

**A step forward: checking internal adherence to a sustainable product developed to the institution.**

**GISELLE MARGARETH PILLA BLANKENSTEIN**  
USP - Universidade de São Paulo  
gmblankenstein@usp.br

To procurement department team and CAPES

A step forward: checking internal adherence to a sustainable product developed to the institution.

## Abstract

Be more sustainable and greener is increasing in importance among institutions. The challenge remains not only in choose the best practices, but in measure taken decision. Besides purchasing greener and more sustainable products, institutions with power consumption may push suppliers to develop them to improve results. Procurement department has a key hole on this context. Regarding to goods not directly involved on production, positive effect depends on business units' adherence. Literature shows there is a gap about how to confirm centralized decisions on big structures. This paper contributes with two tested indicators to check the shift to a sustainable product after its implementation into an educational institution.

Key Words: sustainable indicator – sustainable procurement – performance management and measurement

## Introduction

Since Burtland Report (WCDE, 1987) established sustainable development focused on environmental, society and economy – the triple bottom line – it arises as paradigm to decisions. Green certifications and life cycle methodologies are examples of tools that help managers to make better choices.

Institutions may improve the results of all supply chain pushing suppliers to perform according to sustainable targets. Due to this understanding, purchasing became a key activity to offer products and services more sustainable. The standard quality of their components concentrates great part of studies on this field, probably because good as office supplies, for example, are not considered on life cycle calculations despite their potential reverse impact.

The constant purchase of great amount of one product gives power consumption to the buyer, enabling better conditions to negotiate and creating demand to new products and services. However, more challenge than push suppliers to improve their figures or to shift pieces of a product may be change consumption behavior on work routine.

In this context, how to measure the efficiency of the shift from a good to its equivalent sustainable one? The literature review didn't address this aspect. Two indicators were built and tested from a real demand:

The educational institution introduced sustainability to the agenda asking the departments and units to rethink their processes. The procurement department realized that consumption of plastic cups have been increasing, despite the initiative to give free mugs to all employees and students, and decide to shift plastic cups (imported and sometimes with quality problems) to paper cups. Only suppliers of cups with wax paper

were found and without fulfill sustainable criteria. Due to power consumption, a cup locally produced with certified paper and printed with biodegradable ink was created and introduced on market (allowing external buyers to have more sustainable consumption). The adherence to the new product became necessary information to repeat the experience with other goods.

## Research Question and Target

In a complex organizational structure with different budgets and autonomy levels, how to measure the performance of a centralized decision to buy a sustainable product or service (not directly involved on production) instead of the usual one? This survey tempts to develop an indicator to guide managers to check internally taken decisions and to better implement new ones.

## Literature Review

Purchasing activities are becoming more and more relevant to companies (Caniato *et al*, 2014). Better results are achieve when they not consist only on buy and pay pursuant to internal clients' request, but manager the supply chain (Senapeschi Neto; Godinho Filho, 2011).

The new paradigm includes sustainable development. Papers analyze both green supply chain management (GSCM) and sustainable supply chain management (SSCM). The former is restricted to environmental, the later covers the triple bottom line.

On a literature review, Ahi and Searchy (2015) point out there is a gap whether a supply chain is sustainable or not and also that remains a general lack of agreement on what should be measured in GSCM and SSCM. Sarache-Castro *et al* (2015) confirm there is no common understanding of its concept and found processes and practices, not indicators applied under their understand of GSCM approach.

The lack of consensus encourages researches about it. Huang and Handfield (2015); Alvarez-Rodríguez *et al* (2014) analyzed procurement softwares, all with focus on suppliers characteristics. Burritt and Schaltegger (2014) showed different methodologies to calculate eco and triple bottom line impact. Sarache-Castro *et al* (2015) presented a methodology for the construction of a multicriteria indicator to measure the environmental performance under GSCM approach. Dobos and Vörösmarty (2014) formulated a new method to supplier selection in a green context and developed a methodology that provides a tool to help purchasing decision makers in case of buying bottleneck or routine items.

