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Enabling adoption decision-making for strategic scanning

Edison Fernando Loza Aguirre

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Edison Fernando Loza Aguirre. Enabling adoption decision-making for strategic scanning. Business administration. Université Grenoble Alpes, 2015. English. NNT : 2015GREAG003 . tel-01395138

HAL Id: tel-01395138

<https://theses.hal.science/tel-01395138v1>

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UNIVERSITÉ DE GRENOBLE

THÈSE

Pour obtenir le grade de

DOCTEUR DE L'UNIVERSITÉ DE GRENOBLE

Spécialité : **Sciences de gestion**

Arrêté ministériel : 7 août 2006

Présentée par

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préparée au sein du **Laboratoire CERAG, UMR CNRS 5820**
dans l'**École Doctorale de Sciences de Gestion n°275**

Enabling adoption decision-making for Strategic Scanning

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“
*In theory, there is no difference between theory
and practice. But, in practice, there is.*”

Jan L.A. van de Snepscheut

“
*In his writings, a wise Italian
says that the better is the enemy of the good...*”

Voltaire

Acknowledgments

The completion of my Ph.D. program would not be possible without the support and guidance of many individuals.

First, I want to thank Nicolas Lesca for his constant support. As my dissertation advisor, he always presented me with new ideas and challenges that helped me to learn and conduct quality research. I am also fortunate to have received his valuable advice on both the academic and personal levels.

Second, I would like to thank Marie-Laurence Caron-Fasan for her time, support, kindness and patience. Through her invaluable work, she has strongly contributed to gaining knowledge to conduct my research. I also appreciate her support in my personal life.

Third, I would like to acknowledge my dissertation committee's help and guidance. I am honored to have François-Xavier De Vaujany and Jean-Fabrice Lebraty as my dissertation reporters. A special recognition also goes to Pr. De Vaujany who accepted my candidature for the IAE MSIO master program. Also, I would like to thank Nathalie Mitev who provided me with the right direction to facing the challenges during my research.

Fourth, I would like to thank my colleagues and friends who have always been there for me and contributed with their support, corrections and advice: Alex Buitrago, Bénédicte Branchet, Sabine Carton, Anette Casagrande, Jean-Batipste Colin, Clement Deiber, Carine Dominguez-Peri, Armelle Farastier, Hatem Haddad, Gilbertine Ikili Ossana, Humbert Lesca, Marie-Christine Chalus-Sauvannet, Yann Jacob, Shoujun Li, Sophie Molina, Michel Montier, Daniela Reinoso, Daniel Riofrío and Hugo Yepes. A special thanks to Heather Partner and Carlos Riofrío for the all the hours spent on proofreading my dissertation.

My Ph.D. was funded by the Ecuadorian Senescyt scholarship under the sponsorship by Escuela Politécnica Nacional. A special thanks to Myriam Hernandez, Carlos Montenegro, Gustavo Samaniego, Sandra Sanches and Marco Santorum.

This work uses data collected within a research project supported by the PREDIT 4 and funded by the ADEME. I would like to acknowledge the cooperation and teaching of the colleagues participating in the research project: Blandine Ageron, Nathalie Fabbe-Costes, Cendrine Fons, Olivier Lavastre, Anne Rollet and Christine Roussat.

Last but not least, I would like to thank all my family. Your life examples have been the greatest guidance. To my mother, Maria Elena, thanks for your everlasting support and encouragement. To my beloved wife, María Cristina, thanks for your trust, support and patience. Without you, I would not have been able to complete my studies. Thank you very much. I love you with all my heart. To my daughter, Luciana, thanks for your love and patience. Now, it is time to play with your daddy my little princess!

Thank you all.

Dedication

In memorial of Judith

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Enabling adoption decision-making for Strategic Scanning

1 Setting the Scope of the Dissertation

1.1 Introduction

The research project “Building Strategic Scanning to reduce greenhouse gas emissions and design Sustainable Supply Chains” was proposed in response to the 2009 call for proposals from the French Research and Innovation Program for Land Transport (*Programme de recherche et d'innovation dans les transports terrestres*, PREDIT). The project aimed to contribute to one of the priority research subjects of PREDIT: “How to conduct Strategic Scanning, anticipation and foresight studies in transports and logistics sector?” More specifically, the main objective of the project was to examine the implementation of Strategic Scanning (S.Scan) tools and methods in order to enable companies to effectively adopt Sustainable Supply Chains (SSC).

The project was approved by PREDIT and financed by the French Agency for the Environment and Energy Management (*Agence de l'environnement et de la maîtrise de l'énergie*, ADEME). It was conducted from September 2010 to November 2013 combining the expertise of researchers from two organisations: the Centre for Research on Transport and Logistics (*Centre de recherche sur le transport et la logistique*, CRET-LOG) from the University of the Mediterranean Aix-Marseille and the Centre for Management Studies and Applied Research (*Centre d'études et de recherches appliquées à la gestion*, CERAG) from the University of Grenoble Alpes. The present dissertation was conducted as part of this research project.

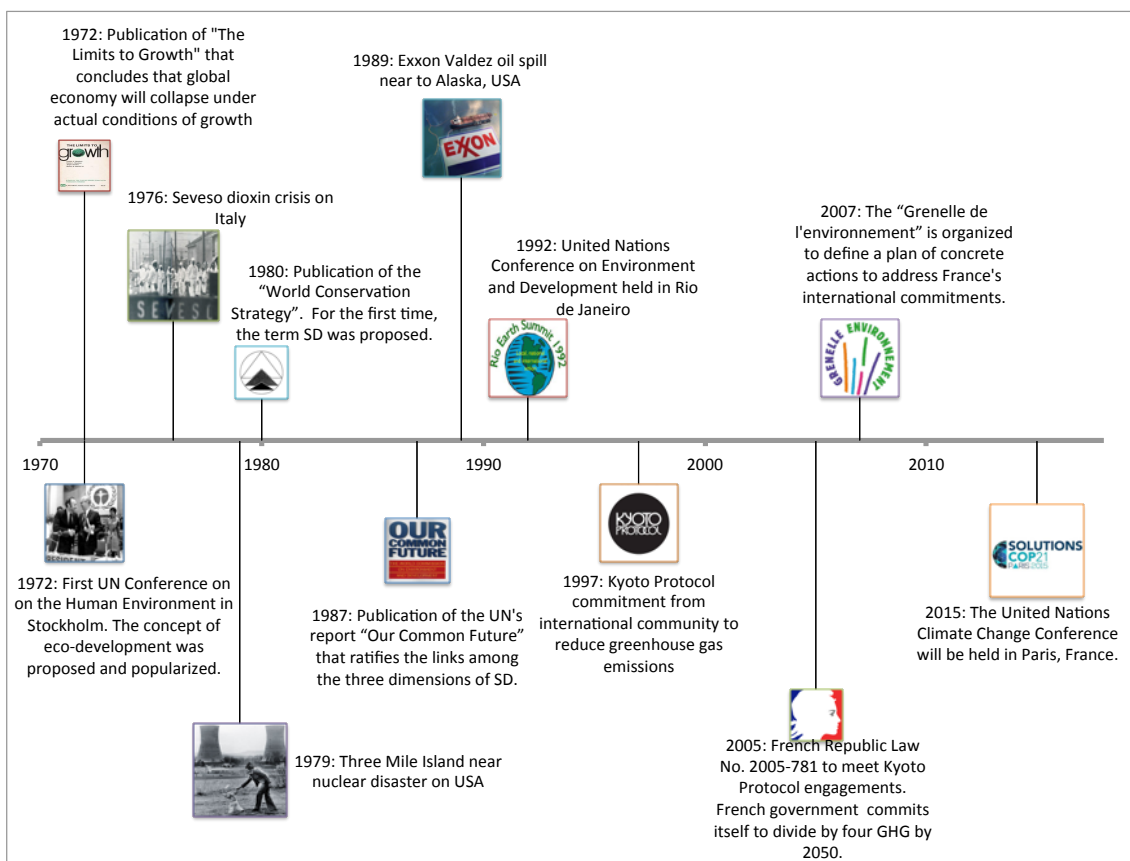
This chapter begins by presenting the institutional, managerial and theoretical relevance of the present dissertation. The scope of the dissertation is set through the results of an explorative field study and founded on a literature review. Afterward, we give an overview of the four empirical essays that composed this research, detailing the theoretical framework and methodological approach adopted in each chapter.

1.2 Relevance of the research

1.2.1 Institutional relevance

Once upon a time, managers were only focused on financial results without any regard for nature conservation or social concerns. Before the 1970s, these “collateral” issues were relegated to the sidelines by politics and public opinion. It was only after the media coverage of major environmental disasters¹ that people around the world began to realize that the traditional conditions of growth couldn’t continue indefinitely. Therefore, it was during that period that the concept of Sustainable Development (SD) started to take shape. Since those days, SD has come a long way in order to get where it is today (Figure 1.1).

Figure 1.1. *Timeline of SD concept evolution and adoption in France*



¹ Some examples of environmental disasters that received media attention on the 70s and 80s: 1976 Seveso dioxin crisis on Italy, 1979 Three Mile Island near nuclear disaster on USA, 1988 explosion on the oil platform Piper Alpha in the North Sea, and oils spills including: 1970 tanker Arrow near Canada, 1977 tanker Borug near Taiwan, 1978 tanker Amoco Cadiz near France, and 1989 tanker Exxon Valdez near Alaska.

It was Ignacy Sachs who advocated for the introduction of what he called “eco-development”. Sachs defined this alternative kind of development as that which is socially desirable, economically viable and environmentally prudent (Sachs, 1981). In this definition, the three dimensions of SD (social, economic, and environmental) were established for the first time.

The concept of eco-development was popularized in the United Nations (UN) Conference on the Human Environment in Stockholm in 1972. It was at this meeting that international representatives discussed environmental and social concerns for the first time. However, the voices raised in Stockholm were not loud enough at the time because the world was not yet ready for thinking about sustainability. Not long after, 1970s oil and economic crises led to a decline in public and political attention to these issues.

The term eco-development would be substituted for that of SD in the “World Conservation Strategy” report presented in 1980 as the result of a collaborative work between the International Union for Conservation of Nature, the UN Environment Programme and the World Wide Fund for Nature. The indissociable connection among the three dimensions of SD was reinforced in the report “Our Common Future”, known as the Brundtland report, in 1987. This report was the result of the work of the World Commission on Environment and Development issued by the General Assembly of the UN in 1984. In the foreword of the report, Gro Harlem Brundtland, Secretary-General of the commission, reported that it is impossible to separate economic issues from social and environmental concerns.

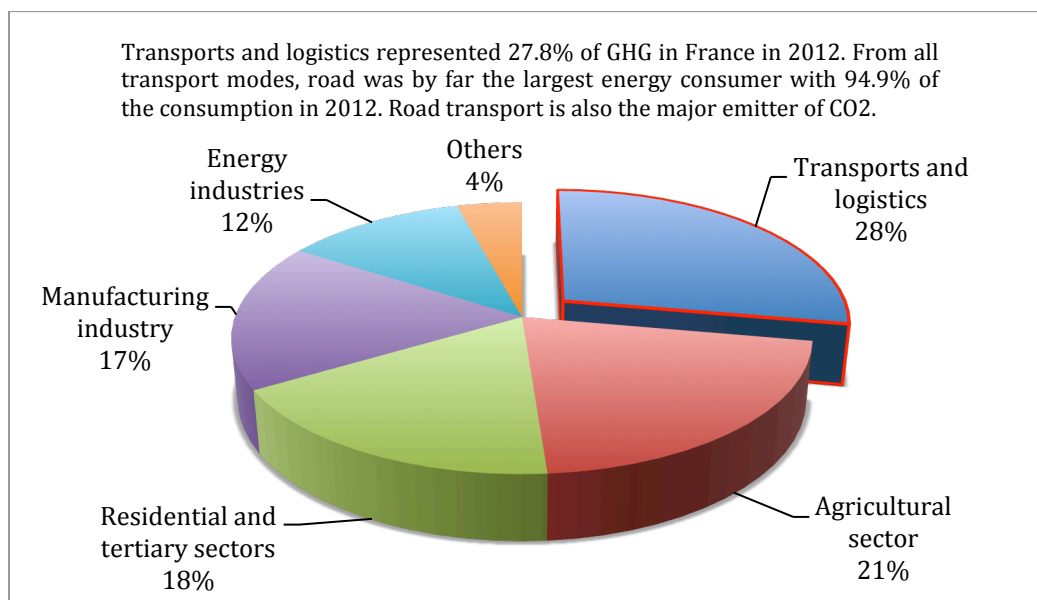
The UN Conference on Environment and Development, held in Rio de Janeiro in 1992, took as a reference the recommendations from the Brundtland report when proposing the “Rio Declaration on Environment and Development”. This declaration, which entered into force in 1994, was the first international commitment to SD and is referred to as the origin of all international initiatives in this field.

In 1997, based on the Rio Declaration, some international parties adopted the Kyoto Protocol, which committed the international community to reduce greenhouse gas (GHG) emissions. Agreements of the Kyoto Protocol have been revised and extended through the 2007 Bali Action Plan, the 2009 Copenhagen Accord, the 2010 Cancun agreements, and the 2012 Durban Platform for Enhanced Action.

To meet its engagements to the Kyoto Protocol, in 2005 the French government committed itself to pursue the “Factor 4”² objective that translates into reducing national GHG emissions by a factor of four by 2050.³ To define a plan of concrete actions to address this commitment, the French government opened a multi-party debate called the “*Grenelle de l’environnement*”. This summit brought together representatives of the national and local governments, industries, trade unions, professional associations, and non-governmental organisations. The final agreements of the *Grenelle* included: reaffirmation of the Factor 4 objective, incrementing of energy efficiency by 20% by 2020, prioritisation of non-road transport modes, and the search for new mechanisms for environmental taxation, among others.

Since transports and logistics is the largest emitter of GHG in France with 27.8% of total emissions (Figure 1.2), the search for a reduction in such pollution cannot evade the establishment of new practices in this sector. Mindful of this, a number of agencies of the French government have launched numerous projects for promoting sustainable initiatives in this sector.

Figure 1.2. *GHG emissions by activity sector in France in 2012*⁴



² Originally, the goal of Factor 4 was phrased as being twice as productive with half the resources (materials and energy). L. Hunter Lovins, Amory Lovins and Ernst von Weizsäcker introduced this concept in their 1998 book, *Factor 4*.

³ Article 2 of the French Republic Law No. 2005-781 of 13 July 2005, establishing the guidelines of energy policy.

⁴ French Ministry of Ecology, Sustainable Development and Energy (2013) *Émissions de gaz à effet de serre (Monde, Europe, France)*. [Online] Available: <http://www.developpement-durable.gouv.fr/Part-et-evolution-des-secteurs.html> [Accessed: 23th November 2014].

In order to coordinate institutional initiatives,⁵ the French government has established the PREDIT. The fourth PREDIT since 1990 was officially launched in 2008. Within this program, as explained in the Introduction (Section 1.1), a call for proposals for a research project titled “Building S.Scan to reduce GHG emissions and design SSC” was launched. The expected scientific contributions for this project were:

- Identify current practices of S.Scan in the SSC context.
- Identify the information needs for S.Scan in the SSC context.
- Study the conditions for adopting S.Scan in the SSC context.
- Evaluate the contributions of S.Scan to developing strategies for SSC.

In addition, the expected contributions to practice for this project were:

- Provide incentive and help organisations to adopt S.Scan for SSC.
- Test S.Scan for SSC in real scenarios with organisations.
- Study how to make the process perdurable.

In order to answer to the objectives raised in the research project, we first performed an exploratory field study to identify actual practices of S.Scan in the SSC context. The results of this study are presented in the section below.

1.2.2 Managerial relevance

In order to assess current practices of S.Scan in the SSC context, we conducted an exploratory study comprised of 42 interviews with 50 managers and executives within 40 organisations from France. We interviewed actors operating at distinct places of the supply chain (Table 1-1, see Appendix 1.1 for details) in order to figure out the practices from organisations at all segments of the chain.

For the interviews, we used a semi-structured interview guide (Appendix 1.2) that included questions about supply chain management and logistics activities, SD, SSC and S.Scan. The interviews were conducted until a saturation point was reached.

⁵ Initiatives from: Ministry of Higher Education and Research; Ministry of Ecology, Sustainable Development and Energy; Minister of the Economy, Finances and Industry; Agency for the Environment and Energy Management; Agency for Innovation OSEO; and the National Agency for Research

Table 1-1. Activity sectors of interviewees

	Organisations	Interviewees
<i>Manufacturers (MAN)</i>	13	15
<i>Distributors (DIS)</i>	6	8
<i>Logistics service providers (LSP)</i>	9	9
<i>Infrastructure managers (INF)</i>	3	5
<i>Higher education & research (HER)</i>	1	1
<i>Communities (COM)</i>	3	5
<i>Clusters (CLU)</i>	1	1
<i>Service providers (SPR)</i>	5	5
<i>Unions (UNI)</i>	1	1
Totals	42	50

The following representative dialogue is offered to illustrate our results. The answers combine declarations from several interviewees.

Q: Do you perform S.Scan in the SSC context?

“Not really” (LSP03). “I know of no organisation that does S.Scan exclusively in SSC context” (SPR05). “We have a S.Scan activity that is related to environmental technologies and intelligent modes of transport. So, it is true that, among others, there are some ‘information blocks’ that include SSC. But nothing specifically dedicated to SSC” (CLU01).

Q: So, you follow the evolutions related to SD and supply chains. Don’t you?

“Yes! But we do not do it on purpose! We collect information on both sustainable investment and supply chains. And yes, it exists an intersection between the two” (SPR01). “It is something in which we can work in the near future. But nowadays, we have not yet taken the decision of doing S.Scan exclusively in SSC” (SPR05)

Q: So, S.Scan in the SSC context... does it make sense for you?

“Yes, because it refers to ‘sustainability’ that drives us to think about what we will do tomorrow in terms of ecological and social initiatives. The, ‘supply chain’ means ‘logistics’. So, it impacts everything here. And S.Scan... well, yes, today we must think about the future. The three fit together” (LSP03). “There is a huge job to do on S.Scan in this subject” (LSP04).

Q: In your view, what are the barriers to adopting S.Scan in the SSC context?

“For me it is very simple, first, we have to define what SSC is! After that we could pass to action, but only if there is a definition that means something” (SPR01). “First, we should agree what means SSC” (COM01).

Q: So, is it hard to say what SSC is in your own words?

“That is not an easy question to answer” (MAN07). “I confess that I have not many ideas about it... Honestly, I had trouble to define what SSC is” (SPR03). “It is a subject that is, in quotation marks, relatively recent. Frankly, I do not know how to define it” (DIS06). “Thus, that’s it, there is a definition to produce... because we have no definition for SSC” (SPR05).

Q: Could you identify what are your information needs for S.Scan in the SSC context?

“In SD there is a multitude of subjects, and of course, supply chains form an integral part of it. Concerning S.Scan for SSC, which ones seem to be the issues that are more relevant to scan? I don’t know... Do you have something from where I can choose? That would be helpful” (DIS06).

Q: Nope sorry, we don’t have such a thing. But, do you consider that target S.Scan in the SSC context is important?

“For me, conducting it without dividing on sectors is a barrier. If it is not well defined on a particular topic, we will obtain a lot of diverse information. So, the solution could be targeting on sectors, that’s it! Or targeting on topics!” (SPR03)

Q: Are there other barriers to adopt S.Scan in the SSC context?

“I think if I ask the question to the direction, the answer will depend on the importance of the subject. That is to say, the adoption of S.Scan in the SSC context means that we agree about the expected results, the actions to implement, etc.” (CLU1) “So, if we propose to adopt it, I think the direction is ready to listen, and why not, to seek ways to implement it. But, in the background, we will think about the costs and benefits, of course” (DIS04).

Q: Are there structured processes or a service of S.Scan in your organisation?

“It is mostly performed by the staff in the course of their activity” (MAN03). “It is latent because everyone makes some of S.Scan. But, there is no service for S.Scan” (LSP3). “Our practices are informal, very informal... I think each service does a little of S.Scan for their own” (MAN07). “But there is nothing formalized either in terms of procedure or in terms of tools” (LSP3).

We summarize the findings of our exploratory study around four points:

- The identification of their own practices of S.Scan in the SSC context is not clear for the organisations that we interviewed. Some managers declare that they do not perform S.Scan in the SSC context, but when they describe their practices

we realize that actually they do perform such activities. These activities are mostly informal, individual and overlapped with S.Scan in other contexts.

- One of the barriers to adopting S.Scan in the SSC context is the lack of understanding of what SSC is. Managers were interested in working on S.Scan for SSC issues, but they had a weak understanding of the meaning, implications, or scope of SSC. On one hand, no one seems able to propose a clear and complete definition of SSC. On the other hand, the elements for a definition are diverse and poorly related (i.e. flow optimization, performance measurement frameworks, and reconfiguration of logistics plans).
- Interviewees expressed difficulties in identifying their information needs in SSC context. Thus, they identified targeting of S.Scan as a crucial stage to allowing efficiency and useful results. They also highlighted the necessity of assistance to target S.Scan for SSC.
- In order to make a decision about adopting S.Scan in the SSC context, managers showed their interest in a better understanding of the potential benefits of this adoption. They also expressed interest in trying something that could guide them to make a decision concerning the adoption of S.Scan in the SSC context.

Looking at these results, we concluded that it would be very difficult, if not near impossible, to study actual practices of S.Scan in the SSC context because they did not formally exist in organisations. Interviewees were interested in the subject but they had not yet made the decision to adopt S.Scan in the SSC context. This raised questions, first, about the need to understand the barriers to this adoption, and then, about how to promote or facilitate the decision to adopt S.Scan. Adoption of S.Scan in the SSC context was part of the expected scientific and practical contributions of the research project of which this dissertation is part. Therefore, the aim of our study was reoriented to study the mechanisms enabling the adoption of S.Scan in such context.

1.2.3 Theoretical relevance

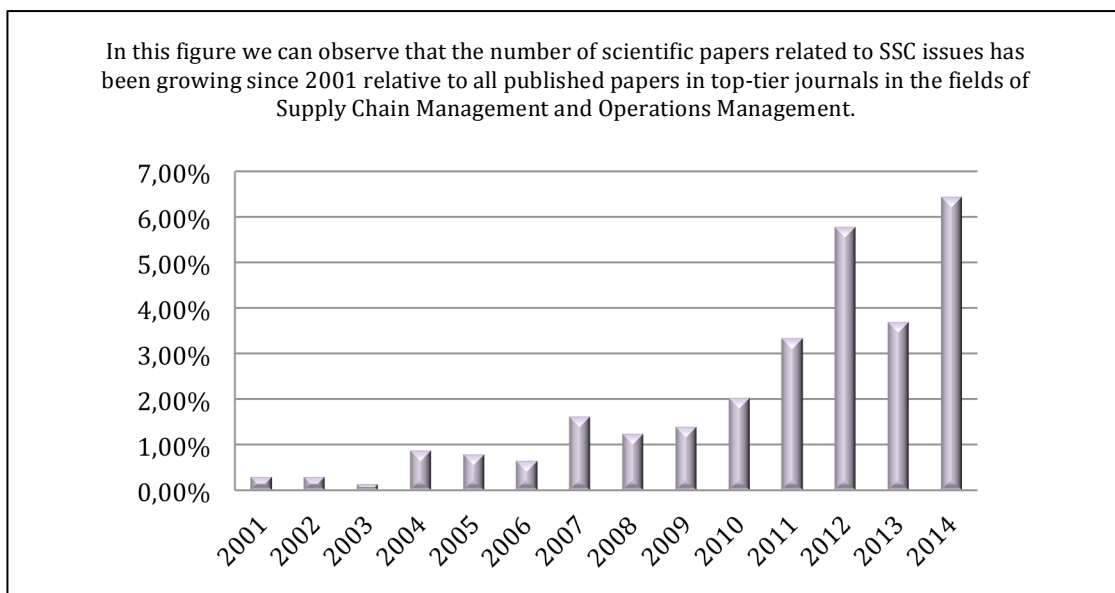
SD appears to be “in vogue” today for governments, managers, academics and the public. Nonetheless, research about this topic is relatively new to management sciences. There are no references to SD in academic publications before 1990. Besides, it was not until the early 2000s that the first publications appeared linking SD with logistics and supply chain management and thus giving rise to the notion of SSC. The

interest in SSC has grown rapidly in the academic community as shown in Table 1-2 and Figure 1-3. Table 1-2 lists the scientific journals that have devoted special issues to this subject. Figure 1-3 presents a review of papers published from 2001 to 2014 in scientific journals commonly recognized as top-tier in the fields of Supply Chain Management and Operations Management concerning SSC.

Table 1-2. *SSC Special issues from Supply Chain scientific journals*

Journal	Issue
International Journal of Production Economics	Vol. 111, Issue 2, 2008; Vol. 152, 2014
International Journal of Production Research	Vol. 50, Issue 5, 2012
Journal of Cleaner Production	Vol. 16, Issue 15, 2008
Journal of Operations Management	Vol. 25, Issue 6, 2007
Journal of Supply Chain Management	Call for papers 2015
<i>Logistique & Management</i>	Vol. 17, Issue 1, 2009
Supply Chain Management: An International Journal	Vol. 17, Issue 1, 2012; Vol. 19, Issue 3, 2014

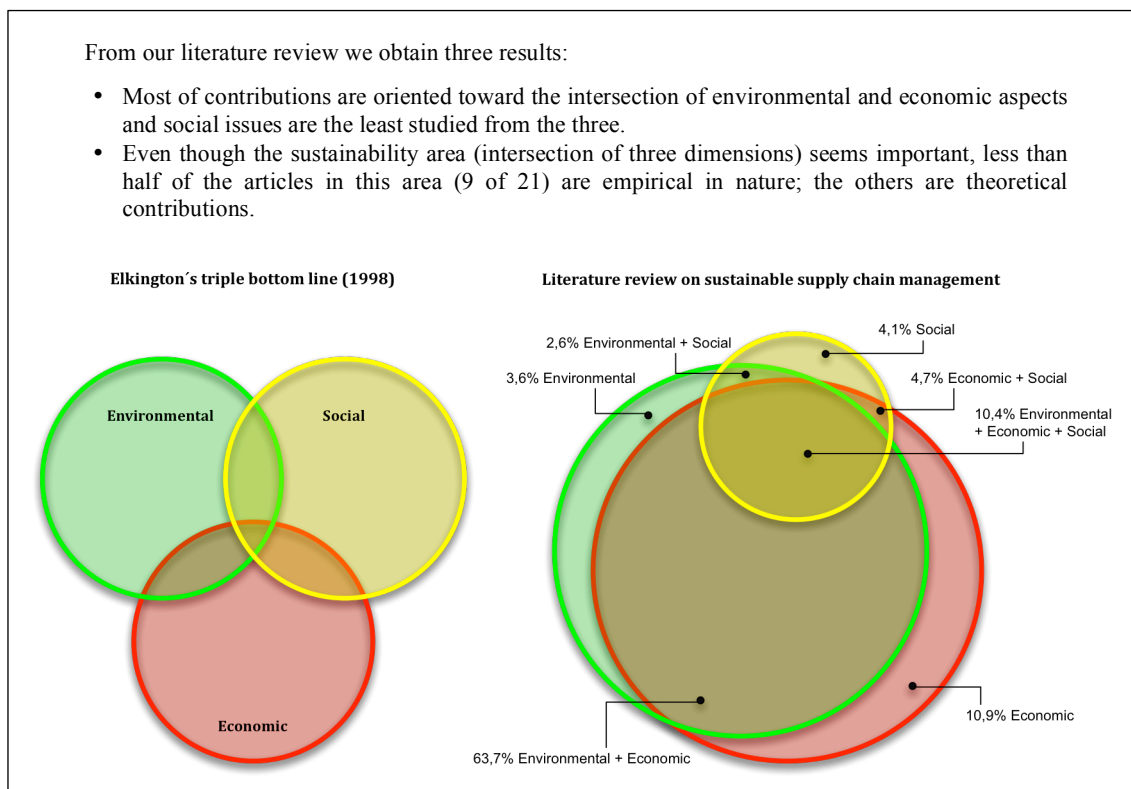
Figure 1-3. *Evolution of the ratio between SSC research papers published and the total number of papers in the field of Supply Chain Management*



Pagell and Wu (2009) defined a SSC as “one that performs well on both traditional measures of profit and loss as well as on an expanded conceptualization of performance that includes social and natural dimensions”. This definition, inspired by the principles of Ellington’s triple bottom line (1998), established the necessary pursuit

of balance between the three dimensions of SD instead of the traditional economic-only view of performance in supply chains. However, as an emerging research area, the study of SSC does not yet have a consensus framework and even the implications of this notion are neither stable nor clear (Carter & Rogers, 2008; Sarkis et al., 2011; Carter & Easton, 2011, Pagell & Shevchenko, 2014). As shown in Figure 1.3, research on SSC seems to suffer a dimensional reduction with a tendency to be oriented only toward environmental and economic aspects, leaving social issues aside.

Figure 1-4. Comparison between Elkington’s sustainability representation and orientations of research in SSC⁶



Several academic studies (Aberre et al., 2008; Walker et al., 2008; Giunipero et al., 2012) have identified barriers preventing initiation or continuity of SSC initiatives, such as cost concerns (Min & Galle, 2001; Orsato, 2006, Walker et al., 2008), lack of legitimacy (Greer & Bruno, 1996; Walker et al., 2008), little interest of customers (Orsato, 2006; Seuring & Müller, 2008a; 2008b), poor supplier commitment

⁶ Figure 1.4 shows the results of an analysis conducted on the same articles used for Figure 1.3. The purpose of our revision was to identify the orientation of each paper in terms of the three dimensions of SD: environmental, social and economic. Each article was read and coded following the main orientation of its focus. An article could belong to one or more dimensions. For graphic representation, we used a geometric approximation of results. The principle for this approximation was to use a proportional equivalence of the number of articles in each category and circular areas that represent SD in the Elkington’s triple bottom line illustration of sustainability.

(Wycherley, 1999; Carter & Jennings, 2002; Walker et al., 2008), absence of guidelines and monitoring frameworks (Moneva et al. 2006; de Brito et al., 2008; Melville, 2010), and non-inciting regulation (Ambec & Barla, 2006; Mollenkopf et al. 2010). Among these barriers, lack of external information has been recognized as a major obstacle for SSC initiatives (Aberre et al., 2008; Seuring & Müller, 2008a; Walker et al., 2008; Wu & Pagell, 2011; Ageron et al., 2012). It has been reported that managers have to struggle with special difficulties when making decisions regarding SSC (Matos & Hall, 2007; Wu & Pagell, 2011), such as uncertainty about outcomes and future regulations, lack of understanding of stakeholders' expectations, and changing decision boundaries. However, very few studies have addressed how to deal with these problems.

From this perspective, S.Scan can help managers satisfy their need for external information concerning SSC issues. S.Scan is defined as “the acquisition and utilization of information about events, trends and the dynamics of the external environment, the knowledge of which would help managers to orient the course of their future actions” (Aguilar, 1967). S.Scan is an Information System (IS) since it is a structured set of resources (e.g. people, technology) oriented to collect, process, store and circulate information within an organisation (Reix, 2002). The kind of information with which S.Scan is concerned comes from the organisation's business environment and has an anticipative nature (Lesca et al., 2012). S.Scan has been proven as an IS allowing managers to stay informed of evolutions (Hambrick, 1982; Lesca et al., 2012), provide insights into their business environment and help them understand it (Smircich & Stubbart, 1985; Teo & Choo, 2001), reduce uncertainty (May et al, 2000), support decision making (Walkers et al., 2003; Lesca et al., 2012), facilitate the identification of threats and opportunities (El Sawy, 1985; Lang et al., 1997; Xu et al., 2003), enhance innovation (Rohrbeck & Gemünden, 2011), anticipate changes (Ansoff, 1975; Choo, 1998), and secure or improve competitiveness (Jennings & Lumpkin, 1992; Wei & Lee, 2004).

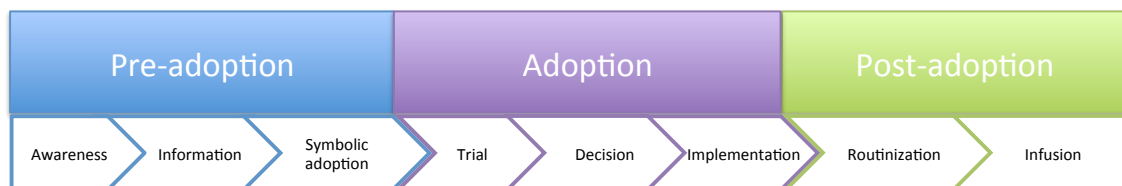
Nonetheless, up to date, academic contributions relating S.Scan with SSC are almost non-existent. On one hand, there has been only one effort in the supply chain and logistics literature to propose a framework and to study the scope of S.Scan in the SSC context (Fabbe Costes et al., 2011; 2014). This contribution, however, was built on experts' advice and not tested in the field. On the other hand there is no study in IS literature about how to use S.Scan concepts and tools for S.Scan in the SSC context.

Concerning adoption of S.Scan, it has not been very well studied. Even though several contributions have brought to light the success and failure factors of S.Scan implementation (Lesca & Caron-Fasan, 2008; Caron-Fasan & Lesca, 2012), the initial stages of adoption, those that precede the decision to engage in S.Scan, have not been studied to date. The present dissertation aims to fill this gap, and thus, to contribute to the S.Scan body of knowledge.

1.3 Research question

The adoption of an IS refers to the process by which an IS is introduced in a social system to support operations, management and decision-making (Cooper & Zmud, 1990; Thong, 1999; Baskerville & Pries-Heje, 2001). The IS adoption process covers three stages (Figure 1-5) that have been described in several contributions (Table 1-3):

Figure 1-5. *IS adoption process*



- (1) The Pre-adoption stage covers the awareness of the introduction of a new IS, efforts from individuals to learn about this IS, and the development of a favourable or unfavourable attitude toward the IS. This stage has been studied from the view of the Symbolic adoption model (Fui-Hoon Nah et al., 2004; Verra et al., 2012) and the Diffusion of innovations theory (Grover & Goslar, 1993; Karahanna, et al. 1999)

Table 1-3. Studies describing IS adoption process

Author	Pre-adoption			Adoption			Post-adoption		
Klonglan and Coward (1970)	Awareness. An individual might become aware of the introduction of an innovation.	Information. Individual may actively seek out information about the innovation.	Evaluation. Individual may decide that the innovation is suited to his/her needs.	Trial. The potential adopter may seek a demonstration of the innovation. If it meets or exceeds the adopter's expectations, he/she may decide to adopt it (use adoption).					
Rogers (1983)	Knowledge. Exposure to the innovation and an understanding of how it functions.		Persuasion. An attitude is formed toward the innovation.	Decision. An individual engages in activities that result in a decision to either adopt or reject the innovation.		Implementation. The innovation is actually put to use.		Confirmation. Individuals seek reinforcement for the decision made, but may reverse this decision if exposed to conflicting messages.	
Kwon and Zmud (1987); Cooper and Zmud (1990)	Initiation. Companies justify the need for adopting Information Technology (IT). They perform an active and/or passive scanning of organisational problems/opportunities and IT solutions are undertaken. Finally, a match is found between an IT solution and its application in the organisation.			Adoption. A decision is reached to invest resources necessary to accommodate the implementation effort.		Adaptation. The IT application is developed, installed, and maintained.	Acceptance. Organisational members are induced to commit to IT application usage.	Routinization. Usage of the IT application is encouraged as a normal activity	Infusion. Increased organisational effectiveness is obtained by using the IT
Rai et al., (2009)	Awareness. Key decision makers are aware of a new IT.	Interest. The firm is committed to actively learn more about the IT.		Evaluation. Acquiring specific innovation-related products and initiating evaluation or trial.	Commitment. The firm has committed to use of the IT in a significant way for one or more activities.	Limited deployment. Establishing a program of regular, but limited, use of the IT for some activities.	Partial deployment. Establishing a program of regular, but limited, use of the IT.	General deployment. The firm has reached a state where the IT is used in a substantial fraction of activities.	
Swanson & Ramiller (2004)	Comprehension. Through the efforts of its members, the firm learns more about an IT innovation and develops an attitude or stance toward it and positions itself, in a basic way, as a prospective adopter or non-adopter.			Adoption. The firm develops a supportive rationale, or business case about the IT innovation. Organisation decides whether to proceed and commit its resources.		Implementation. Bringing the innovation to productive life for its users.		Assimilation. Commences as the IT innovation begins to be absorbed into the worklife of the firm. In time, the innovation may come to be infused and routinized.	
Zhu et al., (2006)	Initiation. Evaluating the potential benefits of IT to improve a firm's performance in value chain activities such as cost reduction, market expansion, and supply chain coordination.			Adoption. Making the decision to use IT for value chain activities (i.e., allocating resources and physically acquiring the technology)				Routinization. The stage in which IT is widely used as an integral part in a firm's value chain activities.	
Hameed et al., (2012)	Initiation. Consists of activities related to recognizing a need, acquiring knowledge or awareness, forming an attitude towards the innovation and proposing innovation for adoption.			Adoption-decision. Reflects the decision to accept the idea and evaluates the options for its acquisition and implementation.		Implementation. Involves acquisition of innovation, preparing the organisation for use of the innovation, performing a trial for confirmation of innovation, acceptance of the innovation by users, and continued actual use of the innovation.			

- (2) The Adoption stage itself covers a trial of the new IS, the decision-making of individuals concerning the adoption of the IS, and the implementation of the new IS. Several theories has been used to study this phase, such as the Theory of reasoned action (Karahanna, et al. 1999; Yoh et al., 2003), Theory of planned behaviour (Brown & Venkatesh, 2005; Riemenschneider et al., 2003), Diffusion of innovations theory (Forman, 2005; Hsu et al., 2007), Social cognitive theory (Compeau et al., 1999; Chan & Lu, 2004), Technology Acceptance Model (Plouffe et al., 2001; Wang & Benbasat, 2005), and the Unified theory of acceptance and use of technology (Anderson et al., 2006; Im et al., 2011).
- (3) The Post-adoption stage covers the routinization and infusion of the new IS. This stage has been studied on the basis of the Expectation-Confirmation Theory (Bhattacharjee, 2001; Thong et al., 2006), and the Expectancy theory (Liu & Khalifa, 2003; Kouki, 2007).

With the IS adoption process in mind, and since

- our exploratory study revealed that managers have not made a decision concerning the adoption of S.Scan in the SSC context,
- there are some barriers that need to be overcome in order to allow the decision of adopting S.Scan in the SSC context (e.g. lack of understanding about the subject itself and the scope of S.Scan, interest of managers in enhancing their understanding about the contributions of S.Scan),
- and, because all that concerns the process before the decision to adopt S.Scan has never been studied in the literature,

we raise our main research question:

How to enable⁷ decision-making for adopting S.Scan?

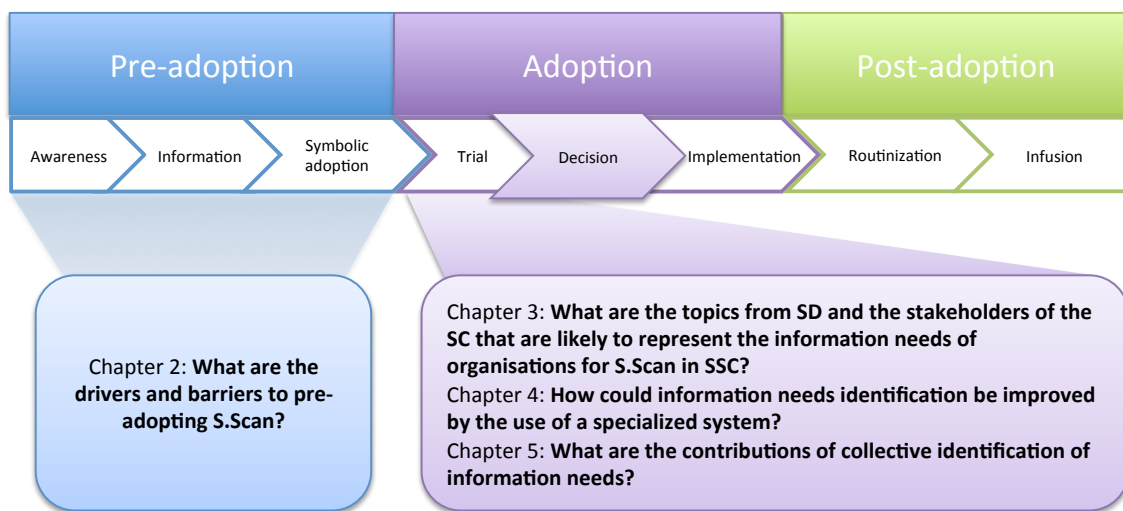
⁷ According to Oxford dictionary: Enable - Give (someone) the authority or means to do something; make (something) possible.

According to Longman Dictionary of Contemporary English: Enable - To make it possible for someone to do something, or for something to happen.

We decompose our main research question into four connected studies (Figure 1.6). First, since no decision about S.Scan adoption can be made without the development of a positive attitude toward it, it is necessary to enhance our understanding concerning the factors that would be involved in the mental adoption of S.Scan. So, our first study aims to answer the question: **What are the drivers and barriers to pre-adopting S.Scan?** Answering this question would contribute to answering our main research question, first, by expanding the initial conclusions of our exploratory study, and second, by furthering our understanding of the rational and institutional pressures leading managers to pre-adopt S.Scan in their organisations or not. This question will be studied in Chapter 2.

Figure 1-6. *Connection of four studies with the IS adoption process*

How to enable decision-making for adopting S.Scan?



Second, as part of the adoption process, Trial is a preceding activity to the adoption decision-making of S.Scan. For the purpose of Trial, we will concentrate our efforts on information needs identification of S.Scan. We do that with the intention to: (1) overcome managers' identified lack of understanding about what SSC is, and (2) to help them to define their information needs in this matter. Consequently, we proceed with two parallel studies to examine how to facilitate/trigger information needs identification in the SSC context. The first study, presented in Chapter 3, is focused on identifying: **What are the topics from SD and the stakeholders of the Supply Chain (SC) that are likely to represent the information needs of organisations for S.Scan in SSC?** We presume that identifying stakeholders and topics to scan in a particular

context will contribute as starting points to facilitate future implementation of S.Scan. Then, in Chapter 4, we study: **How could information needs identification be improved by the use of a specialized system?** This study is intended to advance our knowledge about the usefulness of a specialized system to support identification of information needs. Both studies will contribute to improving existing targeting methods and will serve as a Trial for supporting managers’ decision-making to adopt S.Scan.

Finally, since identification of information needs in SSC context would imply the interaction of managers coming from different units of the organisation, it offers us the opportunity to study the question: **What are the contributions of collective identification of information needs?** This study, presented in Chapter 5, will deepen our understanding about the benefits of collective S.Scan activities that should be taken into account in adoption decision-making.

1.4 Overview of the Papers

This dissertation follows a multi-paper model that includes four empirical studies under one overarching question: **How to enable decision-making for adopting S.Scan?** Each paper corresponds to a chapter of the present dissertation. Data for these studies were collected by using a combination of quantitative and qualitative research methods. The collected data is shared among these studies as presented in Table 1-4.

