

EXAMINING THE RELATIONSHIP BETWEEN THE BARRIERS AND CURRENT PRACTICES OF SUSTAINABLE PROCUREMENT: A SURVEY OF UN ORGANIZATIONS

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ABSTRACT. This paper presents the results of a survey of perceptions on sustainable procurement (SP) in the United Nations (UN). It is the first of its kind to systematically analyse the issue of SP in the UN system. While the UN has a tremendous opportunity to support their objective of sustainable development through SP practices, significant obstacles still block the full implementation of this goal. The purpose of this study is to investigate the barriers to implementing SP practices in the UN system. Based on an online survey that yielded 282 responses, we identified a framework of SP measures and barriers, and conducted a regression analysis to identify underlying correlations. We find significant correlation between good SP practices and low demand, performance measurement and tool barriers.

INTRODUCTION

Commonly referred to as the “power of the purse,” the pursuit of policy agendas through the purchasing function is nothing new in

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public procurement, with examples stretching back to the mid-19th century (McCrudden, 2004). However, the focus on incorporating sustainability – understood in terms of the Triple Bottom Line of social, environmental and economic sustainability (Elkington, 1997) – in public procurement is altogether more recent. While studies in the private sector started looking at environmental issues in supply chains as early as the 1990s (Lamming & Hampson, 1996), it was not until 2006 that the United Kingdom, a forerunner in sustainable public procurement, issued the first national action plan for sustainable procurement facilitated by a multi-stakeholder Sustainable Procurement Task Force (Department for Environment, Food and Rural Affairs [DEFRA], 2006). The following years saw a burgeoning of sustainable procurement national and international approaches, and a consequent upsurge in interest from academic researchers (Walker, Miemczyk, Johnsen & Spencer, 2012; Pagell & Wu, 2009; Preuss, 2009).

In the United Nations, the idea of using sustainable procurement (SP) to pursue sustainable development goals gained traction after the World Environment Day in June, 2007 where Secretary-General Ban-Ki Moon pledged “... to explore ways of making the United Nations more climate friendly and environmentally sustainable, and to develop a climate neutral approach to its premises and operations” (United Nations Environment Programme [UNEP], 2011, p. 15). The United Nations (UN) procured over 15 billion USD worth of goods in 2012, 60% of which originated in developing countries (United Nations Office for Project Services [UNOPS], 2013). With its ambitious development goals in, inter alia, the areas of poverty reduction, environmental sustainability and the empowerment of women, it is natural for the UN to explore ways to leverage its procurement activities to further these goals and its environmental sustainability ambitions. The example of several sustainable procurement initiatives in public and private organisations worldwide is another motivator to consider the concept of sustainable procurement for implementation in UN operations.

A number of key developments and reports in the recent years have concurred to highlight the importance of implementing sustainable procurement in the UN’s operations (UNEP, 2011), to deliver on the pledge of an improved, harmonised environmental sustainability performance in the whole UN system. A report from the

Joint Inspection Unit specifically recommended the establishment of in-house sustainable procurement policies and guidelines to raise the environmental profile of the UN. Today, numerous training materials, guidelines and publications on the topic of SP are being made available to the UN organisations, many of which are collected on the UN's sustainability communication platform called Greening the Blue (www.greeningtheblue.org).

In spite of all these recent efforts to harmonize and advance sustainable procurement in the United Nations, a number of issues are making the implementation problematic (Lund-Thomsen & Costa, 2011). There are concerns that the process itself is more costly or time-consuming than traditional procurement processes. SP is also more complex, requiring procurement staff to take into account a wider range of different factors. This could require training efforts and updated procurement materials. Perhaps the strongest indication that SP is not as straightforward as the recent surge in interest seems to indicate is the fact that the General Assembly has yet to give its official endorsement of SP to the UN entities. This is a reflection of the unease that the concept awakens in especially the member states with developing economies, which fear that stricter environmental and social criteria in procurement will risk cutting their suppliers out of the UN marketplace. The Group of 77 (G77) and China presented these arguments in the Sixty Fourth General Assembly Meeting in 2009, and a decision was reached to postpone the decision on SP (United Nations General Assembly, 2009).

In this environment of increasing focus on the advancement and harmonization of SP in the UN, but also significant obstacles to its successful and widespread implementation, it thus makes sense to study the issue more closely in order to provide actionable and relevant insights. Sustainable procurement in the UN especially represents a largely unexplored field, where findings can largely contribute to our understanding of policy directions in the public sector. As a case study, the UN represents a significant research subject in consideration of its procurement volume, the political and logistical complexity of its procurement operations, and most of all its visibility as an organisation mandated to lead policy development globally.

