

# The Relationship Regulator: a buyer-supplier collaborative performance measurement system

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## Abstract

*Purpose:* this paper proposes an innovative buyer-supplier performance measurement system (called Relationship Regulator – RelReg), aimed at stimulating collaboration on mutual performance. The RelReg is described all throughout the phases of its lifecycle: first, design features and visual representation of the new measurement framework are reported; second, guidelines on how to implement, use and review the system are provided, highlighting the role of the buyer and the supplier at each step.

*Methodology:* A theory building and testing approach is applied. The RelReg developed features primarily ground on previous scientific contributions matched with empirical evidence collected through case studies, workshops and focus groups. The resulting conceptual model is then validated through a dyadic buyer-supplier case study.

*Findings:* Two conceptual frameworks are provided: (1) the RelReg dashboard – a multidimensional performance measurement system; (2) the RelReg lifecycle – set of activities to be performed by both the buyer and the supplier all along the adoption process. Moreover, empirical insights on relevant issues to be considered when adopting the RelReg are reported.

*Originality/value:* The RelReg represents an innovative and smart tool, allowing buyer-supplier dyads to collaborate on relationship performance.

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## **1. Introduction**

Over the years there has been a generalized tendency to increase management vision and control, with companies seeking to control over inter-firm processes and relationships. Several authors have therefore suggested that traditional intra-organizational performance measurement systems (PMSs) need to be broadened, with the development of external supply chain PMSs (SCPMSs), crossing company boundaries (Gunasekaran et al. 2004; Chae et al. 2009; Gunasekaran and Kobu, 2007). Easier said than done.

Three factors need to be considered in nowadays business environment. First, supply chains (SCs) are becoming more and more fuzzy: rather than being mutually exclusive chains, they appear as interconnected and overlapping networks, where companies are immersed and linked through diverse types of relationship (Lambert and Pohlen, 2001; Rice and Hoppe, 2001). Focus and choice is essential when extending the measurement process beyond company boundaries, yet often complex. Second, organizational skills are critical to design and take full advantage of a SCPMS. Although purchasing, supply chain and customer service functions have increased their managerial capabilities in recent times (Luzzini and Ronchi, 2016), they still rarely display and follow formal strategies (Hesping and Shiele, 2015). Third, a reliable and robust information system infrastructure is critical for a successful implementation of an external SCPMSs (Nudurupati et al., 2011). This requires technological knowledge, resources and investments in order to tailor the ICT systems to the company specificities.

In the last fifteen years, internal PMS literature has progressively moved from measurement system design to its implementation (Bourne et al., 2000; Bourne et al., 2002), use (Henri, 2006; Koufteros et al., 2014) and review (Braz et al., 2011). External SCPMSs literature has not experienced this evolution yet. Contributions are still strongly focused on the “what to measure issue”, with a profusion of studies on which performance dimension to tackle (Kannan and Tan, 2002; Gunasekaran et al., 2004) and how to select relevant metrics (Cai et al., 2009; Agarwal et al., 2006). Besides, in most cases only the point of view of the buyer company evaluating its suppliers is considered, thus neglecting two elements: first, suppliers do measure performance of their customers by means of customers PMSs in many cases; second, actively considering the perspectives of both parties is critical to evaluate the effectiveness of the measurement tool. Finally, suppliers PMSs are generally viewed as diagnostic tools for monitoring, which the buyer puts in place to control its supply base with an evaluation purpose (Henri, 2006). The role of the measurement system in enabling mutual collaboration on performance has not been thoroughly investigated so far (Koufteros et al., 2014; Melnyk et al. 2014).

The present study aims at challenging limitations of extant literature by building and testing an innovative framework allowing buyer-supplier collaboration on mutual performance. We call it the Relationship Regulator (RelReg). The RelReg is explained all along its lifecycle elements (i.e. design, implementation, use and review phases), highlighting the role of both parties at each step.

The remainder of the paper is organized as follows: section two reports a review of extant scientific literature on the subject, addressing the streams of SCPMS, supplier evaluation and buyer-supplier relationship evaluation. Section three resumes the goal of the paper and the methodology adopted. In section four the RelReg is described in its constituent elements, highlighting both the design features and guidelines to follow along the implementation, use and review. Besides, empirical evidence from a first buyer-supplier dyadic case study is discussed. Section five reports a critical discussion of the pros and cons of the RelReg as emerging from the case study. Conclusions end the paper.

## **2. Literature Review**

Starting from the late nineties (Van Hoek, 1998; Beamon, 1999), several authors in the academic literature have reported on studies of the development of PMSs addressing the evaluation of activities outside legal company boundaries. Hald and Ellegaard (2011) identifies three converging and overlapping streams of research, according to the scope of the system they address and the labels used: SCPMS tackling SC processes and practices (Gunesakaran et al., 2001 – 2004; Angerhofer and Angelides, 2006); supplier evaluation focusing on first tier suppliers (Simpson et al., 2002; Kannan and Tan, 2002; Luzzini et al., 2014); buyer-supplier relationship assessment, focusing on soft aspects like mutual commitment, integration, trust etc. (Giannakis, 2007; Ramanathan et al., 2011). For the sake of clarity, it is worth providing precise definitions of recurrent labels in this paper. Influenced by Neely et al., (1995) definition of PMS, we refer to external SCPMS as a set of metrics used to quantify the efficiency and effectiveness of inter-firm processes and relationships. From the perspective of a business-to-business company, we can eventually distinguish between suppliers PMSs (set of metrics used to quantify the efficiency and effectiveness of suppliers' actions) and customers PMSs (set of metrics used to quantify both the efficiency and effectiveness of customers' actions).