Table 1-4. *Data collection used in the present dissertation*

Chapter	Data collection	
Chapter 2: Drivers and barriers to pre-adoption of S.Scan in the SSC context	Semi-structured interviews 42 interviews with 50 managers and executives within 40 organisations	Survey 299 respondents, 133 completed questionnaires, 126 questionnaires retained for analyse
Chapter 3: S.Scan for SSC: Where to start?		Field interventions Targeting meetings with 27 managers in headquarters of ten organisations
Chapter 4: Improving targeting of S.Scan: design and implementation of a meeting room system		
Chapter 5: S.Scan through collective targeting for SSC - an ACAP perspective*		

* Only collective targeting meetings were used in this study (18 managers in headquarters of three organisations).

Hereafter, we present a preview of the chapters including the research questions (from those raised in section 1.3), the theoretical background and the research methodology followed.

1.4.1 Preview of Chapter 2: Drivers and barriers to pre-adoption of S.Scan in the SSC context

During the pre-adoption phase, managers evaluate the potential usefulness of an IS to solve an organisational issue and the conditions of its adaptation to the specific context of their organisation. This evaluation may lead, at the end of the pre-adoption stage, to developing an attitude, positive or negative, toward the IS. This attitude will impact the decision to adopt an IS or not. This chapter aims to answer the following question: **What are the drivers and barriers to pre-adopting S.Scan?** In order to answer this question we utilize four theoretical bodies (Figure 1.7).

Figure 1.7. *Theoretical background for Chapter 2*

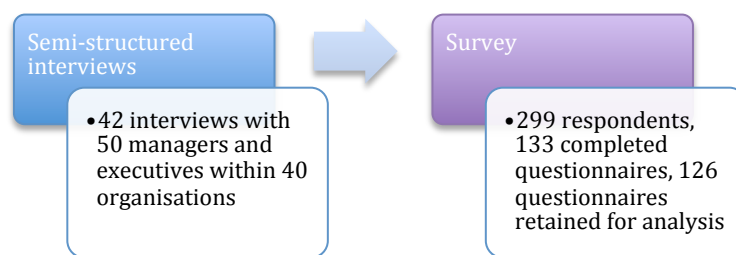


The symbolic adoption model (Klonglan & Coward, 1970) is one of the few theoretical frameworks that addresses the IS pre-adoption stage. It states that before making the decision to adopt an IS, it is necessary that managers mentally accept the

idea of adopting it. We presume that mental (symbolic) adoption would be influenced by both rationality and institutional pressures (DiMaggio & Powell, 1983). Since several institutional pressures usually accompany SD initiatives, SSC context is particularly interesting for studying the influence of such pressures to drive or stop the pre-adoption of S.Scan. As there are no previous studies addressing drivers and barriers to pre-adopting S.Scan, we use S.Scan mission and aims (e.g. Lesca & Caron-Fasan, 2006) and S.Scan failure and abandonment factors (e.g. Lesca & Caron-Fasan, 2008) as starting points to launch our research.

This research is divided into two phases (Figure 1.8). First, a qualitative phase is focused on identifying the drivers and barriers spontaneously mentioned by managers, with the aim of validating or discovering new ones different from those already identified in the literature. Second, a quantitative phase is oriented to unveil meta-drivers and barriers to pre-adopting S.Scan and to identify institutional pressures to pre-adopting S.Scan.

Figure 1.8. *Research approach followed in Chapter 2*



1.4.2 Preview of Chapter 3: Strategic Scanning for Sustainable Supply Chains: Where to start?

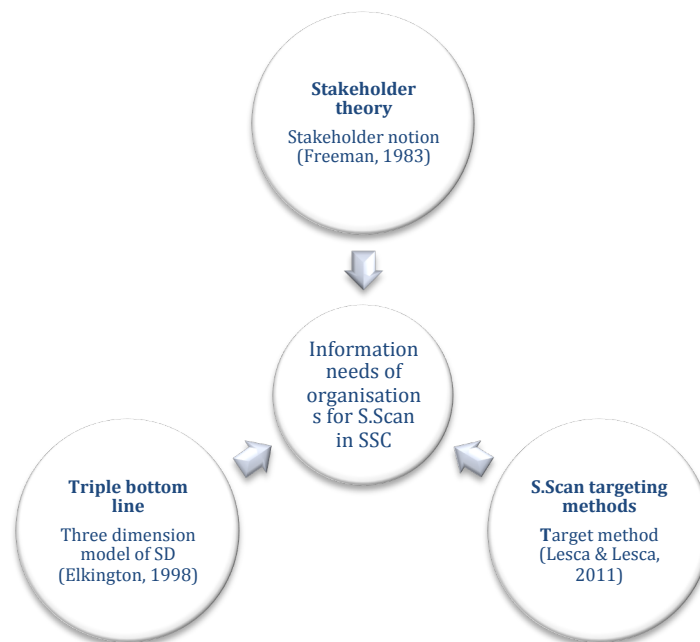
In order to optimize resource allocation and get useful results, organisations should identify their information needs corresponding to their strategic objectives and priorities (Lesca & Lesca, 2014). The process allowing information needs identification for S.Scan is known as Targeting. The information needs can be represented by the actors and topics that will attract organisations' attention over a given period (Gilad & Gilad, 1988; Lesca & Lesca, 2014).

However, the identification of information needs in SSC context is a difficult task because, on one hand, it is an emerging concept that yields implications neither

stable nor clear (Carter & Easton, 2011, Pagell & Shevchenko, 2014). On the other hand, SSC involves a wide range of crosscutting issues whose integration in operations and corporate strategy has proven to be difficult in practice (Ageron et al., 2012; Gunasekaran & Spalanzani, 2012).

The purpose of Chapter 3 is to answer the following question: **What are the topics from SD and the stakeholders of the SC that are likely to represent the information needs of organisations for S.Scan in SSC?** In order to accomplish our research objectives we use three theoretical bodies (Figure 1.9).

Figure 1.9. *Theoretical background for Chapter 3*



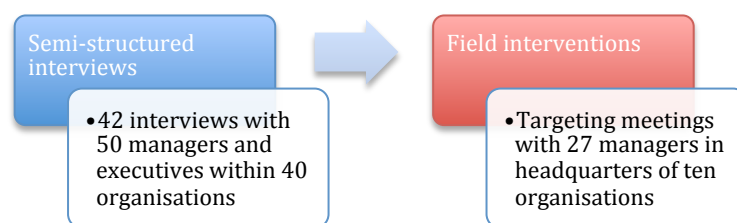
The Triple bottom line is a term proposed by John Elkington (1998) to refer to an accounting framework that represents sustainability as the crossroads of three dimensions: social, environmental and financial. It has been linked to the SD anthropocentric notion proposed initially by the Brundtland Commission and reused and expanded by the Rio Declaration: “Human beings are at the centre of concerns for SD. They are entitled to a healthy and productive life in harmony with nature” (United Nations, 1992). Thus, Triple bottom line has been the most accepted model to represent the multidimensional nature of SD.

Since humans are at the centre of concerns of SD, the Stakeholder Theory posited that organisations should respond not only to the interest of their owners but to

those of “all those groups and individuals that can affect, or are affected by, the accomplishment of organisational purpose” (Freeman, 1983). We presume that an actor to scan is a concept related to Stakeholder’s notion. In the context of our study, we used the Triple Bottom Line and Stakeholder’s notion as starting points to identify information needs for S.Scan in the SSC context. We adopt the “Target” method (Lesca & Lesca, 2011) as the targeting method for our research.

With our research objective in mind, we proceeded with an Action Research (AR) approach to complement our exploratory research. AR is adapted to our research since it is a way to overcome the lack of stable understanding about the meaning and implications of SSC reported from our exploratory study. It would have been impossible to produce results if we had followed other approaches that did not include facilitative involvement of the researcher (e.g. study cases, surveys). Consequently, our two-stage research approach was organised as follows (Figure 1.10): first, we used the exploratory interviews to produce initial lists of stakeholders and topics to scan in SSC context. Then, the lists were expanded and tested through field interventions.

Figure 1.10. *Research approach followed in Chapter 3*

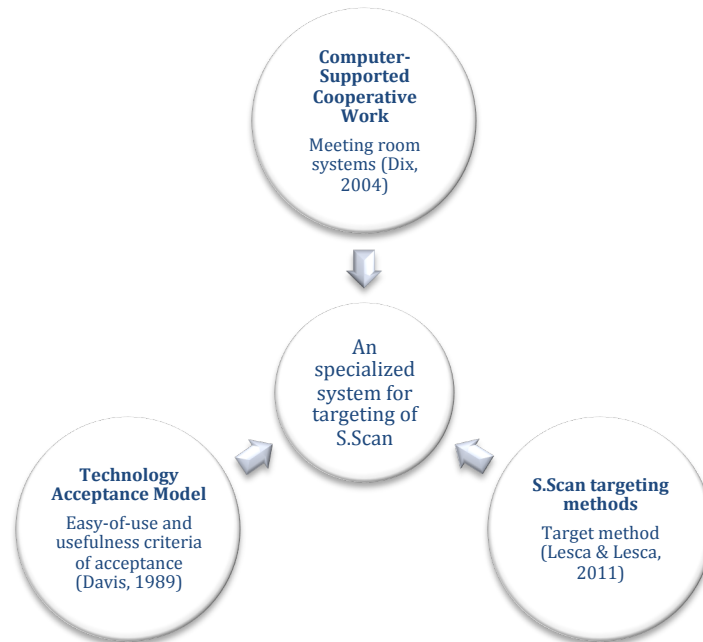


1.4.3 Preview of Chapter 4: Improving targeting of Strategic Scanning: design and implementation of a meeting room system

The objective of Chapter 4 is to answer the following question: **How could information needs identification be improved by the use of a specialized system?** Computer-based systems have already been used for information search and analysis in S.Scan. However, to date, there are no systems available to provide support for information needs identification in S.Scan. Currently, when managers target S.Scan, they use paper and markers which makes it time consuming and entirely unfriendly. This research addresses

this gap by proposing a system to assist them in this activity. In order to accomplish our research objectives we use three theoretical bodies (Figure 1-11):

Figure 1.11. *Theoretical background for Chapter 4*

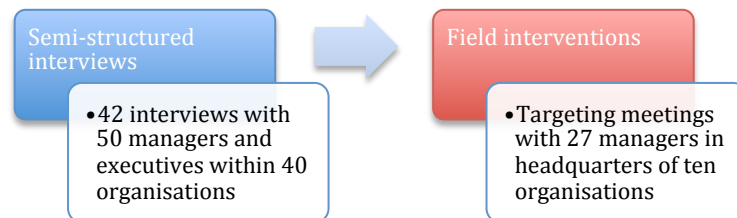


Since targeting can be either an individual or a collective effort, the system to develop should be adapted to both uses. Computer-Supported Cooperative Work (CSCW) is a discipline that studies the design of computer systems to support and coordinate the work of groups of collaborating individuals (Baecker, 1995; Dix, 2004). Meeting rooms systems are a sub-set of CSCW systems that combine face-to-face verbal interaction with technology to make meetings more interactive, effective, and efficient (Dix, 2004; Stair & Reynolds, 2012). Based on the Target method we build a meeting room system to facilitate S.Scan targeting. In order to study the acceptance of our system, we used the criteria of the Technology Acceptance Model (TAM) (Davis, 1989) as our evaluation framework. TAM has been used as the reference framework for studying behavioural intention in the use of computer systems on the basis of the users' perceived usefulness and ease-of-use.

This study also follows an AR methodology to develop our system (Figure 1.12). From the family of AR methods, we adopted an Information System prototyping approach that follows an iterative method of prototype construction and user evaluation until the system achieved full functionality (Baskerville & Wood-Harper, 1998; Gregg,

2009). We designed, implemented, used and evaluated our meeting room system in field interventions in ten organisations working to identify their information needs for S.Scan in the SSC context.

Figure 1.12. *Research approach followed in Chapter 4*



1.4.4 Preview of Chapter 5: Strategic scanning through collective targeting for sustainable supply chains - an absorptive capacity perspective

This chapter aims to answer the following question: **What are the contributions of collective identification of information needs?** To date no study has explored the contributions to the organisation of S.Scan targeting. In addition, there is a lack of studies focusing on collective targeting. This study seeks to address both of these gaps.

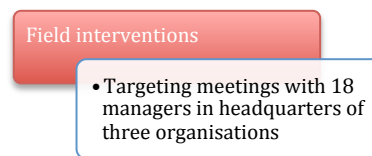
For our research purposes, we draw on absorptive capacity (ACAP) theory to study collective targeting as presented below (Figure 1.13). Over the last three decades, ACAP has been the prevalent theory used to explain the ability of an organisation to recognize the value of new external knowledge, acquire it, assimilate it, and apply it to commercial ends (Cohen & Levinthal, 1990; Lane et al., 2006; Roberts et al., 2012). In this chapter, we use ACAP to interpret how collective targeting interactions can develop organisational capacity to acquire new knowledge.

Figure 1.13. *Theoretical background for Chapter 5*



With our research objectives in mind, we adopted a multiview AR approach (Figure 1.14). We conducted interventions involving one large and two medium-sized organisations operating in manufacturing, distribution and logistics where managers were interested into identifying their information needs for S.Scan in the SSC context.

Figure 1.14. *Research approach followed in Chapter 5*



This dissertation investigates the stages of the adoption process that precede decision-making for adoption of S.Scan. It aims to provide a better understanding of how to provide the managers with tools to evaluate the pertinence of adopting S.Scan. Table 1-5 provides an overview of the dissertation chapters.

Table 1-5. Dissertation Overview Table

Chapter	Chapter 2: Drivers and barriers to pre-adoption of S.Scan in the SSC context.	Chapter 3: S.Scan for SSC: Where to start?	Chapter 4: Improving targeting of S.Scan: design and implementation of a meeting room system	Chapter 5: S.Scan through collective targeting for SSC - an ACAP perspective
Main research question	How to enable decision-making for adopting S.Scan?			
Chapter's research question	What are the drivers and barriers to pre-adopting S.Scan?	What are the topics and the stakeholders likely to represent the information needs of organisations for S.Scan in SSC?	How could information needs identification be improved by the use of a specialized system?	What are the contributions of collective identification of information needs?
Theoretical Background	<ul style="list-style-type: none"> • Institutional theory: Institutional isomorphic change (DiMaggio & Powell, 1983) • IS Pre-adoption: Symbolic adoption (Klonglan & Coward, 1970) • S.Scan missions and aims (Lesca & Caron-Fasan, 2006) • S.Scan failure and abandonment factors (Lesca & Caron-Fasan, 2008) 	<ul style="list-style-type: none"> • Stakeholder theory: Stakeholder notion (Freeman, 1983) • Triple bottom line: Three dimension model of SD (Elkington, 1998) • S.Scan targeting methods: Target method (Lesca & Lesca, 2011) 	<ul style="list-style-type: none"> • Computer-Supported Cooperative Work: Meeting room systems (Dix, 2004) • Technology Acceptance Model: Easy-of-use and usefulness criteria of acceptance (Davis, 1989) • S.Scan targeting methods: Target method (Lesca & Lesca, 2011) 	<ul style="list-style-type: none"> • Absorptive capacity Antecedents of acquisition capability (Cohen & Levinthal, 1990) • S.Scan targeting (Lesca & Lesca, 2011)
Methodology / Sample	Semi-structured interviews 42 interviews with 50 managers and executives within 40 organisations			
	Survey 126 questionnaires	Field interventions Targeting meetings with 27 managers in headquarters of ten organisations		
Expected results for SSC context	<ul style="list-style-type: none"> • Study the institutional and rational pressures influencing pre-adoption of S.Scan in the SSC context. 	<ul style="list-style-type: none"> • Overcome lack of understanding about what SSC is. • Identify information needs for S.Scan in the SSC context 	<ul style="list-style-type: none"> • Identify information needs for S.Scan in the SSC context 	<ul style="list-style-type: none"> • Identify information needs for S.Scan in the SSC context
Contributions for answering the main research question	<ul style="list-style-type: none"> • Enhance the understanding about the drivers and barriers affecting the development of a favourable attitude toward the adoption of S.Scan 	<ul style="list-style-type: none"> • Provide a trial of S.Scan in order to allow evaluation of managers before decision-making about the adoption of S.Scan. • Improve Target method to facilitate/trigger S.Scan targeting. 	<ul style="list-style-type: none"> • Provide a trial of S.Scan in order to allow evaluation of managers before decision-making about the adoption of S.Scan. • Improve Target method to facilitate/trigger S.Scan targeting. • Develop a specialized system for S.Scan targeting. 	<ul style="list-style-type: none"> • Study the contributions of collective targeting for the organisations in order to allow evaluation of managers before decision-making about the adoption of S.Scan.

1.5 References

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Appendix 1-1. List of interviews with participating organisations in exploratory study

Org.	Position in the SSC	Business sector	Interv.	Modality	Duration
MAN01	Manufacturer	Electronic components	2	Face to face	0h47
MAN02	Manufacturer	Packing and packaging materials	1	By phone	0h50
MAN03	Manufacturer	Industrial electronics	1	By phone	1h00
MAN04	Manufacturer	Personal protection gear	1	By phone	1h00
MAN05	Manufacturer	Cosmetics, toiletries and hygiene	1	By phone	0h57
MAN06	Manufacturer	PCs and consumables	1	Face to face	1h30
MAN07	Manufacturer	Cereal and grain processing small-medium industry	1	Face to face	0h50
MAN08	Manufacturer	Dairy products small-medium industry	1	By phone	1h00
MAN09	Manufacturer	Gastronomic specialties small-medium industry	1	By phone	1h00
MAN10	Manufacturer	Candy and chocolates small-medium industry	1	By phone	1h00
MAN11	Manufacturer	Dairy products small-medium industry	1	By phone	0h40
MAN12	Manufacturer	Candy and chocolates small-medium industry	2	Face to face	1h00
MAN13	Manufacturer	Hand tool manufacturer small-medium industry	1	Face to face	1h30
DIS01	Distributor	Alcoholic drinks distributor	1	By phone	0h50
DIS02	Distributor	Printer and photocopier distributor	1	Face to face	1h00
DIS03	Distributor	Pet products distribution	1	By phone	1h00
DIS04	Distributor	Lamps and lighting distribution	2	Face to face	1h04
DIS05	Distributor	Distributor-owned logistics service provider	1	By phone	1h15
DIS06	Distributor	Distributor-owned logistics service provider	2	By phone	1h10
LSP01	Logistics service provider	Logistics service provider	1	By phone	0h55
LSP02	Logistics service provider	Logistics service provider	1	By phone	0h50
LSP03	Logistics service provider	Logistics service provider	1	By phone	0h46
LSP04	Logistics service provider	Logistics service provider	1	By phone	1h10
LSP05	Logistics service provider	Logistics service provider	1	By phone	1h15
LSP06	Logistics service provider	Logistics service provider	1	By phone	1h10
LSP07	Logistics service provider	Freight forwarder	1	By phone	0h40
LSP08	Logistics service provider	Port traction provider	1	By phone	0h50
LSP09	Logistics service provider	Fresh food forwarder	1	By phone	1h15
INF10	Infrastructure manager	Port services	2	Face to face	1h15
INF11	Infrastructure manager	Logistics infrastructure manager	1	By phone	1h10
INF12	Infrastructure manager	Waterway manager	2	By phone	1h20
HER01	Higher education & research	Scientific and technical research	1	Face to face	1h10
COM01	Communities	Urban community	1	Face to face	1h30
COM02	Communities	Inter-communal organisation	2	By phone	1h27
COM03	Communities	Local authority	2	Face to face	1h00
CLU01	Cluster	Competitiveness cluster	1	By phone	0h50
SPR01	Service provider	Consulting office for management	1	By phone	0h55
SPR02	Service provider	Documentation and information service	1	By phone	1h02
SPR03	Service provider	Consulting and auditing in information systems	1	By phone	1h15
SPR04	Service provider	Consulting office for information systems	1	By phone	1h00
SPR05	Service provider	Consulting office in SC management	1	By phone	0h55
UNI01	Union	Independent truck operator union	2	By phone	1h00

Appendix 1-2. Semi-structured interview guide used in exploratory study

A - Introductory questions about the organisation

1. What is the main activity of your organisation?
2. How would you define the business of your organisation?
3. Is flow management important for your business? Why?

B - Questions about logistics and supply chain

4. In your own words, what is logistics?
5. For your organisation, what is logistics?
6. Do you think that logistics is important in your organisation?
7. Talking about logistics, what are the significant developments/changes that you have experienced during the last years?
8. Talking about logistics, what are the key developments that you foresee for the future?

C - Questions about SD

9. What does SD mean to your organisation?
10. What is the role of SD in the structure of your organisation?
11. Is your organisation involved in a certification process in connection with the SD?
12. Has your company a charter? Do you have any kind of documentation about your politics of SD? Would it be possible to have a copy?

D - Questions about SSC

13. In your own words, what is a SSC?
14. What is a SSC for your organisation?
15. What are the mains initiatives in terms of SSC in your organisation?
16. Can you identify some initiatives on SSC in the supply chains of your organisation?
17. If you were asked to improve the logistics of your organisation in order to better meet the needs of SD, what would you suggest?

E - Questions about S.Scan

18. What does the term S.Scan evoke for you?
19. Does your organisation practice some activities of S.Scan?
20. What is the role of S.Scan in the structure of your organisation?

F - Questions about S.Scan in SSC context

21. Does your organisation have activities of S.Scan for being aware of the evolutions of SSC?

If the answer is YES then go to questions 22 to 31

If the answer is NO then go to questions 32 to 39

Talking about the practices of S.Scan in SSC context inside your organisation

22. What is S.Scan in SSC context for your organisation?
23. What are the themes that your organisation scans?
24. Who are the main actors that your organisation scans?
25. What are the sources of information that your organisation uses to be informed about SSC?
26. In your organisation, who collects the information about SSC?
27. Do you receive internal information about SSC?
28. What happens to the information collected by you or by others?
29. Finally, how is used the information collected?
30. Is the S.Scan in SSC context formalized within your organisation?
31. What does the S.Scan in SSC context bring to your organisation?

Your organisation does not practice S.Scan in SSC context

32. What do you think are the barriers to developing/practicing S.Scan in SSC context?

Your organisation does not work on S.Scan in SSC context, but without a doubt, it is sensitive to the evolutions of its environment

33. What are the themes about which your organisation is particularly attentive?
34. Who are the actors about which your organisation is particularly attentive?
35. What are the sources of information your organisation uses spontaneously in order to search for information?
36. Do you receive internal information about your environment? Is some of this information related to logistics, SD or SSC?
37. What happens to information collected by you or by others?
38. Finally, how is the collected information used?

G - Questions about the interviewee

39. What is your position in the organisation?
40. How long have you been working in this job?
41. How long have you been working in your organisation?
42. Have you ever had training in logistics? In S.Scan? In SD? (Internal or external training)

Appendix 1-3. Journal selection for literature review on SSC

The purpose of this review is to study the growth of academic interest toward topics related to SSC. The chosen journals for this review belong to two major fields: “Supply chain management, logistics and transport”, and “Production and operations”. We have chosen these fields because they have been traditionally associated with research in supply chain management.

First, we were interested in identifying the top-tier journals in these fields. In order to do so, we have conducted a review of several journal rankings. Then we have retained only the journals that systematically appear in the top positions of their fields. We focused only on those appearing in the top 5 journals of each classification. Some exceptions were made for those journals that were not considered in a specific ranking but that appear as a top-tier journal in others. The rankings that we used are listed below:

- The journal ranking of the Center for Advanced Studies in Management and Economics (CEFAGE) from the University of Évora (Portuguese: *Universidade do Évora*). 2nd Edition 2009-2011.
- The journal ranking of the National Centre for Scientific Research (French: *Centre National de la Recherche Scientifique* or CNRS), classification of journals in economics and management 2011.
- The Erasmus Research Institute of Management (ERIM) journal list 2011-2015 from the Erasmus University of Rotterdam (Dutch: *Erasmus Universiteit Rotterdam*).
- The Association of Business Schools (ABS) Academic Journal Quality Guide version 4 published in 2010.
- The ranking of journals VHB-JOURQUAL 2.1 published in 2011 by the German Academic Association for Business Research (German: *Verband der Hochschullehrer für Betriebswirtschaft e. V.*).
- The Australian Business Deans Council Journal Ratings List 2010.
- The Excellence in Research for Australia (ERA), 2010 Ranked Journal List from the Australian Research Council and 2011 adjusted ERA Rankings List from the University of Queensland Business School (UQBS).
- The 2011 review of journal rankings for transport, logistics and supply chain management from the Institute of Transport and Logistics of the University of Sydney.
- The 2011 ranking of scientific management journals of the National Foundation for Companies Management Academic Education (FNEGE) (French: *Fondation nationale pour l'enseignement de la gestion des entreprises*).

The journals that were chosen as well as their rank in the cited ranking are listed below in Table A-1-1.

Table A-1-1. Ranks of chosen journals in reviewed journal rankings

		Journal Ranking									
		CEFAGE	CNRS	ERIM	ABS	VHB	ABCD	UQBS	U. Sydney	ERA	FNEGE
Rank scale (from best to worst)		AAA, AA, A, B, C, D	1, 2, 3, 4	STAR, P, S	4, 3, 2, 1	A+, A, B, C, D	A*, A, B, C, D	1, 2, 3, 4	4, 3, 2, 1	A*, A, B, C, D	1*, 1, 2, 3, 4
Production and Operations journals											
	International Journal of Operations and Production Management	B	2	P	3	C	A	2	2	A	2
	International Journal of Production Economics	B	1	S	3	B	A	2	2	A	1
	International Journal of Production Research	B	2	P	3	B	A	3	n/d	B	2
	Journal of Operations Management	A	1	STAR	4	B	A*	1	4	A*	1
	Production and Operations Management	A	1	STAR	3	A	B	3	3	B	1
	Production Planning and Control	C	2	S	3	C	B	2	n/d	A	2
Supply chain and Logistics journals											
	International Journal of Logistics Management	n/d	3	n/d	2	D	B	3	3	B	3
	International Journal of Logistics: Research and Applications	D	3	n/d	2	C	B	4	3	C	3
	International Journal of Physical Distribution & Logistics Management	D	3	S	1	n/d	C	3	3	C	3
	Journal of Business Logistics	n/d	3	S	2	B	B	3	2	B	3
	Journal of Supply Chain Management	D	4	S	1	B	B	3	1	B	4
	Supply Chain Management: An International Journal	C	3	S	3	C	A	2	2	A	3
	Transportation Research Part E	C	2	S	3	B	A	n/d	3	B	2

In order to find the articles for our review, we applied systematically the following filters. We conducted this request in the fields: Title, keywords and abstract.

- Sustainable AND supply chain
- Sustainable AND logistics
- Green AND supply chain
- Green AND logistics
- Sustainability AND supply chain
- Sustainability AND logistics
- Social AND sustainable AND supply chain
- Social AND sustainable AND logistics
- Social AND sustainability AND supply chain
- Social AND sustainability AND logistics
- Social AND responsibility AND supply chain
- Social AND responsibility AND logistics

2 Motivations et freins à la pré-adoption d'un système d'information de veille stratégique dans le contexte de la logistique durable

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2.1 Résumé

Cette recherche porte sur la pré-adoption d'un système d'information (SI) de veille stratégique (VS), c'est-à-dire l'émergence de l'idée d'un tel système et l'étude de l'opportunité de le mettre en œuvre. Plus précisément, l'objectif de la recherche est d'identifier les motivations et les freins qui participent de l'adoption symbolique d'un SI de VS et ainsi contribuer à enrichir les connaissances sur un sujet qui n'a jamais été abordé dans la littérature. L'originalité de l'article est de mobiliser le cadre néo-institutionnel et plus précisément les travaux sur les processus porteurs de changements institutionnels isomorphiques dans le champ de la VS. Sur la base d'une étude exploratoire qualitative et quantitative dans le contexte spécifique de la VS appliquée à la logistique durable, nos résultats révèlent 31 motivations et freins à la pré-adoption d'une VS, dont dix nouveaux, qui se structurent en deux méta-motivations et trois méta-freins. Ils suggèrent ainsi que la pré-adoption d'un SI de VS peut être soumise autant à des pressions rationnelles qu'institutionnelles. Elle peut être motivée par des objectifs de compétitivité tout autant que de mimétisme, et freinée par des objectifs de performance et par l'absence de pressions coercitives. Ces résultats questionnent finalement le rôle et la responsabilité de l'Etat dans le développement de la logistique durable et l'adoption de SI de VS orientés logistique durable.

2.2 Abstract

This research is reporting on the pre-adoption of Strategic Scanning (S.Scan) information systems (IS), that is, the emergence of the idea of such a system and the opportunity study for its implementation. Specifically, the objective is to identify the drivers and barriers to symbolic adoption of S.Scan, and so, to extend knowledge on this subject that has never received attention from the scholars. Research's originality relies on the use of isomorphic processes from neo-institutional theory in the field of S.Scan. On the basis of exploratory qualitative and quantitative studies in the specific field of S.Scan for sustainable supply chains, our results highlight 31 drivers and barriers to pre-adoption of S.Scan, ten of which have not been identified before. Identified drivers and barriers are organized in two meta-drivers and three meta-barriers. Our findings suggest that pre-adoption of S.Scan may be exposed to both rational and politic pressures. On the one hand, pre-adoption of S.Scan can be driven either by competitiveness as much as mimetic pressures. On the other hand, it is hindered by performance constraints and lack of coercive pressures. These results put a question mark about government's role and its responsibility for promoting sustainable supply chain initiatives and for the adoption of S.Scan IS on this issue.

2.3 Introduction

La pérennité et la compétitivité d'une organisation (Jennings & Lumpkin, 1992; Wei & Lee, 2004) dépendent pour partie de sa capacité à comprendre et anticiper les changements de son environnement extérieur (Xu et al., 2003) pour réduire l'incertitude liée à la prise de décision (Walkers et al., 2003), ajuster sa stratégie et ses objectifs (Choo, 2001) et adapter ses tactiques. Cela suppose notamment d'être capable de collecter et filtrer des informations pertinentes (Mosley Roche, 1996) souvent noyées dans des flux d'information surabondants, de les partager et les diffuser aux personnes concernées, de les analyser et de les utiliser pour créer du sens utile pour l'organisation (Rouibah & Ould-Ali, 2002). La veille stratégique (VS) peut aider l'organisation à développer cette capacité à comprendre et anticiper les évolutions de son environnement extérieur.

La VS a été étudiée sous différents angles. De nombreuses recherches ont porté sur les pratiques de VS et leur instrumentation partielle sous la forme de méthodes (i.e. Gilad & Gilad, 1988, Choo, 1999) ou de technologies (i.e. Zhang et al. 2009 ; Chung 2014). Des recherches plus récentes montrent comment les pratiques de veille contribuent à générer des

représentations de l'environnement externe (Belmondo, 2008) et renforcent la capacité d'absorption des organisations (Amabilé et al., 2012). Beaucoup plus rares sont les travaux qui étudient la VS comme un système d'information (SI), c'est-à-dire un ensemble structuré de ressources humaines, technologiques, informationnelles et procédurales qui recueille, transforme, stocke et diffuse de l'information au sein d'une organisation (Reix, 2002), conçu et mis en œuvre pour gérer un processus et assister les êtres humains dans les fonctions d'exécution, de gestion et de prise de décision (Lesca et al., 2010). Quelques recherches ont toutefois montré que la VS est un système complexe (Lesca & Caron-Fasan, 2005) dont le succès, l'efficacité et la pérennité sont sujets à de nombreux facteurs d'échecs et d'abandon, autant dans sa phase de conception, que d'implémentation et de production (Lesca & Caron-Fasan, 2008 ; Caron-Fasan & Lesca, 2012). En revanche, la pré-adoption de la VS, en amont de la conception et de la mise en œuvre du futur SI de VS, n'a jamais été étudiée. Lors de cette phase de pré-adoption, les parties prenantes s'interrogent et évaluent, d'une part, l'utilité et l'opportunité d'investir des ressources dans la mise en œuvre d'un SI de VS, et d'autre part, les conditions de sa faisabilité et de son adaptation au contexte spécifique de leur organisation. Cette évaluation conduit parfois à la décision d'adopter un SI de VS. Mais elle peut conduire aussi à la décision ne pas adopter un tel SI ou à reporter cette décision.

Dans cette recherche exploratoire, nous mobilisons la perspective néo-institutionnelle et la littérature dans le champ de la VS pour étudier quels sont les motivations et les freins qui influencent la pré-adoption d'un SI de VS. Une première phase qualitative, sur la base de 42 entretiens semi-directifs nous permet d'identifier 10 motivations et de freins nouveaux à la pré-adoption d'un SI de VS, en complément des 21 déjà évoqués dans la littérature sur la VS. Une seconde phase quantitative, a ensuite permis de révéler 5 méta- motivations et freins.

Notre étude s'inscrit dans le contexte particulier de la logistique durable (LD). La LD est un domaine dont les organisations s'emparent peu à peu mais pour lequel il existe de nombreuses barrières à sa mise en œuvre (Giunipero et al., 2012). L'une des principales barrières tient au manque d'informations des managers, qui conduit souvent les organisations à choisir de ne pas mettre en œuvre une LD (Walker et al. 2008). A cette barrière informationnelle, la VS orientée LD peut constituer une solution car elle peut aider à anticiper les évolutions et les opportunités à venir en matière de LD, à identifier des contraintes potentielles pour les transformer en opportunités, et finalement à passer d'une posture réactive face aux pressions externes, à une démarche plus proactive et anticipative (Fabbes-Costes et al., 2011). La décision d'adopter une LD s'accompagne de pressions institutionnelles diverses

qui peuvent être à l'origine de changements organisationnels importants (Jennings & Zandbergen, 1995 ; Connor & Dovers, 2004 ; Bansal, 2005). Ce contexte de la LD est donc particulièrement pertinent pour étudier l'influence de ces pressions comme facteurs de motivations ou de freins potentiels à la pré-adoption d'un SI de VS.

La première partie présente le cadre théorique mobilisé. La deuxième partie explique le contexte de la recherche et la méthodologie adoptée. Les résultats sont présentés dans la troisième partie pour être discutés dans une dernière partie. Nous espérons que cette étude livrera des connaissances utiles pour aider les chercheurs et les praticiens à mieux comprendre les freins et les motivations à l'adoption d'un SI de VS. Les résultats de cette étude pourront également aider les praticiens à évaluer avec conscience les raisons pour lesquelles ils décident ou non d'adopter un tel SI.

2.4 Cadre théorique de la recherche

2.4.1 La pré-adoption d'un système d'information (SI) de veille stratégique (VS)

L'adoption d'un SI fait référence au processus par lequel un SI est introduit dans un système social afin de soutenir les opérations, la gestion et la prise de décision (Cooper & Zmud, 1990 ; Thong, 1999 ; Baskerville & Pries-Heje, 2001). L'adoption couvre une succession d'états cognitifs, depuis la prise de conscience d'une technologie jusqu'à sa mise en œuvre (Rogers, 1983). Globalement, les recherches sur l'adoption des SI distinguent trois phases distinctes (voir Annexe 2-A) :

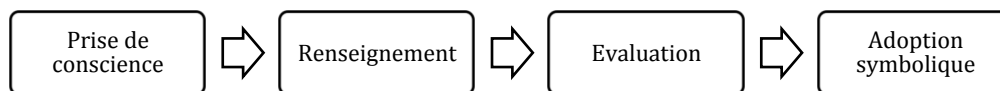
- la pré-adoption est une phase de prise de conscience et de reconnaissance d'un besoin, puis de renseignement et d'évaluation des SI capables de satisfaire ce besoin ;
- l'adoption est une phase de prise de décision et de mise en œuvre du SI ;
- la post adoption est une phase de routinisation et d'assimilation du SI.

La phase d'adoption des SI a fait l'objet de très nombreuses publications, à la lumière des théories de l'action raisonnée, du comportement planifié, de la diffusion de l'innovation, et de la théorie cognitive sociale. Le modèle de l'acceptation de la technologie (TAM) et ses révisions (TAM2 et TAM3), ainsi que la théorie unifiée de l'acceptation et de l'utilisation de la technologie (UTAUT) contribuent également à expliquer et prédire l'adoption des SI par les individus. La phase de post-adoption des SI, quant à elle, a également fait l'objet d'études

nombreuses à la lumière de la théorie des attentes (*expectancy theory*) et du modèle de continuité d'usage des SI (*information systems continuance model*). En revanche, peu d'études portent sur la phase de pré-adoption des SI.

Le modèle de l'adoption symbolique (Figure 2-1) est l'un des rares cadres théoriques qui permet d'expliquer la pré-adoption d'un SI (Fui-Hoon Nah et al., 2004; Verra et al., 2012). Il montre que, pour décider d'adopter un SI, il faut au préalable que les individus prennent conscience de l'existence de celui-ci, qu'ils s'informent et se renseignent, qu'ils en évaluent la pertinence par rapport à leurs besoins, et finalement qu'ils acceptent mentalement (symboliquement) l'idée de l'adopter (Klonglan & Coward, 1970 ; Sapp & Korsching, 2004). L'adoption symbolique est donc présentée comme une condition préalable et nécessaire à l'adoption « matérielle ». Elle s'expliquerait davantage par des facteurs sociologiques tandis que l'adoption « matérielle » répondrait davantage à une rationalité économique.

Figure 2-1. *Le modèle de l'adoption symbolique de Klonglan et Coward (1970)*



Dans le contexte de la VS, la pré-adoption correspond à la phase pendant laquelle une équipe de direction s'interroge sur la capacité de son organisation à être informée des évolutions de son environnement interne et externe, ainsi que sur le besoin de renforcer cette capacité pour réduire l'incertitude des décisions et piloter l'organisation dans le futur. Elle évalue la pertinence de l'idée d'un nouveau SI de VS comme solution possible, c'est-à-dire, d'une part, l'utilité et l'opportunité d'investir des ressources dans sa mise en œuvre, en complément ou en substitution de leurs pratiques actuelles, et d'autre part, les conditions de sa faisabilité dans le contexte spécifique de leur organisation. Cette évaluation conduit parfois à la décision d'adopter un SI de VS. Mais elle peut conduire aussi à la décision ne pas adopter un tel SI. Parfois, la décision est reportée si l'équipe de direction n'en reconnaît pas le besoin, ou si elle estime, soit que ce besoin n'est pas prioritaire, soit qu'un nouveau SI de VS n'est pas une solution pertinente. A ce stade de leur réflexion, la question ne se pose pas encore en termes de choix de technologie ou de SI. Cette question se posera ultérieurement, dans la phase d'adoption, si le besoin d'un nouveau SI de VS et sa priorité sont reconnus par l'équipe de direction. Il s'agit donc d'une phase d'adoption symbolique, qui porte sur la prise de conscience et la reconnaissance du besoin d'un nouveau SI de VS, plutôt que d'une phase

d'adoption « matérielle » qui porterait quand à elle davantage sur l'évaluation et l'engagement dans une nouvelle technologie ou un nouveau SI de VS précis et clairement identifié.

La pré-adoption d'un nouveau SI de VS n'a encore jamais été étudiée. Toutefois, la pré-adoption des SI a fait l'objet de quelques études qui mobilisent principalement le cadre théorique néo-institutionnel (Williams et al., 2009 ; Hofer et al., 2011), et plus précisément la vision organisante, d'une part, et la théorie de l'isomorphisme institutionnel, d'autre part. Ces recherches montrent notamment que la décision d'adopter ou de ne pas adopter un SI ne répond pas uniquement aux exigences de rationalité et d'efficacité, mais qu'elle peut aussi s'expliquer par des pressions institutionnelles ; pressions face auxquelles les organisations tendent à adopter des pratiques considérées comme légitimes par leurs homologues (Pfeffer & Salancik, 1978 ; Meyer & Rowan, 1991).

Le modèle de la vision organisante (Burton Swanson & Ramiller, 2004) montre que les idées et les discours « autorisés » qui émergent au sein de communautés professionnelles (e.g. des praticiens d'entreprise, des consultants, des éditeurs IT, des journalistes spécialisés), sur des innovations technologique ou de nouveaux SI encore peu connus (par exemple aujourd'hui, le Big Data, les google glass, etc.), se diffusent par les échanges inter-organisationnels (e.g. salon professionnels, conférences, presse). Ces discours créent des modes qui légitiment l'adoption de ces innovations par les organisations (Carton-Bourgeois et al., 2003). Dans le contexte de notre étude, l'idée d'un nouveau SI de VS dans la phase de pré-adoption ne se pose pas en termes de technologie innovante et nouvelle. La VS elle-même n'est plus, aujourd'hui, une idée nouvelle pour laquelle les discours « autorisés » ont une forte influence sur la légitimité de son adoption pour les organisations. Ce modèle théorique ne nous semble donc pas pertinent pour notre étude.

La théorie de l'isomorphisme institutionnel (Di Maggio & Powell, 1983) montre que dans un même champ, parce que les organisations qui produisent des services ou des produits similaires, ou qui partagent des fournisseurs, des ressources ou des clients identiques, sont sujettes à des pressions institutionnelles, internes et externes, similaires, elles tendent vers une forme d'homogénéisation structurelle ou de standardisation pour renforcer leur légitimité. Elles ont ainsi tendance à adopter « cérémonieusement » des pratiques considérées comme légitimes par leurs homologues (Meyer & Rowan, 1991; Jepperson, 1991 ; Schuman, 1995). et à investir dans des SI, entre autres raisons, pour répondre aux pressions institutionnelles et maintenir leur légitimité (Lai et al., 2006; Abdennadher & Cheffi, 2011). Dans le contexte de notre étude, la prise en compte de la théorie de l'isomorphisme institutionnel permet

d'explorer comment des pressions institutionnelles internes et externes peuvent elles aussi contribuer à expliquer la pré-adoption d'un nouveau SI de VS, en sus des freins et des motivations.

2.4.2 La théorie de l'isomorphisme institutionnel : un cadre théorique pour étudier les pressions institutionnelles sur les freins et les motivations à la pré-adoption d'un SI de VS

Pour la théorie de l'isomorphisme institutionnel, l'homogénéisation des organisations dans un même champ (tant sur les structures, les processus, les comportements ou la culture) s'explique par trois formes d'isomorphismes :

- L'isomorphisme mimétique résulte de l'incertitude et de la rationalité limitée face auxquels les organisations ont tendance à s'imiter entre elles. L'incertitude peut prendre diverses formes : elle peut être liée à l'environnement, notamment en période de crise ou de changements importants ; elle peut aussi être liée aux objectifs et aux buts de l'organisation, ou à l'utilité et aux usages d'une nouvelle technologie ou d'un futur SI, lorsqu'ils sont imprécis ou ambigus. L'incertitude et la rationalité limitée influencent les organisations d'un même champ à s'imiter entre elles pour être perçues comme plus légitimes. Cette imitation peut aussi être involontaire, par le transfert d'employés et par l'intervention de consultants ou d'associations professionnelles (Di Maggio & Powell, 1983 ; Haveman, 1993 ; Mizruchi & Fein, 1999).
- L'isomorphisme normatif résulte de la professionnalisation des membres de l'organisation, c'est-à-dire de l'ensemble des efforts collectifs d'une profession pour définir leurs compétences et leurs méthodes de travail (Scott, 1995). Tandis que dans une même organisation les métiers sont différents les uns des autres, ils sont très similaires aux métiers des homologues des autres organisations (Di Maggio & Powell, 1983). Deux sources d'isomorphisme normatif sont identifiables. D'une part, la standardisation des cursus éducatifs (e.g. mêmes formations, mêmes écoles et universités, mêmes compétences). Cette source est encouragée par les mécanismes de recrutement qui tentent à privilégier toujours les mêmes profils. D'autre part, par le développement des réseaux professionnels où les modèles organisationnels se diffusent rapidement. L'isomorphisme normatif entretient l'uniformité et la consanguinité qui peuvent aller par exemple jusqu'à l'adoption de règles, de langages

et de codes vestimentaires communs.