To gain an understanding of the current discrepancy between the political discourse and the application of sustainable procurement,

we choose as field of research the perceptions that UN procurement practitioners have of sustainable procurement, and the interaction between this perception and other variables such as subjects' affiliation as practitioners or policymakers, or the level of existing SP activity in the respective organisations. A large sample of UN procurement practitioners is our main research subject; statistical sampling of a quantitative, cross-sectional survey is our method. As far as practical implications are concerned, we believe that researching this topic can bring a contribution to the understanding of the specific challenges faced by large complex international organisations like the United Nations when they start the process of implementing SP in their global operations. We believe our findings can be extended to the public sector large, and more broadly to organisations that are planning to expand their sustainable procurement practices into developing countries, an area of activity so far quite understudied.

With the aim of providing an overview of sustainable procurement and the barriers to its implementation across the entire UN system, we put forward the following research questions:

- Which barriers to SP implementation are the most important ones to overcome?
- How do UN procurement policymakers and practitioners differ in their understanding of the current state of SP and the barriers?
- Is there a relationship between the barriers that staff report and the SP practices they are currently engaged in?

The paper is organized as follows: the first section discusses the theoretical and conceptual background of the paper. Secondly, the methodology is described; thirdly, the findings are presented and discussed; and finally a conclusion wraps up the paper.

LITERATURE REVIEW AND CONCEPTUAL BACKGROUND

The study of sustainable procurement is closely linked to the field of sustainable supply chain management (SSCM) (Carter & Jennings, 2002). Seminal articles in the field of SSCM have recently been arguing that supply chain management needs to become sustainable supply chain management, both in theory and in practice (Pagell, Wu, & Wasserman, 2010; Carter & Rogers, 2008; Carter & Easton, 2011),

and giving examples of the benefits that accrue to organisations through SSCM (Pagell & Wu, 2009), but also the difficulties that can arise (Pagell & Wu, 2011). The same observations hold true of the study of sustainable procurement, a field which is young but gaining much traction especially in the past few years (Walker et al., 2012). Although the body of research is growing, significant gaps in the SP literature still exist especially in the areas of public sector, developing country research (Walker et al., 2012). There is also a lack of conceptual clarity in the field as to the depth of analytic focus of the researches, and as to what dimension(s) of the Triple Bottom Line that are being addressed (Hoejmose & Adrien-Kirby, 2012).

A number of recent papers are starting to explore the link between SP/SSCM and sustainable development (Preuss, 2009; Boons, Baumann & Hall, 2012; Haake & Seuring, 2009; Nijaki & Worrel, 2012). Opportunities and challenges equally abound when extending sustainable supply chains into developing countries (Hall & Matos, 2010; Muller, Vermeulen, & Glasbergen, 2012). Although the conclusion is that there is a clear potential for SP to contribute to sustainable development goals, more research is needed in order to provide clearer guidance to organisations on how to avoid the pitfalls and maximize development gains. UN entities have the potential to be exemplar organisations in this regard, since they have the procurement expertise and presence in developing countries. However, very little academic research has been conducted on UN procurement specifically (Walker & Harland, 2008). Previous research from Lund-Thomsen and Costa (2011) may be the only academic treatment of SP in the UN available. The key findings of the study point to costs, but especially to lack of conceptual clarity and lack of empirical evidence on the actual as opposed to postulated benefits of SP in developing countries, as the main barriers to effective implementation in the UN.

Barriers to Sustainable Procurement

While UN-specific research on SP is sparse, there are a number of studies on the drivers and barriers to sustainable procurement in both the public and private sectors that can be of assistance. Giunipero, Hooker and Denslow (2012) conducted a Delphi study of purchasing executives in the private sector to arrive at a categorization of high, medium and low drivers and barriers to sustainable procurement. They conclude that top management

initiatives and compliance with regulation are the main drivers, while the main barriers are economic uncertainty and the initial investment that is required to do SP. In the public sector, Preuss and Walker (2011) conduct an analysis of the psychological barriers to sustainable procurement. Inspired by works in organizational psychology, the authors aim to construct a conceptual framework of barriers that hamper progress in their sample of local government and health care authorities.