Within the broad area of external SCPMS, most studies address the pattern of the evaluating buyer company, adopting supplier PMSs to control and orchestrate its supply base. This implicitly uncovers two main limitations: first, the lack of insights on customer PMSs put in place by supplier companies to monitor their buyers performance; apart from a few comprehensive SCPMS tackling also downstream processes and relationships (e.g. Gunasekaran and Kobu, 2007; Bullinger et al., 2010), customers PMS are largely neglected, yet often used by companies' customer service functions.

Second, the paucity of contributions reporting also the point of view of the evaluated company; in assessing the effectiveness of the measurement process, it seems logical to take into account both the evaluating and evaluated company perspectives should be taken into account. On this behalf it is interesting to note that the few studies jointly reporting the dyadic perspective, actually highlight a strong dichotomy of perceptions between the two parties. Purdy et al., (1994) and Purdy and Safayeni (2000) report three main conclusions: (1) the majority of suppliers feel that their effectiveness is not accurately reflected in the evaluation, which seems more a test of how much their companies look like the buyer. (2) The evaluating buyer company did not utilise the information gathered through the audit process properly, because in the end their decisions were based only on price savings. (3) Suppliers believe that the score reported is driven by bargaining power rules and does not result from a formal and objective evaluation process. Hald and Ellegaard (2011) by means of two longitudinal case studies investigate how performance measurement information, travelling between the evaluating buyer and the evaluated suppliers, is shaped and reshaped in the evaluation process. The authors highlight that a harsh dialectic often arises between the two parties on the supplier PMS put in place.

Another characteristic of extant scientific literature on external SCPMSs is the primary focus on the design process. Various models have been proposed over the years, like the SC balanced scorecard (Brewer and Speh, 2000; Bhagwat and Sharma, 2007); the SCOR framework (Sellitto et al., 2015; Gunasekaran et al., 2004; Akyuz and Erkan, 2010); process-based approach (Chan and Qi., 2003); suppliers' scorecard (Kannan and Tan, 2002). In parallel algorithms and methodologies for metrics selection and prioritization have been proposed like the analytic hierarchy process (AHP - Cai et al., 2009; Cho et al., 2012), fuzzy AHP (Hong and Zhong-Hua, 2013), Analytic Network Process (ANP – Agarwal et al., 2006). On the other hand, empirical investigation on the effectiveness of previous frameworks and the analysis of other phases within their lifecycle (i.e. the implementation, use and review), are lacking. Nonetheless, several contributions on internal PMSs acknowledge that the implementation (Bourne et al., 2000; Bourne et al., 2003), use (Henri, 2006; Koufteros et al., 2014) and review (Lohman et al., 2004; Braz et al., 2011) of a PMS are crucial determinants of its success, as important as a proper design.

Finally, previous contributions on SPMS have addressed the relationship between system adoption and diverse relationship capabilities constructs, such as socialization mechanisms (Cousins et al., 2008), cooperation (Mahama, 2006), supplier's integration (Carr and Pearson, 1999), supplier's commitment (Prahinski and Fan, 2007; Prahinski and Benton, 2004). However, these papers look at the role played by these relationship capabilities within the SPMS adoption – performance improvement path. This reflects the fact that traditional supplier PMS entails a merely evaluation

purpose, with relationship capabilities (like collaboration), which may emerge as collateral factors. This paper tackles this issue by proposing an innovative buyer-supplier PMS, which intrinsically ground on mutual collaboration to enhance performance.

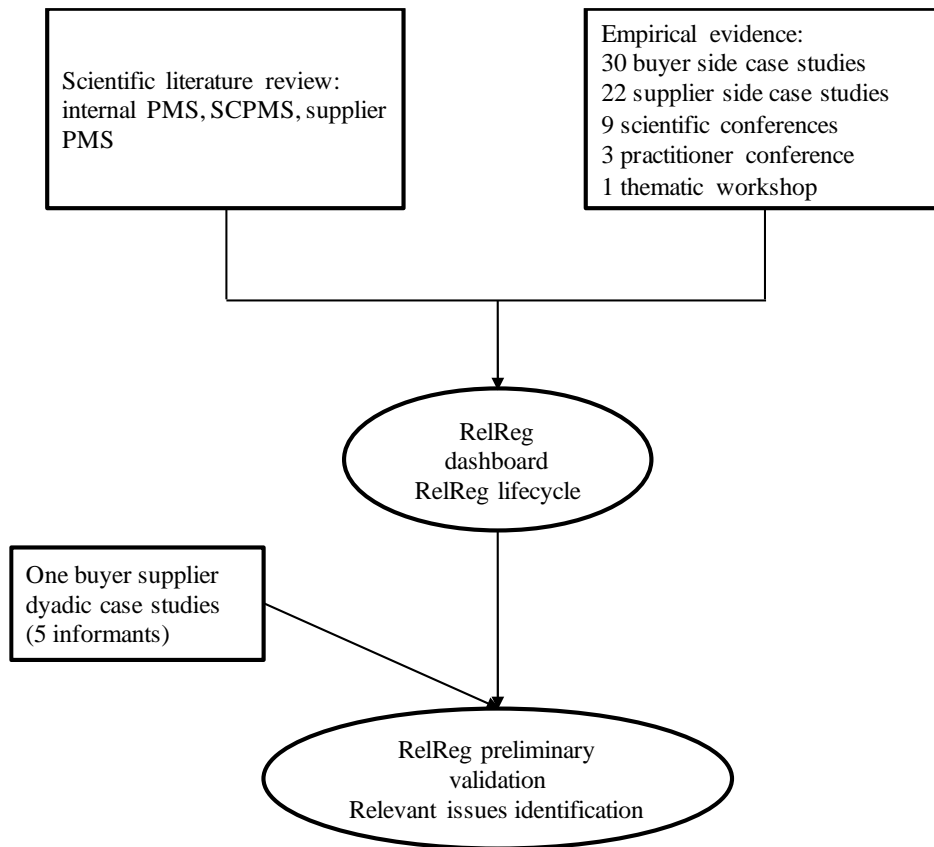
### **3. Research aim and methodology**

Reviewing extant scientific literature, several signals suggest that the traditional pattern entailing the buyer company evaluating its suppliers appears as a highly constraining and limiting scheme. First the fact that suppliers do actively measure some performance of their customers (e.g. forecasting accuracy, payment timeliness) is not taken into account. Second, it seems to prevent the development of relational capabilities (such as mutual commitment, social capital), which strongly affects the effectiveness of the measurement process. *Within this paper we challenge this unidirectional and diagnostic paradigm, by proposing the Relationship Regulator (RelReg), an innovative framework aimed at stimulating a collaborative buyer-supplier performance measurement and management.*