- L'isomorphisme coercitif résulte d'une influence politique au sens large, formelle ou informelle, exercée par l'Etat, par les organisations d'un même champ, ou par les attentes culturelles de la société, et qui favorise l'adoption de normes communes (Di Maggio & Powell, 1983). C'est par exemple le cas de la promulgation de nouvelles réglementations environnementales (Jennings & Zandbergen, 1995). Ces nouvelles règles influencent les organisations concernées à envisager un changement, soit pour s'adapter, soit pour innover. Ainsi, progressivement, les structures organisationnelles reflètent les règles et les normes dominantes d'un Etat ou d'une société (Slack & Hinings, 1994).

Dans le contexte de la pré-adoption d'un SI de VS, le cadre théorique néo-institutionnel et le modèle de l'adoption symbolique suggèrent que la décision d'adopter ou de ne pas adopter pourrait s'expliquer par des pressions institutionnelles, internes et externes, et un objectif de légitimité de l'organisation dans son champ. La littérature sur la VS, quant à elle, explique la décision d'adopter ou de ne pas adopter un SI de VS par des pressions internes plus rationnelles, qui répondent davantage à des objectifs de performance et de compétitivité. Certaines de ces pressions peuvent être des motivations de nature à favoriser l'adoption symbolique. D'autres des freins qui, au contraire, lui font obstacle ou le ralentissent.

2.4.3 Les facteurs d'échec des projets de VS : un cadre théorique pour étudier les freins et les motivations rationnels à la pré-adoption d'un SI de VS

Bien que souvent mobilisées et étudiées, les notions de motivation et de frein n'ont jamais été explicitement définies dans les recherches antérieures (voir par exemple Hofer et al., 2011 ; Walker et al., 2008 ; Robson et al., 2008). Dans cet article nous les définissons comme suit :

- une motivation est une pression, interne ou externe, qui influence l'évaluation d'un nouveau SI de VS comme solution aux besoins de l'organisation, et favorise son adoption symbolique.
- un frein est une pression, interne ou externe, qui influence l'évaluation d'un nouveau SI de VS et ralentit ou entrave son adoption symbolique.

Les études sur les motivations à la pré-adoption d'un SI de VS sont inexistantes. En revanche, une littérature abondante porte plus généralement sur les missions et les objectifs managériaux de la VS et montrent donc l'intérêt à faire de la VS (voir Tableau 2-1). Dans la mesure où il s'agit d'intentions et de volontés stratégiques, nous les assimilons dans cet article à des motivations rationnelles, c'est-à-dire à des pressions internes, en lien avec la mission et les objectifs de performance et de compétitivité de l'organisation, susceptibles de favoriser la pré-adoption d'un SI de VS.

Tableau 2-1. Synthèse de la littérature sur les motivations à la pré-adoption d'un SI de VS

Motivation	Description	Littérature
<i>Se tenir informé</i>	Rester informé pour comprendre l'environnement présent et les changements en train de se réaliser.	Hambrick, 1981 ; Stubbart, 1982 ; Smircich et Stubbart, 1985 ; Raymond et al., 2001 ; Lesca et Caron-Fasan, 2008 ; Lesca et al., 2012
<i>Identifier des menaces</i>	Identifier des menaces/contraintes et s'en protéger	Hambrick, 1981 ; Stubbart, 1982 ; El Sawy, 1985 ; Lang et al., 1997 ; Beal, 2000 ; Xu et al., 2003 ; Lesca et al., 2012
<i>Identifier des opportunités</i>	Identifier des opportunités pour développer de nouveaux produits/services/activités/marchés, etc.	Hambrick, 1981 ; 1982 ; Stubbart, 1982 ; El Sawy, 1985 ; Lang et al., 1997 ; Beal, 2000 ; Xu et al., 2003 ; Lesca et al., 2012
<i>Alimenter l'innovation</i>	Alimenter le processus d'innovation pour aider à se différencier et améliorer sa compétitivité	Raymond et al., 2001 ; Veugelers et al., 2010
<i>Maintenir une position concurrentielle</i>	Maintenir un avantage concurrentiel nouveau pour pérenniser sa position concurrentielle	Hambrick, 1981 ; Jennings et Lumpkin, 1992 ; Wei et Lee, 2004
<i>Se développer</i>	Développer un avantage concurrentiel nouveau pour améliorer sa position concurrentielle	Raymond et al., 2001
<i>Anticiper</i>	Identifier les phénomènes émergents et anticiper les changements et discontinuités à venir pour agir de manière proactive et adapter la stratégie	Hambrick, 1981 ; Choo, 2001 ; Lesca et Caron-Fasan, 2008 ; Lesca et al., 2012

Les études sur les freins à la pré-adoption d'un SI de VS sont également inexistantes. Toutefois, quelques études portent sur les facteurs d'échecs et d'abandon des projets de VS. Certains de ces facteurs concernent le déroulement proprement dit du projet et représentent des complications imprévues qui perturbent la conception et la mise en œuvre du SI de VS, et sont susceptibles de remettre significativement en question ses délais, ses coûts, ses objectifs et ses bénéfices pour l'organisation (Doherty & King, 2001). Ces facteurs d'échecs relèvent davantage de l'adoption et de la post adoption, que de la pré-adoption. D'autres, en revanche, pourraient contribuer à expliquer certains des freins susceptibles d'influencer l'adoption symbolique d'un SI de VS (voir Tableau 2-2).

Tableau 2-2. Synthèse de la littérature sur les freins à la pré-adoption d'un SI de VS

Freins	Description	Littérature
<i>Difficulté à organiser le processus</i>	Faute de méthode type, les organisations ont des difficultés à organiser les différentes étapes du processus de VS	Calori, 1988 ; Yasai-Ardekani & Nystrom, 1996
<i>Absence d'impulsion</i>	La Direction ne prend pas la décision d'engager et d'impulser une dynamique de VS	Lesca & Caron-Fasan, 2008
<i>Mauvaise circulation de l'information</i>	L'intérêt de partager les informations de VS n'est pas compris. Les structures de diffusion des informations sont inadaptées	Englewod & Lenz, 1985 ; Ghoshal & Westney, 1991 ; Lesca & Caron-Fasan, 2008
<i>Culture organisationnelle hostile</i>	Une culture organisationnelle hostile ou peu encline au partage et à la circulation des informations	Diffenbach, 1983 ; Englewod & Lenz, 1985 ; Ghoshal & Westney, 1991 ; Babbar & Rai, 1993 ; Lesca & Caron-Fasan, 2008
<i>Engagement inapproprié de la Direction</i>	Manque de soutien et d'intérêt de la Direction afin de légitimer la VS	Lesca & Caron-Fasan, 2008
<i>Mauvais accès aux informations</i>	Des difficultés pour accéder aux informations pertinentes : - soit parce que les sources mobilisées sont inadaptées - soit parce que l'information est noyée dans une masse de données	El Sawy, 1985 ; Yoon, 2012
<i>Manque d'aide extérieure</i>	Faire de VS est difficile sans aide extérieure	Lesca & Caron-Fasan, 2008
<i>Difficulté à calculer le ROI</i>	Manque de méthodes pour calculer le ROI de la VS	Prescott, 1999
<i>Manque de ressources financières</i>	Un budget insuffisant pour mobiliser en interne ou en externe les ressources nécessaires pour la VS	Ghoshal & Westney, 1991 ; Lesca & Caron-Fasan, 2008
<i>Manque de temps</i>	Manque de motivations des acteurs qui se traduit par une incapacité à dégager du temps	Diffenbach, 1983 ; Lesca & Caron-Fasan, 2008
<i>Défaut d'alignement</i>	Défaut d'alignement de la VS avec la stratégie de l'organisation.	Lesca & Caron-Fasan, 2008
<i>Complexité du projet</i>	Sous-estimation de la complexité de la VS Sur-estimation du périmètre de la VS	Lesca & Caron-Fasan, 2008
<i>Absence d'objectifs clairs</i>	Absence d'une définition claire et partagée des objectifs de la VS	Lesca & Caron-Fasan, 2008
<i>En dehors des priorités de l'organisation</i>	La VS ne fait pas partie des priorités stratégiques de l'organisation	Lesca & Caron-Fasan, 2008

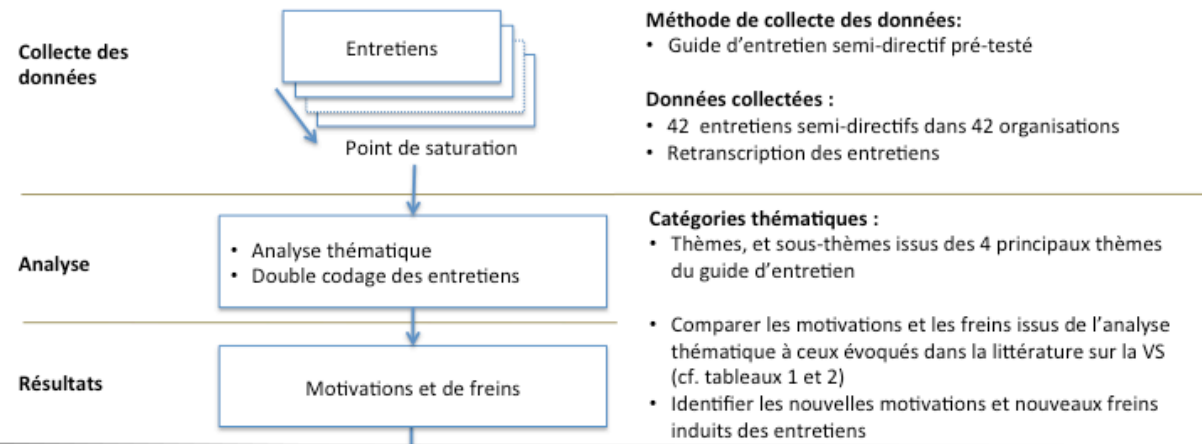
2.5 Méthodologie de la recherche

L'objectif de cette recherche exploratoire est d'identifier quels sont les motivations et les freins qui influencent la pré-adoption d'un SI de VS. L'étude s'est faite dans le contexte particulier de la logistique durable (LD). La méthodologie est divisée en deux phases complémentaires (Figure 2-2). Une première phase qualitative a permis d'identifier quels sont les motivations et freins évoqués spontanément par les managers, et d'en découvrir de nouveaux qui n'étaient jusqu'alors pas identifiés dans la littérature. Une seconde phase quantitative a ensuite permis de regrouper ces premiers résultats pour révéler des méta-motivations et des méta-freins.

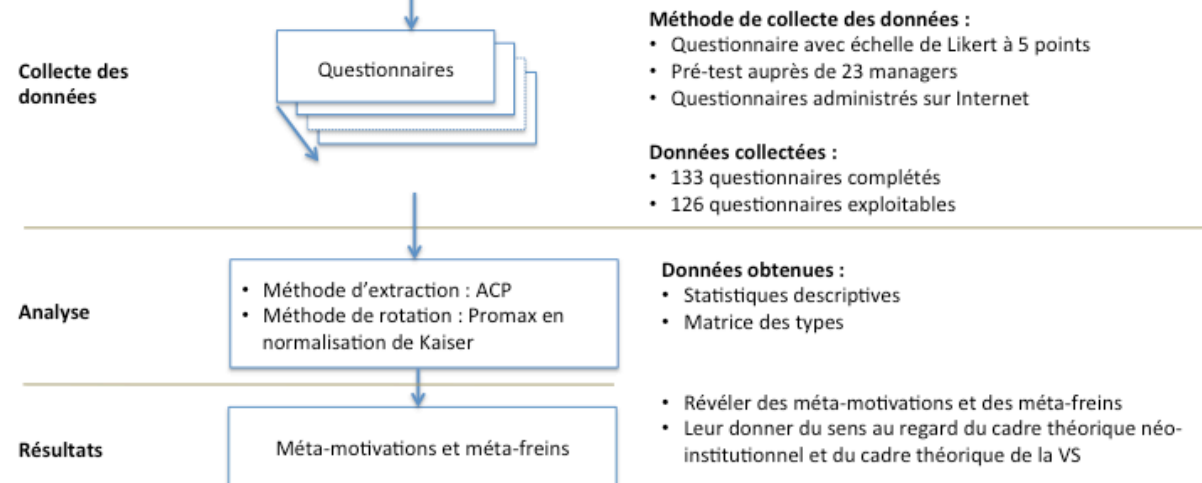
Figure 2-2. Design de la recherche

Contexte de l'étude : la veille stratégique (VS) pour la logistique durable (LD)

Phase qualitative pour identifier des motivation et des frein à la pré-adoption d'un SI de VS



Phase quantitative pour révéler des méta-motivations et des méta-freins à la pré-adoption d'un SI de VS



2.5.1 Contexte de l'étude : une VS appliquée à la logistique durable

Le contexte de l'étude est celui de la VS appliquée à la LD. Face aux récentes initiatives institutionnelles nationales et internationales, les organisations sont incitées à mieux prendre en considération les problématiques de développement durable (DD) dans leurs activités opérationnelles et notamment à repenser leurs schémas logistiques. Toutefois, de nombreuses barrières font obstacle à la mise en œuvre d'une LD (Giunipero et al., 2012). Certaines concernent le manque d'information des managers sur les législations en vigueur ou à venir, ainsi que sur les bénéfices attendus et les risques possibles de telles démarches

(Walker et al., 2008). Ce manque d'information est préjudiciable et conduit souvent à choisir de ne pas pratiquer une LD (Zhou et al., 2000).

Un SI de VS orientée vers la LD peut représenter une solution dans sa capacité à aider à comprendre mais aussi anticiper les évolutions et les opportunités à venir en matière de LD, à identifier des contraintes potentielles pour les transformer en opportunités, et finalement à passer d'une posture réactive face aux pressions externes, à une démarche plus proactive et anticipative (Fabbe-Costes et al., 2011).

Cette étude participe d'un projet de recherche financé par l'ADEME et dont l'objectif était d'étudier les conditions d'opérationnalisation d'une VS appliquée à la LD. D'une durée de 3 ans, ce projet s'est structuré autour de quatre questions principales : qu'est-ce que la VS appliquée à la LD ? Quelles sont les pratiques actuelles de VS dans le domaine de la LD ? Comment développer les pratiques de VS appliquée à la LD ? Quels sont les freins et les motivations à la VS appliquée à la LD ? Cet article porte uniquement sur l'analyse de la dernière question.

2.5.2 Une phase qualitative pour identifier les motivations et les freins à la pré-adoption d'un SI de VS

Dans cette première phase exploratoire nous avons réalisé 42 entretiens semi-directifs entre septembre 2010 et février 2011, avec 50 personnes dans 42 organisations de secteurs différents (voir Annexe 2-B), majoritairement par téléphone (31 entretiens sur 42, soit 73,8 %) et dans une moindre mesure en face à face (11 entretiens, soit 26,2 %). Nous avons ainsi cherché à rencontrer la plus grande diversité possible d'interlocuteurs représentatifs des parties prenantes des chaînes logistiques en France : des entreprises industrielles, des entreprises commerciales, des prestataires de services logistiques (PSL), des gestionnaires d'infrastructure, des institutions qui jouent un rôle en matière d'aménagement et de réglementation, et des consultants spécialisés dans les domaines de la recherche et susceptibles d'influer sur les décisions des acteurs des chaînes (voir Tableau 2-3). L'objectif était aussi de nous entretenir avec des personnes compétentes et concernées par le sujet. Compte tenu du thème étudié et de sa transversalité, nos interlocuteurs étaient susceptibles de faire partie soit d'une direction logistique, DD ou SI/VS, soit d'être proche de la direction générale (voir Tableau 2-4). Les entretiens ont été menés jusqu'à saturation.

Tous les entretiens ont été intégralement enregistrés, puis retranscrits et double codés sur la base de la grille de codage construite au terme de notre revue de littérature (voir Tableaux 2-1 et 2-2). Toutefois, des motivations et freins nouveaux ont également « émergés » de l'analyse (Bardin, 2007) venant ainsi compléter la grille de codage. L'unité d'analyse retenue pour le codage thématique est l'entretien. Pour évaluer la validité du codage, un taux de cohérence, proportion des codages coïncidant entre deux codeurs, a été calculé (Rust & Cooil, 1994). Le taux obtenu montre une cohérence moyenne de 76,86 %, ce qui est supérieur au taux minimal de 70 % recommandé pour ce type d'études exploratoires (Nunnally & Barnstein, 1994).

2.5.3 Une phase quantitative pour révéler des méta-motivations et des méta-freins à la pré-adoption d'un SI de VS

Le questionnaire que nous avons utilisé (voir Annexe 2-C) reprend l'ensemble des motivations et des freins issus à la fois de la revue de littérature et de l'étude qualitative (voir Tableau 2-5 et 2-7). Les motivations et freins ont été mesurés à l'aide des échelles de Likert à 5 points allant de « pas du tout d'accord » à « tout à fait d'accord » pour permettre aux répondants de se positionner sur un point central s'ils le souhaitent. Le questionnaire a fait l'objet de 23 pré-tests auprès de managers ayant tous un intérêt soit pour la logistique et la LD, soit pour la VS.

Les profils des répondants sont les mêmes que ceux de la phase qualitative à savoir : des responsables logistiques/supply chain, transport, DD/Responsabilité sociétale des entreprises (RSE) et VS ainsi que les directeurs généraux (voir Tableau 2-4) des diverses parties prenantes des chaînes logistiques en France (voir Tableau 2-3). Dans la mesure où l'étude porte sur la VS appliquée à la LD, il était essentiel que les répondants disposent d'un niveau d'information satisfaisant sur les décisions relatives à la VS, à la logistique ou au DD.

Le questionnaire a été administré sur Internet en utilisant la plateforme SurveyMonkey entre les mois de mai et d'octobre 2012. Après élimination de 263 questionnaires incomplets, 133 ont été retenus. Sept répondants ont indiqué qu'ils avaient une responsabilité mineure et qu'ils étaient peu informés sur les décisions relatives à l'ensemble des domaines de notre recherche. Leurs questionnaires ont par conséquent été supprimés de l'échantillon. Ainsi, 126 questionnaires ont été exploités et traités à l'aide du logiciel SPSS.

Les données ont été analysées avec deux méthodes d'analyses descriptives. Pour commencer, une analyse univariée (statistiques descriptives autour de la moyenne, de l'écart type et de l'erreur moyenne standard) afin, d'une part, de mettre en évidence l'importance relative de chacun des motivations et freins les uns par rapport aux autres et, d'autre part, de mesurer la dispersion des réponses. Ensuite, une Analyse en Composantes Principales (ACP) a été utilisée pour compléter l'analyse des valeurs moyennes des réponses et de leur dispersion, et mettre en évidence les méta-motivations et méta-freins à la pré-adoption d'un SI de VS.

Tableau 2-3. Parties prenantes des chaînes logistiques interrogées
lors des deux phases de la recherche

Parties prenantes	Phase qualitative		Phase quantitative	
	Nb	%	Nb	%
Entreprises industrielles (PMI, Grande entreprise industrielle)	13	31,0 %	27	21.4 %
Entreprises commerciales (Grand distributeur, PME de service, GSS)	4	9,5 %	15	11.9 %
PSL (Grand PSL généraliste, PSL intégré à un distributeur, commissionnaire, autres prestataires)	11	26,2 %	55	43.6 %
Gestionnaires infra- et super- structures (Port, gestionnaire d'infrastructure)	3	7,1 %	3	2.4 %
Institutions (Ministère, région, syndicat intercommunal, ville, partenaire de valorisation, observatoire régional, cluster et pôle de compétitivité)	5	11,9 %	5	4.0 %
Prestataires de services immatériels (entreprise de VS, SSII pour la logistique, consultant spécialisé en logistique)	6	14,3 %	21	16.7 %
Totaux	42	100%	126	100%

Tableau 2-4. Directions des managers et des dirigeants interrogés
lors des deux phases de la recherche

Fonctions / directions	Phase qualitative		Phase quantitative	
	Nb	%	Nb	%
Logistique / supply chain*	10	20 %	41	30.8 %
Transport / distribution physique*	6	12 %	11	8.3 %
Production / direction industrielle	1	2 %	2	1.5 %
Achat / approvisionnement	3	6 %	12	9 %
Recherche et développement	-	-	7	5.3 %
Commercial / marketing	3	6 %	11	8.3 %
DD / RSE / qualité, sécurité, environnement*	8	16 %	6	4.5 %
VS / Intelligence économique*	4	8 %	2	1.5 %
Systèmes d'information	2	4 %	5	3.7 %
Direction générale	8	16 %	30	22.6 %
Autre	5	10 %	6	4.5 %
Total	50	100	126	100

* répondants étant au cœur de la cible de la recherche

2.6 Résultats

L'étude qualitative a permis d'identifier 31 motivations et freins évoqués spontanément pendant les interviews, dont 10 ne sont pas déjà identifiés dans la littérature. 12, donc 5 nouveaux, traduisent des motivations à la pré-adoption d'un SI de VS (voir tableau 2-5) et 19, dont 5 nouveaux également, traduisent des freins (voir tableau 2-7). L'étude quantitative révèle quant à elle 2 méta-motivations (voir tableau 2-6) et 3 méta-freins (voir tableau 2-8). Les résultats sur les motivations puis sur les freins sont présentés séparément.

2.6.1 Les motivations à la pré-adoption d'un SI de VS

Tableau 2-5. Les motivations à la pré-adoption d'un SI de VS dans le contexte de la LD

Revue de littérature	Etude qualitative		Etude quantitative					
	1	2 Motivations (items)	3 Codage thématique		4 Questions sous-jacentes	5 Statistiques descriptives		
			Nb ¹	% ²		Moyenne	Ecart-type	Erreur standard moyenne
Non	1	Par conviction	4	9,5%	Nous sommes convaincus qu'il faut faire de la VS appliquée à la LD	4,03	1,109	,099
Oui	3	Se tenir informé	33	78,6%	Nous voulons nous tenir informés des évolutions en cours	3,98	1,051	,094
Oui	9	Maintenir une position concurrentielle	8	19,0%	Nous cherchons à maintenir notre position concurrentielle	3,99	1,092	,097
Oui	8	Anticiper	16	38,1%	Nous cherchons à anticiper des changements qui pourraient nous concerner afin de nous y préparer	3,98	1,027	,092
Oui	10	Innové	11	26,2%	Nous voulons alimenter notre processus d'innovation	3,89	1,022	,091
Oui	7	Identifier des opportunités	12	28,6%	Nous cherchons à identifier des opportunités	3,81	1,018	,009
Oui	11	Se développer	3	7,1%	Nous souhaitons développer de nouveaux marchés / de nouvelles activités	3,67	1,206	,107
Oui	12	Identifier des menaces	4	9,5%	Nous cherchons à identifier des menaces	3,65	1,119	,100
Non	2	Faire adhérer	2	4,8%	Faire de la VS nous permet de faire adhérer nos collaborateurs à notre stratégie en matière de LD	3,52	1,136	,101
Non	5	Faire comme les autres	2	4,8%	D'autres entreprises / organisations de notre secteur font de la VS appliquée à la LD	3,47	1,171	,104
Non	4	Communiquer	3	7,1%	Communiquer sur notre VS appliquée à la LD nous évite d'être montrés du doigt en tant que « mauvais élève » du DD	3,03	1,296	,115
Non	6	S'inspirer des autres	20	47,6%	Nous attendons de voir ce que font les autres avant de nous lancer dans la VS appliquée à la LD	1,89	1,045	,093

¹ Nombre d'entretiens dans lesquels chaque motivation est mentionnée

² Pourcentage par rapport au nombre total d'entretiens réalisé = 42

2.6.1.1 Les motivations à la pré-adoption d'un SI de VS

L'analyse thématique des entretiens met en évidence une liste de 12 motivations présentée dans la colonne 2 du tableau 2-5 ci-dessous. Sept sont semblables à des motivations évoquées dans la littérature (voir tableau 2-5 colonne 1) : se tenir informé, identifier des opportunités, identifier des menaces, anticiper, maintenir une position concurrentielle, innover et se développer. Cinq autres sont spontanément évoqués pendant les entretiens, mais ne sont pas identifiées dans les études antérieures dans le champ de la VS :

- faire adhérer : « *Et pour moi, encourager les gens à être en éveil par rapport à tout ce qui se passe autour et leur donner l'opportunité de remonter de l'info, et leur montrer en plus que ça a un écho dans les oreilles de certains, c'est génial pas pour la motivation des collaborateurs* » [Entreprise commerciale]
- par conviction : « *c'est culturel à un moment donné, je dirais que l'on ne se pose la question...* » [Grande entreprise industrielle]
- pour communiquer : « *La veille n'est qu'une manière de communiquer ce qui existe, mais si c'est pour communiquer des études, ça a pas beaucoup d'intérêt, et par contre communiquer des réalisations qui permettent de monter d'une marche, et qui vont pouvoir permettre à des entreprises qui n'ont pas encore fait, de le faire ça me paraît important !* » [Petite entreprise industrielle]
- faire comme les autres : « *Nous, on travaille beaucoup par benchmark, je vais essayer de regarder un peu ce que font les plus grands, les leaders ou ce qu'ils disent dans la presse, des choses comme ça, pour voir si ça s'applique à nous. Donc, ça, c'est un peu peut-être une culture du 'copie/collage' spécial* » [Petite entreprise industrielle]
- pour s'inspirer des autres : « *ils s'investissent plutôt pas mal et en général, ils ont des bonnes initiatives, donc ce sont des gens que nous regardons. On les surveille, enfin, on n'est pas vraiment comparable en terme d'activité, on ne peut pas s'assimiler bien sûr, mais ils ont des offres qui peuvent parfois nous inspirer ou en encore des moyens qui peuvent nous inspirer* » [PSL]

2.6.1.2 Les méta-motivations à la pré-adoption d'un SI de VS

L'ACP suggère une solution à deux ou trois composantes. Nous avons retenu la solution à deux composantes parce qu'elle présentait une cohérence et une pertinence

supérieure⁸. Les résultats de l'analyse en deux composantes principales sont présentés dans le tableau 2-6. Ils révèlent deux principales méta-motivations à la pré-adoption :

- La première méta-motivation désigne la recherche d'une forme de « *proactivité* ». Ici, les organisations manifestent la volonté d'anticiper les changements à venir. Leur attitude est véritablement proactive et montre une volonté de développer de nouveaux marchés et/ou d'alimenter leur processus d'innovation. Cette composante est construite à partir de « Nous voulons alimenter notre processus d'innovation » (0,845) ; « Nous cherchons à identifier des menaces » (0,787) ; « Nous cherchons à identifier des opportunités » (0,775) ; « Nous cherchons à maintenir notre position concurrentielle » (0,762) ; « Nous souhaitons développer de nouveaux marchés/de nouvelles activités » (0,694) et « Nous cherchons à anticiper des changements qui pourraient nous concerner afin de nous y préparer » (0,676).
- La seconde méta-motivation désigne une forme de « *conformisme* ». Les organisations ont une attitude de suiveur en cherchant à se tenir informé sur ce qui existe déjà. Le SI de VS est par ailleurs considérée comme un outil interne de management (pour la motivation des salariés). On peut d'ailleurs s'interroger ici sur leurs motivations réelles, surtout quand certaines répondent vouloir adopter un SI de VS pour ne pas être « montrées du doigt ». Cette composante est construite à partir de : « D'autres entreprises / organisations de notre secteur font de la VS appliquée à la LD » (0,846) ; « Faire de la VS appliquée à la LD nous permet de faire adhérer nos collaborateurs à notre stratégie en matière de LD » (0,819) ; « Nous voulons nous tenir informés des évolutions en cours » (0,788) et dans une moindre mesure par « Communiquer sur la VS appliquée à la LD nous évite d'être montré du doigt » (0,692).

⁸ Une première étape d'analyse a consisté à vérifier la cohérence de l'ensemble des items permettant de créer une bonne structure factorielle. Le coefficient MSA de la diagonale de la matrice anti-image devait présenter des coefficients supérieurs à 0,5 afin de vérifier que les variables étaient bien adaptées à la structure des autres variables. Le coefficient MSA étant inférieur à 0,5 pour l'item 6 (0,392), la suppression de cet item devait être envisagée, bien que non indispensable, car la qualité de représentation de cet item était correcte par ailleurs.

Lorsque l'ACP a été effectuée, la méthode du pourcentage de restitution minimale de la variance (c'est-à-dire seuil minimum de 60 % de variance expliquée) a montré une solution en 3 facteurs. Après rotation Promax afin d'améliorer les résultats de l'ACP, les trois facteurs ont bien été identifiés. Toutefois, l'item 6 était le seul item constitutif du 3^e facteur. Par ailleurs, son sens de corrélation négatif révélait qu'il constituait une mesure ayant une signification différente des deux autres facteurs. Ce résultat a confirmé l'interrogation précédente concernant la suppression de cet item. Après sa suppression, une nouvelle ACP a été effectuée. La solution à deux facteurs a bien été confirmée par le pourcentage de variance restituée (59,99 % de variance expliquée avec deux facteurs).

Tableau 2-6. Matrice des types issue de la factorisation des motivations à la pré-adoption d'un SI de VS dans le contexte de la LD

Matrice des types à 2 facteurs Méta-motivations / motivations / questions sous-jacentes		Composante	
		1	2
Recherche d'une forme de « pro-activité »			
10 Innover	Nous voulons alimenter notre processus d'innovation		,845
12 Identifier des menaces	Nous cherchons à identifier des menaces		,787
7 Identifier des opportunités	Nous cherchons à identifier des opportunités		,775
9 Maintenir une position concurrentielle	Nous cherchons à maintenir notre position concurrentielle		,762
11 Se développer	Nous souhaitons développer de nouveaux marchés / de nouvelles activités		,694
8 Anticiper	Nous cherchons à anticiper des changements qui pourraient nous concerner afin de nous y préparer		,676
Recherche d'une forme de « conformisme »			
5 Faire comme les autres	D'autres entreprises / organisations de notre secteur font de la VS appliquée à la LD		,846
2 Faire adhérer	Faire de la VS appliquée à la LD nous permet de faire adhérer nos collaborateurs à notre stratégie en matière de LD		,819
3 Se tenir informé	Nous voulons nous tenir informés des évolutions en cours		,788
1 Par conviction	Nous sommes convaincus qu'il faut faire de la VS appliquée à la LD		,701
4 Communiquer	Communiquer sur notre VS appliquée à la LD nous évite d'être montrés du doigt en tant que « mauvais élève » du DD		,692

Méthode d'extraction : ACPP.

Méthode de rotation : Promax avec normalisation de Kaiser. La rotation a convergé en 3 itérations.

2.6.2 Les freins à la pré-adoption d'un SI de VS

2.6.2.1 Les freins à la pré-adoption d'un SI de VS

L'analyse thématique des entretiens met en évidence une liste de 19 freins présentée dans la colonne 2 du tableau 2-7. Cette liste est globalement cohérente avec les freins mentionnés dans les recherches antérieures. Cinq nouveaux freins émergent néanmoins (voir tableau 2-7 colonne 1) :

- la difficulté à comprendre le sujet : « *Je ne sais pas trop comment le définir, franchement là ! Comment vous la définissez, vous ? ... Par curiosité !* » [Grand PSL généraliste]
- la difficulté à délimiter l'environnement à surveiller : « *Si c'est pas assez ciblé effectivement ! Ça peut les perdre, et du coup je pense, qu'ils peuvent se dire, bon c'est trop compliqué* » [Institutionnel]
- le manque d'outils et méthodes : « *Les difficultés c'est, ben c'est comment organiser la veille déjà, c'est... comment organiser les chiffres, c'est à dire arrêter l'information importante et laisser passer ce qui est moins important, comment on l'intègre, et comment on va la traiter* » [Gestionnaire d'infrastructure]
- le manque de savoir-faire : « *Mais on sous-traite, on ne sait pas le faire* » [Gestionnaire d'infrastructure]

- le manque de ressources humaines : « *On serait preneur d'un service études, avec en plus des chefs de service, d'un chargé d'étude qui justement rassemble, structure tout un ensemble de bases de données, moi c'est ce que je regrette, c'est quelque chose que je n'ai pas, enfin... de ce côté-là, le service n'est pas suffisamment solide* » [Questionnaire infra et super structures]

Tableau 2.7 - Les freins à la pré-adoption d'un SI de VS dans le contexte de la LD

Revue de littérature		Etude qualitative		Etude quantitative				
1		2 Freins (items)	3 Codage thématique		4 Question sous-jacentes	5 Statistiques descriptives		
			Nb ¹	% ²		Moyenne	Ecart-type	Erreur standard moyenne
Oui	10	Difficultés à calculer le ROI	5	11,9%	Nous ne savons pas évaluer le ROI de la VS appliquée à la LD	3,48	1,238	,110
Oui	17	Absence d'objectif clairs	1	2,4%	Notre organisation n'a pas bien défini ses attentes en matière de VS appliquée à la LD	3,27	1,223	,109
Oui	2	Difficulté à organiser le processus	8	19,0%	Nous avons du mal à organiser le processus de VS appliquée à la LD	3,19	1,211	,108
Oui	16	Complexité	-	-	Faire de la VS appliquée à la LD est beaucoup plus complexe que nous le pensions	3,17	1,064	,095
Non	18	Difficulté à délimiter l'environnement à surveiller	2	4,8%	Nous avons du mal à cerner ce qui doit être surveillé dans le cadre de la VS appliquée à la LD	3,11	1,195	,106
Non	15	Manque de ressources humaines	2	4,8%	Nous manquons de personnes pour animer la VS appliquée à la LD	3,11	1,234	,110
Non	14	Manque de savoir-faire	3	7,1%	Nous manquons de savoir-faire pour faire de la VS appliquée à la LD	2,98	1,249	,111
Non	8	Manque d'outils et de méthodes	5	11,9	Nous manquons d'outils ou de solutions techniques en interne pour faire de la VS appliquée à la LD	2,96	1,235	,110
Non	1	Difficulté à comprendre le sujet	3	7,1%	Nous avons du mal à définir ce qu'est la LD	2,79	1,202	,107
Oui	19	En dehors des priorités de l'organisation	11	26,2%	La VS appliquée à la LD ne fait pas partie des priorités de notre organisation	2,79	1,33	,119
Oui	3	Absence d'impulsion	3	7,1%	Il manque l'impulsion nécessaire pour commencer à faire de la VS appliquée à la LD	2,79	1,324	,118
Oui	4	Mauvaise circulation de l'information	3	7,1%	Les informations ne circulent pas bien	2,75	1,164	,104
Oui	12	Manque de temps	11	26,2%	Nous n'avons pas le temps de faire de la VS appliquée à la LD	2,77	1,285	,114
Oui	9	Manque d'aide extérieure	-	-	Nous n'avons pas trouvé, auprès de prestataires extérieurs, d'offre d'outils ou de méthodes satisfaisantes pour nous aider à faire de la VS appliquée à la LD	2,7	1,126	,100
Oui	11	Manque de ressources financières	7	16,7%	Le coût à l'entrée pour commencer à faire de la VS appliquée à la LD dissuade notre organisation	2,63	1,212	,108
Oui	7	Mauvais accès aux informations	7	16,7	Nous n'avons pas accès aux informations dont nous aurions besoin pour faire de la VS appliquée à la LD	2,55	1,114	,099
Oui	5	Culture organisationnelle hostile	1	2,4%	La culture de notre organisation ne se prête pas bien à la VS appliquée à la LD	2,52	1,401	,125
Oui	6	Engagement inapproprié de la Direction	3	7,1%	La direction de notre organisation ne soutient pas assez l'effort de VS appliquée à la LD	2,37	1,275	,114
Oui	13	Défaut d'alignement	-	-	La VS appliquée à la LD n'est pas en cohérence avec la stratégie de notre organisation	2,07	1,147	,102

2.6.2.2 Les méta-freins à la pré-adoption

L'ACP (voir tableau 2-8) suggère une construction à trois composantes pour caractériser les freins à la pré-adoption d'un SI de VS⁹ :

- La première composante porte sur le « *Manque de ressources et de compétences pour la VS appliquée à la LD* ». Cette composante fait ressortir les difficultés pour une organisation à identifier et mobiliser des ressources humaines et méthodologiques aussi bien internes qu'externes. Elle est composée principalement de : « Nous manquons d'outils ou de solutions techniques en interne pour faire de la VS appliquée à la LD » (0,921) ; « Nous n'avons pas trouvé auprès de prestataires extérieurs d'offre d'outils ou de méthodes satisfaisantes pour nous aider à faire de la VS appliquée à la LD » (0,810) ; « Il manque l'impulsion nécessaire pour faire de la VS appliquée à la LD » (0,721) ; « Nous n'avons pas accès aux informations dont nous aurions besoin » (0,692) ; et dans une moindre mesure « Nous manquons de personnes pour animer la VS appliquée à la LD » (0,615) ; « Le coût à l'entrée pour faire de la VS appliquée à la LD est dissuasif » (0,604) puis « les informations ne circulent pas bien » (0,570).
- La deuxième composante porte sur la « *Difficulté à définir les attentes et les objectifs* ». Cette composante fait ressortir la difficulté pour les organisations à s'engager dans la VS faute de savoir quoi en attendre et comment l'organiser pour qu'elle soit performante. Elle est principalement composée de : « Nous avons du mal à organiser le processus de VS appliquée à la LD » (0,825) ; « Nous avons du mal à définir ce qu'est la LD » (0,768) ; « Nous ne savons pas évaluer le ROI de la VS appliquée à la LD » (0,723) ; et dans une moindre mesure de « Nous n'avons pas le temps de faire de la VS appliquée à la LD » (0,689) ; « Nous avons du mal à cerner ce qui doit être surveillé » (0,642) et « Notre organisation n'a pas bien défini ses attentes en matière de VS appliquée à la LD » (0,434).
- La troisième composante porte sur le « *Défaut d'alignement entre la VS appliquée à la LD et la stratégie* ». En décalage avec les priorités stratégiques de l'organisation et

⁹ Le coefficient MSA de la diagonale de la matrice anti-image présentait des coefficients supérieurs à 0,5 pour l'ensemble des items, montrant que chaque item était bien adapté à la structure des autres variables.

La méthode du pourcentage de restitution minimale de la variance et la méthode des valeurs propres a montré une solution en 3 facteurs. Après rotation Promax, les 3 facteurs ont bien été identifiés, à l'exception de l'item 16 (« Faire de la VS appliquée à la LD est beaucoup plus complexe que nous le pensions ») qui corrélait avec deux facteurs et avec sens négatif. Ce résultat pouvait s'expliquer par la formulation de cet item qui est très large sur l'aspect « complexité ». Le choix des chercheurs a été de le supprimer afin d'obtenir la solution à trois facteurs la plus évidente et de réaliser une nouvelle ACP sans cet item.

sans soutien des instances dirigeantes, la VS n'a pas de légitimité. Elle est composée de : « La VS appliquée à la LD ne fait pas partie des priorités de notre organisation » (0,845) ; « La direction de notre organisation ne soutient pas assez l'effort de VS appliquée à la LD » (0,811) ; « La culture de notre organisation ne se prête pas bien à la VS appliquée à la LD » (0,776) et « La VS appliquée à la LD n'est pas en cohérence avec la stratégie de notre organisation » (0,763).

Tableau 2-8 - Matrice des types issue de la factorisation des freins à la pré-adoption d'un SI de VS dans le contexte de la LD

Matrice des types à 3 facteurs sans l'item 16 ^a Méta-freins / freins / Questions sous-jacentes		Composantes		
		1	2	3
Manque de ressources et de compétences pour la VS appliquée à la LD				
Manque d'outils et de méthodes	Nous manquons d'outils ou de solutions techniques en interne pour faire de la VS appliquée à la LD	,921		
Manque d'aide extérieure	Nous n'avons pas trouvé, auprès de prestataires extérieurs, d'offre d'outils ou de méthodes satisfaisantes pour nous aider à faire de la VS appliquée à la LD	,810		
Absence d'impulsion	Il manque l'impulsion nécessaire pour commencer à faire de la VS appliquée à la LD	,721		
Mauvais accès aux informations	Nous n'avons pas accès aux informations dont nous aurions besoin pour faire de la VS appliquée à la LD	,692		
Manque de ressources humaines	Nous manquons de personnes pour animer la VS appliquée à la LD	,615		
Manque de ressources financières	Le coût à l'entrée pour commencer à faire de la VS appliquée à la LD dissuade notre organisation	,604		
Mauvaise circulation des informations	Les informations ne circulent pas bien	,570		
Manque de savoir-faire	Nous manquons de savoir-faire pour faire de la VS appliquée à la LD	,476	,450	
Difficultés à définir les attentes et les objectifs				
Difficulté à organiser le processus	Nous avons du mal à organiser le processus de VS appliquée à la LD		,825	
Difficulté à comprendre le sujet	Nous avons du mal à définir ce qu'est la LD		,768	
Difficulté à calculer le ROI	Nous ne savons pas évaluer le ROI de la VS appliquée à la LD		,723	
Manque de temps	Nous n'avons pas le temps de faire de la VS appliquée à la LD		,689	
Difficulté à délimiter l'environnement à surveiller	Nous avons du mal à cerner ce qui doit être surveillé dans le cadre de la VS appliquée à la LD		,642	
Absence d'objectif clairs	Notre organisation n'a pas bien défini ses attentes en matière de VS appliquée à la LD		,434	
Défaut d'alignement entre la VS appliquée à la LD et la stratégie				
Engagement inapproprié de la Direction	La direction de notre organisation ne soutient pas assez l'effort de VS appliquée à la LD			,811
Hors des priorités de l'organisation	La VS appliquée à la LD ne fait pas partie des priorités de notre organisation			,845
Culture organisationnelle hostile	La culture de notre organisation ne se prête pas bien à la VS appliquée à la LD			,776
Défaut d'alignement	La VS appliquée à la LD n'est pas en cohérence avec la stratégie de notre organisation			,763

Méthode d'extraction : ACPP.

Méthode de rotation : Promax avec normalisation de Kaiser. a. La rotation a convergé en 7 itérations.

2.7 Discussions et conclusion

Cette recherche montre que les motivations et les freins à la pré-adoption d'un SI de VS peuvent être influencés par deux types de pressions différentes mais complémentaires : la première, plutôt rationnelle, traduit des objectifs de performance, tandis que la seconde, plus institutionnelle, répond à des objectifs de légitimité (voir tableau 2-9).