Define the relevant issues and establish the standard to manager performance are still challenging. Measuring performance can be described as the process of enumerating the efficiency and effectiveness of an action (Ahi and Searchy, 2015). If environmental

performance indicators provide help in terms of standardization while checking out the position of a certain enterprise in terms of environmental goals and targets (Altuntas and Tuna, 2013), *Some of the potential business benefits of sustainability actions are difficult to quantify because they relate to less tangible factors such as reputation and risk avoidance, or to future circumstances related to resource availability, commodity, prices and regulation.* (Styles *et al*, 2012).

Green production and inverse logistic are the issues with more studies, while to experts, green design, green production and green innovation are the most important, dough (Sarache-Castro *et al*, 2015).

Caniato *et al* (2014) designed a purchasing KPI (key performance indicators) tree with six performance areas: cost, time, quality, flexibility, innovation and sustainability doubling them into internal processes and suppliers. They interviewed nine big companies and found KPI related to internal process are less adopted compared to the ones applied to suppliers; they are more focused on cost, often on quality and sometimes on time.

Dobos and Vörösmarty (2014) highlighted the supplier selection of non-strategic items is seldom investigated. They state *while in case of strategic items it is possible to devote time and costly processes to mitigate risk and select suppliers carefully, this is not possible (because of low value, low importance and less structured processes) in case of non-strategic items* and suggest *in case of low importance (low value items) the management focus should be on process efficiency. In case of risk, preventive measures (eg, safety stocks, control of vendors, accurate forecast, etc) are supposed to be done.*

To McNichol *et al* (2011) reducing consumption at all levels is the key to reducing environmental impact. Thinking on the triple bottom line, decrease economy, cause unemployment or any disfavor shall not be sustainable. Procurement is a key part of SSCM (Hanson and Holt, 2014), this is our understanding and the idea present in the different approaches of all literature.

## Methodology

Survey research with literature review on Web of Science database with keywords “indicator and procurement” and “indicator and purchasing” on peer review papers of the last 5 years, in English, Spanish and Portuguese. Two Excel Microsoft files with all purchasing orders of plastic cups and sustainable cups were sent by the procurement department and the theory tested.

## Results and Discussion

Despite none of the read researches focused on a similar situation, the read theory will be the base to build the indicator. The period of the treated figures is twelve months because the research started close to the first anniversary of the sustainable cup. A longer period to showing eventually seasonality is recommended, dough.

Dobos and Vörösmarty (2014) suggested focus on process efficiency in case of low value items. The cups are not expensive, nor essential to educational activities of the institution. The concern of the procurement department in knowing the acceptance of the new product, checking the efforts to develop the sustainable cups, is aligned to the suggestion.

Only analyze the bought quantities of the new product meant nothing. It was not possible to find a tendency to purchasing behavior or if its consumption was related to open activities, for example. The first buy was a sample and took some time for adjustments until the second buy happen, but even on the lasts months it was impossible to affirm anything only taken the new product into account.

The purchasing has two modalities: centralized, asking directly to the stockroom, and direct, buying from homologated suppliers. To each situation a Microsoft Excel file with all buying orders was created and sent by the procurement department. One column has the variable “units” with 69 cups buyers. To the calculation below only numbers of thirty six units that stayed closely to procurement department were taken into account. Consolidate the numbers was the first task before calculate them.

The comparison between the amount of sustainable cups and not sustainable ones showed some measurable information. It was clear the goal of only buy sustainable cups was far away to be achieve and there was space for improvement. Even the best percentage on the last month doesn't mean a tendency due to the irregularity of the absolute numbers.