The RelReg entails a dyadic joint measurement of balanced performance dimensions, some addressing the supplier, some addressing the buyer and some others addressing both parties. The logic behind is to use the measurement tool to enable collaboration and continuous improvement on relationship performance. Acknowledging the critical role of all the phases within the SCPMS lifecycle, after presenting the RelReg design features, we highlight the key activities to be performed when implementing, using and reviewing the framework (Gutierrez et al., 2015; Bititci et al., 2006).

#### *Theory Building Phase*

The research is based on a two-step methodology (see figure 1). The first step grounds on a theory building process, resulting into the development of the RelReg dashboard and lifecycle. The second step is based on a buyer-supplier dyadic case study and it is aimed at refining and providing a first attempt of the RelReg validation by synthetizing relevant issues to be addressed when adopting the tool.



*Figure 1: methodological framework*

The RelReg conceptualization (first step of the methodology) grounds on two pillars: first, the review of extant scientific literature on intra and inter-company performance measurement; second, empirical data coming from the first author's experience on scientific and applied research projects on supplier performance measurement and management, matured in the last five years. Directly inspiring the present research, the following can be mentioned: 30 case studies addressing buyer companies (manufacturing, retail, service sectors) as measuring party, for a total of 88 interviews to managers in the purchasing, supply chain or logistics department; 22 case studies addressing supplier companies (manufacturing, retail, service sectors) as measured party, for a total of 61 interviews; participation to 9 academic conferences including tracks on SC/supplier performance measurement and management; participation as guest speaker to 3 practitioner conferences in the area of purchasing and supply management, holding speeches on supplier performance measurement and management; organization of one practitioners' workshop on the topic; design and execution of a buyer-supplier survey on the design, implementation, use and review of supplier PMSs, achieving a final sample of 147 dyadic responses. As a final ingredient, the co-authors' long research experience on purchasing and supply management and on performance measurement and management has been important to develop and refine the framework.

### *Theory Testing Phase*

The output of the previous theory building phase is the development of the RelReg dashboard (cf. figure 2), and of the RelReg lifecycle (cf. figure 4). Afterwards, a first dyadic buyer supplier case study has been performed, aimed at a preliminary validation of the RelReg and at gaining insights on its applicability. The following table reports relevant information about the empirical sample. The two companies do have in place a long standing partnership and were chosen because they showed interest on the topic of collaborative relationship performance measurement and management.

*Table 1: empirical sample (dyadic case study)*

<b>Company</b>	<b>Role in the industry</b>	<b>Revenues</b>	<b>Employees</b>	<b>Informants</b>
Buyer company (Buy-C)	OEM – first tier supplier of car maker (automotive industry) Core business: production of electronics system, automotive lighting, suspension systems etc.	7.9 mld €	43.000	<ul style="list-style-type: none"><li>• Purchasing Operations Manager</li><li>• Supplier Quality Manager</li><li>• Supply Chain Manager</li></ul>
Supplier company (Sup-C)	Second tier supplier (automotive industry) Core business: production and distribution of electronics and piezoelectric modules and components for the automotive industry	n.p.	n.p.	<ul style="list-style-type: none"><li>• Logistics Manager</li><li>• Sales and Customer Service Manager</li></ul>

Five individual interviews were conducted in addition to a roundtable workshop with all the informants. These were held at the Buy-C headquarters and aimed at openly share opinions on the RelReg. Each interview lasts one or two hours, while the roundtable lasted three-four hours. All the interviews have been recorded and transcribed verbatim. Questions included the following: (1) perceived benefits and criticalities of the system; (2) the comprehensiveness of the set of performance dimensions under scrutiny; (3) the feasibility and reliability of the collaborative design, implementation, use and review; (4) opinions on suitable application contexts; (5) suggestions for improvement and free thoughts on the PMS. The interview questionnaire is reported in the Appendix.

#### **4. Framework development and preliminary validation**

In this section the Relationship Regulator is described along all the phases of its lifecycle. The first paragraph deals with the preliminary activities managers should take care of before setting a RelReg, being selecting the right partners to propose the project and formalize a relationship strategy. The second paragraph reports the RelReg constituent features, highlighting the performance dimensions

to tackle and the design process. The third paragraph finally presents the main activities the buyer and the supplier should take care of along the implementation, use and review phases.

#### *4.1 Antecedents of RelReg adoption*

It is a common thought in operations management literature that competition is no longer between companies, but among supply chains, leading to the concept of supply chain based competition (Zhang, 2006; Qi et al., 2011). This is a critical concept per se, often treated superficially by referring to misleading formulas like the “supply chain vs supply chain” game. In most industries (e.g. consumer goods, consumer electronics, pharmaceutical, automotive etc.), competing supply chains appear more like interconnected or overlapping networks, than mutually exclusive chains of companies enrolled in a tier vs tier competition. Companies are nodes in fuzzy enterprise networks more than tiers in straight SCs: in this context strategic SCM practices could be exploited in order to create privileged path, thus achieving sustainable competitive advantage (Li et al., 2015). The management of buyer-supplier relationships is therefore essential for achieving superior performance. Our effort to develop a buyer-supplier collaborative PMS is a concrete attempt to orientate buyer-supplier dyad to increasing collaboration and continuous improvement.