Tableau 2-9. Synthèse des pressions qui influencent la pré-adoption d'un SI de VS
(dans le contexte de la logistique durable)

Pressions	Méta-motivations	Méta-freins
Rationnelles (Performance)	<p>Compétitivité <i>Recherche d'une forme de pro-activité</i> > La pré-adoption d'un SI de VS peut être motivée par des préoccupations stratégiques de compétitivité et de pérennité de l'organisation.</p>	<p>Efficacité <i>Défaut d'alignement</i> > La pré-adoption d'un SI de VS peut être freinée lorsque sa finalité (i.e. la LD dans notre étude) n'est pas une priorité stratégique de l'organisation.</p> <p>> <i>Difficulté à définir les attentes et les objectifs</i> La pré-adoption d'un SI de VS peut être freinée lorsque l'utilité du système n'est pas clairement définie ou perçue.</p> <p>Efficiace <i>Manque de ressources et de compétences</i> > La pré-adoption d'un SI de VS peut être freinée lorsque l'organisation ne dispose pas des ressources nécessaires (i.e. humaines, méthodologiques, technologiques, financières, informationnelles) pour mettre en œuvre le système, ou lorsqu'elle n'envisage pas de les investir dans le système.</p>
Institutionnelles (Légitimité)	<p>Mimétisme <i>Recherche d'une forme de conformisme</i> > La pré-adoption d'un SI de VS peut être motivée par un besoin de légitimité d'une organisation dans un champ, soit par conviction (i.e. la LD dans notre étude), soit pour faire comme les autres.</p>	<p>Coercition <i>Absence d'incitations réglementaires</i> > L'absence de priorités, d'attentes, d'objectifs et de règles claires et pérennes de la part de l'Etat notamment peut être un frein au développement de la LD dans les organisations, et donc à la pré-adoption d'un SI de VS orienté LD.</p>

Les pressions rationnelles montrent que la pré-adoption d'un SI de VS peut être motivée par des objectifs de compétitivité et de pérennité, lorsque la finalité du système – dans le contexte de notre étude, la prise en compte du développement durable dans les chaînes logistiques – est cohérente avec les priorités stratégiques de l'organisation. Elles montrent aussi que la pré-adoption d'un SI de VS peut être freinée : lorsque les objectifs du système ne sont pas clairement définis et cohérents avec les priorités de l'organisation ; lorsque l'utilité et l'efficacité d'un tel système pour soutenir la réalisation des objectifs de l'organisation ne sont

pas garantis notamment en terme de retour sur investissement ; lorsque l'organisation n'a pas les ressources nécessaires pour mettre en œuvre puis mettre en production un tel SI, ou encore lorsqu'elle en a les ressources mais que les mobiliser pour un SI de VS n'est pas une priorité. Ces pressions rationnelles sont cohérentes avec la littérature sur les freins et les motivations dans le champ de la VS. Mais elles instancient, complètent et structurent, dans la phase de la pré-adoption d'un SI de VS, des connaissances qui étaient jusqu'ici plus générales, diffuses et imprécises dans la littérature (voir tableaux 2-1 et 2-2).

Les pressions institutionnelles, en revanche, montrent que la pré-adoption d'un SI de VS n'est ni exclusivement, ni nécessairement une décision rationnelle. Elle peut aussi résulter d'influences internes et externes, qui peuvent motiver une organisation à renforcer sa légitimité dans son champ. Soit lorsque ses parties prenantes internes sont convaincues d'une mission – par exemple concevoir des chaînes logistiques durables dans le contexte de notre étude – et de l'utilité d'un SI de VS pour améliorer la capacité de l'organisation à identifier et proposer des solutions et des innovations pertinentes pour réaliser cette mission. Soit lorsque l'organisation subit de la part de ses parties prenantes externes de fortes pressions à se conformer aux tendances et aux évolutions de son champ, et qu'elle a besoin pour ce faire d'améliorer sa capacité à les identifier, les connaître et les anticiper pour réagir et s'adapter.

L'étude de la pré-adoption d'un SI de VS à la lumière du cadre néo-institutionnel, et plus précisément de la théorie de l'isomorphisme institutionnel, montre les limites de la perspective rationnelle et stratégique dominante dans le champ de la VS, et la nécessité d'élargir le cadre d'analyse pour prendre également en considération des motivations et des freins d'ordre plus institutionnels. Plus précisément, notre étude montre que la décision d'adopter ou de ne pas adopter un SI de VS peut aussi s'expliquer par une forme d'isomorphisme mimétique. Mais implicitement, bien que cela ne se lise pas dans nos résultats, le contexte politique dans lequel nous avons réalisé notre étude soulève des hypothèses sur l'influence d'un isomorphisme coercitif.

En effet, notre étude s'inscrit dans un contexte politique où la France s'est engagée à réduire ses émissions de gaz à effet de serre de 20% en 2020 et de 75% en 2075 (facteur 4). Toutefois, depuis 2010, la traduction de ces objectifs dans le secteur du transport est beaucoup moins claire : dans un contexte de crise économique et de très faible croissance, les gouvernements successifs se sont désavoués et les priorités nationales ont changé plusieurs fois ; les discours politiques se sont contredits ; les incitations réglementaires annoncées n'ont pas été mises en application ou ont été abandonnées ; les gaz à effet de serre émis pour

fabriquer et transporter vers la France les produits importés ne sont finalement pas pris en compte dans le suivi ; et les moyens à mettre en œuvre ne sont pas non plus clairement identifiés. Si bien que, dans la phase 1 de notre étude, beaucoup des personnes interviewées nous ont expliqué avoir interprété l'instabilité de la pression coercitive comme le signe d'un désaveu des gouvernements. Face à l'incertitude quant aux mesures à mettre en œuvre, beaucoup ont alors abandonné leurs initiatives en termes de LD, en attendant que les objectifs et les incitations politiques se clarifient. Dans un tel contexte, la pré-adoption d'un SI de VS pour soutenir une démarche de LD est nécessairement freinée par l'absence de pressions coercitives de la part de l'Etat.

Cela pourrait aussi expliquer pourquoi, dans la phase 2 de notre étude, malgré nos efforts pour diffuser largement notre questionnaire et l'administrer à grande échelle (auprès des principaux réseaux professionnelles, mais aussi auprès de plusieurs réseaux universitaires de diplômés de formations spécialisés), notre enquête a très peu mobilisé les professionnels de la logistique et de la chaîne logistique au moment où nous avons réalisé notre enquête, la LD n'était plus un sujet pertinent pour la majorité des organisations interrogées ; la pré-adoption d'un SI de VS orienté LD ne pouvait pas l'être davantage. Pourtant, malgré l'absence de pressions coercitives de la part de l'Etat pour motiver un engagement dans la LD et partant, la pré-adoption éventuelle d'un SI de VS, les organisations pourraient aussi subir des pressions des partenaires de leurs chaînes logistiques, voire aussi des consommateurs pour les organisations concernées. Or, dans les 42 entretiens exploratoires que nous avons menés, avec des représentants de toutes les parties prenantes de la chaîne logistique, et dans des secteurs diversifiés (public et privé, B2B et B2C), aucune des personnes interviewées n'a évoqué de telles pressions coercitives ou normatives pour expliquer soit les motivations, soit les freins de son organisation au développement de la LD, et à la pré-adoption d'un SI de VS pour la LD.

Finalement, le contexte de la LD constitue probablement la principale limite de notre étude car les discours « autorisés » n'ont pas encore réellement émergé, les règles et les normes ne sont pas encore établies. Ce constat ouvre donc deux perspectives de recherche complémentaires pour approfondir la compréhension de la pré-adoption d'un SI de VS :

- reproduire notre étude sur des champs plus matures que ne l'est actuellement la LD, pour approfondir la compréhension des pressions institutionnelles, notamment normatives que cette première étude n'a pas permis d'explorer, et leurs influences sur les motivations et les freins à la pré-adoption d'un SI de VS ;
- conduire de nouvelles études sur un champ en construction, comme c'est par exemple

le cas de la LD, à la lumière du modèle de la vision organisante, pour comprendre comment les discours « autorisés » qui émergent au sein d'une communauté professionnelle influencent les freins et les motivations à la pré-adoption d'un SI de VS.

2.8 Références

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Annexe 2-A. Synthèse des processus d'adoption dans la littérature en SI

Auteurs	Pre-adoption		Adoption			Post-adoption	
<i>Klonglan et Coward, 1970</i>	Prise de conscience Un individu se rend compte de l'apparition d'une innovation.	Renseignement L'individu explore activement des informations sur l'innovation.	Évaluation L'individu évalue si l'innovation est adaptée à ses besoins (adoption symbolique).	Essai L'adoptant potentiel peut chercher une démonstration de l'innovation. Si elle répond à ses attentes ou les dépasse il peut décider de l'adopter (adoption matérielle).			
<i>Rogers, 1983</i>	Connaissance Exposition à l'innovation et à la façon dont elle fonctionne.		Persuasion Une attitude favorable ou défavorable est formée vers l'innovation.	Décision Les activités qui aboutissent à une décision d'adopter ou de rejeter l'innovation.	Mise en œuvre L'innovation est mise en service	Confirmation Les individus cherchent à consolider la décision, mais peuvent revenir en arrière s'ils sont exposés à des messages contradictoires au sujet de l'innovation.	
<i>Kwon et Zmud, 1987; Cooper et Zmud, 1990</i>	Initiation Les organisations dressent un bilan de leurs problèmes existants pour chercher une solution IT adaptée.		Adoption La décision est prise d'investir les ressources nécessaires pour mettre en œuvre de la solution IT.	Adaptation La solution IT est mise en œuvre. Des procédures sont révisées et/ou développées.	Acceptation Les membres de l'organisation s'engagent dans l'utilisation de la solution IT.	Routinisation L'utilisation de la solution IT est une activité normale. Ajustement des systèmes de gouvernance de pour tenir compte de la solution IT.	Imprégnation L'efficacité organisationnelle est améliorée par l'utilisation de la solution IT.
<i>Rai et al., 2009</i>	Prise de conscience Les principaux décideurs apprennent l'existence d'une nouvelle IT.	Intérêt L'organisation cherche à en savoir plus sur la nouvelle IT.	Évaluation L'organisation essaie la solution IT.	Engagement L'organisation s'engage dans l'utilisation de la nouvelle IT d'une manière significative pour une ou quelques activités.	Déploiement limité Utilisation régulière de l'IT par certains utilisateurs pour quelques activités.	Déploiement partiel Utilisation régulière de l'IT par certains utilisateurs pour toutes leurs activités.	Déploiement général L'utilisation de la nouvelle IT est largement diffusée dans l'organisation.
<i>Burton Swanson et Ramiller, 2004</i>	Compréhension L'organisation s'informe sur une innovation IT, développe une position autour de son adoption.		Adoption L'organisation analyse la rentabilité de l'innovation IT et décide d'engager ou non des ressources dans sa mise en œuvre.	Mise en œuvre L'innovation est mise en service.	Assimilation L'innovation IT commence à être assimilée dans l'organisation et à montrer son utilité. L'innovation peut rencontrer des problèmes susceptibles de provoquer son rejet.		
<i>Zhu et al., 2006</i>	Initiation Évaluation des avantages potentiels d'une IT pour améliorer la performance d'une organisation dans les activités de sa chaîne de valeur.		Adoption Prendre la décision d'utiliser l'IT pour les activités de la chaîne de valeur. Allocation des ressources et acquisition physique.			Routinisation L'IT est largement utilisé dans les activités de la chaîne de valeur d'une entreprise.	
<i>Hameed et al., 2012</i>	Initiation Reconnaissance d'une innovation IT qui peut répondre à un besoin, l'acquisition des informations concernant la innovation IT, et le positionnement à propos de l'adoption de l'innovation.		Adoption et décision Décision d'accepter l'innovation IT. Évaluation des options pour son acquisition et sa mise en œuvre.		Mise en œuvre L'essai de l'innovation, son acquisition, l'évaluation de son acceptation par les utilisateurs, et son utilisation continue.		

Annexe 2-B. Secteur d'activité des organisations interrogées lors des deux phases de la recherche

Secteurs d'activité	Phase 1 Etude qualitative exploratoire		Phase 2 Etude quantitative confirmatoire	
	Nb	%	Nb	%
Administration publique	5	11.9	5	4
Bâtiment	1	2.4	2	1.6
Chimie et plastique	-	-	3	2.4
Commerce	1	2.4	15	11.9
Constructeur automobile, aéronautique, ferroviaire, naval	-	-	4	3.2
Electronique et informatique	5	11.9	3	2.4
Energie	-	-	1	0.7
Gestionnaire d'infrastructure de transport / logistique	3	7.1	3	2.4
Industrie agroalimentaire	7	16.7	8	6.3
Mécanique et métallurgie	1	2.4	6	4.8
Santé et beauté	1	2.4	3	2.4
Transport et/ou prestation de service	12	28.6	55	43.6
Autres	6	14.3	18	14.3
Total	42	100	126	100

Annexe 2-C. Questionnaire

Dans mon entreprise/organisation, nous faisons de la VS appliquée à la LD parce que :	Pas du tout d'accord 1	Plutôt pas d'accord 2	Ni d'accord ni pas d'accord 3	Plutôt d'accord 3	Tout à fait d'accord 4
1. Nous sommes convaincus qu'il faut faire de la VS appliquée à la LD					
2. Faire de la VS appliquée à la LD nous permet de faire adhérer nos collaborateurs à notre stratégie en matière de LD					
3. Nous voulons nous tenir informés des évolutions en cours					
4. Communiquer sur notre VS appliquée à la LD nous évite d'être montrés du doigt en tant que « mauvais élève » du DD					
5. D'autres entreprises/organisations de notre secteur font de la VS appliquée à la LD					
6. Nous attendons de voir ce que font les autres avant de nous lancer dans la VS appliquée à la LD					
7. Nous cherchons à identifier des opportunités					
8. Nous cherchons à identifier des menaces					
9. Nous cherchons à anticiper des changements qui pourraient nous concerner afin de nous y préparer					
10. Nous cherchons à maintenir notre position concurrentielle					
11. Nous voulons alimenter notre processus d'innovation					
12. Nous souhaitons développer de nouveaux marchés/de nouvelles activités					

<p>2.9 Indiquez les <u>DIFFICULTES</u> que rencontre votre entreprise/organisation dans la conduite d'une VS appliquée à la LD :</p>	<p>Pas du tout d'accord 1</p>	<p>Plutôt pas d'accord 2</p>	<p>Ni d'accord ni pas d'accord 3</p>	<p>Plutôt d'accord 4</p>	<p>Tout à fait d'accord 5</p>
13. Nous avons du mal à définir ce qu'est la LD					
14. Nous avons du mal à organiser le processus de VS appliquée à la LD					
15. Il manque l'impulsion nécessaire pour commencer à faire de la VS appliquée à la LD					
16. Les informations ne circulent pas bien					
17. La culture de mon entreprise/organisation ne se prête pas bien à la VS appliquée à la LD					
18. La direction ne soutient pas assez l'effort de VS appliquée à la LD					
19. Nous n'avons pas accès aux informations dont nous aurions besoin pour faire de la VS appliquée à la LD					
20. Nous manquons d'outils ou de solutions techniques en interne pour faire de la VS appliquée à la LD					
21. Nous n'avons pas trouvé, auprès de prestataires extérieurs, d'offre d'outils et de méthodes satisfaisantes pour nous aider à faire de la VS appliquée à la LD					
22. Nous ne savons pas évaluer le retour sur investissement de la VS appliquée à la LD					
23. Le coût à l'entrée pour commencer à faire de la VS appliquée à la LD dissuade mon entreprise/organisation					
24. Nous n'avons pas le temps de faire de la VS appliquée à la LD					
25. La VS appliquée à la LD n'est pas en cohérence avec la stratégie de mon entreprise/organisation					
26. Nous manquons de savoir-faire pour faire de la VS appliquée à la LD					
27. Nous manquons de personnes pour animer la VS appliquée à la LD					
28. Faire de la VS appliquée à la LD est beaucoup plus complexe que nous le pensions					
29. Nous n'avons pas bien défini ses attentes en matière de VS appliquée à la LD					
30. Nous avons du mal à cerner ce qui doit être surveillé dans le cadre de la VS appliquée à la LD					
31. La VS appliquée à la LD ne fait pas partie des priorités de mon entreprise/organisation					

3 Strategic Scanning for Sustainable Supply Chains: Where to start?

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3.1 Abstract

This article aims to explore the information needs for strategic scanning to overcome the lack of external information that prevents adoption of sustainable initiatives in supply chains. As part of an action research approach, intensive qualitative research within forty organisations allowed the identification of stakeholders from the supply chain and topics from sustainable development that are likely to represent information needs in sustainable supply chains. The identified stakeholders and topics were empirically tested through interventions in ten organisations where managers identified which of them they perceived as the most important to scan. The results allow identifying nineteen stakeholders adapted to sustainable supply chains context complementing generic ones already identified in literature. They provide also insights about how topics can instantiate each of the three pillars of sustainable development in supply chain context, and suggest ‘Compliance’ as a fourth crosscutting pillar. Our results also report that managers are mainly concerned with a green and reactive rather than a ‘truly’ sustainable and proactive integration of sustainable development in their supply chains. This study also provides evidence suggesting that extensive lists of stakeholders and topics provide useful help for managers to identify their information needs for strategic scanning.

3.2 Introduction

The consideration of sustainable development (SD) issues was at the root of many changes in organisations over the last years (Connor & Dovers, 2004; Linton et al., 2007). The initiatives to integrate SD within organisations are generally crosscutting issues since they may affect almost all business areas. In this respect, supply chains

(SC) are particularly involved because of the important role they can play to propose integrated solutions in the three dimensions of SD: economic, social and environmental (Carter & Rogers, 2008; Seuring & Müller, 2008a; Pagell & Wu, 2009).

However, in practice, Sustainable Supply Chains (SSC) initiatives are confronted with prohibitive barriers. Among these, lack of external information has been identified as a major obstacle preventing initiation or continuity of SSC projects (Walker et al., 2008; Wu & Pagell, 2011). When making decisions regarding SSC, managers have to struggle with special difficulties such as: uncertainty about outcomes and future regulations, lack of understanding of stakeholders' expectations, and changing decision boundaries (Matos & Hall, 2007; Wu & Pagell, 2011). However, very few studies have addressed how to deal with this problem.

Strategic scanning (S.Scan) can enable managers to gather and analyse information from the business environment that can help them to reduce decision uncertainty (May et al., 2000; Walkers et al., 2003). However, the identification of the information needs that correspond to organisations' strategic objectives and priorities is necessary to optimize resource allocation, get useful results, and avoid project failure (Lesca & Caron-Fasan, 2008). Simply put, the stakeholders and topics that will attract organisations' attention over a given period can represent its information needs (Gilad & Gilad, 1988; Lesca & Lesca, 2014).

The identification of information needs in SSC is a difficult task since it is an emerging concept that yields implications neither stable nor clear (Carter & Easton, 2011, Pagell & Shevchenko, 2014). At the heart of SSC there is a wide range of crosscutting issues involving operations and corporate strategy. Integrating these issues has been proven to be difficult in practice (Ageron et al., 2012; Gunasekaran & Spalanzani, 2012).

The objective of this exploratory research is twofold: first, to find what are the topics of SD and the stakeholders of the SC likely to represent the information needs of organisations for S.Scan in SSC; second, to identify which of them are perceived as the most important to scan in this context. Answering these questions will also allow revealing current concerns for integrating SD in SC and contribute to understanding how organisations perceive SSC in practice.

This article is organized as follows: first, we explore the background literature on S.Scan and SSC, and we present the stakeholders and topics that have been invoked in previous contributions in the field of SC. This is followed by a description of the action research methodology adopted. Our results are presented in section 3-5, and discussed in section 3-6.

3.3 Literature review and theoretical background

3.3.1 Integrating SD behaviours in SC

The integration of sustainability in SC has been discussed in the literature using three trends. They differ from one another by focusing on different dimensions of SD. First, logistics social responsibility (Carter & Jennings, 2002; Murphy & Poist, 2002) incorporates social and environmental issues but weakly includes the economic dimension. Second, green supply chain (GSC) (Zhu & Sarkis, 2004; Srivastava, 2007) focuses on environmental concerns and their implicit relationship with economic profit but leaves aside social aspects. Third, SSC where several authors (Svensson, 2007; Seuring & Müller, 2008b; Carter & Rogers, 2008; Pagell & Wu, 2009) inspired in the principles of Elkington's triple bottom line (1998), have theorized that to achieve sustainability in SC it is necessary to balance among all three dimensions of SD. This translates into the idea that firms should engage in social and environmental activities that will help, or at least not harm, economic performance (Seuring & Müller, 2008b; Carter & Easton, 2011).

In practice, there are two distinct behaviours when adopting SD integration in SC:

- A reactive behaviour that can be described as the compliance-driven comportment of organisations trying to have a palliative attitude towards sustainability (de Brito et al., 2008; Seuring, 2008). The adoption of SD is a response to external triggers, such as customer pressures or government regulation (Carter & Jennings, 2002; Ageron et al., 2012).
- A proactive behaviour that corresponds to organisations looking forward to transforming a constraint into an opportunity, and to integrating SD into their SC, not as a response to external pressures but as an effort to win new customers, improve financial performance and develop new business models

(Handfield et al, 2005; Rao & Holt, 2005; Markley & Davis, 2007).

It has been suggested that a proactive behaviour is more desirable than a reactive one because of its potential to contribute to innovative, long-term and lasting solutions (Vachon & Mao, 2008; Vachon & Klassen, 2010). Nonetheless, for some organisations, a reactive behaviour may suffice to fulfil their SSC objectives (Aragón-Correa & Rubio, 2007). Therefore the kind of approach to integrate SD in SC is contingent and depends on the organisation's objectives, specific situation and socioeconomic environment.

The decision to adopt SSC initiatives has met prohibitive barriers, such as cost concerns (Min & Galle, 2001), absence of legitimacy (Walker et al., 2008), little interest of customers (Seuring & Müller, 2008a), poor supplier commitment (Carter & Jennings, 2002), absence of guidelines and monitoring frameworks (Melville, 2010), and non-inciting regulation (Ambec & Barla, 2006). In addition, lack of external information for decision-making in SSC has been identified as a major obstacle preventing initiation or continuity of these kinds of projects (Walker et al., 2008; Wu & Pagell, 2011). In this regard, S.Scan can provide a solution to this problem (Lee & Klassen, 2008; Fabbe-Costes et al., 2011; 2014) as discussed below.

3.3.2 Linking SSC and S.Scan

S.Scan is defined as “the acquisition and utilization of information about events, trends and the dynamics of the external environment, the knowledge of which would help managers to orient the course of their future actions” (Aguilar, 1967).

In practice, there are two distinct but complementary modes of data acquisition for S.Scan (Vandenbosch & Huff, 1997; Lesca & Caron-Fasan, 2008):

- “Focused search” is used when managers are already involved in a decision-making process and S.Scan is employed to better understand the decision context, choices and implications. The objective is to explore the organisation's focal vision and the search for reliable and non-ambiguous information to reduce the decision-making uncertainty.
- “Scanning” operates as a “pre-attentive” monitoring of information without a prior particular decision or question to guide the information search. The objective is to explore the organisation's peripheral vision and identify, uncover or anticipate plausible changes in the organisation's business environment.

Linking S.Scan modes of data acquisition and integration behaviours of SD in Supply Chains leads to the conceptual framework shown in Table 3-1. Our research focuses on the “scanning” mode of data acquisition (shown in grey in Table 3-1).

Table 3-1. *Linking S.Scan modes with integration behaviours of SD on SC activities*

Types of integration behaviour of SD in SC activities			
		Reactive behaviour	Proactive behaviour
S.Scan modes of information acquisition and utilization	Focused search	Organisations adopt a palliative attitude for integrating SD in SC as a response to external triggers. S.Scan can help them find reliable and non-ambiguous information to better understand decision context, choices and implications, recognizing alternatives and making decisions.	Organisations integrate SD into their SC as an effort to transform a constraint into an opportunity. S.Scan can help them find reliable and non-ambiguous information to better understand decision context, choices and implications, recognizing alternatives and making decisions.
	Scanning	Organisations adopt a palliative attitude for integrating SD in SC as a response to external triggers. S.Scan can help them explore their peripheral vision and identify new triggers or possible alternatives without a pending decision or question to guide their research.	Organisations integrate SD into their SC as an effort to transform a constraint into an opportunity. Without a pending decision or question to guide their research, S.Scan can help them anticipate plausible changes and identify unknown and unexpected threats, opportunities, problems and alternatives.

3.3.3 Identifying information needs for S.Scan

Some authors have suggested that scanning should have a 360-degree scope. But, in practice, organisations have neither the capacity nor the resources to scan their entire business environment because it could involve the investment of unlimited resources in an endless project without a guarantee to obtain useful results (Hasse & Franco, 2011; Franco et al., 2011). Quite the opposite, scanning with a 360° focus is strongly hindered by information overload (Xu et al, 2011; Bettis-Outland, 2012) and can lead to S.Scan failure (Lesca & Caron-Fasan, 2008).

Several strategies have been suggested to identify information needs for S.Scan prior to starting data acquisition. A first strategy consists of delimiting ‘macro-environmental sectors’ (Aguilar, 1967; Daft et al., 1988; Auster & Choo, 1994) that are general areas of the business environment to scan (e.g. competition, socioeconomic, technological, regulatory, economic, governmental, social, political). However, using macro-environmental sectors to identify information needs is both too wide-range and undetailed to be practical. To answer this limitation, some authors (Nanus, 1982; Stubbart, 1982; El Sawy & Pauchant, 1988; Calori; 1989; Gilad, 2003) proposed to go

into further detail and identify more explicitly the ‘topics’ to scan. Accordingly, topics are defined as specific centres of interest when considering the future of the organisation (e.g. key trends, issues or critical events to scan). Moreover, other authors (Gilad & Gilad, 1988; Lesca & Lesca, 2014) have called for considering also the concept of ‘actors’ or stakeholders to identify information needs for S.Scan. Stakeholders designate the natural or legal persons (e.g. current or potential: competitors, customers, suppliers, partners) whose behaviours, decisions and actions can affect, or be affected by, the accomplishment of organisational purpose, and thus influence the future of the organisation (Freeman, 1984; Jones, 1995; Mitchell et al., 1997). Finally, both stakeholders and topics can be combined, allowing a deeper and more precise identification of information needs according to organisations’ strategic objectives and priorities at a given time (Lesca & Lesca, 2014). In this research, information needs for SSC are defined as the combination of stakeholders and topics to scan.

3.3.4 Entry points to define stakeholders to scan in SSC context

Freeman (1984) listed some generic stakeholders that are common to any organisation: governments, local community, owners, consumer advocates groups, customers, competitors, media, employees, environmentalists, and suppliers. Subsequent contributions have identified additional generic stakeholders such: investors, political groups, and trade associations (Donaldson & Preston, 1995); activist groups, financial intermediaries, and unions (Harrison & St. Jhon, 1998); managers, regulators, and academic researchers (Caroll & Buchholtz, 2009).

Some of the generic stakeholders have been invoked in SSC studies (Table 3-2). As Freeman stated himself (1984), there is a need for identifying groups of stakeholders adapted to specific contexts in order to operationalize this concept. However, to our knowledge, no study has addressed specifically identifying stakeholders in the particular context of SSC.

Table 3-2. Examples of SSC studies invoking generic stakeholders

Stakeholder	Examples
<i>Academic researchers</i>	de Brito et al., 2008; Halldórsson & Kovács, 2010
<i>Activists groups</i>	Dou & Sarkis, 2010; Wu & Pagell, 2011
<i>Competitors</i>	Carter, 2006; Mollenkoft et al., 2010
<i>Consumer advocates groups</i>	Aronsson & Brodin, 2006
<i>Customers</i>	Vachon & Klassen, 2006; Walker & Brammer, 2009
<i>Employees</i>	Carter & Jennings, 2004; Walker & Brammer, 2009
<i>Environmentalists</i>	Matos & Hall, 2007; Parmigiani et al., 2011
<i>Financial intermediaries</i>	Rao, 2002; Keating et al., 2008
<i>Governments</i>	Spence & Bourlakis, 2009; Caniato et al., 2012
<i>Investors</i>	Svensson, 2007; Andersen & Skjoett-Larsen, 2009;
<i>Local community</i>	Carter & Jennings, 2004; Dou & Sarkis, 2010
<i>Managers</i>	Halldórsson & Kovács, 2010
<i>Media</i>	Parmigiani et al., 2011; Caniato et al., 2012
<i>Owners</i>	Markley & Davis, 2007; Svensson, 2007
<i>Political groups</i>	Wolf & Seuring, 2010
<i>Regulators</i>	Carter, 2006; Matos & Hall, 2007
<i>Suppliers</i>	de Brito et al., 2008; Ageron et al., 2012
<i>Trade associations</i>	Andersen & Skjoett-Larsen, 2009; Spence & Bourlakis, 2009
<i>Unions</i>	Markley & Davis, 2007; Pedersen, 2009

3.3.5 Entry points to define topics to scan in SSC context

Though the academic literature dealing with SSC is abundant and has been increasing over the last fifteen years, there is no study identifying the overall scope of topics embodied in it. Except for a few contributions (e.g. Pagell & Wu, 2009; Fabbe-Costes et al., 2011, 2014), most of the research has addressed only one specific aspect or issue at a time. The main issues covered in the literature are presented in Table 3-3.

Table 3-3. SD issues covered in SSC literature

SD issues	Examples
ECONOMIC	
- Reverse logistics and network design (including: closed-loop SC, logistics network design, reverse logistics)	Kocabasoglu et al., 2007; Loomba & Nakashima, 2012
ENVIRONMENTAL	
- Compliance with environmental laws, regulations, norms and standards	Quak & Dekoster, 2007; Koh et al., 2012
- Energy (including: alternative energy sources, energy efficiency, value of energy)	Halldórsson & Kovács, 2010; Hoek & Johnson, 2010
- Gas emissions reduction	Rogers & Weber, 2011; Chaabane et al., 2012
- Global use of materials (including: lean production, remanufacturing, value of raw material)	King & Lenox, 2001; Found & Rich, 2007
- Impacts of transport (including: environmental friendly transport, environmental issues and third party logistics services, transport efficiency and urban logistics, logistics infrastructure development)	Browne et al., 2007; Ortolani et al., 2011
- Reduction and mitigation of environmental impacts of products and services (including: green manufacturing, recycling, design for reuse and disassembly, life-cycle analysis)	Matos & Hall, 2007; Godichaud et al., 2012
- Waste management	Srivastava, 2007; McLeod et al., 2011.
SOCIAL	

SD issues	Examples
- Respect for human rights in investments and procurement (including: supplier respect of human rights, diversity-owned suppliers, suppliers' diversity practices, suppliers' safety and healthcare practices)	Carter, 2006; Awaysheh & Klassen, 2010
- Respect of civil and privacy rights of employees	Murphy & Poist, 2002.
- Occupational health and safety (including: safe movement and storage of products, employee health and safety care, employee security training)	Carter, 2006; Sahin et al., 2007
- Employee education and training	Myers et al., 2004.
- Diversity and equal opportunity (including: minority, disabled and women employment and advancement)	Murphy & Poist, 2002; Carter & Jennings, 2004
- Quality of work life (including: job satisfaction)	Autry & Daugherty, 2003; Jiang et al., 2009
- Respect for consumer rights	Murphy & Poist, 2002.
- Local community involvement (including: local sourcing)	Diniz & Fabbe-Costes, 2007; Hall & Matos, 2010
- Anticorruption initiatives	Carter & Jennings, 2004; Carter, 2006
- Philanthropy/humanitarian (including: donations or charity initiatives)	Tate et al., 2009; Walker & Brammer, 2009

3.4 Methods

3.4.1 Research objectives

The aims of this exploratory study are to identify which stakeholders of the SC and topics of SD are likely to represent the information needs of organisations for S.Scan in the SSC context, and what information needs are perceived as the most important. To explore these questions, we adopted an action research approach.

3.4.2 Research design

Action research aims at solving practical problems while capitalizing on learning from actions and reflection (Baskerville & Wood-Harper, 1998; McNiff, 2013). This methodology is recognized as a practice-changing approach because research conducted in this way is oriented toward improving participants' practices and their settings (Kemmis et al., 2014).

Basically, an action research process involves two phases (Baskerville & Myers, 2004). First, a diagnostic study is carried out, allowing the identification of primary problems and the development of theoretical assumptions about the potential solutions. Subsequently, changes are introduced collaboratively and their effects are studied and translated into new knowledge for both practitioners and researchers (Baskerville & Wood-Harper, 1998).

During diagnosis in this research, we conducted 42 semi-structured interviews with 50 managers and executives within 40 organisations belonging to different business sectors (details in Appendix 3-1). The objective was to understand information needs and practices of participants in terms of S.Scan in the SSC context. We used a semi-structured interview guide that included questions about SC management and logistics activities, SD, SSC and S.Scan. Interviews were conducted until a saturation point was reached, i.e. when no new information was collected.

As a result of interviews analysis, SSC was revealed as an unclear concept for interviewees. They expressed difficulties to identify their information needs in this context (as reported in section 3.5.1). These results lead us to adopt an action science framework as the action research method to meet the research aims.

Action science is a method that considers problems within a local practice context. It builds descriptions and theories within this context, and tests them through intervention experiments that introduce desirable changes to the original situation (Argyris & Schön, 1989). It includes facilitative involvement of researchers who intend to produce practical and theoretical knowledge through reflection and action (Baskerville & Wood-Harper, 1998; Putnam, 1999). This method is adapted to our research for the following reasons:

1. It allows reaching our research objective by unveiling managers' self-understanding of their information needs through a reflective process that allows a comparison of knowledge inferred from the field with topics and stakeholders identified from literature.
2. It is a way to overcome the lack of stable understanding about the meaning and implications of SSC reported from our diagnostic study. Without our facilitative involvement, it would have been difficult to reach results.
3. It is consistent with recent calls for more research in SC and SSC that identifies what is different rather than what is the same and allows looking at SC from new perspectives (e.g. Westbrook, 1995; Coughlan & Coughlan, 2002; Pagell & Shevchenko, 2014).

3.4.3 Data collection and analysis

To meet our research objectives, we followed a two-stage process. We used the diagnostic interviews to produce initial lists that were later expanded and tested through interventions.

3.4.3.1 Stage 1: Building initial lists of stakeholders and topics to scan in SSC context

In order to identify the topics from SD likely to represent the information needs in the SSC context, we studied data collected from diagnostic interviews. First, we followed a rigorous double-coding process using the performance indicator topics of the 2006 version of the Global Reporting Initiative (GRI)¹⁰ as our topic-coding scheme. We used GRI because the topics and the organisation invoked in this framework encompass, classify and complement those identified in our literature review, especially concerning social issues (see Appendix 3-2).

After coding, we performed a thematic analysis of coded items to generate topics that were organized at three levels: meta-topics and topics that both match the categories proposed in the GRI framework, and sub-topics that correspond to identified topics from coding. Some categories, also, were added or modified at each level as they emerged from thematic analysis.

A similar process was used to identify stakeholders. Resulting stakeholders were also classified in three levels: meta-group of stakeholders, group of stakeholders and stakeholders. We identified stakeholders using our literature review as the reference for meta-groups of stakeholders. For each meta-group we identified its constituent group of stakeholders from thematic analysis. Finally, nominative stakeholders mentioned by each organisation were arranged inside each group of stakeholders. New meta-groups and groups of stakeholders not evoked in the literature were added as they emerged from thematic analysis.

¹⁰ The GRI framework (<https://www.globalreporting.org>) is the most widely used standard for sustainability reporting. It is continuously developed through a multi-stakeholder, consensus-seeking approach with the participation of representatives of thousands of professionals and organisations from many sectors, constituencies and regions.

3.4.3.2 *Stage 2: Expanding and evaluating the practical value of lists*

The objective of this second stage was twofold: first, to empirically test and expand the lists produced in the first stage; and second, to unveil what information needs are perceived by participating managers as the most important to scan in the SSC context.

In this stage we proceeded to field interventions with 27 managers in headquarters of ten organisations. The participating organisations are all involved in integrating SD into their SC (details in Appendix 3-3). The participation was systematically audiotaped, and the outputs were saved using a software tool developed for this purpose.

Interventions were conducted through working meetings that lasted between two and three hours each. Participants were asked to retain the stakeholders and topics they considered to represent their information needs for S.Scan in the SSC context. They used the two lists developed from Stage 1 as starting points to trigger their discussions. For each choice, they were asked to explain and discuss their reasoning. Participants were free to suggest new stakeholders or topics to add to the lists, reformulate the contents, and make comments as desired.

Later, participants were asked to select the most important stakeholders and topics to scan according to their organisations’ actual information needs and strategic priorities. Then, they identified the relevant crossings of stakeholders and topics in a matrix as shown in Table 3-4. Once again, participants were asked to explain and discuss the reasons for all of their choices.

Table 3-4. Stakeholders vs. Topics Matrix

		Stakeholders			
		<i>Stakeholder 1</i>	<i>Stakeholder 2</i>	<i>...</i>	<i>Stakeholder N</i>
Topics	<i>Topic 1</i>	X			X
	<i>Topic 2</i>		X		
	<i>...</i>				
	<i>Topic M</i>		X		X

X denotes a relevant crossing between stakeholders and topics

At the end of the intervention, a final assessment was conducted in order to evaluate the practical value of the lists, as a tool to facilitate the identification of information needs in the SSC context. Two researchers then coded the audiotaped

working meetings, concentrating on these final assessments. Both coders used the coding scheme presented in Table 3-5. The inter-coder agreement rate, based on pairwise agreements between coders (Rust & Cooil, 1994), was 83.80%, which exceeds the recommended minimum (70%) (Nunnally & Bernstein, 1994).

Table 3-5. Coding scheme for evaluating practical value of lists

Practical value criteria	Codes	
<i>Intelligibility, since produced knowledge must be designed with the human mind in view (Argyris et al., 1990).</i>	Aintell	Stakeholders' intelligibility
	Tintell	Topics' intelligibility
<i>Relevancy, because produced knowledge should be contextualized, that is, relevant to its use in the action context of participants (Argyris et al., 1990).</i>	Arelev	Stakeholders' relevance
	Trelev	Topics' relevance
<i>Completeness, as the production of valid information is enhanced if the individuals fulfil their expectations (Argyris, 1999). Here, completeness does not refer to the production of exhaustive lists to represent information needs of any organisation. On the contrary, resulting lists should be considered comprehensive and adaptable to the specific needs and context of the organisation (Argyris, 1996).</i>	Acompl	Stakeholders' completeness
	Tcompl	Topics' completeness
<i>Usefulness, because knowledge should be applicable to the achieving of the purposes of participants (Argyris et al., 1990). Usefulness was evaluated in overall terms without differentiation between stakeholders and topics lists</i>	LISuse	Lists' usefulness

3.5 Results

3.5.1 Unearthing difficulties to identify information needs in SSC context

Two results were inferred from the diagnosis carried out to understand information needs and practices in terms of S.Scan in the SSC context. First, interviewees found it hard to understand the meaning and implications of SSC. They recognized the actual importance of the subject and the need for organisations to be prepared for taking it into account, but they failed to understand what would embrace this integration. The following quotes from some interviewees illustrate this concern:

“When I read the name [SSC], it tells me nothing. I see SD behind, but then, what solutions could logistics provide to SD? Well, when I think about, all except for transports, I see nothing. I don't see how we could do SD from logistics” (INT17).

“SSC? I confess that I do not have much idea. SSC... I had trouble understanding it, honestly. I cannot define what is a SSC” (INT40).

Secondly, interviewees’ capacity to identify their information needs to scan was limited. The multitude of subjects involved menaced to drown them with not useful information. This lead them to ask for help to reduce the scanning scope. Some interviewees voiced their difficulty as follows:

“When we talk about SSC we talk about environment. There, there are so many topics, so many effects, that nowadays, we don’t know how to deal with. [...] Which issues seem to be the more relevant to scan? Do you have something from where I can choose? [Asking to interviewer] That would be helpful.” (INT19).

“For me, conducting it [S.Scan for SSC] without focus is a barrier. If it is not well defined on a particular topic, we will obtain a lot of diverse information. If it is not targeted enough, we can lose participants [...] So, the solution could be targeting sectors. That’s it, or targeting topics!” (INT39).

3.5.2 Topics from SD representing information needs in SSC context

The topics representing information needs in SSC context that we identified from our analysis were arranged in the form of a list consisting of seven meta-topics: ‘Environmental’, ‘Human rights’, ‘Labour practices and decent work’, ‘Product responsibility’, ‘Society’, ‘Compliance’ and ‘Logistics management’. These meta-topics group 54 topics and 107 subtopics. Appendix 3-4 lists the meta-topics and topics identified. The full list can be provided on request.

After the thematic analysis of stage 1, two substantial changes were performed in our original coding scheme. First, since participants always referred to regulations in a holistic way without distinction between the diverse facets of SD, all of these topics (i.e. Compliance from Environmental, Product responsibility, and Society) were grouped in a new transversal meta-topic called ‘Compliance’. Second, we grouped under the meta-topic ‘Logistics management’ all the topics representing the economic aspects encompassed in the SSC notion including management of forward and reverse flow and storage of goods and related information in order to meet customers' requirements. Thus, eleven topics inferred from thematic analysis were integrated in this meta-topic to complement the five topics inferred from the literature review.

The meta-topics ‘Environmental’, ‘Logistics management’ and ‘Compliance’ were relevant for almost all organisations in both stages (‘Environmental’: 42 of 42 organisations interviewed on stage 1, 10 of 10 interventions on stage 2; ‘Logistics’: 42/42, 8/10; ‘Compliance’: 41/42, 7/10). On the contrary, ‘Human Rights’ was by far the meta-topic least systematically mentioned in stage 1 (11/42), nonetheless it was relatively well retained in stage 2 (6/10).

Participants were mostly interested in the following ‘Environmental’ topics: ‘Impacts of transports’ (41/42; 8/10), ‘Energy consumption’ (35/42; 6/10), ‘Gas emissions reduction’ (34/42; 6/10), ‘Impacts of products and services’ (31/42; 7/10), ‘Waste management’ (30/42; 6/10), and ‘Use of materials’ (18/42; 6/10). Managers’ interests in the ‘Logistics management’ meta-topic were mostly centred on: ‘Logistics cost and revenues’ (24/42; 5/10) and ‘Improvement on management of flows’ (27/42; 4/10), whereas ‘Compliance with laws’ (29/42; 6/10) was by far considered as the most important topic from ‘Compliance’.

