Principles*** (FP), and (iv) general statements about how operations are conducted, which we call ***Operational Practices*** (OP). These address supply chain's activities, policies, choices, decisions, etc.

We grew interested in preparing similar conceptual maps for other firms, but based on primary data, that is to say, on data obtained directly from the practitioners with the explicit purpose of building the map (as opposed to an existing case study on a separate subject).

Stage 3: Developing an early framework

To that end, we conducted a collaborative management research (CMR) project with Saflex,

a business unit of Solutia, a specialty chemical manufacturer. Collaborative management research (CMR) is "defined as *an emergent and systematic inquiry process*, embedded in an agreed-upon *partnership* between actors with an interest in influencing a certain system of action and researchers interested in understanding and explaining such systems" (Pasmore, Stymne, Shani, Mohrman and Adler, 2008; emphasis in the original). The origins of collaborative management research, according to Shani, David and Willson (2004), can be traced back to the works of *action research* pioneers. Action research, defined by Harris (2007) as "an informed investigation into a real management issue … resulting in an actionable solution" is – according to Naslund (2002) – "especially suited for an applied field such as logistics" since it strives "to advance both science and practice."

The CMR project with Solutia lasted two years; the first half year was dedicated to creating the conceptual map. During this time, data collection about the activities of the supply chain function was conducted through 41 qualitative interviews, approximately one hour long each. From the data collected in these interviews we developed an understanding of how the supply chain strategy, in the form of Functional Principles and Operational Practices describing supply chain activities, serves as link between the business strategy and the operations that are taking place in the field.

With the purpose of validating the conceptual map that was being prepared from the interview data, three panel discussions were conducted, approximately three hours long each, with a team of eight supply chain managers from the supply chain function of the firm.

On account of having access to primary data and thanks to the close collaboration with the firm, the resulting conceptual map was much richer in detail than the early one made with secondary data, allowing us to identify an additional layer that was not apparent before: (v) specific statements about means in place to support the Operational Practices, which we call ***Supporting Means***. This includes mechanisms, resources, etc.

Based on the map, we were able to develop an early understanding of how these layers interact, and were able to propose an early framework of supply chain strategy, in relation to the business strategy and the operations in the field. This framework, presented below, was tested and refined through a second CMR project.

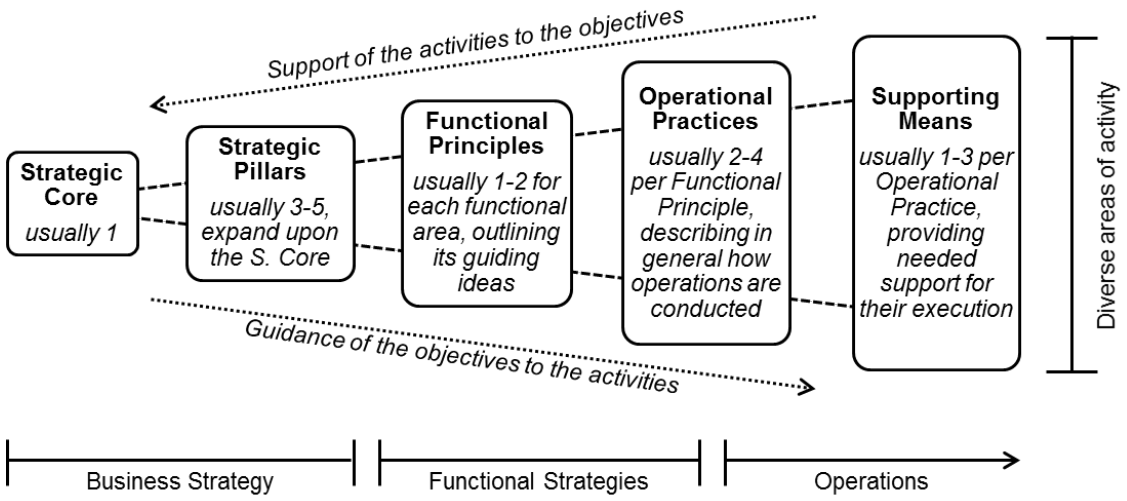

Figure 1: A working framework of a supply chain strategy and its context

Stage 4: Testing and refining the framework

A second CMR project was conducted with a distribution company that we will call Libica[2]. The project lasted seven-month, of which three months were dedicated to building the map. Data collection for the map included 22 qualitative interviews, scheduled for one hour each, on the subject of the firm's activities. Validation of the map was conducted during a panel discussion, scheduled for four hours, with a team of 24 managers, mostly from the supply chain, but also including related functions.