A first aspect to consider is that as SCs become increasingly complex, companies are likely to interact with a lot of external partners. From the RelReg sponsor perspective (either a buyer or a supplier) is therefore of vital importance to carefully select the right SC partner to engage. A structured approach to portfolio management is therefore a key antecedent to succeed. Strategic relevance of the partners, current relationship capabilities in place, technical feasibility are some of the factors that should be taken into account. Taking from granted a high commitment from both parties involved, is then of fundamental importance to define a formal buyer-supplier relationship strategy that the RelReg should operationalize (Kaplan and Norton, 2010; Hespington and Shiele, 2015). The relationship strategy formalization should be the synthesis of a shaping and reshaping process of the two parties' own strategies. It is of primary importance that the buyer and the supplier eventually agree on a limited set of strategic objectives, acting as the basement of their relationship.

To conclude developing a RelReg is a game of “focus and choice”. Focus on your urgent SC needs and choose the right SC partner to engage in the project, through a mature portfolio management approach. Then focus on both parties needs within the specific relationship and choose a limited number of agreed goals to pursue.



#### *4.2 The RelReg design features*

The essence of the RelReg is to enable collaboration within the buyer-supplier performance measurement and management process. The implicit logic of traditional external SCPMS (Simpson et al., 2002; Kannan and Tan, 2002) can be resumed in the following statement: “autonomously measuring something to evaluate someone”. The RelReg turns this logic into: “joint measuring something to collaborate on mutual performance”. In other words, we shift the logic of the external SCPMS from a tool for evaluation to a tool for collaboration (Giannakis, 2006). To put this statement into practice, we should facilitate the rising of collaboration all along the RelReg lifecycle, starting from its design characteristics. Figure 2 shows the RelReg dashboard.

UNIT OF ANALYSIS		SUPPLIER (metrics)	BUYER (metrics)
<b>FINANCIAL DIMENSION</b> “To achieve financial value from this relationship, what parameters should be optimized?”	BUSINESS RELATIONSHIP	<i>Revenue growth</i>	<i>Extra-savings</i>
	TRANSACTIONAL COSTS	<i>Total cost of sales</i>	<i>Total cost of ownership</i>
		<i>Distribution costs</i>	
<b>OPERATIVE PROCESSES</b> “To ensure routinely operational excellence, which SC operational activities should be optimized?”	ORDER CYCLE	<i>Agreed Order Fulfillment</i>	
	Order	<i>Order Fill Rate, Order Lead Time</i>	<i>No of Urgent Orders, order variability</i>
	Delivery process	<i>Punctuality index Flexibility index Reactivity index</i>	
	Invoicing	<i>Invoicing Accuracy, Invoicing Timeliness</i>	
	Payment		<i>Payment Timeliness Documentation accuracy</i>
	NEW PRODUCT DEVELOPMENT	<i>Product development time No of new products developed per year</i>	
	TRACEABILITY AND STOCK CONTROL	<i>Inventory level, Security Stocks Level,</i>	
<b>PLANNING PROCESSES</b> “To achieve superior coordination, which planning process must we excel at?”	DEMAND PLANNING		<i>Forecast Accuracy, Forecast Variability</i>
	PRODUCTION PLANNING	<i>Actual Versus Planned Production</i>	
	DISTRIBUTION PLANNING	<i>Changes Entity, Changes Frequency</i>	
<b>PRODUCT/SERVICE EXCHANGED</b> “To add value for the final customer, which quality target should respect the good exchanged?”	QUALITY-BASED PERFORMANCE	<i>Quality rate, Number of defects</i>	
<b>RELATIONSHIP INTANGIBLE CAPABILITIES</b> “To continuously improve our relationships, which capabilities should we develop?”	SOCIAL CAPITAL	<i>Mutual trust Goal alignment Number of meetings Perceived value of the relationship</i>	
	INFORMATION CAPITAL	<i>Exploitation of collaborative platforms Digitalization degree Information quality Information timeliness</i>	

Figure 2: RelReg dashboard: an illustrative example of the model

The metrics reported in the RelReg above are just examples: the set of metrics to select within each category is strictly dependent upon the strategic goals of the relationship and the availability of data. The performance category introduced are deriving both from literature (Simpson et al., 2002; Kannan and Tan, 2002; Luzzini et al., 2014) and from panel of experts' workshops and interviews joined by the authors. A deeper analysis follows, highlighting the core questions animating debate with panel of experts on each dimension.

- Financial dimension. To achieve financial value from the relationship, which parameters should be optimized? Notwithstanding the corporate strategy, profitability is ultimately the key objective of every profit-oriented company. Empirical evidence highlights that financial strategies are simple; companies can make more money by: (1) selling more; (2) spending less. Any programs put in place (and strategic buyer-supplier partnership are no exception), creates more value for the company only if it leads to selling more or spending less. Thus, the company's financial performance gets improved through two basic approaches – revenue growth and productivity. Considering the buyer-supplier relationship within the RelReg, the buyer would be primarily compelled to lower the total “cost of ownership” of acquiring goods/service from the supplier. The supplier instead would be interested to lower the total cost of sales and to increase the revenues within the specific customer relationship.
- Operational processes. To ensure routinely operational excellence, which SC processes should be optimized? Operational processes sustain the daily flows of materials, information, documentation and money between the buyer and the supplier (Kaplan and Norton, 1996). Depending upon the buyer-supplier strategy, more emphasis could be given to efficiency or effectiveness. Depending upon the buyer-supplier processes in place, the unit of analysis is modeled.
- Planning processes. To achieve superior coordination, which planning process must we excel at? Mutual and anticipated visibility of demand, production and distribution plans is at the basis of interface process coordination. Monitoring the accuracy of these plans will stimulate a continuous improvement in the overall planning processes, which could eventually result in operational improvement (Gunasekaran et al., 2001-2004).
- Product/service quality performance. To add value for the final customer, which quality target should respect the product/service exchanged? The overall quality of the product/service supplied is critical to add value along the supply chain and deliver something appealing for the end consumer (Simpson et al., 2002; Kannan and Tan, 2002).
- Relationship intangibles capabilities. To sustain our relationship, which capabilities should we develop? This dimension identifies the intangible assets that are important to stimulate and

fuel mutual collaboration. We distinguish between social capital and information capital. The former relies in the degree of integration and mutual trust characterizing the relationship between the two parties. The latter identifies the availability of information system, networks and infrastructure required to support the buyer-supplier strategy. Qualitative metrics based on Likert scale questionnaire submitted to both the buyer and the supplier company could be used (Cousins et al., 2008).