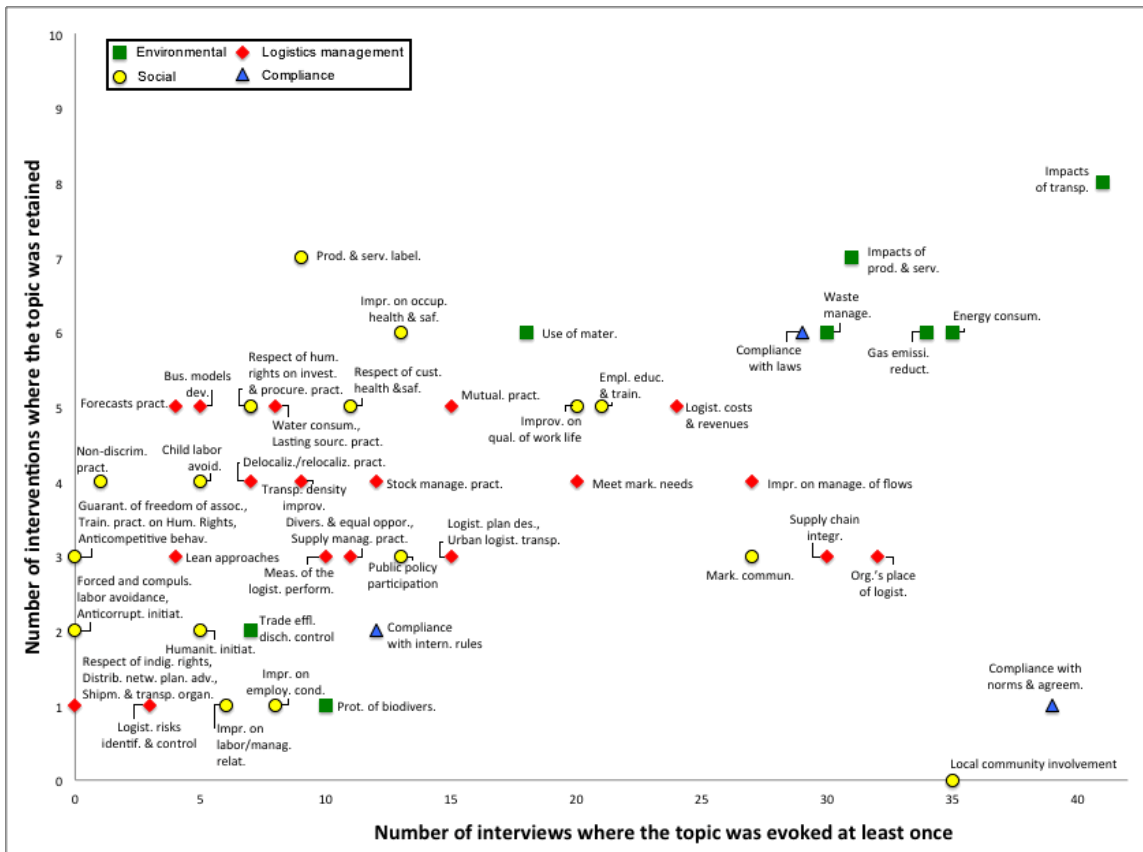
‘Respect of consumer rights’ was the only topic from our coding scheme that was neither mentioned in interviews nor retained in interventions. ‘Local community involvement’ was the only notable inconsistency since it was mentioned in 35 interviews from stage 1 but was never retained during interventions.

Globally, almost all the topics (86.62%) identified from interviews in stage 1 were retained at some point during interventions. Neither the structure nor the contents of the list we built from the interviews were questioned during interventions. Table 3-6 presents a summary of results of the topics, and Figure 3-1 shows a scatter plot of topics representing information needs for S.Scan in the SSC context from interviews and interventions.

Table 3-6. Summary of topics' results

Results	Meta-topics / topics
Consistent with literature	<p>Environmental</p> <p>Energy consumption, Gas emissions reduction, Impacts of transports, Impacts of products and services, Protection of biodiversity, Trade effluents discharges control, Use of materials, Waste management, and Water consumption.</p> <p>Human Rights</p> <p>Child labour avoidance, Forced and compulsory labour avoidance, Guarantee of freedom of association, Non-discriminative practices, Respect of human rights on investment and procurement practices, Respect of indigenous rights, and Training practices on Human Rights.</p> <p>Labour practices and decent work</p> <p>Diversity and equal opportunity, Employee education and training, Improvements on employment conditions, Improvements on labour/management relations Improvements on occupational health and safety, and Improvements on quality of work life.</p> <p>Product responsibility</p> <p>Marketing communications, Product and service labelling, and Respect of customer health and safety.</p> <p>Society</p> <p>Anticompetitive behaviour, Anticorruption initiatives, Humanitarian initiatives, Local community involvement, and Public policy participation.</p> <p>Logistics management</p> <p>Distribution network planning advances, Improvements on management of flows, Lasting sourcing practices, Lean approaches, Logistics plan design, Mutualization practices, Urban logistics transport, and Shipment and transport organisation.</p>
Contradictory with literature	<p>Product responsibility</p> <p>Respect of consumer rights</p>
New insights not mentioned in the literature	<p>Compliance</p> <p>Compliance with internal rules, Compliance with laws, and Compliance with norms and agreements.</p> <p>Logistics management</p> <p>Business models development, Delocalization / relocation practices, Forecasts practices, Lean approaches, Logistics costs and revenues, Logistics risks identification and control, Measurement of the logistics performance, Meet market needs, Organisation's place of logistics, Stock management practices, Supply chain integration, Supply management practices, and Transport density improvement.</p>
Modifications to coding scheme	<p>Compliance topics from 'Environmental', 'Product responsibility', and 'Society' were grouped in a new meta-topic named 'Compliance'</p>

Figure 3-1. Topics representing information needs for S.Scan in SSC



3.5.3 Stakeholders from SC representing information needs in SSC context

Our results allow identifying 38 meta-groups of stakeholders. Half of them were identified in our literature review of stakeholder theory. The other 19 were identified by the analysis of interviews in Stage 1 or by the suggestion of participants during interventions in Stage 2. Appendix 3-5 shows a list of identified meta-groups of stakeholders. The full list can be provided on request.

Nine of the new meta-groups of stakeholders we identified are specific to the SSC context (i.e. ‘Logistics service provider’, ‘Distributors’, ‘Producers’, ‘Service providers’, ‘Infrastructure managers’, ‘Treatment centres’, ‘Collectors’, ‘Recovery centres’, and ‘Assembly centres’). Seven represent the stakeholders that in a SD perspective can influence organisations’ activities in a direct (i.e. ‘Governmental body’, ‘Standardization committees’ and ‘National authorities of health’) or in a more indirect manner (i.e. ‘Clusters’, ‘Public opinion’ and ‘Patent-holders’). Finally, two meta-groups

of stakeholders represent the potential sources of inspiration for the organisation on SD (i.e. ‘Leading actors’ and ‘Innovative customers’).

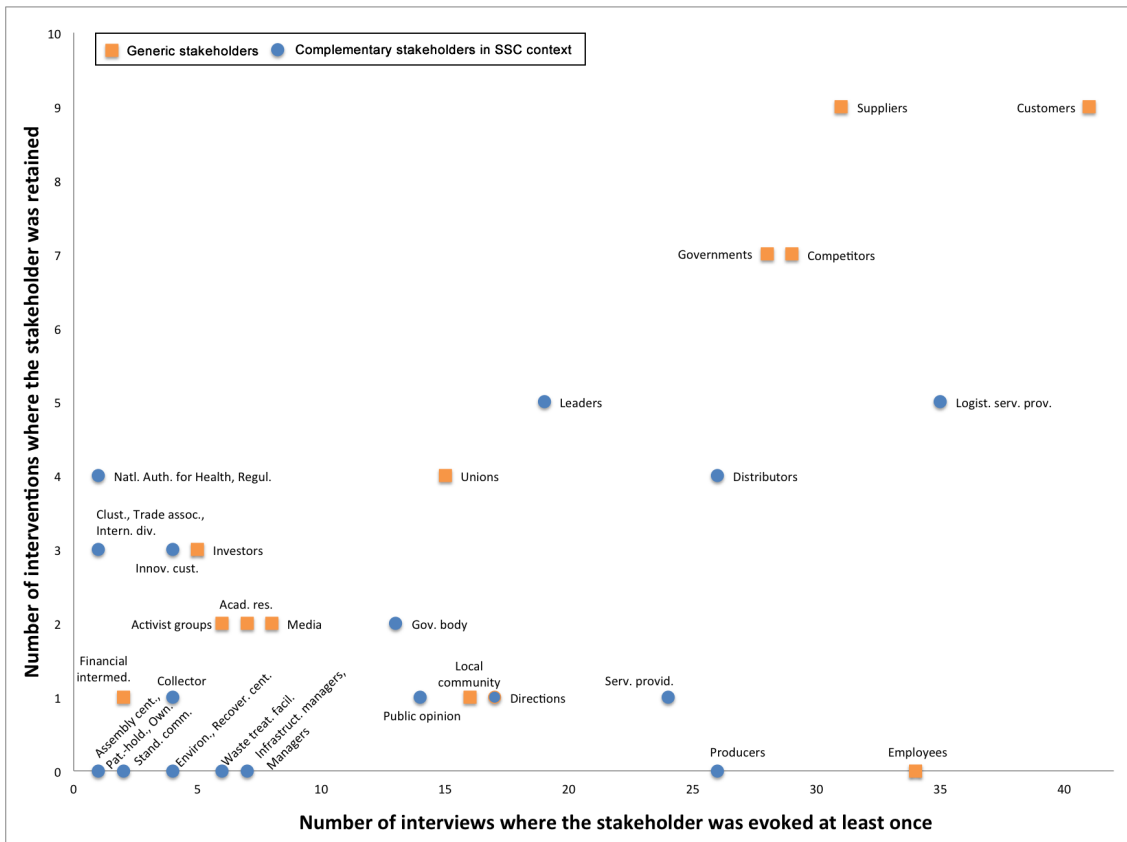
Five meta-groups of stakeholders were relevant for at least half of the participants in both stages: ‘Customers’ (41/42; 9/10), ‘Logistics service providers’ (35/42; 5/10), ‘Suppliers’ (31/42; 9/10), ‘Competitors’ (29/42; 7/10) and ‘Governments’ (28/42; 7/10). On the contrary, two meta-groups identified from the literature review were never mentioned during either research stage: ‘Customer advocate groups’ and ‘Political groups’. Stakeholders from reverse logistics poorly retained the attention of participants (i.e. ‘Waste treatment facilities’ (6/42; 0/10), ‘Collectors’ (4/42; 1/10), ‘Recovery centres’ (4/42; 0/10) and ‘Assembly centres’ (1/42; 0/10)).

72.5% of stakeholders proposed from Stage 1 were retained at least once during interventions. Neither the structure nor the contents of the list we built from the interviews were questioned during interventions. Table 3-7 presents a summary of stakeholders’ results and Figure 3-2 shows a scatter plot of stakeholders representing information needs for S.Scan in the SSC context from interviews and interventions.

Table 3-7. Summary of stakeholders’ results

Results	Meta-groups of stakeholders / Groups of stakeholders
Consistent with literature	Academic researchers, Activist groups, Competitors, Customers, Employees, Environmentalists, Financial intermediaries, Governments, Investors, Local community, Managers, Media, Owners, Regulators, Suppliers, Trade associations, and Unions.
Contradictory with literature	Customers advocate groups, and Political groups.
New insights not mentioned in the literature	Assembly centres, Collector, Clusters, Directions, Distributors, Governmental body, Infrastructure managers, Innovative customer, Internal divisions, Leading actors, Logistics service provider, National Authorities for Health, Patent-holders, Producers, Public opinion, Recovery centres, Services providers, Standardization committees, and Waste treatment facilities.

Figure 3-2. Stakeholders representing information needs for S.Scan in the SSC context



3.5.4 Information needs perceived as the most important to scan

In stage 2, participants selected the stakeholders and topics they perceived as most important to scan in their strategic and organisational context. These stakeholders and topics were interrelated through a matrix to represent information needs in the SSC context. Table 3-8 presents an aggregated matrix from interventions including only the stakeholders and topics crossings retained above the average (sum of organisations retaining a particular crossing over the number of retained crossings = $260/182 = 1,43$). The average indicate that at least two out of ten organisations have retained one particular crossing out of 2356 possible choices. Each organisation has retained 26 crossings on average. The complete aggregated matrix is presented in Appendix 3-6.

Table 3-8. Aggregated matrix from interventions ¹

Perceived most important topics to scan		Perceived most important stakeholders to scan							
		Competitors	Leaders	Forward Supply Chain		Supporting actors	Institutions		Others
				Suppliers	Customers	Logistics service providers	Government	Governmental body	
Product responsibility			3	3	4			2	
- Respect of customer health and safety								2	
- Product and service labelling				2					
- Marketing communications			2		2				
Labour practices and decent work				2	2				
Human rights				3	3				
- Child labour avoidance				2	2				
- Guarantee of freedom of association				2	2				
- Non-discriminative practices				2	2				
- Respect of Human Rights on investment and procurement				2	2				
- Training practices on Human Rights				2	2				
Environmental		2	4	5	5	2	5	2	2
- Impacts of products and services			3	4	3				
- Impact of transports			2	2		2	3		
Compliance			2	2	2		2		
- Compliance with laws			2	2	2		2		
Logistics management			2	2	4		2	2	
- Meet market needs							2		

¹ Number of interventions where a particular stakeholder and topic crossing was retained. The matrix presents only crossings retained above the average Colour density represents the number of organisations retaining a particular crossing.

The topic/actor crossings most retained (by 5 organisations out of 10) correspond to those linking ‘Environment’ with ‘Government’, and ‘Environment’ with the closest actors on the Forward SC (i.e. ‘Suppliers’ and ‘Customers’). Crossings between ‘Environment’ and ‘Leading actors’, and ‘Logistics management’ and ‘Customers’ were both retained by 4 out of 10 organisations.

Forward SC actors are those who have the highest concentration of crossings in Table 3-8 (29 out of 51 retained crossings = 56,86% of crossings). These actors were crossed with almost all of the topics perceived as the most important to scan (16 out of 18 available crossings with topics). On the topics side, ‘Environmental’ topics were crossed with 8 out of 9 of the stakeholders perceived as most important to scan and they have a concentration of 15 out of 51 retained crossings (29,41%).

Participants considered less important the crossings linking social topics from ‘Human Rights’ and ‘Labour practices and decent work’ with institutional stakeholders

such as ‘Government’, ‘Government bodies’ or ‘Natural authorities of health’, and ‘Activist groups’. No stakeholder from the reverse SC was retained in the matrix.

4.5. Evaluating the practical value of topics and stakeholders lists

During interventions, the lists of topics and stakeholders we suggested helped managers to identify their information needs, identify new actors and topics they did not think of before, debate about their respective information needs, and define common priorities. The use of lists did not constrain participants since they were free to question, deliberate and add new topics or stakeholders adapted to their context, or even to modify terminologies to better adapt them to their organisational language. Table 3-9 shows the thematic coding results of experiments using the coding scheme from Table 3-5. Table 3-10 presents extracts illustrating the results inferred from our analysis for each of these coding categories.

Table 3-9. Content analysis results from interventions

Codes		Number of coded items by intervention										Total
		EXP 01	EXP 02	EXP 03	EXP 04	EXP 05	EXP 06	EXP 07	EXP 08	EXP 09	EXP 10	
<i>Tintel</i>	Topics’ intelligibility	23	3	11	6	8	3	8	5	16	38	121
<i>Texhaus</i>	Topics’ completeness	18	5	5	7	4	0	9	0	32	14	94
<i>Tpertin</i>	Topics’ relevance	46	0	5	1	4	0	15	1	18	20	110
<i>Aintel</i>	Stakeholders’ intelligibility	6	0	5	3	3	6	6	2	10	1	42
<i>Aexhaus</i>	Stakeholders’ completeness	39	0	7	8	5	0	6	0	0	7	72
<i>Apertin</i>	Stakeholders’ relevance	9	0	3	1	0	0	4	0	3	0	20
<i>LISuse</i>	Lists’ usefulness	1	1	0	4	3	1	0	0	1	2	13

Table 3-10. Extracts from coding categories

Notable outcomes/issues	Lists of topics	Lists of stakeholders
INTELLIGIBILITY	Coded as: <i>Tintel</i>	Coded as: <i>Aintel</i>
Participants considered the lists fitting their language, facilitating the understanding.	- “These terms seem right to me. Investors, customers, etc. frequently challenge us with them. We know them.” (EXP10) - “They are not redundant. They are according to my understanding.” (EXP08)	- “Yes, they are (understandable). I don’t know for the other organisations where you have worked, but for me, they are good. Even when we reformulated some of them, broadly speaking, they are good”. (EXP05)
COMPLETENESS	Coded as: <i>Texhaus</i>	Coded as: <i>Aexhaus</i>
Topics and stakeholders covered most of the participants information needs	- “My feeling is that I liked the categories we have examined. We explored almost all the categories. I have not seen anything missing.” (EXP05) - “There are plenty of interesting things concerning us, today.” (EXP04)	- “We can say that 90% of elements that we see are at the heart of our preoccupations.” (EXP05)
RELEVANCE	Coded as: <i>Trelev</i>	Coded as: <i>Arelev</i>
New topics/stakeholders were suggested to participants that they had never thought of before	- “Was it helpful? I would say yes, at least for me, because... I asked at the start and I stayed in a ‘logistics- activity’ logic, when in fact it is much larger than that. So, in quotation marks, ‘I restrained my brain at the beginning’, when what we needed was to open it” (EXP10)	- “I found them relevant. There was some that I never thought about before. ‘Regulators’, for instance, they are good ones. Also, what you said about truck sizes, regulations and others that I discovered.” (EXP05)

Notable outcomes/issues	Lists of topics	Lists of stakeholders
USEFULNESS	Coded as: LISuse	
Lists were considered as a useful tool to stimulate thinking about SSC	<ul style="list-style-type: none"> - <i>“The fact that we have discussed this topic here, together, that we have raised doubts, it’s natural. If I had no doubt, it would be surprising.”</i> (EPX01) - <i>“I found the approach quite interesting, especially the discussions about actors and topics.”</i> (EXP04) 	
Lists were considered as useful and helpful tools to identify information needs in S.Scan for SSC	<ul style="list-style-type: none"> - <i>“I liked the approach, all about the proposition of topics.”</i> (EPX05) - <i>“I find this interesting. On the one hand, I know that we are going to manage it, and on the other, I am open to this kind of thing occurring.”</i> (EXP06) - <i>“It’s a broad topic, a very broad topic that integrates many, many actors. That is why, if you listed all of them, it is because you know that they are numerous.”</i> (EXP06) 	

The lists were evaluated in terms of their usefulness, relevancy, completeness, and intelligibility. (1) Concerning usefulness, participants expressed their satisfaction with using the lists since the results of interventions allowed them to identify their information needs and scanning priorities. (2) The lists were considered relevant as they included relevant topics and stakeholders from the SSC context. They allowed managers not only to identify their information needs but also to include topics/stakeholders that they had never thought of before. (3) Participants also considered the lists as complete enough to fulfil their expectations. They confirmed that most of their strategic priorities and SSC concerns were covered in the lists. (4) Last, intelligibility was corroborated through participants’ understanding of the proposed lists. Both the content and the structure of the lists were soon understood and used during interventions.

3.6 Discussion and conclusions

Our results suggest that with regard to integration of SD in SC: (1) managers are mainly concerned with a GSC view (environmental and economic concerns) rather than with a “truly” SSC which also integrates social concerns, and (2) managers seem to prefer a reactive and follow-up behaviour rather than a proactive one when they consider SD integration in their SC.

3.6.1 A green-economical view of topics to scan for SSC

Despite the fact that theoretical SSC contributions called for balancing social, economic and environmental concerns (Seuring & Müller, 2008b; Carter & Rogers, 2008; Pagell & Wu, 2009), our results report an imbalance among these three dimensions when organisations identify their information needs for S.Scan in this context. Compliance was revealed as a driver for adoption of environmental and

economic initiatives, while social aspects were left aside. The prevalence of environmental and economic aspects suggests a drift towards the GSC view of integration of sustainability in SC.

Social topics to scan, even when present in both stages, were by far the least retained by participants in this research. Only two of them interested managers in both stages of this research, both concerning organisations' employees (i.e. 'Improvements on quality of work life' and 'Employee training and education'). Other social topics were far less retained or not retained at all. This could be explained either because the organisations we met do not associate these issues within their understanding of SSC, or because they do not feel confronted with 'social' problems and as a consequence they do not see the need to perform S.Scan on these topics.

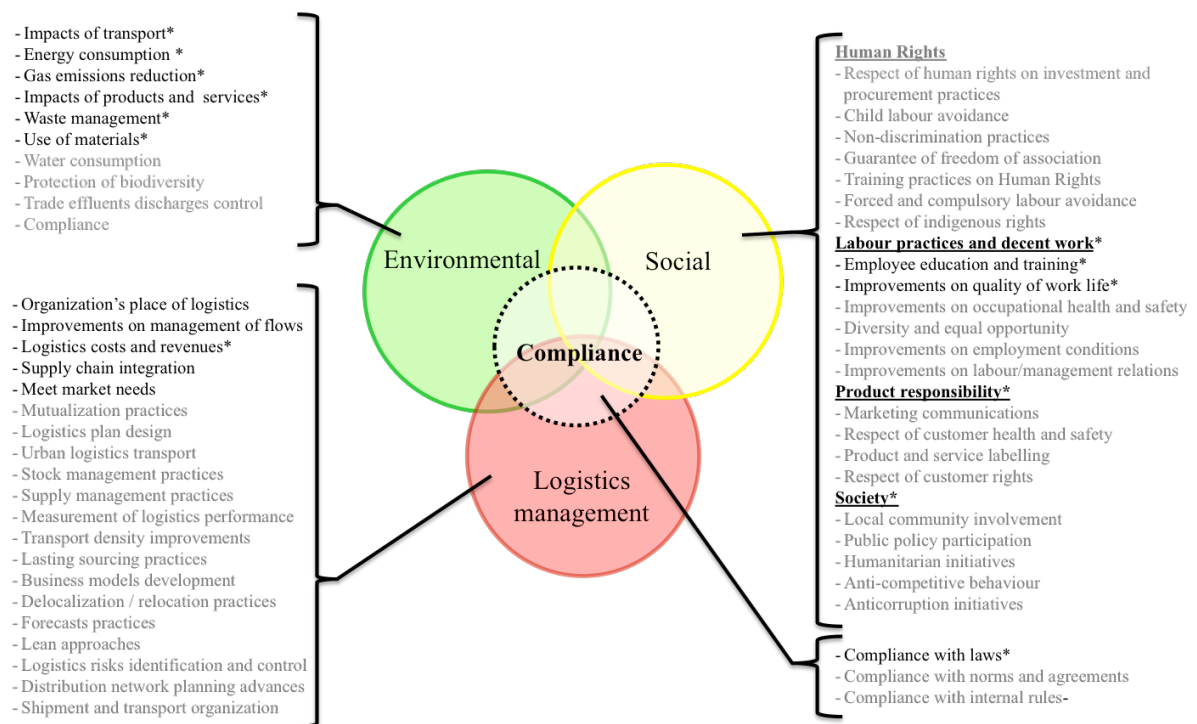
However, two contradictory results are interesting to point out concerning actual social information needs from organisations in our study. First, "Local community involvement" was regularly mentioned in the first stage (35 out of 42 organisations mentioned it), but in the second stage, when it came to identifying the topics to scan in practice, it completely disappeared (0 of 10 organisations retained it). Second, topics from 'Human Rights' and 'Labour practices and decent work' were retained only by the organisations that were already confronted with these issues in some call for tenders. However, they were never linked with governmental regulatory or promoter's entities in SD (e.g. 'Government' itself, 'Government bodies' or 'Natural authorities of health'). Both of these results would suggest that, in practice, social aspects are not perceived as a relevant part of information needs for SSC initiatives, even when they are part of the organisational rhetoric.

Results of economic information needs, compiled in the 'Logistics management' meta-topic, revealed that participants consider it important to scan every issue related to reconfiguring SC from a management control standpoint. This is not surprising since economic performance has been identified as a main component of sustainability integration in SC (Carter & Rogers, 2008). The major concerns shifted to understanding the evolutions of their SC in their value networks: what its future place is (de Brito et al., 2008; Vachon & Klassen, 2008), how SD will reconfigure it and indirectly affect the organisation's activity (Matos & Hall, 2007; Frota Neto et al., 2008; Lee & Klassen, 2008), and whether its reconfiguration will drive new business models (Zhu & Sarkis, 2004; Rao & Holt, 2005).

Environment related information needs were those that most retained the attention of participants in both stages. The results show that SSC was strongly instantiated in environmental aspects such as ‘Impacts of transports’, ‘Energy consumption’, ‘Gas emissions reduction’, ‘Impacts of products and services’, ‘Waste management’ and ‘Use of materials’. These concerns are enclosed in the “green manufacturing” arena (Srivastava, 2007), which has been regulated and promoted during the last few years (Chua & Oh, 2009; Zhu et al., 2011).

In fact, “Compliance” topics to scan were ever-present in Stages 1 and 2 since the integration of SD in SC seems to depend on the evolution of regulations. Even if some interviewees and all intervention participants affirmed that they started SSC initiatives based on their own commitment (Koh et al., 2012; Zhu & Sarkis, 2004). conformity to existing and future laws was the first issue retained by most of them. Participants always referred to regulations in a holistic and transversal way, cross-cutting all other dimensions of SD. This situation leads to considering ‘Compliance’ as a new dimension for representing information needs in the SSC context. Thus, from our results, topics to scan in the SSC context were represented slightly differently from the SD triple bottom line representation (Elkington, 1998) as shown in Figure 3-3.

Figure 3-3. Topics representing information needs for S.Scan in the SSC context

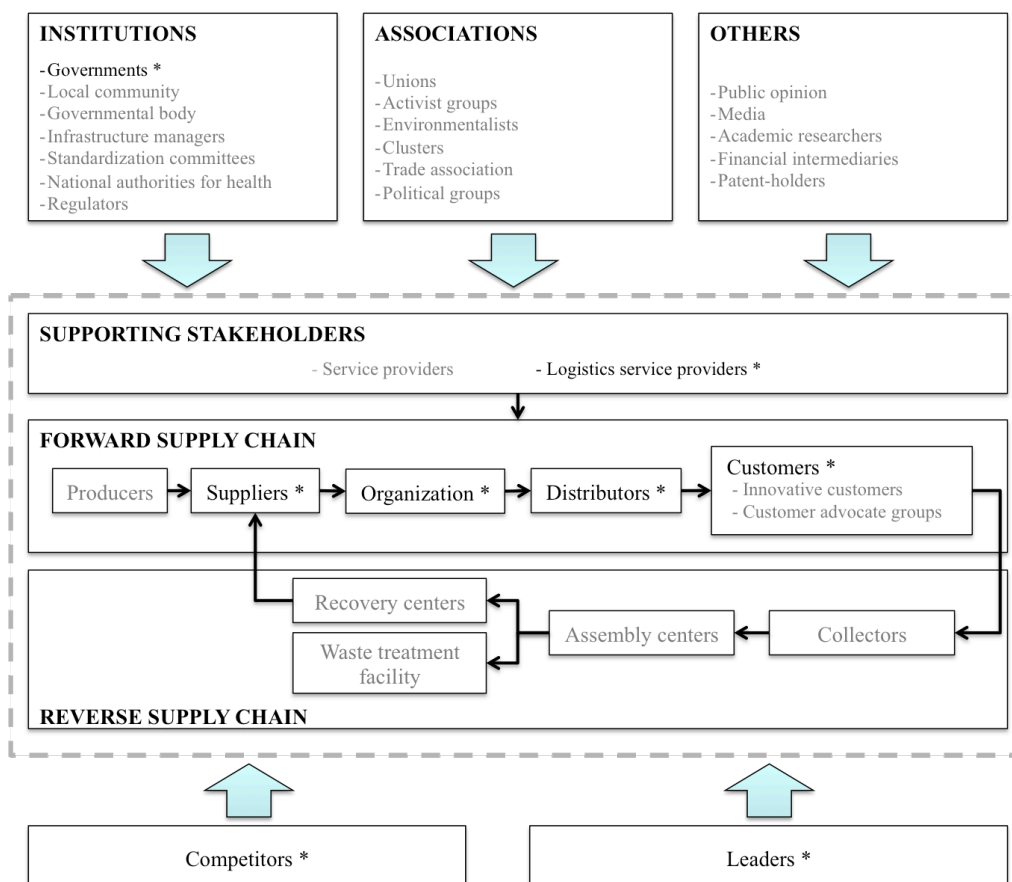


* Topics retained more than average in both interviews and interventions

3.6.2 A fragmented view of stakeholders to scan for SSC

The notion of SC refers to the integrated, coordinated, aligned and interdependent group of trading partners who participate in the production and delivery of a product from the very far supplier to the final consumer (Altekar, 2005; Vitasek, 2013). Thus, literature suggests that organisations no longer compete solely; rather, today competition is between rivals SC (Lambert et al. 1998; van Hoek et al., 2001). Accordingly, several authors have suggested that an effective integration of SD should be performed all along the SC and not in an isolated fashion (Krause et al., 2009; Wolf, 2011), while others have suggested that S.Scan in the SSC context should be performed from a network perspective (Fabbe-Costes et al., 2011; 2014). However, this extended integrative view of the SC seems not to be present in the organisations we met, at least in reference to their information needs. Instead, our results suggest that organisations' interests are turned toward close stakeholders in the forward SC as well as some institutional stakeholders as shown in Figure 3-4.

Figure 3-4. Stakeholders representing information needs for S.Scan on SSC context



* Meta-group of stakeholders retained above the average in both interviews and interventions

First, “Government” was constantly mentioned in both stages of this research. Being able to anticipate the changes in regulations implies having the capacity to gather information from institutional actors at all levels: local, national or international. This confirms our previous result that “Compliance” is a key factor in terms of information needs in the SSC context and also suggests a reactive rather than proactive behaviour to integrate SD into SC. This observation is consistent with previous research showing that institutional pressures are the main drivers for SSC initiatives (Zhu and Sarkis, 2007).

Second, the near organisation's “Forward SC” stakeholders (i.e., “Suppliers”, “Distributors”) were the most frequently mentioned in the interviews and retained during interventions. Far-upstream stakeholders such as “Producers” or “Second tier suppliers” were often mentioned during interviews but never or weakly retained in interventions. This result can be explained either because the organisations we met are not confronted with this problem or because they do not have the capacity to be informed about practices of their suppliers or of their suppliers’ suppliers (Ageron et al., 2012), as was sometimes explained by participants during interventions. This highlights the limitation of organisations to master their integration initiatives of SD since a firm can be no more sustainable than its upstream partners (Krause et al., 2009). Surprisingly, though “Reverse SC” is a topic that has retained a lot of academic and public interest, “Reverse SC” stakeholders were rarely mentioned in our interviews and hardly ever retained in the interventions. During interventions, some participants explained that they still consider reverse SC activities as a source of cost rather than value creation, and because they are not a priority for organisations. This suggests that participant organisations do not expect solutions or issues coming from stakeholders of the reverse SC.

Third, “Competitors” and “Leaders” were also identified as key stakeholders to scan. This provides evidence for follow-up strategies. Managers have been traditionally interested in analysing competitors' strategies, activities, practices and performance for comparative and competitive purposes (Ghoshal & Westney, 1991). Scanning competitors as well as leaders for benchmarking and imitation purposes can help organisations identify good practices and sources of opportunities or threats in SSC projects (Zhu et al., 2005).

3.6.3 Managerial implications

In this research we identified topics and stakeholders to help managers identify their information needs in S.Scan for SSC. Resulting lists should not be considered exhaustive, but are comprehensive and practical. Thus, they must be adapted to the context and priorities of each organisation in order to help managers consider stakeholders and topics they had never thought of before, reduce blind spots in their peripheral vision, and be used to trigger and facilitate information needs identification for S.Scan in the SSC context. Further research should evaluate their robustness and utility in practice, when organisations use them to design and implement S.Scan information systems to support pro-active SSC activities.

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Appendix 3-1. List of interviews with participating organisations in Stage 1

Org.	Position in the SSC	Business sector	Interv.	Modality	Duration
- INT01	Manufacturer	Electronic components	2	Face to face	0h47
- INT02	Manufacturer	Packing and packaging materials	1	By phone	0h50
- INT03	Manufacturer	Industrial electronics	1	By phone	1h00
- INT04	Manufacturer	Personal protection gear	1	By phone	1h00
- INT05	Manufacturer	Cosmetics, toiletries and hygiene	1	By phone	0h57
- INT06	Manufacturer	PCs and consumables	1	Face to face	1h30
- INT07	Manufacturer	Cereal and grain processing small-medium industry	1	Face to face	0h50
- INT08	Manufacturer	Dairy products small-medium industry	1	By phone	1h00
- INT09	Manufacturer	Gastronomic specialties small-medium industry	1	By phone	1h00
- INT10	Manufacturer	Candy and chocolates small-medium industry	1	By phone	1h00
- INT11	Manufacturer	Dairy products small-medium industry	1	By phone	0h40
- INT12	Manufacturer	Candy and chocolates small-medium industry	2	Face to face	1h00
- INT13	Manufacturer	Hand tool manufacturer small-medium industry	1	Face to face	1h30
- INT14	Distributor	Alcoholic drinks distributor	1	By phone	0h50
- INT15	Distributor	Printer and photocopier distributor	1	Face to face	1h00
- INT16	Distributor	Pet products distribution	1	By phone	1h00
- INT17	Distributor	Lamps and lighting distribution	2	Face to face	1h04
- INT18	Distributor	Distributor-owned logistics service provider	1	By phone	1h15
- INT19	Distributor	Distributor-owned logistics service provider	2	By phone	1h10
- INT20	Logistics service provider	Logistics service provider	1	By phone	0h55
- INT21	Logistics service provider	Logistics service provider	1	By phone	0h50
- INT22	Logistics service provider	Logistics service provider	1	By phone	0h46
- INT23	Logistics service provider	Logistics service provider	1	By phone	1h10
- INT24	Logistics service provider	Logistics service provider	1	By phone	1h15
- INT25	Logistics service provider	Logistics service provider	1	By phone	1h10
- INT26	Logistics service provider	Freight forwarder	1	By phone	0h40
- INT27	Logistics service provider	Port traction provider	1	By phone	0h50
- INT28	Logistics service provider	Fresh food forwarder	1	By phone	1h15
- INT29	Infrastructure manager	Port services	2	Face to face	1h15
- INT30	Infrastructure manager	Logistics infrastructure manager	1	By phone	1h10
- INT31	Infrastructure manager	Waterway manager	2	By phone	1h20
- INT32	Higher education & research	Scientific and technical research	1	Face to face	1h10
- INT33	Communities	Urban community	1	Face to face	1h30
- INT34	Communities	Inter-communal organisation	2	By phone	1h27
- INT35	Communities	Local authority	2	Face to face	1h00
- INT36	Cluster	Competitiveness cluster	1	By phone	0h50
- INT37	Service provider	Consulting office for management	1	By phone	0h55
- INT38	Service provider	Documentation and information service	1	By phone	1h02
- INT39	Service provider	Consulting and auditing in information systems	1	By phone	1h15
- INT40	Service provider	Consulting office for information systems	1	By phone	1h00
- INT41	Service provider	Consulting office in SC management	1	By phone	0h55
- INT42	Union	Independent truck operator union	2	By phone	1h00

Appendix 3-2. Abstract of GRI v3 2006

Indicators & protocols / Section	Description
□ Environmental	
- Use of materials	Global use of materials, use of recycled materials.
- Energy consumption	Consumption, sources, efficiency.
- Water consumption	Withdrawal, sources, recycling and reuse.
- Protection of biodiversity	Impacts of activities, products and services.
- Gas emissions reduction	Greenhouse gas emissions, ozone-depleting substances, others (NO, SO).
- Trade effluent discharges	Water discharges, spills.
- Waste management	Production, disposal.
- Impacts of products and services	Reduction and mitigation of environmental impacts of products and services, ecological footprint, recycling and reuse of sold products and packaging, energy efficiency in buildings.
- Compliance	Compliance with environmental laws and regulations.
- Impacts of transports	Impacts of transporting products, goods, materials and members of the workforce.
□ Human Rights	
- Human rights in investment and procurement	Respect for human rights in investments, control to suppliers and subcontractors,
- Diversity and equal opportunity	Application and control of non-discrimination initiatives.
- Guarantee of freedom of association	Right of employees to collective bargaining.
- Child labour avoidance	Measures to contribute to the abolition of child labour.
- Forced and compulsory labour avoidance	Measures to contribute to the elimination of all forms of forced or compulsory labour.
- Training practices	Training of security personnel in aspects of human right.
- Indigenous rights	Respect of rights of indigenous people.
□ Labour practices and decent work	
- Improvements on employment conditions	Human resources structure, job stability, benefits.
- Improvements on Labour/management relations	Coverage of employees by collective bargaining agreements, participatory organisational change.
- Improvements on occupational health and safety	Accident prevention, health and safety management, agreements with trade unions.
- Employee education and training	Employee training, skills development, career development.
- Diversity and equal opportunity	Composition of governance bodies, diversity in the workplace.
- Improvements on quality of work life	Repetitive tasks, physical work environment, social environment of the office, impacts of professional responsibilities in employee' s personal lives.
□ Product responsibility	
- Respect of customer health and safety	Impacts of products and services, compliance with regulations and voluntary codes.
- Product and service labelling	Compliance with regulations and voluntary codes, customer satisfaction.
- Marketing communications	Adherence to laws, standards and voluntary codes related to marketing communications.
- Respect of consumer rights	Security of customer data, respect for private life.
- Compliance	Compliance with laws and regulations concerning the provision and use of products and services.
□ Society	
- Local community involvement	Impacts, development programs, local community engagement.
- Anticorruption initiatives	Anti-corruption policies, measures and procedures; employee training.
- Public policy participation	Participation in public policy development and lobbying.
- Anti-competitive behaviour	Respect the competition, compliance with regulations anti-monopoly.
- Compliance	Compliance with business activity laws and regulations.

Appendix 3-3. List of participating organisations in Stage 2

Org.	Position in the SSC	Business sector	Meetings	Participants	Modality	Duration
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- EXP01	Manufacturer	Hand tool manufacturer	3	10	Group	7h40
- EXP02	Distributor	Lamps and lighting	1	1	Individual	1h15
- EXP03	Manufacturer	Pharmaceutical products and services	2	2	Individual	2h10
- EXP04	Manufacturer	Leisure sporting goods	1	1	Individual	1h55
- EXP05	Manufacturer	Medical and surgical equipment	1	1	Individual	2h45
- EXP06	Distributor	Toy distribution	1	1	Individual	1h25
- EXP07	Manufacturer	Flexible composite materials	1	2	Group	2h40
- EXP08	Distributor	Health services	1	1	Individual	2h05
- EXP09	Distributor	Pharmaceutical products and services	1	4	Group	1h50
- EXP10	Manufacturer	Electronic components	1	4	Group	2h00

Appendix 3-4. List of meta-topics and topics from interviews and interventions

Meta-topics / Topics	Literature review	GRI indicators	Stage 1 ¹	Stage 2 ²
□ Environmental	✓	✓	42	10
- Impacts of transports	✓	✓	41	8
- Energy consumption	✓	✓	35	6
- Gas emissions reduction	✓	✓	34	6
- Impacts of products and services	✓	✓	31	7
- Waste management	✓	✓	30	6
- Use of materials	✓	✓	18	6
- Water consumption	✓	✓	8	5
- Protection of biodiversity	-	✓	10	1
- Trade effluents discharges control	-	✓	7	2
□ Human Rights	✓	✓	11	6
- Respect of human rights on investment and procurement practices	✓	✓	7	5
- Child labour avoidance	-	✓	5	4
- Non-discriminative practices	✓	✓	1	4
- Guarantee of freedom of association	-	✓	-	3
- Training practices on Human Rights	✓	✓	-	3
- Forced and compulsory labour avoidance	✓	✓	-	2
- Respect of indigenous rights	-	✓	-	1
□ Labour practices and decent work	✓	✓	31	6
- Employee education and training	✓	✓	21	5
- Improvements on quality of work life	✓	-	20	5
- Improvements on occupational health and safety	✓	✓	13	6
- Diversity and equal opportunity	✓	✓	11	3
- Improvements on employment conditions	-	✓	8	1
- Improvements on labour/management relations	-	✓	6	1
□ Product responsibility	✓	✓	31	7
- Marketing communications	-	✓	27	3
- Respect of customer health and safety	✓	✓	11	5
- Product and service labelling	-	✓	9	7
- Respect of consumer rights **	-	✓	-	-
□ Society	✓	✓	36	4
- Local community involvement	✓	✓	35	-
- Public policy participation	-	✓	13	3
- Humanitarian initiatives	✓	-	5	2
- Anti-competitive behaviour	-	✓	-	3
- Anticorruption initiatives	-	✓	-	2
□ Compliance	✓	-	41	7
- Compliance with laws *	✓	-	29	6
- Compliance with norms and agreements *	✓	-	39	1
- Compliance with internal rules *	✓	-	12	2
□ Logistics management	✓	-	42	8
- Organisation's place of logistics *	-	-	34	3
- Improvements on management of flows	✓	-	27	4
- Logistics costs and revenues *	-	-	24	5
- Meet market needs *	-	-	20	4
- Supply chain integration *	-	-	30	3
- Mutualization practices	✓	-	15	5
- Logistics plan design	✓	-	15	3
- Urban logistics transport	✓	-	15	3

Meta-topics / Topics	Literature review	GRI indicators	Stage 1 ¹	Stage 2 ²
- Stock management practices *	-	-	12	4
- Supply management practices*	-	-	11	3
- Measurement of the logistics performance *	-	-	10	3
- Transport density improvement*	-	-	9	4
- Lasting sourcing practices	✓	-	8	5
- Business models development*	-	-	5	5
- Delocalization / relocation practices*	-	-	7	4
- Forecasts practices*	-	-	4	5
- Lean approaches	✓	-	4	3
- Logistics risks identification and control*	-	-	3	1
- Distribution network planning advances	✓	-	-	1
- Shipment and transport organisation	✓	-	-	1

¹ Number of interviews where the topic was evoked at least once. ² Number of interventions where the topic was retained. * Topic added or changed as result of thematic analysis. ** Suggested topic in coding scheme but not retained during interviews and interventions

Appendix 3-5. List of meta-groups of stakeholders from interviews and interventions

Meta-group of actors	Literature review	Stage 1 ¹	Stage 2 ²
- Customers	✓	41	9
- Suppliers	✓	31	9
- Competitors	✓	29	7
- Governments	✓	28	7
- Logistics service provider *	-	35	5
- Distributors *	-	26	4
- Leaders *	-	19	5
- Unions	✓	15	4
- Employees	✓	34	-
- Services providers *	-	24	1
- Producers *	-	26	-
- Governmental body *	-	13	2
- Directions *	-	17	1
- Local community	✓	16	1
- Public opinion *	-	14	1
- National Authorities for Health *	-	1	4
- Regulators	✓	1	4
- Investors	✓	5	3
- Innovative customer *	-	4	3
- Media	✓	8	2
- Academic researchers	✓	7	2
- Activist groups	✓	6	2
- Clusters *	-	1	3
- Trade associations	✓	1	3
- Internal divisions *	-	1	3
- Collector *	-	4	1
- Infrastructure managers *	-	7	-
- Managers	✓	7	-
- Financial intermediaries	✓	2	1
- Waste treatment facilities *	-	6	-
- Environmentalists	✓	4	-
- Recovery centres *	-	4	-
- Standardization committees *	-	2	-
- Assembly centres *	-	1	-
- Patent-holders *	-	1	-
- Owners	✓	1	-
- Customer advocate groups **	✓	-	-
- Political groups **	✓	-	-

¹ Number of interviews where the stakeholder was evoked at least once. ² Number of interventions where the stakeholder was retained. * Actor added or changed as result of thematic analysis. **Suggested stakeholder from coding scheme but not retained during interviews and interventions

Appendix 3-6. Assembled matrix from interventions crossing perceived most important stakeholder and topics to scan in S.Scan in the SSC context ¹.