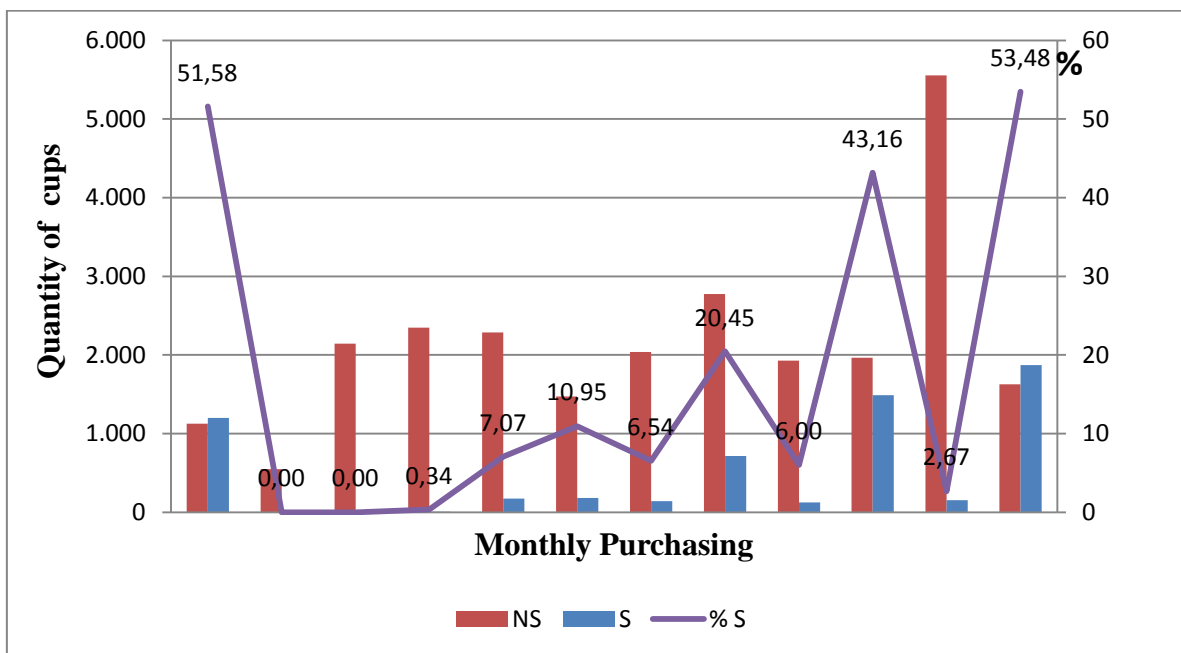


Fig. 1: Percentage of sustainable cups purchased relating to the total bought amount of cups

The first chart shows the percentage of adherence to the sustainable product and reveals the goal was not achieved, neither has a consistent improvement through the months. It means that alone the first chart is not enough to managing the result. Three hypotesis to the low result raised:

H1 the sustainable cups are more expensive and there is no budget to invest on cups;

H2 the staff responsible to order the purchase of the cups ignore the sustainable cups exist;

H3 the sustainable cup was disapproved.

To understand what was happen interview the staff of the procurement department of each unit would be the obvious solution, but there were no available people neither to do it, nor time or money - even among the 36 units nearby the procurement department. More data was needed to define a sample.

Filtering the purchasing orders out three behaviors were found: (i) units that only buy sustainable cups; (ii) units that never bought sustainable cups; (iii) units that buy both. They are shown in the second chart. Some units don't buy cups every month, clearing the inconstancy of the absolute numbers. Besides that, know that on average 16 units never bought sustainable cups and take care of them could be more important then look to others units.