Within the five categories identified, we coherently distinguish between metrics addressing the supplier's performance, metrics addressing the buyer's performance and transversal metrics jointly addressing both parties. Each metric in the RelReg should be exploded according to the paradigm proposed in the Balanced Scorecard (Kaplan and Norton, 1996) and re-adapted coherently with the presence of two actors. Figure 3 reports all the information to be defined for each metric.

Strategic relationship objective	Measures	Target			Initiatives	
		Joint definition	Supplier definition	Buyer definition	Supplier	Buyer
Improve delivery performance	Punctuality index = No of orders line delivered on time on total no of orders			<input checked="" type="checkbox"/> 95%	Planning optimization	Forecast improvement

Figure 3: metric definition table - an example

First the strategic objective underneath should be stated as well as the precise measures on which the buyer and the supplier have to converge. Then the target should be included, identifying which actor defines it. Finally, a set of initiatives aimed at achieving the target, have to be listed: in most cases (especially when dealing with SC operational and planning processes or relationship capabilities) even if a certain performance is evaluating just one actor (either the supplier or the buyer), also the relationship partner could provide its support to improve the performance. The punctuality index as reported in Figure 2 is a good example: the supplier is the main responsible and should act on his delivery planning process and in the downstream transportation operations to improve the performance. On the other hand, also the buyer company could provide an active support, for example by improving its forecasts or optimizing the inbound logistics operations. Generally speaking, it is essential that both actors involved jointly managed various steps of the RelReg adoption.

### *4.3 The RelReg lifecycle*

From internal PMS literature we know that most performance measurement and management projects fail because they are poorly implemented, use and review, rather than poorly designed (Bourne et al., 2003). In order to make the RelReg as a “ready to adopt” tool in the hands of practitioner, it is worth reporting in this research which are the main elements to consider within each phases of the PMS lifecycle and how should they be shaped when applying to a buyer-supplier PMS as the RelReg.

Once the RelReg is designed, it should be implemented. The implementation phase entails all the procedural steps enabling measurements to be made regularly (Bourne et al., 2000; Bourne et al., 2002; Bourne et al., 2003): data collection and integration, performance measures calculation and reporting management. In the RelReg these basic steps should be shaped coherently with the presence of two actors. Due to the existence of metrics addressing the buyer and metrics addressing the supplier, the primary data collection naturally involves the two parties. Each part is initially responsible to provide reliable data, either qualitative or quantitative, and to rigorously calculate the performance measures. The reporting phase is particularly important in enabling the collaborative approach on mutual performance, the fundamental logic behind the RelReg. A complete visibility on mutual performance agreed on the RelReg should be allowed. The frequency of the reporting depends upon the industry and the timing of the mutual flows between the buyer and the supplier. The management information systems are critical to the success of PMS implementation (Nudurupati et al., 2011; Ho, 2007), particularly in data collection, analysis, presentation and dissemination (Neely, 1999). In the RelReg case, they should enable an efficient and effective integration of the two parties; MIS technology innovation like web based or cloud platform for data sharing could be exploited.

The way the PMS is used ultimately defines its purpose and the expected outcome from the adoption. Using a PMS implies activities like feedback management, discussion on performance reported, improvement plans design, contract and incentives management. The most referred framework describing the PMS use is the diagnostic vs interactive paradigm (Henri, 2006). The diagnostic use reflects a traditional top-down feedback approach. Measures are used to unilaterally track progress towards goals, monitor results, compare outcomes to expectations, and drive rewards mechanisms accordingly. The interactive use reflects a bi-directional role of the PMS, which enables discussion on results and fosters continuous improvement, while in the meantime, improving functional integration. The RelReg, as a collaborative buyer-supplier PMS, is more oriented towards an interactive use. However, this should not relax the constant effort on continuous improvement: roles, responsibilities and consequences should be clear from the beginning.

The last step of the PMS lifecycle entails the review of the set of metrics adopted, aimed at keeping the PMS constantly aligned with a changing strategy (Braz et al. 2011). Reviewing the RelReg first implies to detect changes in the relationship strategies and coherently reformulate the goals of the collaboration. Contextual variables (like technological innovations, changing in customers' needs, competitors' actions, new industry regulations etc.) or company specific (changes in the business strategy, new supplies need) could lead to review the buyer-supplier relationship strategy. Then, coherently with the new goals, the design features of the measurement tool should be updated, by introducing new metrics, or changing the targets and initiatives to existing ones. Figure 4 graphically shows all the steps of the RelReg lifecycle.