Perceived most important stakeholder to scan

Perceived most important topics to scan	Perceived most important stakeholder to scan																		
	Competitors	Leaders	Forward SC						Supporting actors	Institutions				Associations		Others			
			Suppliers	Organisation		Distributors	Customers			Logistics service providers	National authorities of health	Governmental bodies	Governments	Regulators	Activist groups	Trade associations	Unions	Financial intermediaries	Public opinion
Product responsibility	1	3	3		1	1		4	1		2	1	1		1	1		1	
- Respect of customer health and safety			1		1	1		1	1		2								
- Marketing communications	1	2						2			1	1	1		1	1			1
- Product and service labelling		1	2		1	1		1			1	1	1		1	1			1
Labour practice and decent work			2		1	1		2	2	1	1								
- Diversity and equal opportunity			1					1	1		1								
- Improvements on labour/management relations								1	1										
- Improvements on quality of work life			1		1	1				1									
Human rights	1	1	3	2		1	1	3											
- Child labour avoidance		1	2	1			1	2											
- Forced and compulsory labour avoidance		1	1					1											
- Guarantee of freedom of association		1	2	1			1	2											
- Respect of indigenous rights		1	1					1											
- Human Rights on investment and procurement	1	1	2			1		2											
- Non-discrimination practices		1	2	1		1	1	2											
- Training practices on Human Rights		1	2	2			1	2											
Society			1					1											
- Anti-competitive behaviour								1											
- Anticorruption practices			1					1											
Environmental	2	4	5		1	1		5	1	2	1	2	5	1	2	1			1
- Materials		1	1									1							
- Products and services	1	3	4			1		3				1	1		1	1			
- Transport	1	2	2		1	1		1		2		1	3						
- Waste			1								1			1					
Compliance	1	2	2					2							2				1
- Compliance with laws	1	2	2					2							2				1
Logistics management	1	2	2					4	2	1	2	1	2		1				
- Business models development		1						1											
- Forecasts practices	1		1					1											
- Logistics costs and revenues		1																	
- Improvements on management of flows								1											
- Measurement of logistics performance								1											
- Meet market needs		1				1		1	1	1	1	1	2		1				
- Mutualization practices								1											
- Lasting sourcing practices																			
- Stock management practices								1	1		1								
- Supply chain integration								1											
- Urban logistics transport								1	1										

¹ Number of interventions where a particular actor and topic crossing was retained.

4 Improving targeting of Strategic Scanning: design and implementation of a meeting room system

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4.1 Abstract

It is necessary to target Strategic Scanning activities in order to be efficient and provide useful results. Targeting consists of defining and outlining the part of the business environment that corresponds to organisations' strategic objectives and priorities. However, there is a lack of systems to help managers target their information needs for Strategic Scanning. Through an action research methodology, we designed, implemented, used and evaluated a meeting room system called TargetBuilder to help managers target Strategic Scanning. Evaluations of TargetBuilder through interventions in 10 organisations indicate that it helps managers achieve relevant targeting results for their context and according to their strategic objectives. Lessons from the design and implementation of TargetBuilder lead to the proposal of four major improvements to previous targeting methods: (1) the use of suggested lists of actors and topics as starting points to trigger and facilitate discussions, (2) the definition of actor and topic importance to produce useful targeting results, (3) the evaluation of the organisation's perceived capacity to be informed early enough, and (4) a mechanism to signal scanning relevancy in the short-, mid- or long-term.

4.2 Introduction

Strategic scanning (S.Scan) refers to “the acquisition and use of information about events, trends, and relationships in an organisation's external environment, the knowledge of which would assist management in planning the organisation's future course of action” (Aguilar, 1967, p. 1). S.Scan is a crucial activity to help managers

make decisions (Walkers et al., 2003; Lesca et al., 2012). Accordingly, it contributes to the intelligence stage of the decision-making process by gathering information from the business environment to help identify discrepancies, unknown or unexpected problems, formulate answers, or choose an implementable solution among multiple alternatives (Simon, 1991; Turban & Aronson, 1998). In this sense, the objective of S.Scan is to reduce decision uncertainty and to allow taking action (May et al., 2000).

There are two complementary modes of data acquisition in S.Scan (Vandenbosch & Huff, 1997; Lesca & Caron-Fasan, 2008): one is “focused search” that is used when managers are already involved in a decision-making process, and they look for reliable and non-ambiguous information to understand the context, choices and implications of their decisions. Thus in this mode, a specific question bounds the overall scope of the information search (Choudhury & Sampler, 1997). The other mode is called “scanning” and it is used when managers have no prior specific questions or decisions likely to guide the search of information. Instead, they perform continuous monitoring of information that could eventually help anticipate changes in the organisation’s business environment or reveal threats and opportunities (Aguilar, 1967).

In this research we are interested in the scanning mode. Since managers in this mode have a very vague idea of what to look for, they may encounter difficulties in limiting the spectrum to be scanned. This can lead to undesirable situations such as: over-abundance of irrelevant information exacerbating the problem of data overload (Xu et al., 2011) and becoming an hindrance (Bettis-Outland, 2012), overwhelming managers making them overlook or miss important information (Garg et al., 2003; Albright, 2004; Dean & Webb, 2011), and consequently paralysis of analysis and decision making (Stanley & Clipshain, 1997; Li, 2011). Thus, information acquisition can be very ineffective if managers do not delimit the scope of their information search in line with the organisation’s strategic objectives and priorities (Yasai-Ardekani & Nystrom, 1996). This operation is named “targeting” and it is performed prior to the start of data acquisition (Lenz & Engledow, 1986; Gilad & Gilad, 1988; Choo, 1998; Lesca & Lesca, 2011). However, unveiling information needs is not an easy process (Choo, 1998). Sometimes, it implies the interaction of managers coming from different units of the organisation who might initially share neither the same interests nor the same vocabulary or that might have a fragmentary and fuzzy understanding of the overall issues to be scanned.

Computer-based systems have already been used in S.Scan to support information scanning (e.g., CI Sider (Chen et al., 2002) and analysis (e.g., Abima (Lau et al., 2012), BizPro (Chung, 2014)). However, there are no systems available to provide support to target S.Scan. Currently, if managers perform targeting, they use paper and markers, making it time consuming and entirely unfriendly.

By following an action research approach, this study examines **how could targeting of S.Scan be improved by the use of a specialized system**. For this purpose, we designed, implemented, used and evaluated a meeting room system that employs an adaptation of a proved targeting method. Resulting outputs would allow focusing the efforts of data gathering, facilitating the identification of relevant information sources to scan or feed automated tools for information search. We evaluated the system by studying: its contributions to assist in information needs identification, its capacity to produce targeting outputs, and participants' acceptance in terms of perceived usefulness and perceived ease-of-use. Improvements resulting from the use of the system in real situations allowed increasing both the system and the targeting method acceptability and utility.

In Loza Aguirre et al. (2013) we presented preliminary results of this study where we reported our experiences building and evaluating the system. This paper goes further in theorizing the contributions of our new constructs, method improvements, and our system. Our results shed new light on our understanding of targeting and reports improvements that managers can use in practice.

The remainder of the paper is organized as follows. The next section explores the S.Scan targeting process and how a Group Support System (GSS) could help managers with this task. In section 4-4, we detail the action research methodology followed in this research. Afterward, we present the changes we introduced in the targeting method, and the system implementing them. Section 4-6 details our evaluation process. Finally, we discuss the conclusions, limitations and future work.

4.3 Related Work

4.3.1 Targeting Strategic Scanning

Targeting consists of delimiting the scope of S.Scan by defining and outlining “the part of the environment that corresponds to organisations’ strategic objectives and priorities over a given period” (Lesca & Lesca, 2011, p. 70). Even though some authors (Batistella & de Toni, 2011; Mayer et al., 2012) have suggested that organisations should scan their entire business environment, in practice, organisations do not have the capacity and the resources to do so (Franco & Hasse, 2011; Hasse & Franco, 2011). Worse still, conducting a 360-degree scan is not a guarantee to obtain useful results, and it can even lead to information overload.

In the past, various methods have been proposed to perform targeting. Some resort to limiting the number of consulted information sources (El Sawy, 1985; Zhang et al., 2009). Others propose limiting the topics to scan by monitoring only key trends or specific critical events (Nanus, 1982; Gilad, 2003; Wei & Lee, 2004; Kim et al., 2013; Mayer et al., 2012), or by limiting the number of emerging issues being tracked (Stubbart, 1982; El Sawy & Pauchant, 1988). Another method suggests listing specific competitors to scan (Gilad & Gilad, 1986). One final method proposes a holistic approach by identifying and interrelating relevant topics and actors to scan (Lesca & Lesca, 2011). In this study, we focus on this latter method called the “Target method”, as it is the most inclusive for two reasons: first, because it refers not only to competitors but also to all the other actors from the business environment that can affect the future of the organisation; and second, because it does not deal with actors and topics to scan in an isolated fashion, but considers also the interrelationships among them.

The Target method defines an actor as a natural or legal person whose decisions and actions could have an influence on the future of the organisation and its activities. A topic is a center of interest when considering the future of the organisation. Not all the topics have relation with all actors, and correspondingly, not all the actors have relation with all topics. Consequently, in a “Target Matrix”, participants identify only the crossings between actors and topics (AxT) that are relevant and important for them as shown in Table 4-1. The result of targeting S.Scan with the Target method is a

nominative list of actors, a precise list of topics, and a Target Matrix with the AxT to scan.

Table 4-1. Target Matrix Example according to Target method

		Actors			
		Actor 1	Actor 2	Actor 3	Actor 4
Topics	Topic 1				
	Topic 2				
	Topic 3				
	Topic 4				

✓ denotes AxT crossings to scan

This research improves targeting by using a specialized system. Since targeting can be either an individual or a collective effort, the system should be adapted to both uses. In this context, GSS seems to fit this requirement as presented below.

4.3.2 Using specific designed systems to target S.Scan

Previous studies have proposed several systems for S.Scan. Concerning information gathering, Elofson (1993) proposes an AI-based system to improve trust relations between managers and information agents and to capture the heuristics used by managers to classify threats and opportunities. Chen et al. (2002) deal with information overload coming from the Internet using real-time collection, indexation, and categorization of webpages from previously specified websites. This system provides an up-to-date and comprehensive view of the user’s website interests. Srivastava and Cooley (2003) present a web business intelligence system to gather information from the web and deliver relevant information to users according to suitable user profiles. Zhang et al. (2009) develop web-crawler programs for monitoring, classifying, and filtering online news in the context of syndromic surveillance.

Other efforts have been conducted to help managers to analyse collected information. Lau et al. (2012) implemented an adaptive business intelligence system to support evolutionary learning, domain-specific sentiment analysis, and business relation mining to aid decision makers under different mergers and acquisitions scenarios. Chung (2014) develops an intelligent system that extracts and categorizes factors that can influence market reactions. These factors are extracted from textual papers and reports using text-mining procedures. Palomino, Taylor and Owen (2013) combine elements of text and data mining, forecasting and optimization in order to conduct

systematic searches for trends, opportunities and challenges on the web that might affect the probability of achieving management goals.

All these systems propose solutions for information search and analysis in S.Scan. However, to date, there has been no research centred on a system to help managers target their information needs in S.Scan. This research addresses this gap by proposing a system to assist them in this activity.

When targeting is performed collectively, some members from an organisation work together in meetings to share their understandings of strategies, issues and priorities, to discuss expectations and information needs, to identify common objectives to scan, and to build an actionable representation of the organisation’s environment to scan. Considering this, the system should be adapted to be used in individual and group scenarios.

Computer-Supported Cooperative Work (CSCW) is a discipline of Human-Computer Interaction that studies the design of computer systems to support and coordinate the work of groups of collaborating individuals and the effect of technology on their work patterns (Baecker, 1995; Dix, 2004). CSCW systems are often referred as GSS. They have been largely proven in several studies as valid systems to help and improve teamwork (e.g. Nunamaker & Vogel, 1989; Anson et al., 1995). They can be classified following a time/space comparison where GSS are placed according to where and when participants perform their cooperative work as shown in Table 4-2.

Table 4-2. *Current research focus within CSCW (Johansen, 1988)*

	One meeting site (Same place/co-located)	Multiple meeting sites (Different place/remote)
Synchronous communication (same time)	Face-to-Face interaction Public computer displays, meeting rooms, etc.	Remote interactions Shared-view conferencing systems, chats, Instant Messaging, virtual worlds, collaborative editors, video conferencing, etc.
Asynchronous communication (different time)	On-going tasks Team rooms, shift work groupware, project management; etc.	Communication and coordination Structured messaging systems, workflow management, version control, meeting schedulers, blogs, wikis, etc.

Since in practice collective targeting is a process usually performed on a same place/same time basis (i.e., synchronous co-located), we are interested in face-to-face interaction systems (highlighted in grey in Table 4-2). Meeting rooms are a sub-set of GSS fit for face-to-face interactions that facilitate and capture common understandings of participants. Meeting rooms combine face-to-face verbal interaction with technology to make the meeting more interactive, effective, and efficient, while keeping an account of the process for construction and recording of results (Dix, 2004; Stair & Reynolds, 2012). These characteristics fit targeting S.Scan needs, such as adaptation to individual and group scenarios, facilitated interactions during face-to-face meetings, and improved interactivity during discussions by using visual instruments.

4.4 Research method

This study examines how targeting of S.Scan could be improved by the use of a specialized GSS. By following an action research methodology, we developed a system implementing an adaptation of the Target method.

4.4.1 Research context

This research is a part of a larger project on building S.Scan to reduce greenhouse gas emissions and design sustainable supply chains. Two government agencies in a European country sponsored and financed this project. It helps managers developing practices of S.Scan for identifying opportunities and overcoming difficulties associated with starting, maintaining and developing Sustainable Supply Chains (SSC) initiatives.

In recent years, SSC has emerged as a new approach that tries to integrate sustainable development concerns within supply chain activities. Therefore, a SSC is “one that performs well on both traditional measures of profit and loss as well as on an expanded conceptualization of performance that includes social and natural dimensions” (Pagell & Wu, 2009, p. 38).

In practice, SSC initiatives confront prohibitive barriers (Giunipero et al., 2012). Among these, lack of external information is an important obstacle preventing SSC initiatives (Seuring & Müller, 2008; Walker et al., 2008; Ageron et al., 2012). From this perspective, S.Scan can help managers satisfy their need for external information

concerning SSC issues. Since S.Scan can assist them to anticipate changes and identify threats and opportunities, it can lead organisations to change from a reactive posture concerning SSC to a more proactive one (Fabbe-Costes et al., 2011).

However, identifying information needs for conducting S.Scan in a SSC context is not easy for two reasons. On the one hand, as an emerging subject, SSC does not yet have a consensus framework, and the understanding of its implications is neither stable nor clear (Carter & Rogers, 2008; Sarkis et al., 2011; Pagell & Shevchenko, 2014). Indeed, managers are mostly worried about operational issues concerning their daily activity and thus tend to orient their attention only to environmental and economic aspects, leaving social issues aside (Carter & Rogers, 2008; Seuring & Müller, 2008; Pagell & Wu, 2009). Thus, it is necessary to offer an effective approach to targeting S.Scan for SSC that helps managers overcome their limitations to understand SSC, broaden their vision of SSC by including actors and topics they had never thought of before, and identify their information needs for S.Scan.

On the other hand, since the context of SSC has a very broad scope and also because initiatives on this matter are generally crosscutting issues along the organisation (Carter & Rogers, 2008; Pagell & Wu, 2009), identifying information needs may demand the participation of members from different departments or units within the organisation; each of them with his own vision, understanding, and interest about the subject. Consequently, the targeting approach requires implementing mechanisms to facilitate discussions between participants while allowing the collective identification of their information needs for S.Scan in the SSC context.

Thus, SSC offers an interesting context for our research since it opens an opportunity for developing and evaluating a system to improve targeting in a real scenario.

4.4.2 Research design

This study follows an action research methodology to develop a system to improve targeting of S.Scan. Action research is a research methodology whose goal is to solve practical problems while expanding scientific knowledge (Baskerville & Myers, 2004). Action research is based upon a cyclical process that comprises five stages as shown in Figure 4-1. Table 4-3 presents these stages in this research.

Figure 4-1. *Canonical action research process model (Baskerville & Wood-Harper, 1996)*

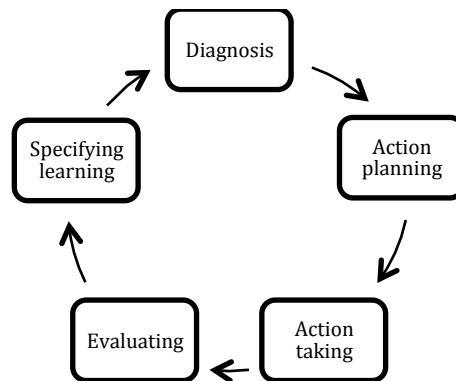


Table 4-3. *Characteristics of action research process applied in this study (Baskerville & Wood-Harper, 1996)*

Action research stage	Application on this research
Diagnosis Identification of primary problems.	Objective: Understanding practices and information needs of managers in S.Scan for SSC. Performed by: Semi-structured interviews within 42 organisations operating at distinct places in the supply chains and belonging to different business sectors.
Action planning Specification of the actions that should relieve or improve primary problems. A theoretical framework should guide planned actions.	Objective: Designing a solution to help managers to improve targeting of S.Scan in the SSC context. Performed by: <ul style="list-style-type: none"> Adapting the Target method to the research context. Designing a meeting room system to implement the adaptation of the Target method.
Action taking Implementation of the planned action in the frame of an active intervention into the participating organisations.	Objective: Implementing and using the designed system in interventions with managers. Performed by: <ul style="list-style-type: none"> Implementing a web based meeting room system based on the adaptation of the Target method. Ten interventions within medium to large organisations with facilitative involvement of three researchers: two acting as facilitators providing guidance during meetings and one as system administrator.
Evaluating Evaluation of the outcomes by the practitioners.	Objective: Evaluating the results as well as the acceptability and utility of the system. Performed by: <ul style="list-style-type: none"> Analysis of targeting outputs from interventions to evaluate capacity to produce a condensed representation of information needs for S.Scan. Thematic analysis of transcribed intervention tapes to evaluate perceived acceptance and contributions to solve difficulties to identify information needs in SSC context.
Specifying learning Identification of knowledge for the scientific community as a result of the success or failure of the theoretical framework.	Objective: Identifying new knowledge for S.Scan literature as a result of the interventions. Performed by: <ul style="list-style-type: none"> Identification of new dimensions of targeting S.Scan feasibility and utility in organisations Identification of potential improvements to the Target method learned through system improvements and users' feedback.

It is possible to identify different forms of action research, each with its own structure, model, and set of goals (Baskerville & Wood-Harper, 1996). In this research we adopt an Information System prototyping approach that follows an iterative method of prototype construction and user evaluation until the system achieves full functionality (Baskerville & Wood-Harper, 1998; Gregg, 2009). We performed a facilitative involvement with study subjects (Baskerville & Wood-Harper, 1996). Thus, our tasks and those of participants were clearly defined: while we helped managers with expert advice, guidance and technical knowledge, the burden of identifying information needs for S.Scan rested with managers. We manipulated the system to facilitate interventions and make the best use of the limited time of participants. For allowing design, implementation, and evaluation of improvements to the method and the system, we use an iterative approach of the action research cycle.

We conducted a diagnosis stage in order to provide a detailed understanding of practices and the managers' information needs in S.Scan for SSC. This stage included interviewing 50 managers from 42 organisations that operate at distinct places in the supply chain and that belong to different business sectors (Appendix 4-1). We performed interviews using a previously tested semi-structured interview guide that included themes related to Supply Chain Management and Logistics activities, Sustainable Development, SSC issues, S.Scan, and S. Scan for SSC. We audiotaped, transcribed, double coded and analysed the interviews.

As a result of the analysis, we found that interviewees considered SSC as a fuzzy concept for them and their organisations. They were interested in working on S.Scan for SSC issues, but they were capable neither to define precisely what perimeter of their activities and their environment was concerned, nor to identify their information needs. Thus, they highlighted the need for assistance to target S.Scan in SSC the context. Details of the results of this stage are presented on section 4.6.

4.5 Proposing solutions to improve Targeting

Considering results obtained from the diagnosis stage, first of all, we proposed an adaptation of the Target method to the research context in order to deal with the broad scope and transversality of SSC. Then, we designed a meeting room system to

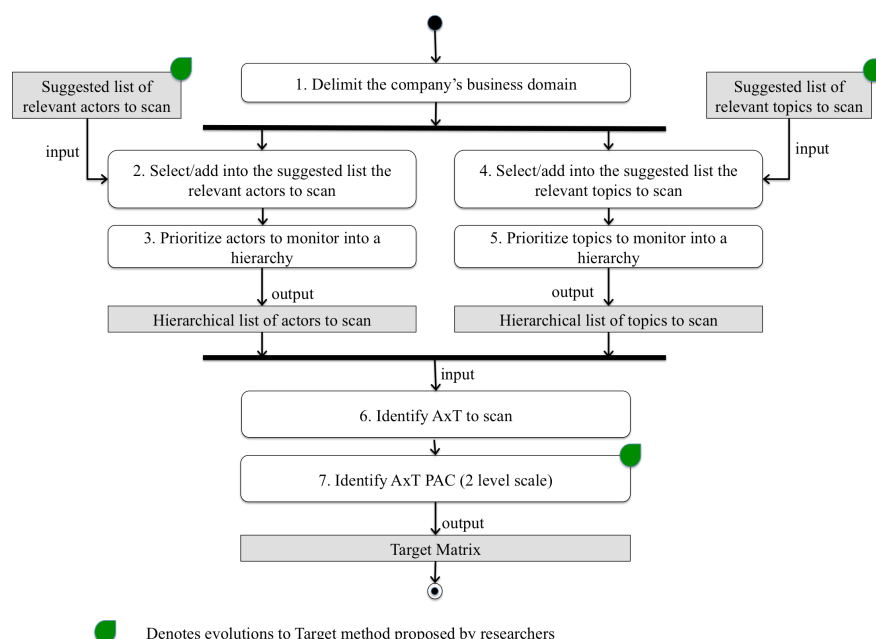
implement the adapted Target method in order to facilitate discussions in real situations during interventions with managers in the action taking stage.

4.5.1 Proposing adaptations to the Target method

Before interventions, we proposed two modifications to the Target method (Figure 4-2):

- The use of lists of suggested actors and topics. Usually, it is the participants who identify and propose the relevant actors and topics to scan. Instead, in this research, we suggest lists of actors and topics to participants as starting propositions in order to trigger and facilitate discussions, and to expand their understanding of SSC. We developed the suggested lists by qualitative analysis of interviews collected during the diagnosis stage following a rigorous double coding process and thematic analysis (Boyatzis, 1998; Saldaña, 2009; Chapter 3).
- The definition of Perceived Anticipatory Capacity (PAC) in the Target Matrix as a qualitative self-assessment indicator to designate the perception of participants about the organisation’s capacity to be informed early enough about a particular AxT. Participants would use this indicator as a filtering criterion to define priorities in scanning.

Figure 4-2. Adaptation of the Target method for the purpose of this research



4.5.2 Implementing a system to help managers target S.Scan: TargetBuilder

TargetBuilder, as its name suggests, is a system conceived to assist individuals as well as groups in targeting meetings to identify their target to focus scanning activities. It is based on the adaptation of the Target method proposed in the previous section.

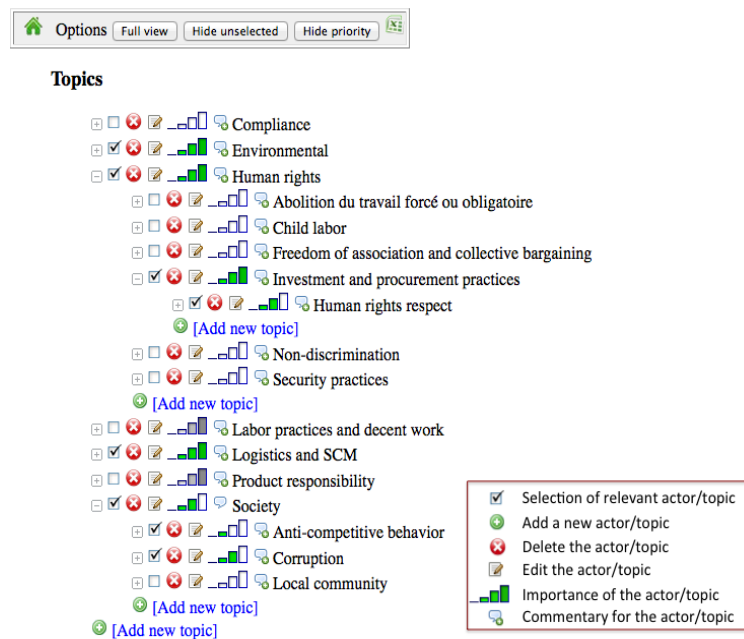
We implemented TargetBuilder as a web GSS, allowing users to access it through an Internet browser. We exceeded initial requirements, allowing future implementations in asynchronous and/or remote environments as well as large-scale deployments. TargetBuilder uses a three-tier architecture built over a PC environment running Apache, PHP and MySQL. We used AJAX techniques to improve interactivity. Also, we used data and presentation layer paradigms to facilitate translation in multilingual environments. Results are automatically saved in a database and can be exported to portable document or spreadsheet formats. We conceived the system in two modules that are presented below.

4.5.2.1 *Actors/Topics Manager*

This module allows users to create and use hierarchized lists of actors and topics to target S.Scan. It implements phases 2 to 5 of the adapted Target method shown in Figure 4-2. The outputs of this module are hierarchical lists of relevant actors and topics selected by participants. An example of the interface of the Actors/Topics manager is shown in Figure 4-3. The main functionalities of this module are:

- Selection of relevant actors/topics from hierarchized lists (phases 2 and 4 of Target method).
- Support for adding/editing/deleting actors/topics in hierarchical lists.
- Commentary support for each selected actor or topic.
- Evaluation of actors'/topics' perceived importance in S.Scan using a four level scale ranging from low to high importance (phases 3 and 5 of Target method).

Figure 4-3. Example interface of Actor/Topics Manager from real experiments of S.Scan in the SSC context



4.5.2.2 Target Matrix Module

This module allows the creation of the Target Matrix. The Target Matrix is built using the crossing of topics (vertical axis) and actors (horizontal axis). The main functionalities of this module, as an implementation of phases 6 and 7 of the adapted Target method, are:

- Filtering of actors and topics according to their identified importance.
- Selection of relevant AxT in the Target Matrix.
- Commentary support for each selected AxT.
- PAC option control (Green = satisfactory, Red = not satisfactory).

The output of this module is the Target Matrix of selected AxTs. The PAC option allows managers to filter the Target Matrix in order to visualize priorities in the S.Scan process implementation. An example of the original interface of the Target Matrix module is shown in Figure 4-4.

Figure 4-4. Example of original Target Matrix interface conceived in Laboratory.



4.5.3 Iterations of the action research cycle

In order to avoid uncontrollability, contingency threats, and to improve the validity of results (Kock, 2004), we studied several instances of individual users and groups involved in targeting of S.Scan completing four iterations of the action research cycle. Thus, new versions took into account the early feedback from managers after each iteration. As a result, we implemented three main improvements (Figure 4-5):

- The PAC scale was changed from having two to having three levels (Green = satisfactory, Orange = needs to be improved, Red = no capacity at all).
- An alternative representation of PAC for colour-blind people was included.
- Time scale relevance (TSR) functionality was introduced, allowing managers to indicate the relevancy of a particular AxT in the short-, mid- or long-term.

Figure 4-5. Example of definitive Target Matrix interface after 4 iterations of the action research cycle.

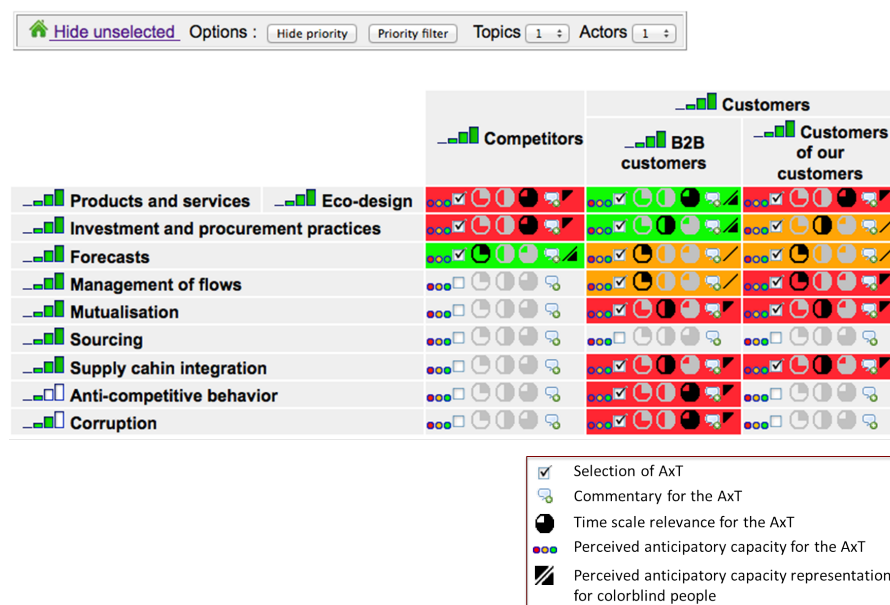


Table 4-4 presents a synthesis of iterations of the action research cycle and the main changes that we implemented to our research products as a result of suggestions from participants.

Table 4-4. Improvements to TargetBuilder and the Target method as a result of participants' suggestions

Iteration	Constructs	Target method	TargetBuilder
Iteration 1 (Original implementation) Interventions: EV01	Definition of PAC to designate the perceived organisation's capacity to be informed early enough about a particular AxT.	<ul style="list-style-type: none"> The use of lists of suggested actors and topics to trigger and facilitate discussions, and to expand participants' understanding about a subject. The use of PAC as a 2 level self-assessment scale to define priorities in scanning. 	Actors/Topics Manager <ul style="list-style-type: none"> Selection of relevant actors/topics from lists. Adding/editing/deleting actors/topics in lists. Commentary support for each selected actor/topic. Perceived importance evaluation using a four level scale. Target Matrix module: <ul style="list-style-type: none"> Filtering by actor/topic importance. Selection of relevant AxT. Commentary support for each selected AxT. Filtering by PAC 2 colour PAC option control.
Iteration 2 (from participants' suggestions) Interventions: EV02		<ul style="list-style-type: none"> PAC redefinition as a 3 level scale 	Target Matrix module: <ul style="list-style-type: none"> Colour-coding for PAC option control from 2 to 3 colours.

Iteration	Constructs	Target method	TargetBuilder
Iteration 3 (from participants' suggestions) Interventions: EV03 – EV08		<ul style="list-style-type: none"> Definition and filtering of the most important actors and topics to scan in order to reduce Target Matrix size and facilitate visualization before selection of relevant AxT. 	Target Matrix module: <ul style="list-style-type: none"> Alternative representation for colour-blind users.
Iteration 4 (from participants' suggestions) Interventions: EV09 & EV10	Definition of TSR as an indicator to designate the relevancy of a particular AxT in the short-, mid- or long-term.	<ul style="list-style-type: none"> The use of TSR as a 3 level temporal horizon indicator to define priorities in scanning. 	Target Matrix module: <ul style="list-style-type: none"> 3 level TSR option control. Filtering by TSR and/or PAC. Control to display only desired elements on each cell

4.6 Evaluation

In this section we present the results of this study. They are organized in two subsections, covering the details of the interventions and our evaluation procedure. The latter includes the results concerning the impacts on the social setting, the evaluation of targeting outputs obtained from interventions, and the evaluation of the perceived acceptance of TargetBuilder.

4.6.1 Interventions

We conducted active interventions within organisations that were interested in identifying their information needs in S.Scan for SSC. The primary goal was to help managers with targeting S.Scan in a context that they initially identified as fuzzy for them and their organisations. We conducted the interventions with 27 managers in the headquarters of 10 organisations. At this stage, we were interested in representatives from medium to large organisations coming from different places in their supply chains and belonging to different industries whose operations could benefit from the integration of SSC. Table 4-5 lists all participating organisations in these interventions.

Table 4-5. List of participating organisations in interventions

Org.	Business sector	2012 Net sales (US\$ millions)	Meetings	Participants	Combined duration
<i>EV01</i>	Medical and surgical equipment	1.070	1	1	2h45
<i>EV02</i>	Toys distribution	170	1	1	1h25
<i>EV03</i>	Hand tool manufacturer	450	3	10	7h40
<i>EV04</i>	Lamps and lighting	140	1	1	1h15
<i>EV05</i>	Pharmaceutical products	10.800	2	2	2h10
<i>EV06</i>	Leisure sporting goods	320	1	1	1h55
<i>EV07</i>	Flexible composite materials	210	1	2	2h40
<i>EV08</i>	Health services	790 ^a	1	1	2h05
<i>EV09</i>	Pharmaceutilca products	1.130	1	4	1h50
<i>EV10</i>	Electronic components	390	1	4	2h00

^a. Operating budget

We co-built with managers the target outputs for SSC during meetings where TargetBuilder was video projected in the room as a supporting system for discussion. Based on the adaptation of the Target method (Figure 4-2), managers carried out the following stages:

- Using the Actors/Topics Manager module, we asked participants to designate, discuss, and retain from suggested lists the actors and topics they considered relevant in terms of S.Scan for SSC in their organisational context, and to explain the reasons for their choices.
- Afterwards, participants used the Target Matrix module to select and discuss AxTs they considered relevant in terms of S.Scan for SSC for their organisations, and to explain why. Also, we asked participants to evaluate and discuss PAC for each selected AxT.

We collected data using a participant observation approach (Baskerville & Wood-Harper, 1996). The meetings lasted an average of two hours. We audiotaped and transcribed word-by-word the meetings for analysis. We saved in a logbook the experiences and feedback of the researcher who administrated TargetBuilder during the meetings. We conducted interventions until reaching a saturation point when participants mentioned neither new suggestions nor significant negative comments about the system.

4.6.2 Evaluation procedure

We evaluated interventions with TargetBuilder considering: (1) its relevance to solve the contextual problem, meaning overcoming the limitations to identify information needs in SSC context; (2) the target outputs: lists of relevant actors and topics for S.Scan and a Target matrix; and (3) user acceptance evaluation from a semi-structured assessment that was conducted after each system implementation iteration (Appendix 4-2).

4.6.2.1 Impacting the social setting: overcoming limitations to identify information needs in SSC context

As a result of the analysis of interviews performed at the diagnosis stage, we found that interviewees considered SSC as a fuzzy concept for them and their

organisations. They were interested in working on S.Scan for SSC issues, but they had a weak understanding of the meaning, implications, or scope of SSC. Two participants verbalized their concern as follows:

“It [SSC] really is a subject that is, in quotation marks, relatively recent. [...] Frankly, I do not know how to define it. Out of curiosity, how do you define it? [Asking to interviewer]” (INT19)

“For me it is very simple, we have to define what is SSC! [...] After that I could take action, but only if there is a definition that means something.” (INT37)

This condition restricted their capability to identify and target their information needs to perform S.Scan for SSC and thus highlighted the necessity of assistance to target S.Scan for SSC. Therefore, interviewees identified targeting of S.Scan as crucial in this context to allow efficiency and useful results. Participants articulated their concerns related to identifying and targeting information needs as seen in the following quotes:

“In sustainable development there is a multitude of subjects, and of course, this [supply chain] forms an integral part of it. [...] Concerning S.Scan for SSC, which ones seem to be the issues that are more relevant to scan? Do you have something from where I can choose? [Asking to interviewer] That would be helpful.” (INT19)

“For me, conducting it [S.Scan for SSC] without dividing on sectors is a barrier. If it is not well defined on a particular topic, we will obtain a lot of diverse information. If it is not well targeted, we can lose them [managers], I think that they could say: “Well, that is very difficult”. [...] So, the solution could be targeting on sectors, that’s it! Or targeting on topics!” (INT39)

Problem perception changed at the end of interventions. TargetBuilder allowed managers to overcome their limitations to understand SSC and to broaden their vision by including actors and topics they had never thought of before:

“I would say yes [it was useful], at least for me, because I doubted at the beginning when I was in a ‘business logistics’ logic, whereas in fact we see that it [SSC] is much larger than that. So, in quotation marks, I restrained my brain at the beginning, when what we needed was to open it.” (EV10)

“This is a huge topic, a very, very huge topic, that implies many, many actors. If you listed them, it is because you know that there are a lot. It implies thousands of actors from different countries and plenty of trades. This is a truly global context and a complicated economic environment. So, yes. I found it [the approach] very useful. Now, I see we will get something to work with.” (EV02)

The system facilitated discussions between participants allowing the collective identification of their information needs for SSC matters:

“At beginning, there was a lot of things, a lot of information and I asked myself thousands of questions. Now, I think we come to the end. The result is what counts. The crossings in the matrix, etc., and that is interesting.” (EV05)

“I think the method may be used also on marketing, or on innovation, or on others fields. That's why it seems interesting for me. It is that by following this collective approach, even when none of us is specialized in SSC, we get to identify what we will have to scan.” (EV03)

4.6.2.2 Targeting outputs

Table 4-6 shows a synthesis of obtained targeting outputs and declarative perceptions of acceptance of TargetBuilder by participants. It includes: the size of the resulting matrix by experiment, the total number of selected AxT in the Target Matrix, whether PAC functionality was used or not, and the number of AxT for each PAC category as identified by participants in experiments.

Table 4-6. Targeting outputs from interventions

Outputs	Intervention									
	V01	V02	V03	V04	V05	V06	V07	V08	V09	V10
List of relevant actors for S.Scan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
List of relevant topics for S.Scan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target Matrix	Partial	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Size of Target Matrix containing most important AxT	11x46	9x36	9x4	4x15	11x6	10x7	7x3	6x4	5x4	5x10
Total selected AxT	N/A ^a	N/A ^a	26	41	29	40	11	14	18	32
PAC utilisation	No	N/A ^a	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
• AxT with PAC = No satisfactory at all	N/A ^a	N/A ^a	8	41	10	11	4	4	10	21
• AxT with PAC = Needs to be improved	N/A ^a	N/A ^a	13	0	11	16	4	6	6	10
• AxT with PAC = Satisfactory	N/A ^a	N/A ^a	5	0	8	13	3	4	2	1
Declared user acceptance	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

^a. Not applicable because Target Matrix was not finished

Participants considered that the Target Matrix obtained is a condensed representation of their information needs in S.Scan. In 8 out of 10 interventions, the Target Matrix was satisfactorily achieved, and in 9 out of 10 the system was overall well accepted as a solution for targeting S.Scan.

However, the Target Matrix could not be finished in the first two interventions (EV01 and EV02). Even when participants prioritized actors and topics to scan in their respective lists, the resulting Target Matrices were simply too big to deal with (EV01 with a matrix size of 11x46 and EV02 with a size of 9x36). It prevented an adequate presentation of matrices to be usable for managers in practice. This situation leads us to put even more emphasis on the definition of the most important actors and topics to scan from lists. We proposed to start by selecting the only five actors and topics considered as the most important to scan (those that actually capture or concentrate the most concerns on SSC for the organisation at present). Then, during discussions, participants added other actors or topics that they considered as very important to scan. As a consequence of this change, we were capable of producing acceptable and actionable target outputs in the remaining eight interventions.

In two interventions (EV01 and EV04), participants did not use PAC's colour-coding because they took a monochromatic approach, adopting a radical position about their capacity to obtain information based on the presumed capacity of other co-workers to be informed. In the first case (EV01), the participant decided to colour code all the AxTs in Green because he presumed that there must be someone in the organisation with the capacity to be early informed about the retained AxT without knowing who the person might be. In the other case (EV04), the participant adopted the very opposite heuristic: he decided to code everything in Red because the AxT were very important according to him, but yet he did not know whether anyone in the organisation had the capacity to be early informed. During the 8 other cases, participants coloured the resulting matrices following their perception about the organisation's capacity to be early informed. In EV06 for instance, filtering the Target Matrix using the PAC criteria allowed focusing the organisation's attention on only 11 priority AxTs rather than 40 (as shown in Figure 4-6). This was a useful result for the participants because they obtained a clear and precise view of which AxTs represented a priority in the S.Scan process. Thus, they knew exactly what decisions to take to cover actual blind spots (i.e. red AxTs).

Figure 4-6. Example of application of importance and PAC based filtering of the Target Matrix from intervention in EV06

Resulting target matrix from EV06 including all retained actors and topics			Activist groups	Authorities	Clusters	Communities	Customers	Financial institutions	Government agencies	Leader actors	Suppliers		
			NGOs	Ministries	Professional-technical centers	Chamber of commerce	Competitors	Consumers, users	Agency 1	Agency 2	Innovators	Tier 1	Tier 2
Environmental	Emissions	Emissions	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
		Energy	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
	Materials	Eco-materials	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
		Hazardous materials	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
		Material consumption reduction	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
		Cost and revenues of recycling	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
	Products and services	Eco-design	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
		Eco-technologies	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
		Materials recycling	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
		Eco-friendly vehicles	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Transport	Employee displacement	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
	Flux optimization	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
	Improvement in the volume/km ratio	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
Water	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑		
Logistics and SCM	Business models	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
	Relocation	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
	Urban logistics	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
Product responsibility	Customer health and safety	Marketing communications	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
		Customer pedagogy	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
	Product and service labelling	Environmental information	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
		Product traceability	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	

Resulting target matrix from EV06 including only actors and topics retained as the most important by participants			Activist groups	Authorities	Clusters	Customers	Financial institutions	Government agencies	Leader actors	Suppliers	
			NGOs	Ministries	Professional-technical centers	Consumers, users	Agency 1	Agency 2	Innovators	Tier 1	Tier 2
Environmental	Materials	Eco-materials	☑	☑	☑	☑	☑	☑	☑	☑	☑
		Material consumption reduction	☑	☑	☑	☑	☑	☑	☑	☑	☑
	Products and services	Cost and revenues of recycling	☑	☑	☑	☑	☑	☑	☑	☑	☑
		Eco-design	☑	☑	☑	☑	☑	☑	☑	☑	☑
Product responsibility	Product and service labelling	Environmental information	☑	☑	☑	☑	☑	☑	☑	☑	
		Product traceability	☑	☑	☑	☑	☑	☑	☑	☑	

^aPriority filters: Actors importance 3 and above, topics importance 4

Resulting target matrix from EV06 including only AxTs in which organization perceived not to have anticipatory capacity			Activist groups	Customers	Leader actors	Suppliers	
			NGOs	Consumers, users	Innovators	Tier 1	Tier 2
Environmental	Materials	Eco-materials			☑	☑	
		Material consumption reduction			☑	☑	
Product responsibility	Product and service labelling	Environmental information	☑	☑	☑	☑	
		Product traceability	☑	☑	☑	☑	

^bPriority filters: Actors importance 3 and above, topics importance 4 and PAC filter: AxT identified without anticipatory capacity

4.6.2.3 Acceptance evaluation

To deal with subjectivity and improve the validity of results (Kock, 2004), we performed a rigorous double coding process that we validated by inter-coder consensus. Two of the researchers coded transcriptions based on the coding scheme shown in Table 4-7. Both coded interviews and commentaries about TargetBuilder, organizing them into three categories: positive criticism, negative criticism, and development

suggestions. The inter-coder agreement rate, based on pairwise agreements between coders (Rust & Cooil, 1994), was 83.80 %. This value exceeds the recommended minimum for exploratory studies (i.e., 70 %) (Nunnally & Bernstein, 1994).