We used the conceptual map to test and refine the framework we had developed before. The resulting, working framework is shown in Figure 1. It positions functional strategies (including the supply chain strategy) as a conceptual bridge between the business strategy and the operations in the field.

The conceptual map from the second project also helped us deepen our understanding of how the different layers relate to each other. These relationships are described in Figure 2. Through the second project we also became more aware of the distinction between two types of concepts, which we call *Nominal* and *Executed* (see bottom of Figure 2). Nominal concepts are those that come from the firm's stated objectives; among the nominal concepts are the Strategic Core and the Strategic Pillars. Executed concepts are those that are inferred from the activities of the firm;

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

among the executed concepts are the Supporting Means and the Operational Practices. Functional Principles can be of either type: in some instances they are explicitly stated by the firm as objectives (*nominal*), while in some other instances they have to be inferred from the activities of the firm (*executed*). We refer collectively to the nominal concepts as the *Nominal Strategy*, and to the collection of executed concepts as the *Executed Strategy*.

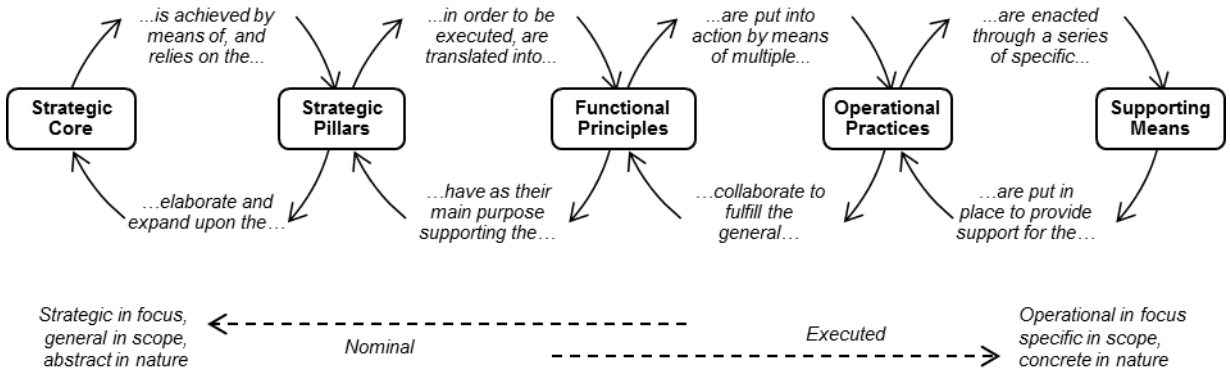

Figure 2: Relationships between different layers of our framework

It is easy to see that the five layers of concepts we have described (Figures 1 and 2) run along a spectrum that goes from the strategic to the operational in terms of focus, from the general to the specific in scope, and from the abstract to the concrete in nature. At the left end of the spectrum we find the Strategic Core, the driving force behind the strategy of the firm, which along with the Strategic Pillars represent what we identify as the *Business Strategy*. At the right end of the spectrum we find the means that support the firm's operations, dubbed Supporting Means Choices. Bridging these two ends of the spectrum we have the Functional Pillars and the Operational Practices, which together represent what we call the *Functional Strategies*.

The five layers we have identified in our working framework are not supposed to be definitive and exhaustive: additional layers could be specified if needed. More important than the specific layers is the idea that they belong to a continuum that runs from the strategic to the operational, and the understanding that concepts closer to the strategic end provide the *why* for those closer to the operational end, which in turn provide the *how* for those closer to the strategic end. This idea of a spectrum along which one can move by asking *why* and *how* proved to be, in our experience, instrumental in building upon the working framework we have presented above.

4. DISTILLING A METHOD

Despite its simple appearance, the working framework we developed served as a solid platform to build a method that practitioners can use to express a business unit's supply chain strategy. A protocol to replicate our approach was prepared through careful examination of the steps we followed in building the conceptual maps in our CMR projects and then articulation of these steps as actionable instructions, in clear and straightforward language applicable to a generic business unit. The result is what we call the *Functional Strategy Mapping Method* ("FSM Method"). The conceptual map, main output of the method, is correspondingly called a *Functional Strategy Map* ("FSM").

Outline of the method

The FSM Method includes ten steps. Limitations of space prevent us from presenting the detailed protocol of the FSM method as part of this paper. It is available as Appendix 1. A very brief summary of each step is provided below.