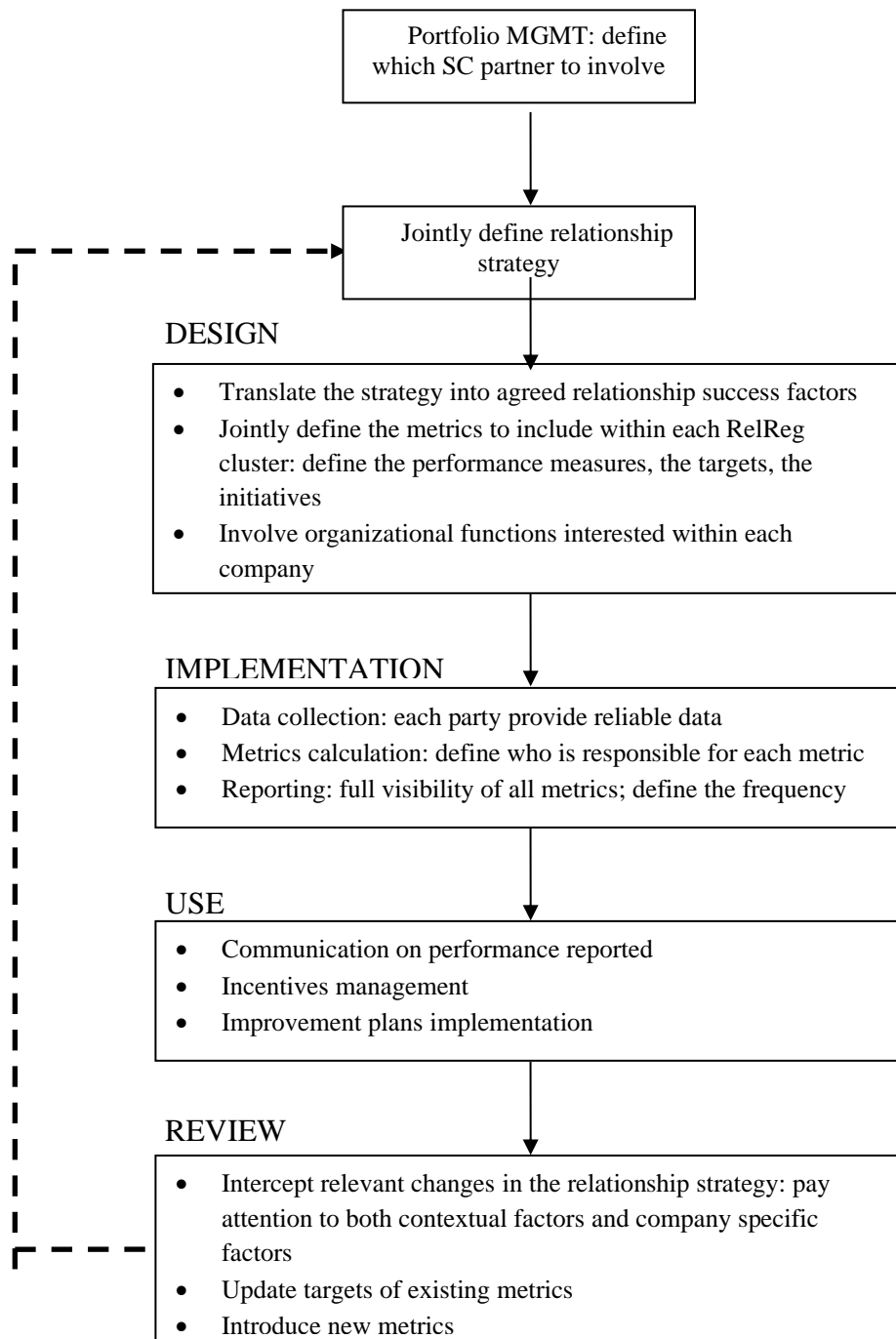


Figure 4: The RelReg lifecycle

#### 4.4 Insights from a dyadic case study

The first insight emerged from the case study is the different reactions among the buyer company and the supplier company in respect to the RelReg. The Sup-C representatives appeared enthusiastic, showing a positive attitude towards the innovative tool since the beginning. Sup-C does have in place a customer PMS, aimed at recording payment behaviours of customers, yet the measurement is not structured and is never reported to the counterpart. The RelReg is designed to allow a bilateral

performance measures sharing, fostering mutual collaboration more than control and evaluation. This element hit the attention and curiosity of the Customer Service Manager: *“it happens that customers engage us in performance improvement plans to fix some specific issues. We are always willing to collaborate and improve our performance to better serve the customer, yet it sometimes happens that the problem is within the customer operations, not ours. More often, to maximise a specific relationship performance, a one party’s effort is just not enough”*. In his view, since metrics have the power to focus the attention on what really matters, the RelReg would help in freeing the potential of the relationship. Looking at the other side of the coin, the Buy-C representatives appeared more cautious about the tool. Reporting the words of the Purchasing Manager: *“we pay the supplier and therefore it seems logical that we set the indicators with relative targets [...] however it is true that with some very important suppliers such a tool could help in maximizing performance”*. The Supply Chain Manager further elaborates on this: *“I’m interested in the operative and planning processes performances; on both dimensions a mutual visibility is of critical importance... if I want suppliers to be reactive, flexible and punctual, unilateral service level agreements may not be enough; such a tool could be useful at least in stimulating a more systematic information exchange.”*

The interviewees were then asked to comment on the completeness of the RelReg in terms of performance dimensions addressed. The Buy-C representatives agreed the most innovative performance dimensions present to be the financial and relationship soft capabilities dimensions. As the Purchasing Manager admitted: *“we already have in place a lot of metrics on the operative processes and on the product/service exchanged... but, while we agree that the goodness of the relationship is a critical element, we still do not have specific metrics for this, yet everything is left to buyers’ personal experience and perception about the suppliers. Considering the financial dimension, we always look at the suppliers’ financial statements in the supplier selection phase; then the information is not tracked systematically and this has led to unpleasant surprises in the past”*. The Supplier Quality Manager adds on that: *“One aspect that is missing within the RelReg is the sustainability performance, which is increasingly important for our company and invest our suppliers consequently. Nowadays, as for the financial performance, sustainability is carefully and thoroughly monitored only in the supplier selection phase”*. Also the Sup-C representatives acknowledged the completeness of the RelReg dashboard; in particular they seemed attracted by a higher control on transactional costs, yet rather sceptical about the feasibility of putting in place a reliable costing system.