Table 4-7. Coding scheme for interventions

Code	Description
Concerning TargetBuilder	
SYSposit	Positive criticism of the system
SYSnega	Negative criticism of the system
SYSsugg	System development suggestion
Concerning adaptations to Target method	
METposit	Positive criticism of the method
METnega	Negative criticism of method
METSugg	Method development suggestion

We used positive (SYSposit, METposit) and negative criticisms (SYSnega, METnega) to evaluate the acceptance of participants according to two criteria (Davis, 1989):

- Perceived usefulness defined as the degree to which a person believes that using a particular solution would enhance his or her job performance.
- Perceived ease-of-use that refers to the degree to which a person believes that using a particular solution would be effortless.

Table 4-8 shows the coding results of interventions using the coding scheme presented in Table 4-7.

Table 4-8. Content analysis results from interventions

Codes	Numbers of coded verbatim fragments per intervention										Total
	EV01	EV02	EV03	EV04	EV05	EV06	EV07	EV08	EV09	EV10	
SYSposit	1	6	1	0	0	1	0	4	10	12	35
SYSnega	5	0	0	0	0	0	0	0	4	0	9
SYSsugg	17	2	25	0	0	1	0	0	5	0	50
METposit	4	3	23	9	5	19	3	11	16	37	130
METnega	8	9	39	5	5	0	1	0	1	0	68
METSugg	2	0	23	6	3	2	17	0	7	3	63
Totals	37	20	111	20	13	23	21	15	43	52	355

As shown in Table 4-8, the system (SYS) and the adaptations of the Target method (MET) received more positive than negative criticisms. Table 4-9 shows a synthesis of the results of the thematic analysis.

Table 4-9. *Verbatim fragments from thematic analysis*

Evaluation criteria	Positive criticism	Negative criticism
Perceived usefulness	<p>A useful approach for targeting S.Scan that offers condensed real-time results</p> <ul style="list-style-type: none"> • <i>“It’s simple like that [with TargetBuilder] because you have everything at the end.” (EV02)</i> • <i>“What is interesting for me is the immediate visualization in squares and the matrix approach.” (EV09)</i> • <i>“We get a clear synthesis. We can see all the topics we dealt with and that is very clear.” (EV10)</i> <p>A useful approach for identifying scanning priorities</p> <ul style="list-style-type: none"> • <i>“It is the first structured and guided deliberation about a kind of development that concerns the future. It provides us with elements to think and to influence decision making. It would be useful when we have several options to arbitrate.” (EV08)</i> • <i>“They [results] serve primarily to prioritize, that’s it, and to have a slightly clearer picture.” (EV09)</i> 	<p>Hardly readable results depending on matrix density and size</p> <ul style="list-style-type: none"> • <i>“It is not really familiar. It is a little dense. The result that we get is large. We filtered over priority and you see... we have so many actors. We do not have selected a lot but at the end we have a large packet.” (EV01)</i> • <i>“The interior of the squares seems very difficult for me. There are a lot of things. When there are a lot of things, I see nothing. So, what is important? (asking to us)” (EV09)</i>
Perceived ease-of-use	<p>A ludic approach simple to use</p> <ul style="list-style-type: none"> • <i>“I find it visual enough, easy enough. (EV06)”</i> • <i>“A question or two explanations helped me understand the meaning of the choices that were available [...] I like it, because it is visual, it is functional, it is interactive, and it is alive. I think that doing this on paper has been be more tedious.” (EV08)</i> 	

As shown in Table 4-9, participants perceived TargetBuilder as a ludic and useful system for targeting S.Scan that facilitates managers getting condensed results and identifying priorities to scan. However, they identified an acceptance problem related to readability of the results in the Target Matrix module. This situation caused some participants to be discouraged about the real contribution of TargetBuilder to enhancing their performance of targeting S.Scan. This problem was solved in the 3rd iteration through emphasis on the definition of actor and topic importance (section 4.5.3), and with a functionality to allow displaying only the desired elements in each cell in the 4th iteration.

4.7 Discussion and conclusions

This research focuses on examining how targeting could be improved by the use of a specialized system conceived to help managers in this task. Lessons in designing, implementing, using, and evaluating the system through four iterations in 10 interventions allow identifying the contributions that we present and discuss in this section.

4.7.1 Contributions of the research to the Target method

This study enables to propose four significant improvements to the Target method that were never mentioned before in the S.Scan literature (Figure 4-7):

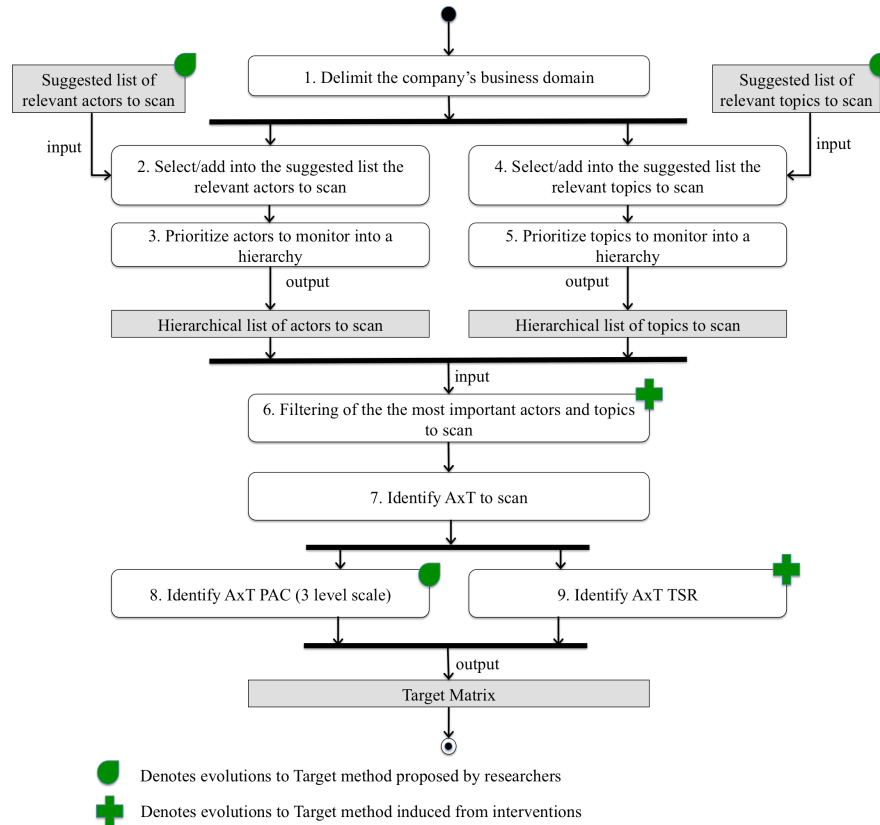
- The suggestion of lists of actors and topics to participants as starting points to trigger and facilitate discussions.
- The use of perceived importance to identify and prioritize the most important actors and topics to scan to produce smaller and more manageable Target Matrices.
- The introduction of PAC as a qualitative self-assessment to evaluate the perceived organisation's capacity to be informed early enough about a particular AxT.
- The introduction of TSR to evaluate the relevancy of a particular AxT in the short-, mid- or long-term.

Our results introduce temporality and anticipatory capacity concepts as new theoretical contributions in the field of S.Scan.

Time scales of short-, mid- and long-term represent the concept of temporality. Temporality is contingent upon both the organisation's decisional context and the speed of change in its business environment. Considering temporality entails increasing the information needs dimensions from two (Actors and Themes) to three (Actors, Themes and Time). This change allows going deeper in reflecting what the priorities and blind spots to scan are, as well as for whom and in what time frame. Also, it increases our understanding about what "anticipating" means. Anticipating does not necessarily mean to contemplate too far in the future but to do it on different time scales on the basis of perceived priorities. Seemingly, the introduction of this concept contributes to a better

acceptance of targeting. Without it, targeting results would have not been useful for participants in some of our interventions.

Figure 4-7. Improvements to the Target method through the action research process



Anticipatory capacity is the set of resources, skills and knowledge that an organisation can use to identify changes in its business environment and act early. Resources can be human, technological and informational. Their use helps organisations to build information threads. Skills refer to the ability of the organisation to mobilize relevant, diverse and complementary sources of information. Knowledge to determine organisational information needs relates to the understanding of the actors and themes from which changes could come and also of organisational priorities, weaknesses and blind spots.

Anticipatory capacity needs to be dynamic to see coming changes in a moving environment. It implies developing the resources, skills and knowledge used to identify new themes and actors. TargetBuilder is a first step to assess and support the development of these dynamic anticipatory capacities. An avenue for future research would be to develop more accurate and actionable indicators for anticipatory capacity.

4.7.2 Contributions of the research to targeting activity

Concerning social situation contributions, the results of this research can be useful to help managers through their decision process by:

1. Identifying information needs for S.Scan of fuzzy subjects:

Managers were initially unable to identify their information needs for S.Scan because SSC was revealed as a fuzzy concept in the interviews performed at the diagnosis stage. The use of both the Target method and TargetBuilder enables producing results that are a condensed representation of participants' priorities in S.Scan, relevant for their context, and according to their strategic objectives.

2. Allowing an efficient use of resources for intelligence activities:

Since organisations do not have unlimited budgets to scan their entire business environment, reducing the scope of S.Scan can provide them with effective and useful results. In this research, we probe the definition of actor and topic importance, and the use of PAC and TSR as mechanisms to identify priorities to scan. This reduction of scope is very important in situations where the context is fuzzy or too large, when participants want to explore new dimensions of their environment, when they are starting S.Scan activities, or when they have no previous experience with this activity.

3. Reducing risks of S.Scan failure:

The use of TargetBuilder and the Target method allow managers to successfully deal with several failure factors for setting up and running S.Scan that were already identified in the literature (Lesca & Caron-Fasan, 2008), such as having no clear or consensual priority, divergent interests among stakeholders, absence of a shared interest, objectives not being clearly defined, or a scanning focus that is too wide.

4. Establishing an assessment of organisational scanning capacities:

In this paper, participants use PAC to evaluate their organisation's capacity to be informed early enough about a particular AxT. This assessment allows them to identify blind spots and define priorities to scan in order to establish a starting point to initiate scanning activities, or to make decisions to improve their capacity to be informed according to their priorities.

5. Identifying scanning priorities according to a temporal horizon of decisions:

Decisions do not all have the same temporal horizon. In this research, participants suggest and test TSR as a mechanism to identify their information needs priorities for S.Scan in the short-, mid- and long-term. This allows them to have a clear picture of where to concentrate their scanning efforts according to their strategic horizons and the nature of the decision to be made. This result is a new insight that has never been highlighted in previous publications.

6. Fostering teamwork participation:

TargetBuilder offers a ludic and interactive environment that triggers and encourages discussion and participation of members from different departments or units within the organisation. Some of these members neither exchange ideas regularly nor share the same vision, understanding, or interest about the subject. Interventions with TargetBuilder and the adapted Target method allow a diversification of viewpoints for identifying information needs and facilitate the acceptance of results at the end of interventions.

7. Broadening managers' understanding of social situations:

During interventions, the use of suggested lists of actors and topics facilitates and triggers discussions of participants about a subject that was weakly understood. Lists also allow managers to broaden their environment understanding by including actors and topics that they had never considered before. However, the construction of the lists is a long process that is difficult to be performed in practice by individual organisations. We believe that a new system or functionality would be necessary to help automatize or assist managers in the building of lists of actors and topics relevant for each new S.Scan context.

4.7.3 Results validity and limitations

Some limitations, however, are present in this research. Even though the experiments allowed developing TargetBuilder, the same participants who suggested improvements did not backward validate the introduced changes. This is a consequence of the incremental nature of the research in real situations with various organisations. Finally, perceived ease-of-use was only partially evaluated because users did not

manipulate the system themselves. They actively participated in meetings but the authors manipulated the system.

4.7.4 Future work

Regarding improvements to the Target method, further research could be oriented to more deeply study the value of PAC and TSR as prioritizing criteria for targeting S.Scan and enhancing S.Scan outputs' utility for decision-making in organisations. Concerning TargetBuilder, further research could evaluate if managers take ownership of the system in scenarios where they use it themselves without our assistance. Future work would also focus on testing the adaptation of the system to contexts other than SSC. However, the development of mechanisms to facilitate the creation of lists of actors and topics to suggest in each context seems necessary to fit the method to any particular S.Scan context.

Additionally, TargetBuilder as a web system has the potential to be used in environments other than meeting rooms, such as remote or asynchronous scenarios, or as a large-scale Internet service available for different business sizes or sectors. Interoperability with other S.Scan systems must be developed, especially with systems oriented to information search on the web.

4.8 References

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Appendix 4-1. List of interviews with participating organisations in diagnosis stage

Org.	Business sector	Interviewees	Modality	Duration
Industrial companies				
- INT01	Electronic components	2	Face to face	0h47
- INT02	Packing and packaging materials	1	By phone	0h50
- INT03	Industrial electronics	1	By phone	1h00
- INT04	Personal protection gear	1	By phone	1h00
- INT05	Cosmetics, toiletries and hygiene	1	By phone	0h57
- INT06	PCs and consumables	1	Face to face	1h30
- INT07	Cereal and grain processing small-medium industry	1	Face to face	0h50
- INT08	Dairy products small-medium industry	1	By phone	1h00
- INT09	Gastronomic specialties small-medium industry	1	By phone	1h00
- INT10	Candy and chocolates small-medium industry	1	By phone	1h00
- INT11	Dairy products small-medium industry	1	By phone	0h40
- INT12	Candy and chocolates small-medium industry	2	Face to face	1h00
- INT13	Hand tool manufacturer small-medium industry	1	Face to face	1h30
Trading company				
- INT14	Alcoholic drinks distributor	1	By phone	0h50
- INT15	Printer and photocopier service provider	1	Face to face	1h00
- INT16	Pet products distribution	1	By phone	1h00
- INT17	Lamps and lighting distribution	2	Face to face	1h04
Logistics service provider				
- INT18	Distributor-owned logistics service provider	1	By phone	1h15
- INT19	Distributor-owned logistics service provider	2	By phone	1h10
- INT20	Logistics service provider	1	By phone	0h55
- INT21	Logistics service provider	1	By phone	0h50
- INT22	Logistics service provider	1	By phone	0h46
- INT23	Logistics service provider	1	By phone	1h10
- INT24	Logistics service provider	1	By phone	1h15
- INT25	Logistics service provider	1	By phone	1h10
- INT26	Freight forwarder	1	By phone	0h40
- INT27	Port traction provider	1	By phone	0h50
- INT28	Fresh food forwarder	1	By phone	1h15
Infra/superstructure management				
- INT29	Port services	2	Face to face	1h15
- INT30	Logistics infrastructure manager	1	By phone	1h10
- INT31	Waterway manager	2	By phone	1h20
Institutions				
- INT32	Scientific and technical research	1	Face to face	1h10
- INT33	Urban community	1	Face to face	1h30
- INT34	Inter-communal organisation	2	By phone	1h27
- INT35	Local authority	2	Face to face	1h00
- INT36	Competitiveness cluster	1	By phone	0h50
Others stakeholders				
- INT37	Consulting office for management	1	By phone	0h55
- INT38	Documentation and information service	1	By phone	1h02
- INT39	Consulting and auditing in information systems	1	By phone	1h15
- INT40	Consulting office for communications	1	By phone	1h00
- INT41	Consulting office in supply chain management	1	By phone	0h55
- INT42	Independent truck operator union	2	By phone	1h00

Appendix 4-2. Intervention semi-structured assessment guide

- Does the method seem useful to obtain targeting results? Why?
- Does this approach seem redundant with other practices that you already have? With which ones?
- Does the computer system seem useful to obtain targeting results? Why?
- How the system should be improved to have a value for your business?
- Does the approach is easy to understand?
- Could you easily reuse this approach?
- What should be done to make the approach easier to understand and use?
- Does this approach something that you could / would use again?
- What should be done to make the approach more acceptable in your business?

5 S.Scan through collective targeting for SSC - an ACAP perspective

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5.1 Abstract

In order to provide useful results, strategic scanning must target the parts of the environment that correspond to strategic priorities. Despite its importance, there has been limited research on targeting. We use concepts from absorptive capacity theory to study how collective targeting can support strategic scanning. Through an intensive analysis of qualitative data collected from three field interventions, this research suggests that interactions between participants during targeting activities provide further benefits than just identifying the business environment to scan. Our results highlight the value of collective targeting to develop organisational absorptive capacity. They suggest that collective targeting allows participants to enhance their capabilities to acquire new knowledge, share their prior knowledge and experience, recognize value of new knowledge, develop a common understanding of activation triggers, and develop social integration mechanisms.

5.2 Introduction and research motivation

It is hard to imagine a manager in today's business organisations who could avoid performing any kind of strategic scanning (S.Scan). Ranging from personal, informal or unstructured practices to organized, centralized and specialized units or even outsourced services, S.Scan has become an essential activity to help managers keep informed of evolutions (Hambrick, 1982; Lesca et al., 2012), understand their business environment (Smircich & Stubbart, 1985; Teo & Choo, 2001), identify threats and opportunities (El Sawy, 1985; Xu et al., 2003), support innovation (Rohrbeck &

Gemünden, 2011), anticipate changes (Choo, 1998), reduce uncertainty (May et al., 2000), support decision-making (Walkers et al., 2003; Lesca et al., 2012), and secure or improve competitiveness (Jennings & Lumpkin, 1992; Wei & Lee, 2004). Accordingly, “to the extent that an organisation's ability to adapt to its outside environment depends on knowing and interpreting the external changes that are taking place, S.Scan constitutes a primary mode of organisational learning” (Choo, 1999, p.21).

S.Scan has been defined as “the acquisition and use of information about events, trends, and relationships in an organisation’s external environment, the knowledge of which would assist management in planning the organisation’s future course of action” (Aguilar, 1967, p.1). S.Scan as a strategic information system is supported by information technologies (Wei & Lee, 2004; Lau et al., 2012) and specialized systems can help gather and analyse information from the business environment. The issue, however, is to design and configure systems to harvest relevant information while disregarding irrelevant information (Wagner, 2004). Even though some authors have suggested that organisations should “conduct a 360° scanning of their environment” (Battistella & Toni, 2011, p.1031), in practice no organisation has the resources to scan its entire business environment. Instead, in order to be efficient and provide useful results, some authors have proposed a phase prior to information gathering denoted as “targeting” (Lenz & Engledow, 1986; Gilad & Gilad, 1988; Choo, 1998; Lesca & Lesca, 2014). This phase allows managers to identify the parts of the environment on which to focus their attention in relation to strategic objectives and priorities.

Despite its importance, little is known about how to carry out this targeting phase. Most research is limited to: describing the characteristics of information needs (e.g. Wilson, 1984; Choo, 1998); identifying the difficulties in generating information needs (e.g. MacMullin & Taylor, 1984; Case, 2002); or proposing a process to conduct targeting in practice (e.g. Gilad, 2004; Lesca & Lesca, 2014); none explores the contributions of targeting to S.Scan and whether it should be an individual or a collective activity. Our study seeks to address this gap and thus contribute to the S.Scan literature.

As S.Scan could be carried out in organisations by groups or teams of individuals (El Sawy & Pauchat, 1988; May et al., 2000; Rouibah & Ould-ali, 2002), we are interested in targeting activities where participants coming from different parts of the organisation work collectively on defining the scope of S.Scan, for instance using

meeting room and collaborative systems. For this purpose, we draw on absorptive capacity (ACAP) theory, a well-established theoretical approach, and we apply its concepts to the study of collective targeting.

Over the last three decades, ACAP has been a prevalent theory used to explain the ability of an organisation to recognize the value of new external knowledge, acquire it, assimilate it, and apply it to commercial ends (Cohen & Levinthal, 1990; Lane et al., 2006; Roberts et al., 2012). Some authors have suggested links between ACAP and S.Scan, especially about the acquisition of knowledge. Indeed, S.Scan enables the identification of knowledge from various external sources (Flatten et al., 2011; Haller et al., 2013) and helps produce expertise that is essential for determining the potential value of external knowledge (Zahra & George, 2002).

ACAP theory can serve as a theoretical lens for understanding how collective targeting contributes to S.Scan. Specifically, it can provide additional explanatory power over existing literature on S.Scan targeting in two ways. First, ACAP is based on the contributions of organisational members. However, it focuses on the links across members' absorptive capacities rather than the sum of their individual capabilities (Cohen & Levinthal, 1990). Still, it can help interpret how collective targeting interactions can reinforce links between participants. Second, ACAP theory states the existence of antecedents that influence knowledge acquisition. ACAP can help explore collective targeting in relation to these antecedents.

Despite significant work on ACAP, a major criticism remains: much research is on its benefits but little work has been carried out on the study of its antecedents (Jansen et al., 2005; Volverda et al., 2010). We address this by focusing on the antecedents of ACAP in the context of targeting in S.Scan based on our empirical fieldwork; and we aim to study empirically how collective targeting contributes to S.Scan in order to expand ACAP. We hope this will provide insights into (1) the benefits for organisational ACAP of collective interactions in the identification of S.Scan information needs, and (2) the elements to be agreed/negotiated between participants to facilitate targeting.

This study is the first to examine the contributions of collective efforts to perform targeting for S.Scan and explore the value of collective targeting from the perspective of ACAP theory. Our study can also make practitioners more aware of why

targeting should be a collective rather than individual activity, and how they can carry it out to identify their information needs for S.Scan.

First, we discuss the background literature on targeting S.Scan and ACAP theory. Then we present our research context, participating organisations and our research methodology, which was based on data gathered during three collective targeting interventions in these organisations. Then we analyse our findings and discuss their contribution to both S.Scan and ACAP as well as their limitations.

5.3 Theoretical foundations

5.3.1 Targeting strategic scanning

There are two distinct but complementary modes of information gathering in S.Scan (Vandenbosch & Huff, 1997; Lesca et al., 2012): “focused search” that is used when managers look for information to answer specific questions or to help take specific decisions to guide the search of information; and “scanning” is used when managers carry out “pre-attentive” monitoring without having pre-specific questions or decisions likely to guide the search. “Scanning” is based on the monitoring of information that could help anticipate changes in the business environment.

In this research we focus on “scanning” because managers who use this mode have a very vague idea of what to look for; therefore information gathering can be very difficult if the organisation has not previously targeted its search. Delimiting the scope of S.Scan is crucial since organisations must choose how to allocate resources among the overwhelming number of potential information sources. This contrasts with “focused search” where the overall scope of the information search is bounded by the problem (Choudhury & Sampler, 1997). For several authors (e.g. Choo, 1998; Lesca & Lesca, 2014), the first phase of S.Scan is a phase of definition of information needs, usually called targeting.

Targeting consists in delineating “the part of the external environment to which the executives in an organisation deem it relevant to focus their attention as a matter of priority, and for a given period” (Lesca & Lesca, 2014, p.22). It is the process of expressing and translating tacit or implicit managers’ information needs into an explicit form that can lead to collective and organisational action. Identified information needs

can also be used as input into information systems for collecting and analysing information. In practice, identifying information needs for S.Scan is often perceived as a difficult task (Choo, 1998; Case, 2002).

Five strategies have been proposed to limit the scope of S.Scan:

- (1) Limiting the number of information sources to consult (El Sawy, 1985; Zhang et al., 2009);
- (2) Monitoring only key trends or specific critical events (Nanus, 1982; Wei & Lee, 2004; Gilad, 2004);
- (3) Limiting the number of emerging issues being tracked (Stubbart, 1982; El Sawy & Pauchant, 1988);
- (4) Defining the topics and competitors to scan (Gilad & Gilad, 1988);
- (5) Identifying and interrelating the relevant topics and actors to scan, as well as the information sources to examine (Lesca & Lesca, 2014).

This latter targeting strategy seems to us the most inclusive for two reasons. First, in addition to topics and sources, it also incorporates the actors in the environment whose decisions and actions could have an influence on the organisational future. The notion of actors is close to that of stakeholders (Freeman, 1983) and is not restricted to competitors. Second, it considers the interrelation between identified relevant actors and topics to scan, together with the information sources that should be scrutinized. The latter is important because only some combinations of actors and topics are relevant to scan. We focus here on this targeting strategy to investigate how collective targeting contributes to S.Scan in “scanning” mode. We next examine what concepts from ACAP theory can be of help to analyse these practices.

5.3.2 Absorptive capacity: An overview of relevant concepts

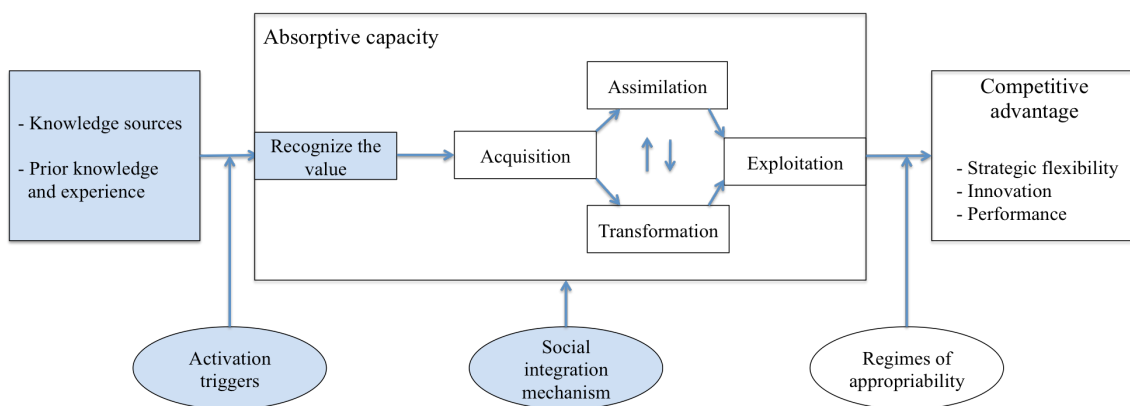
ACAP was originally defined as “the ability of a firm to recognize the value of new external information, assimilate it, and apply it to commercial ends” (Cohen & Levinthal, 1990, p. 128). ACAP has been considered as critical to encourage innovation and development of competitive advantage. Developed initially in the field of innovation and R&D (Cohen & Levinthal, 1990; Henderson & Cockburn, 1994), it was then mobilized in other areas such as: organisational learning (Jansen et al., 2005; Lichtenthaler, 2009), inter-organisational learning (Lane & Lubatkin, 1998; Tsai, 2001),

strategic management (Mowery et al., 1996; Vandenbosch et al., 1999), and information systems (Roberts et al., 2012; Saraf et al., 2013).

Later, Zahra and George (2002) reconceptualised ACAP in response to critiques about the ambiguity and diversity of definitions, components, antecedents and outcomes of the theory developed till then. They defined an organisation’s ACAP as “the set of organisational routines and processes by which organisations acquire, assimilate, transform and exploit knowledge to produce dynamic organisational capabilities” (p. 186). As shown in Figure 5-1, they propose four capabilities that combined together represent the ACAP of an organisation:

- Acquisition denotes an organisation’s capability to identify and acquire external knowledge that is critical to its operations.
- Assimilation refers to the capability to analyse, interpret and understand the knowledge obtained from external sources.
- Transformation is the organisation’s capability to develop and refine routines that combine existing and new knowledge.
- Exploitation represents the capability to refine, extend and modify existing competences by incorporating newly transformed knowledge.

Figure 5-1. ACAP model (Todorova & Durisin, 2007)



The information systems (IS) literature has also contributed to these four capabilities. The implementation process of an IS can help organisations acquire new knowledge through interactions between consultants and organisational members (Volkoff et al., 2004; Ko et al., 2005). Enterprise Resource Planning systems can provide new external knowledge from “best-practices” embedded in the system itself (Srivardhana & Pawlowski, 2007). Other IS such as knowledge management systems,

facilitate transformation and exploitation of tacit knowledge (Pavlou & El Sawy, 2006). For its part, S.Scan can foster acquisition capability (Zahra & George, 2002; Flatten et al., 2010; Haller et al., 2013) which is itself influenced by five antecedents represented in blue in Figure 5-1 and further detailed in Table 5-1.

Table 5-1. *Antecedents influencing the acquisition capability*

Antecedents	Description	Authors
Knowledge sources	The greater an organisation's exposure to diverse and complementary knowledge sources, the greater its ACAP.	Zahra & George (2002)
Prior knowledge and experience	Past experience of an organisation influences, on the one hand, the locus of its search for knowledge, and on the other hand, its ability to acquire and assimilate external knowledge especially when it is new or remote from its current activities. A greater diversity of prior knowledge and experience facilitates the acquisition of new knowledge in organisations.	Cohen & Levinthal (1990) Zahra & George (2002)
Recognizing the value	Organisations' ACAP depends on the ability to value new external knowledge. Recognizing the value refers to the organisation's ability to understand, in due time, the potential of new knowledge. Prior knowledge as well as the understanding of the organisation objectives and constraints can enhance its ability of seeing the potential of new external knowledge.	Cohen & Levinthal (1990) Todorova & Dusisin (2007)
Activation triggers	They refer to events, situations or issues that encourage the response of an organisation to a specific stimulus. These triggers influence the relationship between knowledge sources, experience and acquisition capacity. Triggers can be: internal as those that redefine the strategy of the organisation, or external like those that could impact the future of the industry sector to which the organisation belongs. A shared understanding of the triggers and their strategic meaning among organisational members supports fast and efficient acquisition of knowledge.	Kim (1998) Zahra & George (2002) Marsh & Stock (2006) Todorova & Dusisin (2007)
Social integration mechanisms	They refer to the mechanisms that build connectedness and shared meanings, and therefore influence all components of ACAP. They impact the social interactions, and the knowledge processes that take place among organisational members.	Zahra & George (2002) Todorova & Dusisin (2007)

5.4 Research method

5.4.1 Research objectives

Our research aim is to explore how collective targeting contributes to expanding ACAP theory. We attempt to answer the following two questions: What are the benefits for organisational ACAP of collective interactions in the identification of information needs? What elements should be agreed/negotiated between participants to facilitate targeting? To explore these questions, we studied 6 collective targeting meetings with 17 managers within the headquarters of 3 organisations in which we intervened

following a Multiview action research approach (Avison & Wood-Harper, 1990; Avison et al., 1998; Baskerville & Wood-Harper, 1998).

5.4.2 Research context: sustainable supply chains

Sustainability has been at the root of many changes in organisations over recent years. Supply chains are particularly involved because of their potential contributions to environmental solutions (Carter & Rogers, 2008; Pagell & Wu, 2009). Incentives to develop and adopt sustainable supply chains (SSC) can impact the future of the industry to which an organisation belongs. SSC are an activation trigger that can encourage sustainable organisations.

Our interventions were conducted as part of a larger exploratory research project sponsored and financed by two government agencies in a European country. This project aims to help managers overcome the lack of external information identified as one of the barriers to SSC initiatives (Walker et al., 2008; Wu & Pagell, 2011). The interventions involved one large and two medium-sized organisations operating in manufacturing, distribution and logistics (see Table 5-2).

Table 5-2. Organisations and profile of participants

Org.	Brief description	2012 Net sales (US\$ millions)	Number of employees	Participants position/role
ORG1	A hand tool manufacturer whose brand is well known as one of the leaders in the commercial construction market. As half of their production is exported to foreign countries, their SSC issues include: local compliance and geographic evolution of markets. The organisation is in a transition period having been acquired by an American company.	450	570	<ul style="list-style-type: none"> • Supply chain manager • Quality manager • Environmental quality manager • Production manager • Customer service manager • Unit production manager • Marketing manager • Buyer assistant • R&D manager • Product manager
ORG2	The wholesale pharmaceutical distributor leader in the European country concerned. Working as the link between producers and retailers, their SSC issues include: warehousing, urban distribution, customer health and safety.	6500	3600	<ul style="list-style-type: none"> • Logistics manager • Organisation and methods manager • Pharmaceutical and quality manager • Purchasing manager
ORG3	A worldwide leader in electronic components with operations in more than 10 countries. Their interest in SSC includes: reducing their carbon footprint, human rights, sourcing, and flow management.	390	940	<ul style="list-style-type: none"> • Logistics manager • Sustainable development manager • Supplier quality manager

5.4.3 Research design: Multiview action research

Action research involves adapting theory into practical concepts to influence actions in organisations, assist in practical problem-solving and feed back into academic research (Baskerville & Wood-Harper, 1998; Shah et al., 2007). During an initial exploration we found that the notion of SSC was a fuzzy concept for our organisations. Even when they were interested in adopting S.Scan for SSC, they did not know how to start and how to define their information needs. We played a “helping role” by collaborating with practitioners and providing expert advice, technical knowledge and independent viewpoints (Baskerville & Wood-Harper, 1998).

The primary goal of this collaboration was helping organisations define their information needs for S.Scan on SSC. By doing this, we were able to study closely their collective targeting activities and how they contribute to developing acquisition capabilities. The same linear process was used for all interventions, using the framework of the Multiview action research methodology as presented in Table 5-3.

Table 5-3. *Multiview action research method adopted in this study*

Characteristics of action research	Characteristics of Multiview action research (Baskerville & Wood Harper, 1998)	Characteristics of the Multiview action research method adopted in this study
Process model	<p>Linear process Involves a single sequence of activities.</p>	<p>The intervention follows a step-by-step linear process: (1) Researchers contact organisations that are interested in participating in the study because of their interest in S.Scan on SSC and because they have difficulties in doing so. (2) Organisational stakeholder chooses and invites members of the organisations to participate in joint meetings with researchers. (3) At the beginning, participants give background information to help researchers understand their organisational context. Researchers then present S.Scan concepts and targeting method to participants. (4) During the meetings, participants interact with researchers to learn and engage with the proposed targeting method and appropriate it. (5) Participants use the proposed method to define their organisational information needs. (6) The researchers’ intervention is evaluated through an assessment by participants.</p>
Structure	<p>Rigorous structure Delineates stages, steps or activities carried out in a sequence or cycle, or selected according to rules or heuristics.</p>	<p>The targeting method, the action research method and the researchers who carry out the intervention are the same for all interventions.</p>

Table 5-3. *Multiview action research method adopted in this study (...continued)*

Characteristics of action research	Characteristics of Multiview action research (Baskerville & Wood Harper, 1998)	Characteristics of the Multiview action research method adopted in this study
Researcher involvement	Facilitative involvement Distinguishes the researcher as an expert. Subjects carry the weight of solving the problem. The task of the researcher is to facilitate subjects with expert advice, technical knowledge or an independent viewpoint.	Researchers are involved as experts in a helping role by providing guidance and knowledge to participants about: concepts, methods, advice, independent opinions and viewpoints, and lessons learned from previous interventions.
Primary goals	System design To create or modify an organisational system.	The primary goal is to help organisations define their information needs for implementing S.Scan on SSC.

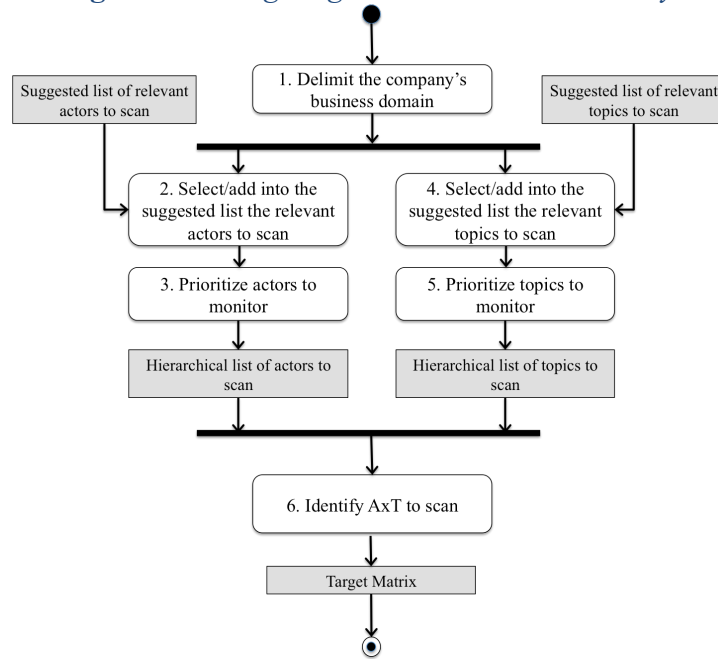
5.4.4 Data collection

Data was collected during meetings that lasted 2-3 hours each. Five meetings were conducted, three for ORG1 and one each for ORG2 and ORG3. All meetings were audiotaped and transcribed. Researchers' feedback was also noted in a logbook. Data were stored in a meeting room system that was implemented to facilitate targeting in collective settings (Chapter 4).

The targeting method (Lesca & Lesca, 2014) was used to define information needs for S.Scan. It starts by identifying lists of relevant actors and topics to scan. An actor is a natural or legal person whose decisions and actions could have an influence on the future and the activities of the organisation. The topic is a centre of interest relevant to the future of the organisation. Actors and topics are later interrelated in the form of a "Target Matrix" where participants retain only the cross-relations Actors/Topics (AxT) that are relevant and important to them.

Researchers suggested lists of potential actors and topics to scan. During the meetings, these lists were used to facilitate discussions between participants. They were based on a literature review of SSC and earlier research (Chapter 3). The targeting method is presented in Figure 5-2 and was implemented as a meeting room system for our interventions.

Figure 5-2. Targeting method used in this study



5.4.5 Data analysis

Two researchers independently double-coded transcripts following a hybrid approach (Boyatzis, 1998; Saldaña, 2009). First, an initial set of categories was identified based on the ACAP framework (see Table 5-3). We focused on the antecedents that influence acquisition capability (see Table 5-1). Data were then open-coded by thematic units to identify emerging sub-categories. Thematic units, i.e. interactions between participants (Strauss, 1987; Montgomery & Duck, 1990), were used instead of meaning units (e.g. phrases, paragraphs) because we were interested not only in individual statements but also in the exchanges that allow participants to share and build conceptualisations, representations, ideas, or impressions.

Table 5-1. Coding scheme for data analysis

Antecedents	Codes	Coding category of interactions
Knowledge sources	SOU	Comments about the extent to which the interventions of researchers (involved as experts in the Multiview action research) provided new knowledge to participants.
Prior knowledge and experience	EXP	Interactions enabling the improvement of prior knowledge and experience among participants.
Recognizing the value	VAL	Interactions enabling the development of capabilities to recognize the potential of new valuable knowledge. It includes the development of common cognitive structures about the organisations and its constraints.
Activation trigger	ACT	Interactions enabling a better understanding of SSC (since SSC was the topic of the intervention).
Social integration mechanisms	SOC	Interactions enabling communication and collaboration among members that could support future internal transfer and exploitation of knowledge.

Through a comparative process (Miles & Huberman, 2010) data was grouped based on how it fitted into emergent sub-categories. Inter-coder agreement rate, based on pairwise agreements between coders (Rust & Cooil, 1994), was 79.19%. This value exceeds the recommended minimum for this type of studies (70%) (Nunnally & Bernstein, 1994).

5.5 Results

Our results are presented in five parts consistent with our coding scheme (see Table 5-3). They show evidence of contributions of collective targeting to each of the five antecedents influencing the acquisition capability identified in the literature (see Table 5-1); and they instantiate these antecedents in 9 sub-categories providing further insights into the contributions of collective targeting and S.Scan to organisational ACAP (see Table 5-4).

Table 5-4. *Results from the thematic analysis of the collective targeting interventions¹*

Major / Sub- categories	Code	Organisations / meetings					Total
		ORG1			ORG2	ORG3	
		M1	M2	M3	M4	M5	
Number of participants during meetings		3	8	9	4	3	27
Knowledge sources	SOU	0	8	14	9	10	41
- Knowledge about S.Scan and targeting	SOUmeth	-	4	5	4	4	17
- Knowledge about SSC	SOUlist	-	4	9	5	6	24
Prior knowledge and experience	EXP	2	15	13	13	20	63
- Information sharing	EXPinfo	2	8	8	11	9	38
- Sharing of practices and experience feedback	EXPprac	-	7	5	2	11	25
Recognizing the value	VAL	10	4	6	12	15	47
- Building a shared business vision	VALbuss	5	0	2	3	7	17
- Building a shared strategic vision	VALstrat	1	-	3	7	4	15
- Building a shared understanding of anticipation	VALanti	4	4	1	2	4	15
Activation trigger	ACT	1	2	4	0	4	11
- Building a shared understanding of SSC	ACTssc	1	2	4	0	4	11
Social integration mechanisms	SOC	1	2	5	2	5	15
- Sharing a common language	SOClang	-	2	3	1	4	10
- Boundary spanning mechanism	SOCboun	1	0	2	1	1	5
Totals		14	31	42	36	54	177

¹The values represent the number of thematic coded units for each major category and sub-category.

5.5.1 Knowledge sources

Interactions show evidence of knowledge transfer from the researchers to the participants. It puts the researchers not only in a helping role, but also makes them a new valuable source of external knowledge for the organisation, therefore increasing the organisational ACAP:

Knowledge about S.Scan and targeting refers to targeting and S.Scan concepts, methods, IT solutions and expertise that the researchers provided through intensive discussions, interactions and guidance, to which the participants had not been exposed before. They recognized this knowledge transfer as an organisational learning process: *“Basically, it is about the appropriation of this working method, see if it is okay or not, turn it to fit even better to organisation’s operations. It is about learning a way of working, and in particular, about a new way of working together”* [ORG1-M3]. The participants not only accepted this new knowledge, but they also started to appropriate it by considering whether and why it should be disseminated to others in the organisation:

ORG3-M5-P1: So, if we have this result, it can be shared. It can be a way for us to share with others. After all, are they going to buy it or not? Will they use it to “prioritize” or not?

ORG3-M5-P2: Yes, my point is this. If they build it together, rather than ... I do not mind bringing it they will not buy it. They will look and say “OK, this is what you did, great!” And then it will stop there. But, if they build it, then...

ORG3-M5-P3: I agree with you. It will not get easier, but I agree with you. Now we can say to them that this method exists, and that they can do the same exercise.

ORG3-M5-P2: Yes, absolutely, it is to be used ... It's just that, in fact, I think it is to be used and reused, actually... well. I think that the approach, the logic is good.

Some participants were interested in using it to identify information needs on other topics than SSC: *“I think the method may be used also on marketing, or on innovation, or on others fields”* [ORG1-M3]. They also identified alternative uses of the targeting method: first, as a management tool to monitor the S.Scan process: *“Actually, it is something that could be a measuring instrument, from a management point of view. Not really to measure, but to compare one year to another”* [ORG2-M4]. Secondly, as an action plan to identify and pilot priorities in and between activities: *“This is a tool that seems interesting enough to have a precise mapping, and at the same time, it is simple enough to guide teams to prioritize their work ... That’s it. There are plenty of things to do. It is an action plan! Behind it, there is an action plan”* [ORG2-M4].