Step 1 - Scope

Define the scope of the project. Identify which functions, besides the supply chain, will be included. Then identify individuals within these functions to be interviewed. Include individuals directly involved in crafting the business strategy, and others in the two levels reporting 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 gateway 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 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.

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. 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 can be 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 should 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 business strategy. Identify in these documents both the central strategy statement of the firm (the 'Strategic Core') and the set of expanded strategic objectives (the 'Strategic Pillars'). 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 3, 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.

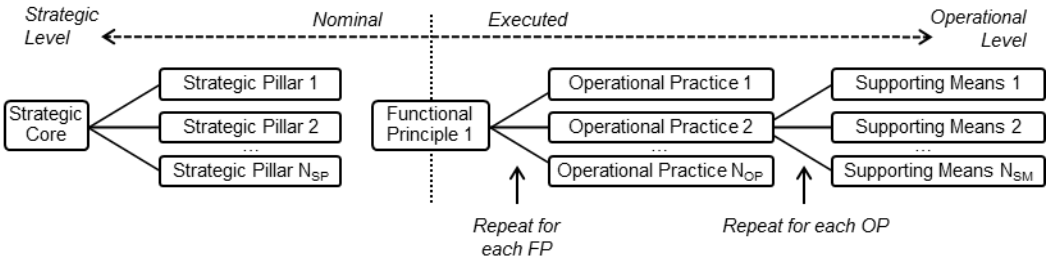

Figure 3: Template for building a 5-level FSM

Step 10 - Validate 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 can be revised as needed to improve its validity. It is possible to prepare a shorter version of the final map, where only four layers are shown, for the sake of space (see template in Figure 4).

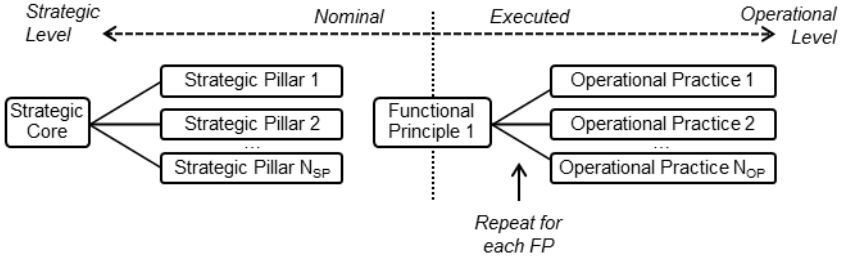

Figure 4: Template for building a 4-level FSM

Illustrative example

As an aid for practitioners in implementing the method, a detailed illustrative example is provided as Appendix 2. The example is based on our CMR project with Libica, with all sensitive information duly disguised. The resulting FSM is shown below in Figure 5. The fifth layer, Supporting Means, was suppressed for the sake of space. The boundary between the nominal and executed strategies in this map is denoted by a dotted line.

4. TESTING AND VALIDATION IN THE FIELD

At the time of this writing, a total of nine projects have applied in the field our approach to express a business unit's supply chain strategy. In this section we briefly discuss how these projects have contributed to test and validate the method.