As far as the RelReg lifecycle is concerned, everybody agreed: *“starting such a thing is the most critical issue!”* citing the Buy-C Supply Chain Manager. They highlighted that, though collaboration and mutual trust may be taken for granted within highly collaborative relationships, moving forward



towards the RelReg co-design is far from being immediate. The Buy-C purchasing manager highlighted: *“set a good PMS is quite a tortuous journey per se... developing it with a supplier entails a greater effort, though I admit benefits could be higher in the long run”*. The specific metric definition (cf. figure 3) resembles this complexity. Reporting the words of the Sup-C Customer Service Manager added: *“I appreciate all the information needed to be collected for the single metric... often we receive rather obscure metrics from our customers, with no idea on how they have been calculated; this could be frustrating. Considering targets, this is even worse... sometimes they are simply unreliable. [...] The RelReg approach is very mature, though I honestly do not know how many customers within our portfolio would be willing to undergo this process”*. The implementation of the RelReg was credited as problematic too, as the data collection process directly involves both actors. Quoting the Buy-C Supply Chain Manager: *“the implementation mechanisms should be well oiled... if a party fails in collecting data, the overall system fails”*. The Sup-C Logistics Manager further elaborates on this: *“I think it is of primary importance to ground on a dedicated ICT infrastructure, which would make things more efficient and more importantly would guarantee a rigorous implementation of the RelReg”*. Both parties agreed on the fact that the RelReg adoption would more likely start from the buyer company and that top management commitment would be decisive to overcome cultural and operational obstacles to RelReg design and implementation. Once put in place, actively using and periodically reviewing the system was considered as less critical. Nonetheless, given the great effort and buyer-supplier integration needed along the RelReg design and implementation, the commitment of both parties in using and reviewing the RelReg in a mature way is somehow taken for granted.

In the final roundtable, Buy-C and Sup-C managers confronted themselves on the main criticalities and benefits of the RelReg adoption. As far as criticalities are concerned, in addition to the Buy-C cultural reticence in being measured by a supplier, the main issue for both parties was the time and resources needed to adopt the RelReg all along its lifecycle. All the managers strongly remarked how the RelReg could be applied only with a very limited number of SC partners; an upper bound of three parallel RelReg adoption emerged from the round table. Another critical issue raised by the managers concerned the relationship between the RelReg and the other systems in place, i.e. the traditional supplier PMSs (called vendor rating) for Buy-C and the customer evaluation procedures in place at the Sup-C. The Sup-C Customer Service frankly admits: *“we do serve several customers and most of them report periodic reports on our performance... metrics are always different! If we put in place the RelReg, sure we would focus a lot on its performance areas, but we can not ignore the others! This may further increase the entropy in my department”*. The Buy-C representatives were also worried about the additional entropy brought by the RelReg within an already complex and time

consuming activity as the suppliers' performance measurement and management. Quoting the Buy-C Supplier Quality Manager: *"of course some suppliers are more important than others, but our company quality and service level standards are very demanding and so we can't neglect the rest of the supply base. Plus, we are always overloaded, so it is important for the RelReg to be as much integrated as possible with our systems and operations"*.

On the other hand, both parties emphasize the breakthrough innovation that the tool could bring when applied in a real buyer-supplier relationship. Managers referred to *"real"* and *"systematic"* collaboration: real, in light of the bilateral performance measurement; systematic because the strategic goals of the relationship are operationalized into a set of shared metrics. Indeed, everybody involved recognized the value added by a structured PMS, under the curtain of the well-known adage *"what you measure is what you get"*. Both parties eventually recognized that mutual trust and a good relationship is a critical antecedent, otherwise at the first performance pitfall things may go wrong and even damage the relationship.

A final issue addressed in the roundtable discussion was the most suitable application context. In addition to a good and long term oriented relationship already in place between the buyer and the supplier, the timing for the RelReg adoption emerged as critical. On this behalf, the Purchasing Manager said: *"I think the most suitable occasion to start the RelReg adoption would be when we have to involve the designated supplier - one with whom we already have a long standing and trustworthy relationship - into an innovation project which directly involves his supplies. These situations are not rare in our business and could represent the driver for adopting the RelReg"*. An agreement among the other manager converge in this point. Thus, the top management commitment was identified as another important ingredient. Reporting the words of the Sup-C Customer Service Manager: added *"I think that an important innovation in the supply requested could definitely motivate the RelReg, which could sound hard to justify otherwise; moreover, I think the top management commitment to be decisive to overcome obstacles to the adoption"*.

## **5. Discussion**

Extant literature does not tackle the issue of collaboratively measuring and managing external SC performance. Nevertheless, this pattern is not diffused within companies: it is generally limited to a short panel of SC actors with partnership relationships and by the way not related to a structured performance measurement and management process. Each company within a SC naturally displays a far higher confidence on internally developed SCPMSs than in performance measures coming from external partners. Large companies always measure some kinds of SC performance by themselves and this eventually results in a myriad of metrics flowing within a SC. These metrics often increase

the distance among SC partners rather than integrate them (see Purdy et al., 1994; Purdy and Safayeni, 2000). Focusing on dyadic relationships, each actor generally relies upon its own measures, thus often leading to rigid relationships and to the impossibility to carry on joint performance improvement plans (Hald and Ellegaard, 2011). Performance measures are used to fuel harsh negotiations, increase the bargaining power and develop autonomous local optimization processes (Luzzini et al., 2014). The RelReg challenges this paradigm starting from agreed relationship goals and allowing an active participation of both parties from the design to the review phase. The idea is to adopt the measurement tool to quantify the outcomes of mutual collaboration efforts, thus aiming at continuous improvement and win-win initiatives.