The strongest inspiration for the present study comes from Brammer and Walker's (2011) article entitled "Sustainable Procurement in the Public Sector: An International Comparative Study." This paper provides a first-of-its-kind analysis of a survey of 280 public sector procurement bodies worldwide in order to gauge the differences in their approach to SP and the barriers and facilitators they report. They find that the nature and extent of SP practices vary across all regions and highlight the most important barriers and facilitators such as national policy environment and organisational contextual factors. We therefore endeavour to extend the findings of Brammer and Walker (2011) to a "complex confederal network of highly heterogeneous organizations" (Walker & Harland, 2008, p. 832) such as UN. The attempt is to expand the findings of that research by focusing on a single organisation with multi-national characteristics, to determine the sector specific barriers proper of international public organisations. Responding to the research call of Brammer and Walker (2011), we also provide a more current snapshot of the perceived status of SP in the UN compared to pioneering studies on the subject (Lund-Thomsen & Costa, 2011), that allows drawing conclusions of the evolution of this policy instrument in the UN system. Finally, we further develop this approach by introducing the variable of current level of implementation of SP practices. One of the main contributions of this paper is the analysis of how the current status of implementation of SP in the organisation influences the SP barriers reported by procurement practitioners.

Conceptual Background

The aim of the paper is to provide a sound insight of the most salient obstacles to the implementation of sustainable procurement in the UN as they emerge against the background of current SP practices. Pioneering research has been conducted on this topic

(Hasselbalch, Costa, & Blecken, 2014) through semi-structured interviews with a sample of UN practitioners and policy makers from the largest procuring UN entities. The conclusion of that exploratory study was that especially the issues of policy, mandate, market barriers and procurement procedures constituted significant obstacles, while the highest level of disagreement between practitioners and policy makers was found in barriers related to resource needs and policy issues. The study seemed to indicate that the most significant barriers to tackle were those that existed in the higher strata of organizational hierarchies (policy and mandate issues), rather than the lower ones (operational issues). The study also pointed out at the limitations of deriving conclusions based on qualitative data from only twenty procurement experts employed in UN organisations, and at the need to confirm the findings through more statistically sound data.

To this end, we revisit the framework of barriers to SP used in Hasselbalch, Costa, and Blecken (2014), in order to provide some statistical rigor to the preliminary ranking by confirming our finding on a larger and more representative sample of procurement staff. We have chosen to continue working with the distinction between procurement practitioners and procurement policymakers, to test whether there are significant discrepancies in these two groups' understandings of SP barriers and focus areas. The assumption is that practitioners and policymakers may have different perceptions of the relative importance of various barriers and opportunities for SP, and that such dis-alignment may constitute a barrier in its own right. Finally, we are interested in exploring whether there is a relationship or connection between the SP practices that are currently implemented in various UN organisations and the barriers that procurement staff report. To this end, we conduct factor analysis and regression analysis to explore potential connections.

METHODOLOGY

Inspired by the innovative work of Brammer and Walker (2011), the authors intend to carry out an international comparative study but within a more homogeneous sample of procurement practitioners from a single organisation, with the assumption that their conclusions can be more consistently extended to all large international organisations, public and private, that face similar structural and

political constraints. As previous research on this subject was constructed on the basis of qualitative data from a limited number of procurement staff and experts employed in UN organisations, the logical next step was to test the theory and the findings of these exploratory studies by increasing the sample size and relying more on quantitative techniques.

Survey Design

The choice of research tool fell on an online survey as the best technique (Alreck & Settle, 1985) to reach the targeted population. The questionnaire was constructed using online survey software and distributed over email, on the assumption that regular access to email systems is an integral part of the work for all recipients of the survey, and that they are familiar with the online survey modality. During the survey design, due consideration was given to reasonably limit the time commitment required to filling the survey.

In scoping the survey, the authors acknowledged that the focus of the research was on the individual respondents' perceptions of sustainable procurement, and not on the official organisational discourse on the topic that tend to be politically charged. It was then decided to leave the option to respondents to remain anonymous. While this limits our statistical understanding of the sample, we believe the gains in terms of openness of the responses overcome this shortcoming. In lack of a unified database of all UN practitioners dealing with procurement, the survey was distributed through internal mail distributors in various UN agencies, plus various professional UN mailing lists and relevant working groups. It is estimated that these channels would reach an ample share of the UN procurement community. The barrier framework to be submitted to respondents was derived from Preuss and Walker (2011) and from Hasselbalch, Costa, and Blecken. (2014), with minor adjustments based on empirical testing carried out within the authors practitioners network, with the aim of increasing clarity of the questions while taking into consideration the cultural diversity of the surveyed subjects.

Data Collection Process

The survey consisted of two parts. The survey began with asking respondents to identify themselves as either a procurement policymaker (defined as someone who works with procurement at a

policy level, i.e. setting priorities and developing guidance material) or a procurement practitioner (defined as someone who works with procurement on an operational level, i.e. carrying out actual transactions).