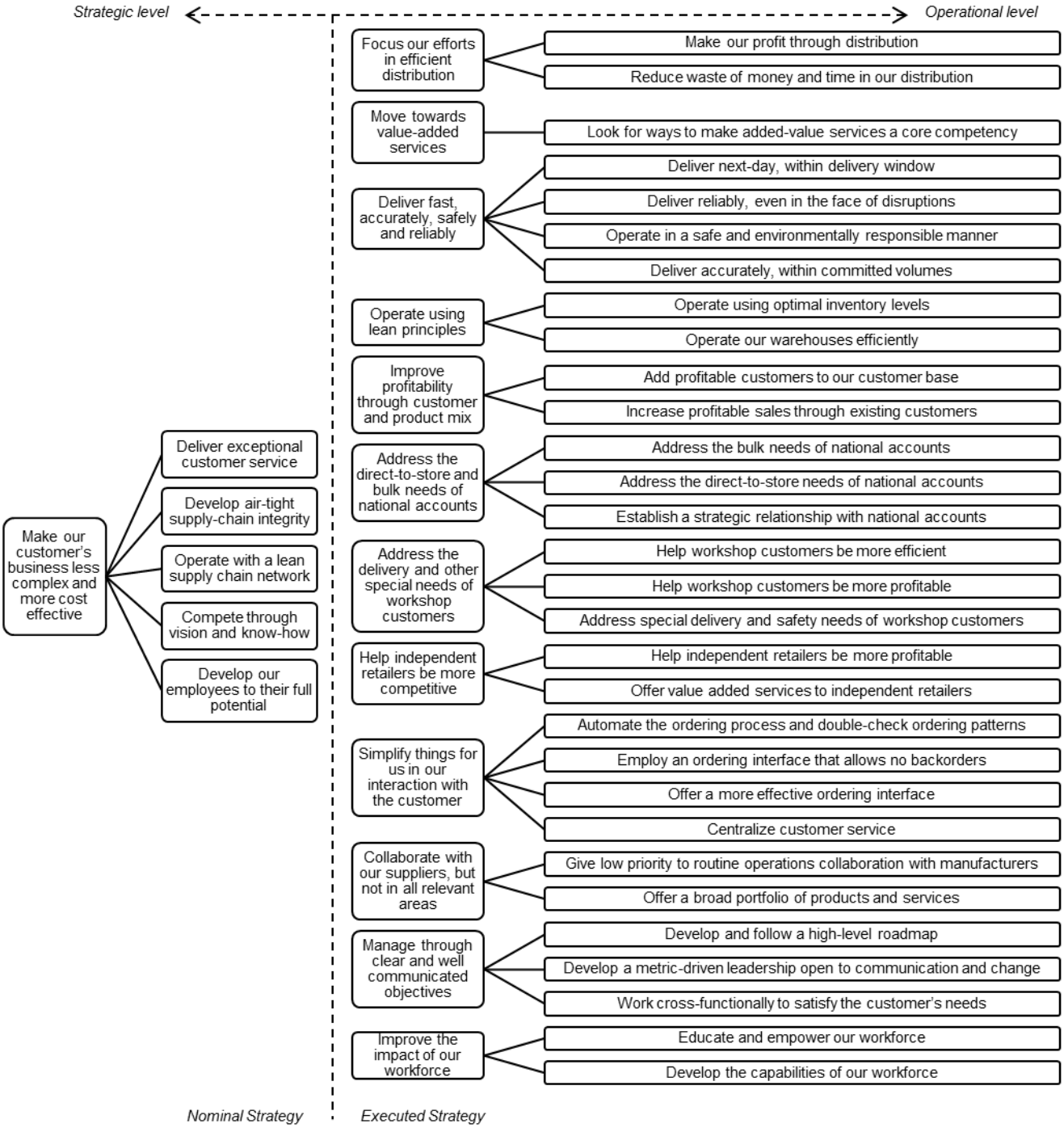

Figure 5: Validated 4-level Functional Strategy Map for Libica

Table 1 lists these projects along with a few of their salient features. Only projects where the FSM method was applied using primary data are included in the list.

First-hand testing and validation

Our CMR projects with Saflex and Libica (listed in Table 1 as Project 1 and Project 2, respectively) allowed us to test first-hand the FSM Method as an approach to capture and express the supply chain strategy of a business unit. The results highlighted two important success factors of the new method: first, the FSM Method managed to tap into the tacit knowledge of the firm to reveal the supply chain strategy; and second, the output (the FSM) was deemed an actionable conceptualization of the supply chain strategy of the respective business units by the executives in charge. Both of these aspects are expanded and discussed below.

#	*Facilitator*	*Year*	*Industry*	*Region*	*Comment*
1	Author	2007	Chemical	Global	CMR project for developing method.
2	Author	2009	Health care	North America	CMR project for refining method.
3	Consultant #1	2010	Food - Meat	Latin America	Consulting project. Followed protocol.
4	Consultant #2	2011	Food - Oils	Latin America	Consulting project. Followed protocol.
5	Master Students	2011	Aerospace	North America	Master's thesis project. Adapted protocol.
6	Doctoral Student	2011	Semiconductor	Europe	Doctoral thesis project. Adapted protocol.
7	Doctoral Student	2011	Automobile	Europe	Doctoral thesis project. Adapted protocol.
8	Doctoral Student	2011	Pharmaceutical	Europe	Doctoral thesis project. Adapted protocol.
9	Doctoral Student	2011	Beverages - Wine	Europe	Doctoral thesis project. Adapted protocol.

Table 1: List of projects applying the FSM method in the field

Tapping into Tacit Knowledge

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. 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.

Actionable FSM

That the resulting FSM is actionable ebecame clear when we used the FSM of both Saflex and Libica as the starting point for evaluation and reformulation of their respective supply chain strategies. The details of these exercises will be discussed in separate papers, yet let us cite here some reaction to the findings of the evaluation exercise.