Knowledge about SSC refers to the scope of SSC, what may be relevant topics and actors to scan, and what issues it raises. At the beginning managers had limited insights and SSC was a fuzzy and unclear notion. They tended to reduce it to their understandings, embedded on the one hand, into their own practices and organisational priorities, and on the other hand, into their actual knowledge of what best practices other organisations in their industry had already implemented. When exposed to the lists of actors and topics, participants were mostly surprised to discover that they had neither heard nor thought of some aspects of SSC: *“I found them [actors and topics] relevant. There was some that I never thought about before. ‘Regulators’, for instance, they are good ones. Also, what you said about truck sizes, regulations and others that I discovered”* [ORG1-M3].

5.5.2 Prior knowledge and experience

The presence of participants from different services broadened the diversity of knowledge, and promoted information sharing about daily practices. Sharing of prior knowledge and experience also resulted both in a better understanding of key issues in S.Scan for SSC, and in the identification of gaps in the actual acquisition capacity at the organisational level:

Information sharing refers to interactions where a participant provided information previously unknown to other participants. It allowed them to clarify topics under discussion, justify the need to scan specific actors or topics, and assert viewpoints about possible scenarios. Information shared was both external (e.g. regulatory changes, customer expectations) and internal (e.g. future changes in the organisation, explanations about the operation of internal services or processes). For example, talking about the relevance of adding a topic related to the measurement of greenhouse gas emissions, a participant informed the others about a law coming into force that may have an impact on the organisation:

ORG2-M4-P1: We know how to measure it now, but...

ORG2-M4-P2: According to the regulations, yes. We are asked to do it. Apparently, we need to do it for next year...

ORG2-M4-P1: No, we need to do it for this year.

ORG2-M4-P2: (Surprised) For this year?

ORG2-M4-P1: Yep. For this year

Sharing of practices and experience feedback refers to interactions where participants both enrich discussions by illustrating ideas and sharing their personal experiences from daily practices. Some participants were familiar with these practices because they are part of their job, but some others were not. Below, three participants discussed the practices implemented in the organisation for gathering customer feedback about product usage:

ORG1-M3-P1: What measures have we got today to see what end-users think?

ORG1-M3-P2: This is in auditing... We do...

ORG1-M3-P3: Application technicians.

ORG1-M3-P2: Yes, that's it. We go in the field...

ORG1-M3-P1: Are there some of us still doing it?

ORG1-M3-P2: We have two people who are in there all the time, three days per week minimum, with customers.

ORG1-M3-P3: However, it's a bit like purchasing. There are different practices in different units.

Interactions also helped participants identify significant gaps in the actual acquisition capability of the organisation. Below, participants discovered they did not know about sustainable practices of foreign suppliers:

ORG3-M5-P1: We work with top-tier carriers, and when we ship to Asia, I do not know with whom they are carrying. And if I ship to the depths of the provinces of those countries, I know that I can arrive there in five days, but to whom they will contract, I do not know.

ORG3-M5-P2: Have you had that problem yet?

ORG3-M5-P3: Yes, I saw it on a supplier audit, where, when I asked about the compliance of labour laws, they said, "This is in conformity with national legislation". So I cannot go further than that. This is in conformity with the legislation. Now, the requirements of the regulation of that country, of course...

ORG3-M5-P1: Exactly. Absolutely. In addition, it is clear that we cannot duplicate our needs, demands, expectations... they are not "duplicable". So we have to settle for that. Recently, we needed it... We had a call for tender in which we had to answer this question, and we had to know how it happens at our Asian supplier. We send them a checklist. The only thing we can say now is: "Well, yes, they are in conformity with our demands, but..."

ORG3-M5-P3: First, we cannot check it, and second, their requirements are very, very far from our European requirements. And therefore, we cannot fight against it.

5.5.3 Recognizing the value

Participants had to negotiate and agree on issues that would enhance the organisational ability to recognize the potential value of new external knowledge. It was achieved by building shared understandings of business visions and anticipation:

Building a shared business vision about operational aspects was necessary to identify the targets of S.Scan. Interactions encouraged the sharing and understanding of visions from different business units: *“It also allows broadening and accepting that maybe others could have different visions we don’t know. [...] Actually, the problem is to share what we want to do, but we only get there by small steps.[...] I think that’s why I really see a real benefit, because in fact, at the same time, it gives us a vision of the others”* [ORG1-M1]. Participants were able to build their business visions around a unifying topic: *“That’s why it seemed to me interesting to structure and show that by a collective approach, even if none of us is specialized in SSC, we were able to bring out the things that we have to scan”* [ORG1-M2]. The interaction below shows that a participant was able to broaden his vision by recognising social constraints in daily logistical issues: *“Well, it broadens, actually. I really had only the logistics part in mind, in fact. Whilst here, we went out of logistics. Eventually, it became a bit of my original question. We went out of the principle of “supply chain” - let’s say - and thus there is more than a principle of ... Well, I do not know, it is “sustainable development” and other stuff...”* [ORG3-M5-P1].

Building a shared strategic vision was another requirement to identify the targets of S.Scan. To do so, participants had to agree about strategic priorities. The interaction below illustrates the negotiation of different viewpoints about strategic priorities when considering customer expectations:

ORG1-M3-P1: I think there are two that are a priority. I mean: what do we want to pass as a message? So, consumer awareness and energy bill? Costs?

ORG1-M3-P2: Yes, but the bill...

ORG1-M3-P3: Do we orientate everything towards “company profit”?

ORG1-M3-P1: What does it mean?

ORG1-M3-P3: That is to say: what is beneficial for the company? This is both to have a message for our customers in the sense of what they want, what they will expect, and then at the same time, to measure the savings that can be achieved...

ORG1-M3-P2: We will not have the same levers according to what orientation we take.

Building a shared understanding of anticipation was another concern since the purpose of S.Scan was to enhance the organisational ability to anticipate changes in the sustainable logistics environment. Building a common understanding of anticipation implied agreeing about the relevance of timescales (short, medium and long-term). Initially, the notions of timescale for S.Scan were not the same for participants. In the

interaction below, timescale had to be negotiated to reach a common understanding of anticipation:

ORG3-M5-P1: When we talk about strategic scanning, for me, it is something that must be done immediately.

ORG3-M5-P2: Yes, but there may be things also in the long-term.

ORG3-M5-C1: And for you, long-term, what is it? Is it a year? Is it ten years?

ORG3-M5-P1: No, for me, long term, it would still be 18 months and beyond.

ORG3-M5-P2: We were told three years.

ORG3-M5-P1: Yes.

ORG3-M5-C1: Okay. That's the long-term for you.

ORG3-M5-P1: Between 18 and ... Yes.

ORG3-M5-P2: In microelectronics, a cycle is six months.

ORG3-M5-P3: Yes.

5.5.4 Activation triggers

Participants built a shared understanding of what SSC meant for them, what new issues it raised, and how it could trigger changes. This understanding among organisational members fosters speed and efficiency in the acquisition of new knowledge.

Building a shared understanding of SSC was not easy because participants were not experts and had different understandings due to respective operational concerns. At the beginning, the participants belonging to logistics and transport units found it the hardest to absorb sustainable concerns. Discussions drove these participants to broaden their understanding of SSC: *“I would say yes, at least for me, because... I asked at the start and I stayed in a ‘business logistics’ logic, when in fact it is much larger than that. So, in quotation marks, I restrained my brain at the beginning, when what we needed was to open it”* [ORG3-M5]. Through interactions, participants were able to develop a common meaning of SSC and relevant elements: *“That's why it seems interesting for me. It is that by following this collective approach, even when none of us is specialized in SSC, we get to identify what we will have to scan”* [ORG1-M3].

5.5.5 Social integration mechanisms

Sharing of a common language refers to agreeing terminologies and wordings, not only to foster communication and collaboration among participants, but also to identify information needs that can be communicated to and understood by other organisational members who will be involved into S.Scan for SSC: *“Yes, that is*

speaking to us. That speaks to the ten people who are here, but it must be clear also to others” [ORG1-M3].

Boundary spanning mechanism refers to the creation of communication paths that foster collaboration and knowledge sharing. Participation in collective targeting enhanced relationships among members from different parts of the organisation and put in relation members that had not talked before. Below, participants comment on the usefulness of collective targeting to develop a common language about SSC and to build communication paths:

ORG3-M5-R: So, did you find this intervention useful?

ORG3-M5-P1: It is something useful for internal sharing, because it allows developing an agreement about the definitions.

ORG3-M5-P2: And also, to know what others are doing, because we don't know what is happening in each other's department. The problems of logistics are something that we didn't know before today.

5.6 Discussion and conclusions

Our research provides in-depth findings on how collective targeting and S.Scan contribute to developing antecedents of acquisition capability in ACAP (see Table 5-5). They show that both collective targeting and action research interventions contribute to improve organisational ACAP.

Table 5-5. Synthesis of the main results

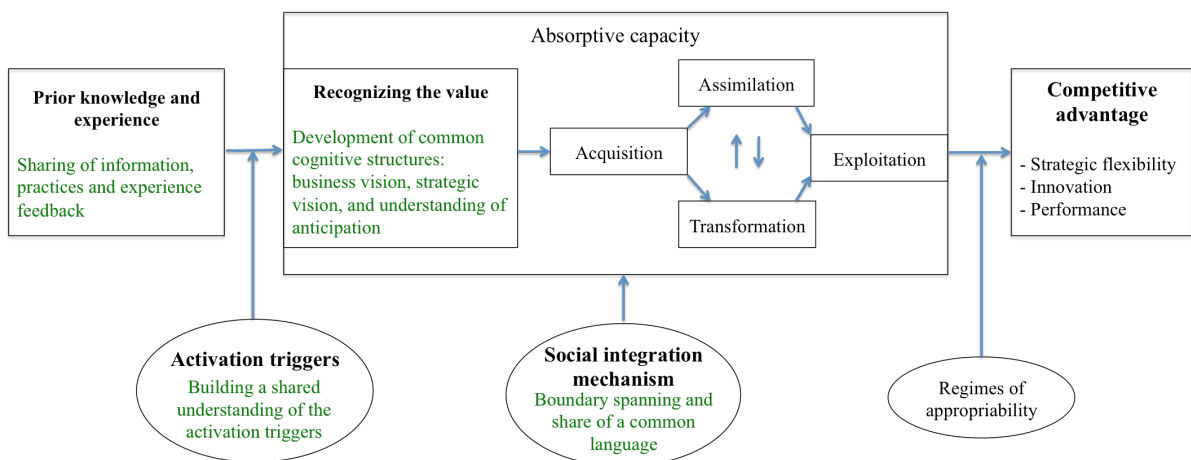
Antecedents	Description
Contributions of Multiview action research to develop organisational ACAP	
Knowledge sources	During interventions following a multiview action research method, researchers not only played a helping role, they also provided new knowledge to the participants (e.g. new concepts, new methods, new IT and new expertise). They act as a new valuable source of external knowledge for the organisation that can contribute to increasing organisational ACAP.
Contributions of S.Scan and collective targeting to develop organisational ACAP	
Prior knowledge and experience	Collective targeting, with participants from different services, promotes sharing of information, daily practices and prior experiences and broadens the diversity of knowledge. It fosters both the understanding of key issues in S.Scan for SSC, and the identification of gaps in the actual acquisition capacity at the organisational level.
Recognizing the value	Collective targeting makes participants build shared understandings of strategic and operational visions, and anticipation, in order to develop the capability of the organisation to recognize the potential value of new external knowledge.
Activation triggers	Collective targeting makes participants share their individual understandings of activation triggers and their possible implications in terms of impact, issues and priorities for the organisation. They build a shared understanding of the activation triggers that contributes to better identify their information needs for S.Scan and foster organisational acquisition capacity of new knowledge.
Social integration mechanisms	Collective targeting makes participants discover they need to share a common language not only to define their information needs for S.Scan, but also to disseminate them to collaborators in order to foster acquisition capacity of new knowledge at the organisational level. Participation in collective meetings allowed the creation of communication paths that foster knowledge transfer inside the organisation.

5.6.1 Contributions of S.Scan and collective targeting to develop organisational absorptive capacity

Previous research has concentrated on the study of the benefits of ACAP but has neglected its the antecedents (Jansen et al., 2005; Volverda et al., 2010). In this regard, several authors have suggested that S.Scan can foster acquisition capability (Zahra & George, 2002; Flatten et al., 2011; Haller et al., 2013), but without offering details on how this happens. In this paper we address this gap by: first, providing evidence of the contributions of S.Scan and more specifically, collective targeting to develop antecedents of organisational ACAP; and second, providing empirical details about how this contribution occurs. As represented in Figure 5-3, our results suggest that collective targeting interactions increase organisational capability by allowing:

- (6) Sharing prior knowledge and experience that foster future knowledge acquisition;
- (7) Build shared understandings of organisational activities and strategy that will develop the capability of the organisation to recognize and acquire new valuable knowledge;
- (8) Improve shared understanding of activation triggers that will facilitate organisational responses to these triggers;
- (9) Develop social integration mechanisms that will foster knowledge acquisition and transfer in the future.

Figure 5-3. Contributions of collective targeting to ACAP



5.6.2 Contribution of Multiview action research to develop organisational absorptive capacity

Previous research has shown that IS implementation is a source of external knowledge for organisations. Not only because of the knowledge embedded in the IS themselves, but also by the exchanges with designers and consultants (Volkoff et al., 2004; Ko et al., 2005; Srivardhana & Pawlowski, 2007). Action research has also been presented as “a way of convincing non-researchers of the value of the research” (Constantinides et al., 2012). We show that interacting with researchers during an action research project is a major source of external knowledge for organisations. As experts in a helping role by providing guidance and knowledge, researchers contribute to an “action learning” process that facilitates the appropriation process of both conceptual knowledge (e.g. S.Scan and targeting concepts; lists of topics and actors of the SSC), new methods (e.g. collective targeting), new IT (e.g. the room meeting system prototype we implemented) and expertise (e.g. know-how and lessons learned from previous research and practice). Multiview action research enables organisations to become aware of new knowledge and evaluate its relevance to their organisational settings, and possibly experiment before deciding to apply it.

5.6.3 Contributions of the research to targeting and S.Scan practices

Our study suggests that interactions between participants during collective targeting provide further benefits than just identifying the business environment to scan. In order to facilitate targeting, some elements needed to be agreed upon between participants. They concerned the sharing of: language, issues, business vision, strategic vision, understanding of anticipation, and understanding of activation triggers. Through interaction, participants were able to develop a common understanding of these elements, facilitating the identification and acknowledgement of information needs at the organisational level as interventions progressed.

One of our interventions proved difficult since it faced two major failure factors of S.Scan IS projects as identified in the literature: an unstable team composition across meetings and a misalignment between S.Scan and organisational strategy (Lesca and Caron-Fasan, 2008); still, we observed that collective targeting could help overcome two other failure factors (Ibid): by helping to reduce the focus of scanning and defining

objectives clearly; and by producing the target matrix that was considered a useful communication tool as well as a way to facilitate management involvement.

This research brings new insights firstly into how to carry out S.Scan targeting and about the benefits of its collective practice; and secondly, how to better align S.Scan information systems with organisational strategies and activities, and with external environmental issues and triggers. S.Scan targeting should be performed as inclusively as possible. The participation of members from different organisational parts fosters information needs definition and can facilitate future information gathering, dissemination and analysis. Finally, interactions among participants during collective meetings should be strongly promoted. These interactions include those with external experts or researchers in order to feed learning and appropriation of methods and external knowledge.

5.6.4 Limitations and avenues for future research

Future research could include a larger number of cases, in a range of different organisations, and about different triggers or topics for activation. A longitudinal study following a S.Scan implementation from beginning to end would help study contributions of collective targeting as S.Scan iterates and progresses through the subsequent phases of acquisition and utilization.

Information technologies such as our meeting room system can be a useful tool to facilitate interactions among participants, and constitutes an organisational memory by providing a repository of targeting data. These include elements agreed such as language, lists of actors and topics to scan, and can be easily employed for internal dissemination. Future research could also explore whether and how targeting data could form an input for automated information gathering and analysis in S.Scan systems.

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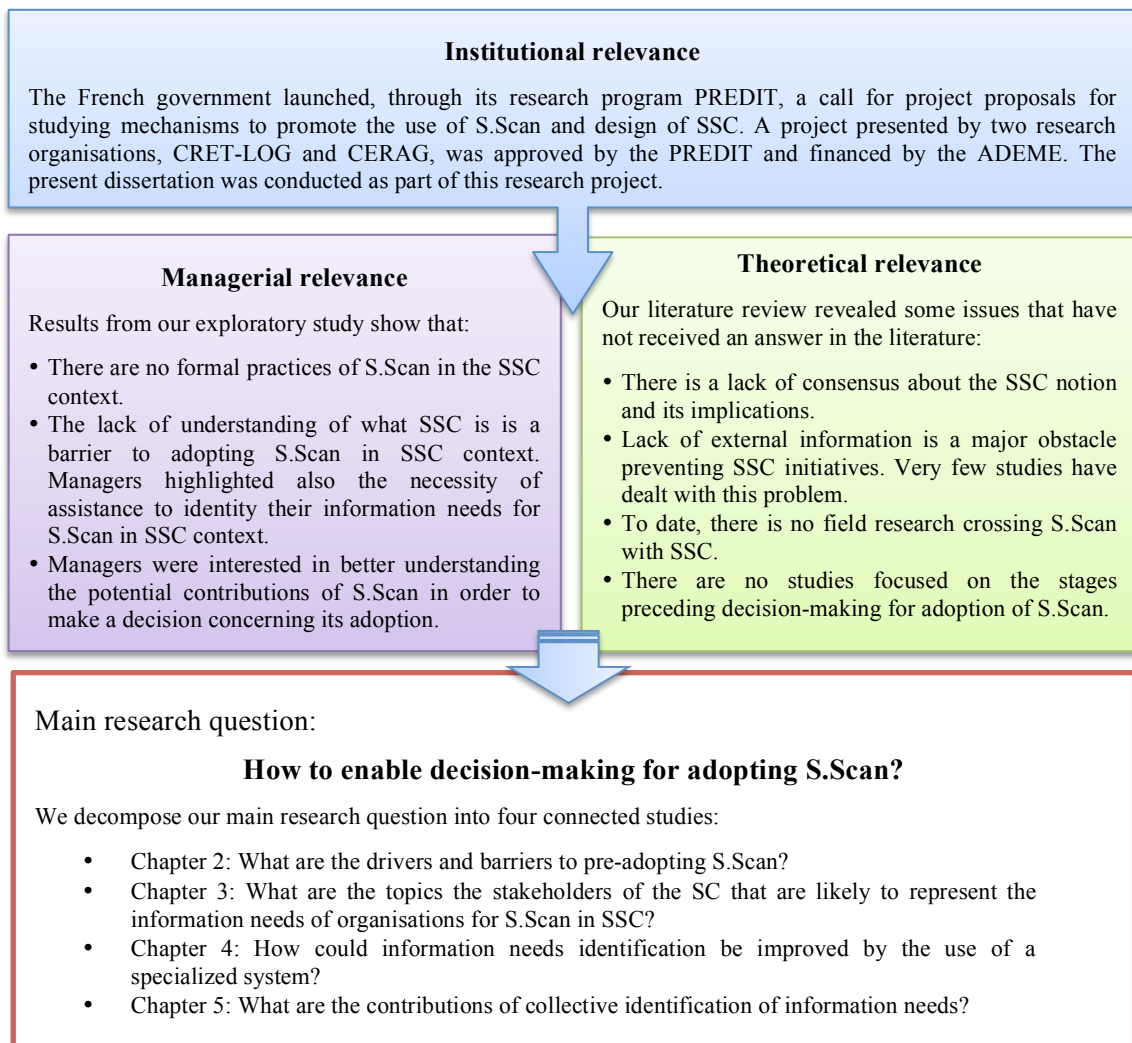
6 General Conclusion

In this chapter, we discuss how each of the four studies contributes to answering our research questions. First, we review our motivations and research objectives. Afterward, we sum up the results of each study and then we state the general contributions of this dissertation. Finally, we point out the limitations of our work and identify issues for future research.

6.1 Revisit: Motivations and Objectives

Motivated by an institutional request, reoriented by the findings from our exploratory study, and confirmed by a gap in the literature, this dissertation addresses the research question: How to enable decision-making for adopting S.Scan? (Figure 6.1)

Figure 6.1. *Research motivations and questions*



6.2 Summary of Research Findings

This dissertation follows a multi-paper model in which each connected study contributes to answering our main research question. In response to our research objective, we studied, in the first place, the drivers and barriers for pre-adoption of S.Scan in order to enhance our understanding of this stage of the adoption process. Then, we Trial S.Scan targeting with managers in order to Provide them with more tools for their decision-making about S.Scan adoption. Consequently, our four studies contributed with diverse blocks to answer our research question.

- Our first study (Chapter 2) allowed us to understand that institutional pressures have an influence into the mental decision of whether or not to adopt S.Scan. This result is important if we consider that SSC in the context of this dissertation is subjected to several institutional pressures. As we reported in this study, such pressures were linked not only to S.Scan activity but also to SSC adoption itself.
- Chapters 3 and 4 contributed to the trial and improvement of the Target method, allowing identification of information needs for S.Scan in SSC context. Further, these improvements allowed introducing two new concepts to S.Scan to help practitioners identify their priorities to scan. Both studies are strongly linked. While Chapter 3 contributes to identifying the stakeholders and topics likely to represent information needs of managers in SSC context, Chapter 4 combines them, in a meeting room system, with temporal considerations and self-perceived anticipatory capacity with the aim of facilitating S.Scan targeting and to identifying priorities to scan.
- In Chapter 5, we studied interactions in collective targeting meetings to understand the contribution of such activities to developing organisational ACAP. Our work allowed the understanding of which themes are to be agreed/negotiated in order to facilitate targeting activity and to produce results that represent the information needs of the organisation as a whole. The results of this chapter contribute to managers' decisions for adoption of S.Scan by highlighting connected benefits to the organisation from the practice of S.Scan, for example, increasing ACAP.

Each study also has specific contributions that we summarize in Table 6.1 below. These contributions are presented as a whole in the following section.

Table 6.1. Specific contributions of each chapter

Study	Results
Chapter 2: Drivers and barriers to pre-adoption of S.Scan in SSC context.	[Empirical knowledge] Contribution to S.Scan body of knowledge by identifying the drivers and barriers to pre-adopting S.Scan
Chapter 3: S.Scan for SSC: Where to start?	<p>[Model] An adaptation of the Triple bottom line model including the topics from SD likely to represent information needs for S.Scan in SSC context</p> <p>[Model] A model for SSC including the stakeholders from SC likely to represent information needs for S.Scan in SSC context</p> <p>[Method] Improvements to Target method by including lists of topics and stakeholders to scan as starting points to trigger/facilitate information needs identification</p>
Chapter 4: Improving targeting of S.Scan: design and implementation of a meeting room system	<p>[Concept] Introduction of temporality as a new dimension to define information needs for S.Scan.</p> <p>[Concept] Anticipatory capacity as the set of resources; skills and knowledge that an organisation can use to identify changes in its business environment and act early</p> <p>[Method] Improvements to Target method by identifying time relevancy and organisation's anticipatory capacity as mechanisms to define priorities for S.Scan.</p> <p>[System] A meeting room system to facilitate information needs identification for S.Scan</p>
Chapter 5: S.Scan through collective targeting for SSC - an ACAP perspective	[Model] An adaptation of ACAP model including the contributions of S.Scan collective targeting

6.3 Contributions

This dissertation makes several contributions to theory, research and practice. While these contributions were highlighted at the end of each chapter, the overall contributions of the dissertation are presented in this section.

6.3.1 Contributions to theory

This dissertation contributes to theory by: (1) advancing our knowledge of the antecedents and contributions of S.Scan targeting, (2) proposing new concepts and

improvements to the way we proceed to identify information needs, and (3) decrypting what meaning managers give to SSC.

- **Advancing our knowledge of the antecedents and contributions of S.Scan targeting**

What does the literature say?

To date, the contributions focused on S.Scan targeting have been centred on the study of the process for identifying information needs. There are no studies addressing what happens before the initiation of S.Scan when managers deliberate about the decision of adopt S.Scan.

In a similar vein, there are no studies focused on collateral contributions of S.Scan practices. Concerning targeting, no study has focused on identifying which gains a collective practice could contribute to organisations.

Our contribution:

In this dissertation, we offered insights into what surrounds information needs identification activities. Concerning antecedents of targeting, we identified that pre-adoption of S.Scan may be exposed to both rational and political pressures. On one hand, competitiveness (searching for pro-activity) and mimetic pressures (search for legitimacy) were revealed as driving pressures to starting S.Scan. On the other hand, performance constraints (i.e. lack of alignment, unclear objectives, and lack of resources and skills) and coercive pressures (lack of government encouragement) hindered S.Scan pre-adoption, even when the results of Chapter 2 are limited to the SSC context. However, they showed that rationality is not the only driver for pre-adoption of S.Scan. Instead, institutional pressures should also be considered when analysing pre-adoption of S.Scan.

Concerning collective targeting practices, we provide evidence that interactions during information needs identification improve organisational ACAP by (1) allowing the sharing of prior knowledge and experience that foster future knowledge acquisition, (2) building shared understandings of organisational activities and strategies that will develop the capability of the organisation to recognize and acquire new valuable knowledge, (3) improving shared understanding of activation triggers that will facilitate organisational responses

to these triggers, and (4) developing social integration mechanisms that will foster knowledge acquisition and transfer in the future.

- **Proposing new concepts and improvements to the way we proceed to identify information needs**

What does the literature say?

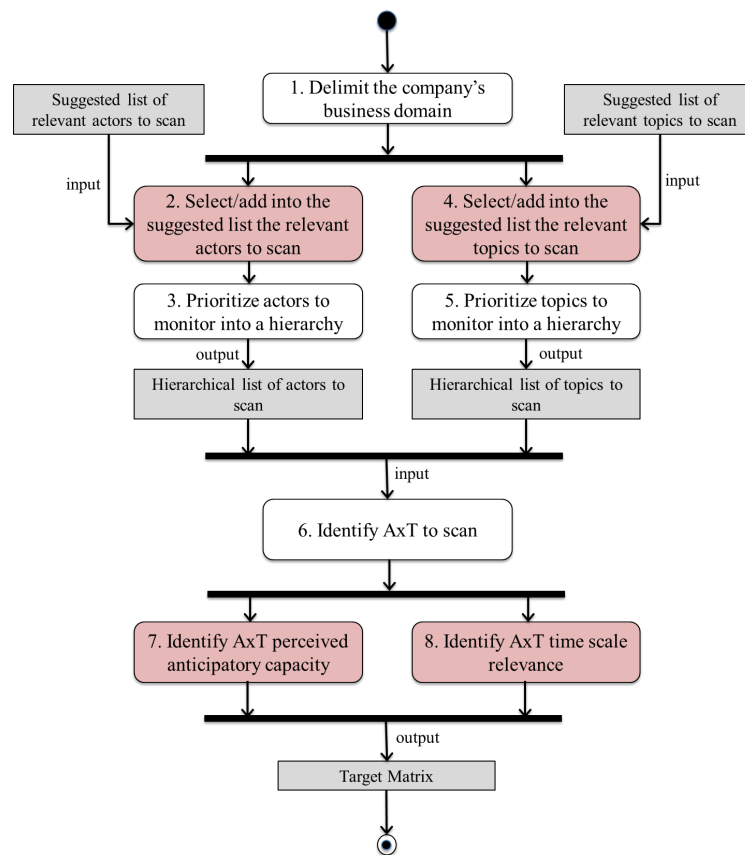
Three strategies have been proposed to identify information needs for S.Scan in the past. For this research, we start from the Target method (Lesca & Lesca, 2011) that proposes to link actors and topics to scan in order to represent information needs. Even though the Target method suggests the necessity to continuously revise the S.Scan target in order to adapt it, to date there is no mechanism to perform an assessment about the capacity to be informed about specific topics and actors.

Our contribution:

The knowledge about S.Scan targeting was improved by the introduction of two new concepts: temporality and anticipatory capacity. On one hand, temporality refers to identification of short-, mid-, and long-term time slots for identified information needs. This allows enhancing our understanding of anticipation and thus defining scanning priorities on a time basis. Temporality complements actors and topics as a new dimension to identify information needs, taking into account the relevance of these two in time. On the other hand, anticipatory capacity refers to the resources, skills and knowledge that an organisation has in order to be informed early. Efforts to develop this capacity could be organized as a function of self-assessment evaluations based on each information need and not necessarily as a whole.

The Target method was improved to include the two new concepts we theorised. Figure 6.2 highlights in red where the improvements to the Target method are introduced in this dissertation. The addition of a suggestive list of actors and topics developed in Chapter 3 was particularly useful in helping managers to make sense of unclear SSC concepts and identify their information needs.

Figure 6.2. Contributions to the Target method



- **Decrypting what SSC would mean**

What does the literature say?

Several authors (Svensson, 2007; Seuring & Müller, 2008b; Carter & Rogers, 2008; Pagell & Wu, 2009) have theorized that to introduce sustainability in supply chains, it is necessary to balance all three dimensions of SD. This translates into the idea that firms should engage in social and environmental activities that will help, or at least not harm, the economic performance of its supply chain (Seuring & Müller, 2008b; Carter & Easton, 2011).

Several authors have suggested that an effective integration of SD should be performed all along the SC and not in an isolated fashion (Krause et al., 2009; Wolf et al., 2011). This implies the participation of all the members in a supply chain from the initial supplier to the final consumer.

Finally, it has been suggested that a proactive behaviour concerning SD integration is more desirable than a reactive one because of its potential to

contribute to innovative, long-term and lasting solutions (Vachon & Mao, 2008; Vachon & Klassen, 2010).

Our contribution:

Chapter 3 provided new elements for the understanding of what a SSC is in terms of topics and stakeholders representing information needs of organisations. Thus, our results reported the prevalence of legal, environmental and economic interests in SSC focus on the close stakeholders in the forward SC as well as some institutional stakeholders. Regulation emerged as a key topic driving SSC initiatives in an organisation.

The extended view of a SC as a network of organisations working together was not present in our study. Instead, individual organisations worried of react worried of react to external incitation were the most prevalent figures. Our results put a question mark on the integration of sustainability in supply chains. We did not observe the balance of the three dimensions of SD in practice. Instead, a narrow view based on economic and green preoccupations seems to be closer to how organisations make sense of SSC.

6.3.2 Contributions to research

This dissertation makes two contributions to research, by (1) combining AR methods to investigate one general research issue, and (2) operationalizing AR with qualitative methods for data collection and analysis.

- **Combining AR methods to investigate one general research issue**

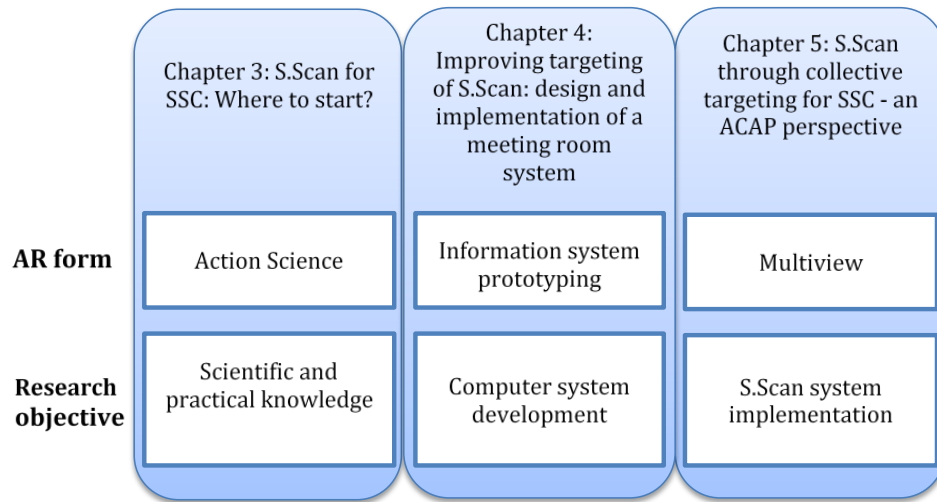
What does the literature say?

In their very well cited article, Baskerville and Wood-Harper (1998) have identified ten AR forms employed in the Information Systems research field. The authors characterized each of the AR forms by the process model, structure, researcher typical involvement, and primary goals. However, to date, no contribution has combined two or more of these forms in order to achieve its research objectives.

Our contribution:

The studies from Chapters 3, 4 and 5 each follow a different form of AR (Figure 6.3): action science, information systems prototyping and multiview AR, respectively. This approach was necessary since the objectives of each study were different. In all three AR forms used, researchers were involved as facilitators. However, the employed process model was different:

Figure 6.3. *AR forms employed in each study*



- In Chapter 3 we were interested in producing practical knowledge as well as scientific knowledge. However, we were interested in a reflective analysis of theory-in-use versus espoused-theory¹¹ as a means to unveil actual information needs and meaning given to SSC. Our objective and the type of process followed justified the choice of Action Science as the AR form for this study.
- The Chapter 4 objective was to design, develop and test a meeting room system to facilitate targeting. We followed an iterative process in which we completed four iterations of the AR cycle in order to introduce improvements to the system. Iterative computer system development is a well-used strategy to develop specialized systems (e.g. Boehm's spiral model of software development (Boehm, 1988)). The pursued objective

¹¹ An espoused-theory is one that an individual claims to be following. A theory-in-use is one that can be inferred from action (Argyris & Schön, 1978; Baskerville et Wood-Harper, 1998).

and the process model followed justified the choice of Information System prototyping AR form to address this portion of our general research issue.

- In Chapter 5, we were interested in studying the contributions to the organisation of collective targeting during S.Scan implementation. In this case, we were interested in introducing an organisational change (S.Scan targeting activity) and observing the results in the organisation. Thus, a linear process was followed and repeated in each organisation. Both research objectives and processes justified the use of a Multiview AR form in this case.

The combination of different AR forms allowed us to fulfil our general research objectives. Thus, the combination of these forms for studying small-connected portions of a general research issue is a contribution of this dissertation to research.

- **Operationalizing AR with qualitative methods for data collection and analysis**

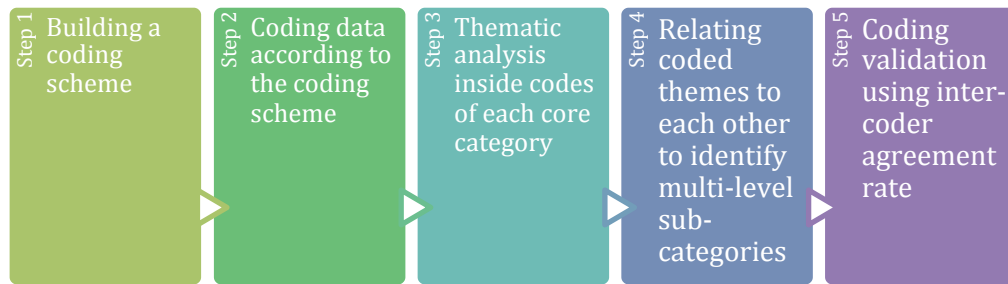
What does the literature say?

AR collection and data analysis has been performed using mixed methods (qualitative + quantitative). However, in the field of information systems, there are few contributions guiding researchers into the practice of AR data analysis to assure rigour and reduce subjectivity. Several solutions have been proposed, such as the use of the Grounded Theory approach (Kock, 2004).

Our contribution:

We followed a rigorous method for data collection and analysis in our AR implementation. We rigorously transcribed each intervention for analysis. We proposed, however, a five step approach mixing inductive and deductive thinking to analyse our collected data (Figure 6.4):

Figure 6.4. *Qualitative analysis approach used for action research interventions*



1. Coding scheme building. It involves the definition of the categories that will be used to guide coding. The coding scheme was built from the literature (Chapters 2, 4, 5) or induced from the data itself (Chapter 3).
2. Double coding of any data from transcripts that relates to the core categories identified.
3. Thematic analysis inside the data coded under a same category. The objective is to let the themes of each coded item emerge.
4. Interrelation of coded themes to each other connected theme. Combinations can be organized as multi-level sub-categories of core categories defined in step 1. If necessary, we can propose new core categories.
5. Estimating inter-coder agreement rate based on pairwise agreements between coders. Coding is validated when it exceeds the recommended minimum (70%).

This approach differs from the “open-axial-selective” method of the Grounded Theory in the fact that it starts from a coding scheme built from literature. As a result, this approach contributes to expanding and deepening the initial coding scheme. It allows not only to identify new core categories and sub-categories, but also to figure out the meaning given to each category by participants at interventions. We report that this approach could be used for analysing data collected through AR.

- **Proposing a qualitative assessment method for technology acceptance**

In Chapter 3, we reported about the utilization of a qualitative method to evaluate user acceptance of a computer system. Traditionally, user evaluation is performed by the use of surveys. However, in scenarios where the number of

users is reduced or when a system is in the initial stages of development, quantitative methods may not be the best option. Instead, our qualitative approach is presented as an alternative, as reported in this dissertation.

6.3.3 Contributions to practice

With regard to practice, this dissertation makes four contributions by (1) identifying political pressures driving and hindering adoption of S.Scan in SSC context, (2) identifying elements needed to be agreed upon between participants to facilitate information needs identification, (3) proposing new mechanisms to prioritize information needs for S.Scan, and (4) proposing a qualitative assessment method for technology acceptance.

- **Identifying political pressures driving and hindering adoption of S.Scan in SSC context**

Our results in Chapter 2 highlighted the necessity of managers who would like to start S.Scan activities to consider political influences as well as rational considerations. In the particular context of SSC, pre-adoption of S.Scan was hindered by lack of governmental encouragement for promoting SSC initiatives. Thus, we provide evidence that institutional pressures play an important role in the success or failure to start S.Scan activities. These pressures could be present in contexts other than SSC.

- **Identifying elements needed to be agreed upon between participants to facilitate information needs identification**

Chapter 5 reported that it is necessary to promote the sharing of four elements during targeting meetings in order to facilitate information needs identification. These elements are business vision, strategic vision, understanding of anticipation, and understanding of activation triggers. We observed that as interventions progressed, participants developed a common understanding of these elements that facilitated the identification and acknowledgment of information needs at the organisation level.

- **Proposing new mechanisms to prioritize information needs for S.Scan**

In Chapter 3, we contributed two concepts to identify priorities for S.Scan: Perceived Anticipatory Capacity (PAC) and Time Scale Relevance (TSR). PAC was used as a self-assessment evaluation of an organisation's capacity to be informed early enough about a particular crossing of actor and topic to scan. It allows identifying blind spots and defining priorities to scan.

TSR was used during interventions as a mechanism to identify scanning priorities according to a temporal horizon relevance of decisions in the short-, mid- and long-term. Thus, managers can use TSR to concentrate their scanning efforts according to these horizons and the nature of the decision to be made.

6.4 Limitations and Future Research

This research had two major limitations:

- First, this study was realized in the context of SSC. However, as discussed in Chapter 2, organisational priorities changed during our research because of the European debt crisis, which provoked the cancellation of almost all government stimulation measures that promoted sustainability adoption. This fact had an impact in the interest of participating organisations to pursue S.Scan implementation. Future studies can continue our research in other contexts, or use different IT for S.Scan, such as Big Data or Enterprise Social Networking, to enhance the results presented in this dissertation.
- Second, our study was concentrated on the initial stages of S.Scan adoption. We did not continue our observations about the decision-making stage of S.Scan. This condition limited our results concerning the impact of our initiatives on the final decision of adoption of S.Scan. Future studies can continue our research by focusing on the decision-making process. These studies could find a theoretical background in Decision Theory (Simon, 1960; Brim, 1962).

This dissertation leaves some issues open for future research about information needs identification for S.Scan:

- PAC and TSR concepts should be studied deeply to better understand them and their utility and impact on S.Scan activity.
- Concerning the preparation of the lists of actors and topics, the development of mechanisms to facilitate the creation of such lists to fit the method to any

particular S.Scan context is necessary. Future research can focus on the development of a computer-based system allowing the automatic identification of actors and topics using, for instance, Natural Language Processing techniques.

- Concerning our system, there is still work to be done:
 - Complement actors and topics identification with information sources.
 - Facilitate the interface between our system and other systems for information collection.
 - Study system application in remote asynchronous applications.

6.5 References

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Résumé :

En réponse à une demande institutionnelle, réorientée par les conclusions d'une étude exploratoire et confirmée par une revue de littérature, cette thèse cherche à répondre à la question de recherche suivante : comment rendre possible la prise de décision d'adopter une veille stratégique (VS) ?

Ce travail suit un modèle multipapier dans lequel chaque étude contribue à répondre à la question de recherche principale. Notre première étude (chapitre 2) nous a permis de comprendre que les pressions institutionnelles ont une influence sur la décision mentale d'adopter ou pas une VS.

Les chapitres 3 et 4 ont contribué à essayer et à améliorer une méthode de ciblage permettant d'identifier les besoins en information pour la VS. En outre, ces améliorations ont permis l'introduction de deux nouveaux concepts pour aider les praticiens à identifier leurs priorités pour faire de la VS. Les deux études sont fortement liées. Le troisième chapitre contribue à identifier les parties prenantes et les thèmes susceptibles de représenter les besoins d'information des gestionnaires dans un contexte spécifique. Le chapitre 4 reprend ces éléments et les combine avec des considérations temporelles et une autoévaluation de capacité d'anticipation dans un système type salle de réunion avec le but de faciliter le ciblage et d'identifier les priorités pour la VS.

Dans le chapitre 5, nous avons étudié les interactions dans les réunions collectives de ciblage afin de comprendre la contribution de ces activités au développement de la capacité d'absorption organisationnelle. Nos travaux ont permis d'identifier les thèmes à négocier afin de faciliter l'activité de ciblage et de produire des résultats qui représentent les besoins d'information de l'organisation dans son ensemble. Enfin, nous présentons nos contributions théoriques, à la recherche, et à la pratique.

Mots-clés :

Veille stratégique, adoption, ciblage, logistique durable, recherche action

Abstract:

This dissertation addresses the question of how to enable decision-making to adopt Strategic Scanning (S.Scan). This work was motivated by an institutional request, reoriented by the findings from our exploratory study and supported by literature lack.

This document follows a multi-paper model in which each connected study contributes to answer our main research inquiry. Our first study, Chapter 2, allowed us to understand that institutional pressures have an influence into the mental adoption of S.Scan.

Chapter 3 and 4 focus into trial and allow the improvement of Target method aiding the identification of information needs for S.Scan. In addition, these improvements let to introduce two new concepts to S.Scan, helping practitioners identify their scan priorities. These studies are strongly linked, on one side, Chapter 3 contributes to identify the stakeholders and topics likely to represent information needs for managers in a particular context; on the other side, Chapter 4 combines the previous information with temporal considerations and a self-perceived anticipatory capacity within a meeting room system with the aim to facilitate S.Scan targeting and identifying scan priorities.

In Chapter 5, we studied the interactions in collective targeting meetings in order to understand the contributions of such activities to develop organizational absorptive capacity. This work allowed the understanding of the main themes to be negotiated in order to ease the activity of targeting and to produce results, which represent the information needs of the organization as a whole. Finally, we present our: theoretical, research, and practice contributions.

Key words:

Strategic scanning, adoption, targeting, sustainable supply chains, action research