It seems logical the RelReg to be introduced by the buyer company, once overcome internal cultural barriers related to be evaluated by their supplier. Once proposed, we do not expect a negative reaction from the designated supplier, who has nothing to lose from a more structured collaboration. In terms of design features, the managers interviewed mostly recognized the completeness of the tool. On this behalf, the lack of the sustainability dimension was mentioned by the Buy-C Supplier Quality Manager. It may be worth adding it, in cases when buyer-supplier relationship strategic goals are strongly related to the sustainability. Nevertheless, we prefer not to further complicate the RelReg basic version dashboard, as sustainability aspects may be included within other dimensions (i.e. operative processes).

As the dyadic case study further remarked, the RelReg adoption is with no doubt a highly time-consuming and resources demanding process: a partnership should be developed; a joint SCPMS should be designed finding a convergence on the metrics to be adopted; a reliable management information infrastructure should be put in place to link the two parties and allowing data collection, performance measures calculation and reporting. Investments in time and resources are needed and the benefits could be tangible only in the long run. Another element that clearly emerged from the case study was that while a RelReg does tackle a single buyer-supplier strategic relationship, companies interact with a lot of strategic SC partners. Consequently, there may be problems of RelReg integration with other external SCPMSs, both in terms of design features coherency and consistency with systems and implementation procedures. Both parties identify this as a potential source of entropy. Four elements have been highlighted as critical to overcome obstacles and skepticism and allow for a successful RelReg adoption: (1) the top management commitment is essential, given the strategic nature of the RelReg in nurturing collaboration within highly strategic buyer-supplier relationship. (2) find the right counterpart; only a very limited subsample of strategic suppliers (cf. Kraljic, 1983) is so critical to justify the RelReg adoption, yet this is not enough; a long standing and trustworthy relationship already in place represents a critical antecedent. (3) The timing

of the RelReg introduction, which appears to be more suitable in supporting an innovation process within the specific buyer-supplier relationship. In this phase should be important to use the RelReg with a certain degree of flexibility, considering that the goals of a buyer-supplier relationship may undergo some changes. (4) Maximize the consistency of the RelReg adoption in respect to existent SCPMSs, in terms of design features and implementation systems and operations; when possible, it would be intelligent to use for the RelReg the same metrics as the other systems. This will allow for a structured benchmark between highly important suppliers (customers) and the rest of the supply (customer) base.

## **6. Conclusions**

This study reports the RelReg as an innovative buyer-supplier performance measurement system aimed at collaboratively measuring buyer-supplier relationship performance. Both the system design features (the RelReg dashboard) and activities to be performed all along the adoption process (the RelReg lifecycle) are provided. Finally, the RelReg is empirically tested and improved and supported by the dyadic-case.

A thorough empirical validation for the proposed framework is an action for future research. While the dyadic case study represents a first step in this direction, the present paper should be considered as a mainly conceptual paper, aimed at proposing an innovative framework for buyer-supplier collaborative performance measurement and management. We therefore encourage both scholars and practitioners to implement the RelReg in a real buyer-supplier relationship, in order to further refine and test the proposed model. Another limitation of the study relies in the link between the buyer-supplier strategy and the RelReg adoption. The measurement tool naturally comes after a mapping of the relationship strategy, aimed at highlighting key goals to operationalize. Future research should tackle the issue on how to build and describe the relationship strategy and consequently shape the RelReg coherently, also challenging the performance dimensions identified, if necessary.

We deem this paper to have several managerial implications. The RelReg is supposed to be a simple and smart tool, ready to be applied by practitioners. Indeed, we have provided normative guidelines (section 4) that could support companies within the RelReg adoption process. First, we highlighted the importance of portfolio management and of buyer-supplier strategy definition as fundamental antecedents. Once the right counterpart has been chosen and strategic goals have been agreed, the RelReg could be designed by selecting key metrics within the clusters identified. Finally, providing guidelines on the implementation, use and review too, we aim at supporting practitioners all along the steps of the lifecycle.

This study is at the crossroads between external SCPMS literature and buyer-supplier relationship management literature and display theoretical contributions to both. Rather than addressing the topic from a holistic perspective like other research before (think about SCOR based framework), we propose the single dyad as the fundamental unit to tackle (see the case study reported). Then we build a new measurement tool, which allows both parties to take an active role in the measurement and management process. Our hope is that this study may fuel a new stream of research based on buyer-supplier collaborative performance measurement and management.

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## **Appendix – Interview questionnaire**

### *RelReg dashboard*

- Which are the elements of the RelReg dashboard that most help you to do your job? And why?
- From your perspective, which elements of this dashboard could be considered as the “most important” for you to manage your relationship with the SC partner?
- Do you like the idea behind the RelReg, i.e. providing an innovative buyer-supplier PMS aimed at fostering in a structured way the collaboration on mutual relationship performance?
- Do you think that all relevant performance dimensions are covered (cf. the five blue boxes)? If not, what is lacking?
- What are the most important performance dimensions? Why? could you mention three examples of that?
- What is the least important performance dimension? Why? Could you give me an example???
- What would you change in the model???
- Do you think that all sub-units within each performance dimension are covered?
- Is the graphical representation effective?
- Do you have any other considerations on the RelReg design features?
- Do you think that this dashboard needs to be shared with other functions/departments in your organization? Why?

### *Metric definition*

- Do you think the amount of information to be tracked within each metric is enough?
- If not, which kind of information is missing?
- Do you think that some piece of information within the metric focus is redundant?
- If yes, which element(s) would you take off?
- Do you have any other consideration related to how to characterize each metric?

### *RelReg lifecycle*

- Do you like the idea of maintaining a high buyer-supplier integration all along the RelReg adoption process (from design to review)?

- Do you think it is feasible?
- Which could be the main barriers?
- Which additional benefits you may recognize? Can you give me three examples please?
- Would you be ready to adopt the RelReg with some SC partners? why? And when?
- In which industries do you think the RelReg could be more suitable? Why?
- Which are the drivers for the RelReg adoption?