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."

The reactions to the findings of these evaluation exercises, conducted using the FSM as their starting point, reveal the extent to which such a map is an actionable device, in that it serves as foundation to conduct further analysis that can produce useful, grounded insights on the supply chain strategy of a firm.

Third-party testing and validation

Besides the two projects that we conducted first hand, the FSM Method was applied in seven separate projects by third-parties, who received varying degrees of guidance. These projects are described below.

Projects by consultants in Colombia

The first third-party to try the FSM Method in the field was a team of consultants based in Bogota, Colombia. These consultants were not involved in the process of developing the FSM Method. Aware of our team's work on it, they requested a copy of the protocol to apply it in several projects. A total of three consultants applied the FSM Method's protocol step by step. Through online and occasional physical meetings with them we followed their progress and provided some general guidance when needed. One of the projects was aborted, due to a change in management in the target firm, when the project sponsor was promoted before the project was completed. At the time of this writing, two FSMs in as many projects (listed in Table 1 as Project 3 and Project 4, respectively) have been completed by separate consultants and validated as fair representations of the supply chain strategy in question. Both FSMs are now being used as foundation for the evaluation of these firms' supply chain strategies.

On the protocol, one of the consultants commented: "The method is well defined, clear and easy to follow," and reported that the Supply Chain Director of one of the target business units remarked 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." This Supply Chain Director 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."

Project by graduate students in the United States

Another application of the FSM Method was a master's thesis project by a team of two graduate students, X3 and X4 (2011, full citation withheld to protect the double-blind peer review), regarding the supply chain strategy that an aerospace company is applying for a specific project. The students were given the FSM protocol and some general guidance on the approach, yet they were afforded wide latitude in its implementation. For the sake of brevity, the students decided on their own to expedite some of the steps in the protocol so that they would require less time, at the expense of some granularity. The resulting FSM was validated by the target firm as representative of the supply chain strategy in question. In their conclusions, X3 and X4 state the FSM Method is "applicable to the aerospace industry", since it allowed them to "elicit the tacit supply chain strategy" of the project they were analyzing, which enabled them to "evaluate and diagnose how well the current supply chain strategy … fits with the project's documented business strategy."

Projects by a doctoral student in Portugal

A doctoral student in Portugal, not involved with developing the FSM Method but aware of it, requested the protocol and illustrative examples of the FSM method, in order to apply the approach in her research. She neither requested nor received any significant guidance on the approach, besides a few cursory clarifications. Due to time constraints, she also decided to adapt the protocol to speed up the process of creating the maps. She successfully completed four FSMs for as many case studies, which were validated by the target firms and published in her doctoral dissertation (X5, 2011, full citation withheld to protect the double-blind peer review).

Just as in the case of the two American graduate students, the abbreviation of certain steps in the protocol prevents us from claiming these projects validate the exact protocol we have

presented in Appendix 1. Yet the fact that these five projects completed FSMs that were validated by the target companies as representative of their respective supply chain strategies is evidence in favor of the robustness of the FSM Method in general, irrespective of a specific detailed protocol.

6. COMPARISON WITH EXTANT LITERATURE

Eisenhardt (1989) has stated that an "essential feature of theory building is the comparison of the emergent concepts, theory, or hypotheses with the extant literature". We compared both our working framework and the general ideas behind the steps of the FSM Method to the extant literature, both within supply chain strategy and from other areas. What follows are some comments on this process of *tying back* to the literature.

Cascading or hierarchical chain of strategies

The hierarchical nature of our working framework of supply chain strategy (shown in Figure 1) is in line with Narasimhan, Kim, and Tan's (2008) 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". The fact that our framework, which was developed independently, came to be in line with the proposition of Narasimhan*, et al.* lends credence to its theoretical validity.

Tapping into tacit knowledge

'Tacit knowledge' is a prominent concept in the organizational literature (i.e. Baumard, 1999; Harrison, 2004; Tsoukas, 2005). 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, emphasis is ours). 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 prescription for asking individuals about specific activities, as opposed to generalizations, in order to tap into the tacit knowledge of an organization, provides support to Step 2 of the FSM Method.