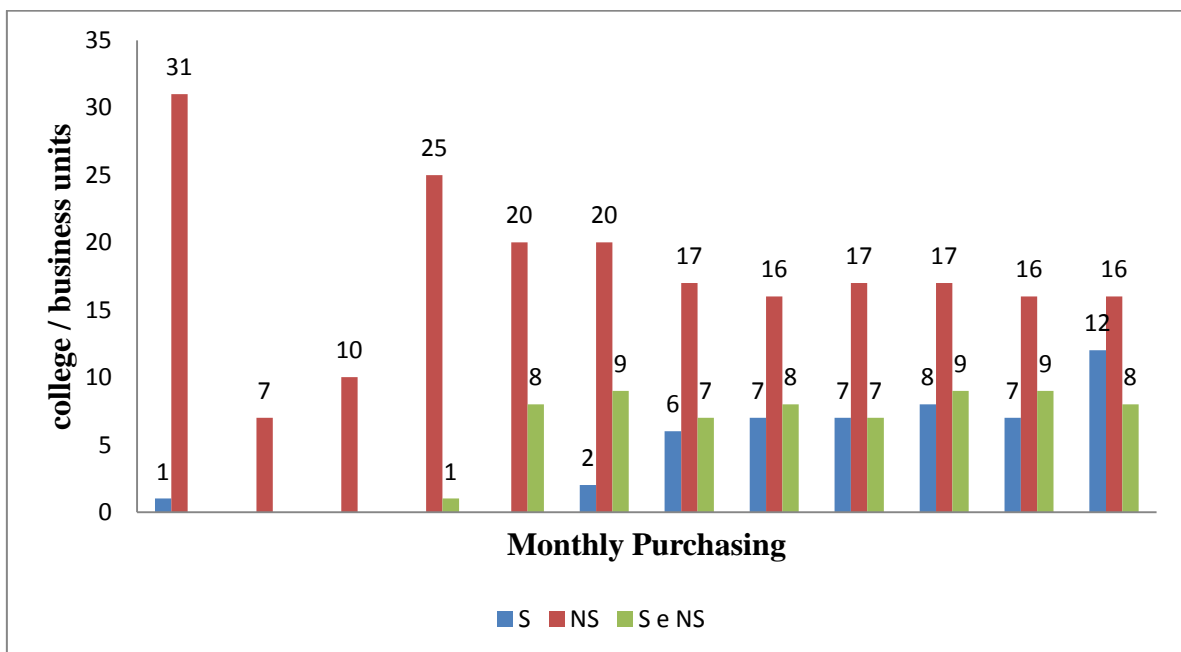


Fig. 2: Percentage of units that buy sustainable cups, not sustainable cup and both.

Reviewing the hypothesis, if the higher price of sustainable cups is the reason to continuously buy plastic cups, more units using sustainable cups will increase the amount of purchase making smaller the difference of price between plastic cups and sustainable cups. If the sustainable cups are ignored by those who fill in the purchase orders, communicate their existence explaining the benefits is the recommended priority.

The perception of the quality may be checked following the same procedure of the other goods. If none exists, the sustainable cups are a great opportunity to implement one. The suggestion is a true/false questionnaire only with true sentences about the qualities of the product: it checks the approval and also divulges the product.

## Conclusion, limitations and future research

Sustainable institutions are concerned about the quality of their purchasing. The procurement department has a key role to improve results to the supply chain. Studies focus more on suppliers' KPIs than on internal process, more on components of the product than on goods that indirectly affect production.

Big institutions have power consumption to create demand for sustainable products that don't exist on market. Once developed the new sustainable product, measure the results is needed. The quantity of purchased sustainable cups was not enough to understand how good the implementation was. The existence of purchasing orders of non sustainable cups indicates possibility of improvement. To plan the strategy to check the adherence on the new product, three groups were identified: units that only buy sustainable cups, units that never bought sustainable cups and units that buy both.

This paper reports a possible scenario on big institutions, but focus only on part of the first try to make purchasing more sustainable. It is based on official numbers - situations as reimburse employees for cups bought directly by them couldn't be analyzed due to lack of data. Identify internal process of purchasing prior to develop new products - specially those like office supplies - may avoid surprises. The survey didn't analyze that because the process to develop the new product (choose the item, the suppliers' KPI and so on) have been done. Future studies with this focus might be useful

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