Activities as the essence of strategy

The idea that a firm's strategy can be found in its activities is well rooted in the literature. Porter (1996), for example, states that "the essence of strategies is in the activities". Andrews (1987) states that "strategy is the pattern of decisions in a company" that "reveals" its goals. Cigolini, *et al*. (2004)– after conducting an extensive meta-analysis of over a hundred case studies in supply chain management – conclude 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). These ideas, within a relatively recent school of thought within the strategy field known as *strategy as practice* (Jarzabkowski, 2005; Johnson, Langley, Melin, Whittington, 2007; Golsorkhi, Rouleau, Seidl, Vaara, 2011), provide support to Steps 3 through 7 of the FSM Method's, which seek to reveal a firm's executed strategy based on an analysis of the firm's activities.

Conceptualization and crystallization

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," by means of which "concepts become transferable".

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 the concept" (Ibid.)

The FSM Method includes steps to facilitate both conceptualization and crystallization of knowledge regarding the supply chain strategy. Steps 2 through 7 deal with conceptualization, namely making the supply chain strategy explicit, as it is executed in the activities of the firm; whereas Step 10 provides a first step towards crystallization.

FSM and the techniques-tools matrix

Although it is not its main purpose, a FSM can be used as a starting point to build the techniques-tools matrix proposed by Cigolini, *et al.* (2004). Figure 6 shows a techniques-tools matrix that was built on the basis of Saflex's FSM.

	OP1	OP2	OP3	OP4	OP5	OP6	OP7	OP8	OP9	OP10	OP11	OP12	OP13	OP14	OP15	OP16	OP17	OP18	OP19	OP20	OP21	OP22	OP23	OP24	OP25	OP26	OP27	OP28	OP29	OP30	OP31
FP1	✓																														
FP2						✓																									
FP3								✓	✓	✓																					
FP4		✓		✓	✓		✓	✓			✓	✓		✓			✓					✓	✓		✓	✓				✓	
FP5								✓										✓	✓	✓			✓								
FP6								✓													✓		✓								
FP7								✓									✓							✓	✓	✓				✓	
FP8							✓	✓		✓																				✓	✓

Figure 6: A 'techniques-tools matrix' built on the basis of a FSM

To build it, the *m* Functional Principles from the FSM were arranged as row headers and the *n* Operational Practices 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 Practice provided support to a Functional Principle, 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 variant is not limited to concepts in the interface between firms, whereas theirs is.

Similarities with Schnetzler, et al.'s (2007)

Finally, it is interesting to compare the FSM, which is mostly built *from the ground up* and based on the knowledge of specific activities of the firm, with 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. Differences notwithstanding, the structural similarities and the fact that the FSM was developed independently from Schnetzler, *et al.*'s lends some validity to both representations.

6. DISCUSSION

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

Limitations of the FSM Method

Our experience with the FSM Method suggests some instances where the FSM Method, in its current form, is faced with particular challenges and limitations.

A first challenge is in dealing with the tensions that exist around burning areas of unresolved conflict within the organization, whose effects can be felt in the discourse of respondents: different members of the organization may have very different and strong views about these areas, views that 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 and fast 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.

Based on our experience, the FSM Method works best for expressing the supply chain strategy of a single entity, such as a single business unit. A limitation that has become apparent, both through our direct experience and through reports from one of the Latin American consultants that applied it, is that the FSM Method does not lend itself to the task of mapping into a single FSM the supply chain strategies of multiple business units. Thus, it is recommended that a separate FSM be prepared for each entity, i.e. each business unit.

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.

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 based on any particular supply chain management theory, we anticipate that it could be applied to other realms within management and strategy.

8. CONCLUSION

The working framework discussed in this paper suggests an understanding of supply chain strategy as a logical bridge between the business strategy and the supply chain operations in the field. This novel framework, although still a work in progress, may be considered in its own right a contribution to the existing supply chain management literature.

Building upon this framework, 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 grounded and meaningful manner. We have shown multiple ways in which the FSM Method *ties back* to the literature. 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.

The FSM Method was applied by us in two collaborative management research projects, and by third parties in an additional seven projects. The resulting *Functional Strategy Maps* were deemed by the target firms as fair representations of their respective supply chain strategies. Furthermore, in our two collaborative management research projects, the FSMs served as starting point to conduct later evaluation exercises that yielded important insights into these two firms' supply chain strategies. These insights were described by the heads of supply chain in these firms as both accurate and revealing, lending further weight to the validity of the FSM as a grounded depiction of a business unit's supply chain strategy.

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 hope that other researchers will find that the self-knowledge that a firm derives from creating a *Functional Strategy Map*, is beneficial both as a device to communicate their supply chain strategy and as a meaningful starting point for its evaluation and improvement efforts.

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Appendix 1

Protocol of the FSM Method

(Revised October 2011)

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 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.

Step 3 – Identify areas of activity and specific 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 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 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 firm. The right half of the map shows a conceptualization of the executed strategy.

Step 10 - Validate FSM 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.

REFERENCES

Patton, M.Q. (2001), *Qualitative research and evaluation methods*, Sage Publications, Thousand Oaks, CA.

Appendix 2

FSM Illustrative Example: Libica

(Revised Oct 2011)

This appendix illustrates the FSM Method with examples taken from our action research project with Libica. All sensitive information has been duly disguised. References are made to the steps of the method, detailed in Appendix 1.

The Executive Vice President of Operations of Libica decided to help rethink their supply chain strategy, since the firm's business model had changed in the recent past. He decided to engage us in capturing 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 2.

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 2: Final list of respondents from Libica

A total of 22 interviews were conducted **(Step 2)** 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.

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 activities under it: *'Help independent retailers be more competitive.'* The summary for this area of activity is shown in Table 3.

- 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 3: 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 7.

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.

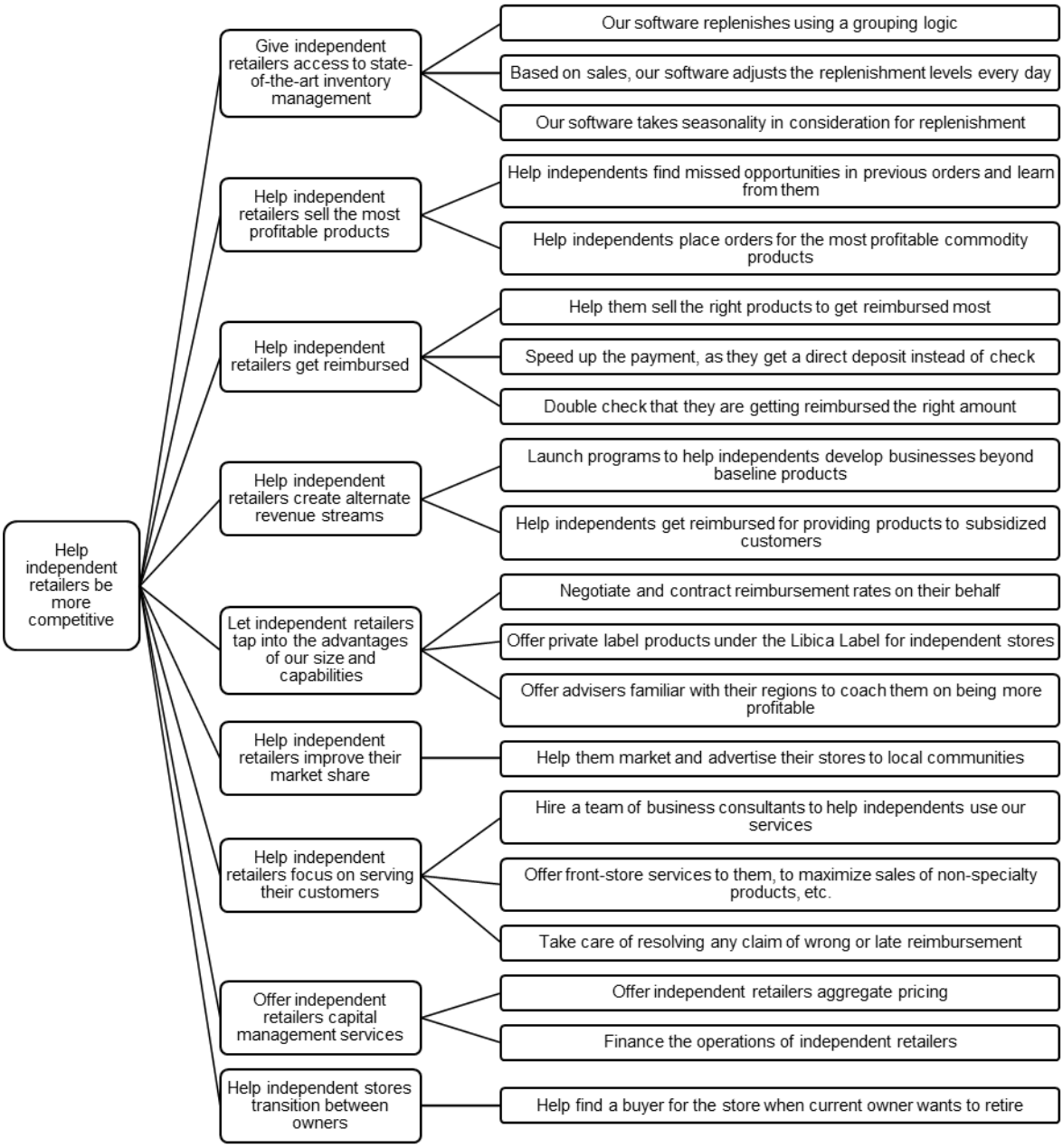

Figure 7: Initial partial map for area “Help independent retailers be more competitive”

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. 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.

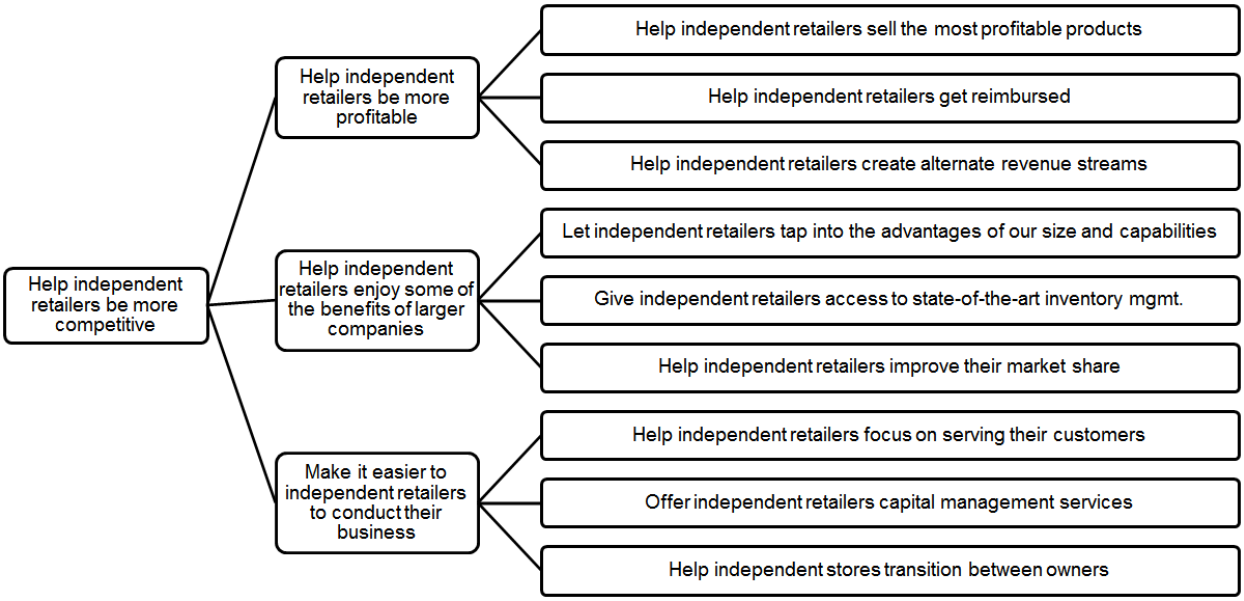

Figure 8: Revised partial map for area "Help independent retailers be more competitive"

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 8. Notice that, to keep the figure simple, we do not show the layer of supporting means.

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. After validating these elements with our sponsor, we prepared the conceptual map shown in Figure 9.

We then assembled an FSM out of the elements prepared thus far **(Step 9)**. 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.

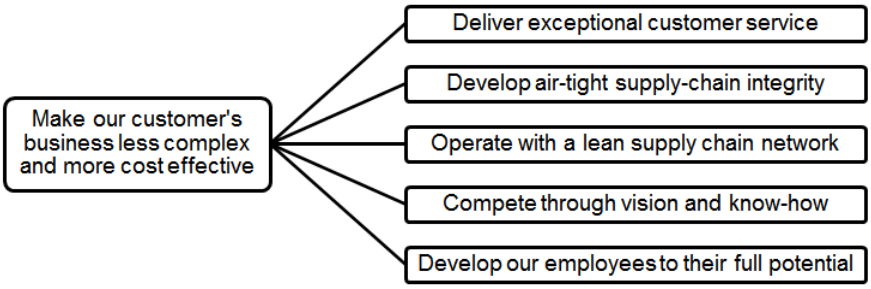

Figure 9: Mapped nominal strategy of Libica.

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 5 of the paper. The boundary between the nominal and executed strategies is denoted by a dotted line.