The first part of the survey then asked a number of questions on current SP practices at the respondents' organisations to gauge the current state of SP implementation, rated on a 5-point Likert scale (Likert, 1932). These questions are primarily based on a review within the authors' internal practitioner network. We call these questions the "measures of SP implementation" (Table 1 below). On the basis of the outcome of previous research on sustainable procurement in the UN, the "measures of SP implementation" were conceived as background information that not all respondents would be necessarily aware of. It was hence decided to leave the option not to complete this section, and to maintain focus of the following part of the survey.

This was followed by the second and main part of the survey, which consisted of a matrix of questions, mainly derived from Preuss and Walker (2011), tempered by the analysis from Hasselbalch, Costa, and Blecken (2014). Each "barrier to SP" was presented organised by category, and respondents were asked to rate the

TABLE 1
Measures of SP Implementation

Measures of SP implementation
- My organization is currently doing SP
- My organization should be doing more SP
- My organization has a clear policy on SP
- Our procurement manual contains a section on SP
- Our solicitation documents include SP criteria
- We use Life Cycle Costing (or Whole-Life Costing) in our evaluation
- Sustainable procurement means more expensive procurement
- My organization is willing to pay a higher price to do more SP
- Doing sustainable procurement could hurt our relationship with suppliers
- My organization takes steps to follow up and verify suppliers' reports on sustainability criteria

importance of the barrier on a scale of 1 (unimportant) to 7 (very important) (Table 2 below). While it was not required to rate the “measures of SP implementation,” it was mandatory to rate all barrier items to complete the survey. This decision was taken on the basis that our primary objective with the survey was to obtain more rigorous data on the barrier framework, specifically. With the large number of barrier items, it was also decided to use a scale of 1-7 rather than 1-5 to capture more detail.

TABLE 2
Barrier Framework

Category	Barrier
Information	<ul style="list-style-type: none"> - Lacking general information on SP (or lacking awareness) - Difficulty in defining environmental criteria - Difficulty in defining social criteria
Tools	<ul style="list-style-type: none"> - Lack of tools and guidelines to support SP - Procurement manual does not cover SP - Difficulty in applying SP tools and techniques such as Life Cycle Costing
Performance measurement	<ul style="list-style-type: none"> - Lack of monitoring/auditing of SP performance - Lacking goals and targets for SP performance - Lacking sustainability benchmarks
Policy/strategy	<ul style="list-style-type: none"> - Lacking SP policy - Procurement policies focused on cost-effectiveness only - Need for more top management commitment - Lack of inter-agency collaboration on procurement issues - Staff resistance to organisational change
Mandate/politics	<ul style="list-style-type: none"> - Lack of UN General Assembly endorsement of SP - Lack of support/interest by Member States - SP does not support our efforts to meet our current mandate - Risk of damaging relations with developing countries
Supply	<ul style="list-style-type: none"> - Sustainable goods/services unavailable in local markets - Risk of limiting competition in our global supply base

TABLE 2
Barrier Framework

Category	Barrier
Demand	<ul style="list-style-type: none"> - Requisitioners do not demand SP - Donors do not demand SP - Beneficiaries do not demand SP
Resources	<ul style="list-style-type: none"> - SP is too expensive in general - Inability to justify higher upfront costs - SP takes too much time - Training needs - Lacking funds in our budget to do SP - Lacking staff to support/implement SP - Lacking in-house technical expertise

Dissemination and Response Rate

The survey was created using online survey software and disseminated to the target population by email, being the entire UN procurement community. The UN procurement community we take to mean all UN staff that are employed in roles where they either carry out procurement transactions (practitioners) or have responsibility for setting procurement policy or strategic direction, or are otherwise engaged in designing training and guidance material (policymakers).

Several different channels were used to reach procurement communities across all UN entities. Procurement mailing lists exist in most UN organisations, and were used in concurrence with professional networks.¹ The survey was distributed through those channel and maintained active for a total of six weeks, reaching a total response rate of 282. Data cleaning brought the number of responses down to 272, as we removed the rows of data where respondents had given all barrier items the same rating, on the assumption that they were clicking through the survey and not actually ranking barriers.

Measuring and Analysing Sustainable Procurement in the UN

The first part of our analysis seeks to obtain statistical indicators that will assist us in answering our first research question and determine which barriers to SP are perceived as the most important

to overcome. Comparing the variable means for the barrier items is one way to gauge the relative importance of the various measures and provide an overview of the data that is easy to comprehend.

When considering our second research question by comparing data from the policymaker group and practitioner group, we looked for significant differences in the means determined by the non-parametric Mann-Whitney *U* test, which has the advantage that the data need not be normally distributed (Mann & Whitney, 1947).

Finally, in response to the third research question, we conducted an exploratory factor analysis on the 10 “measure of SP implementation” items and the 30 barrier items respectively in order to reduce the number of variables and look for joint variation in response to unobserved latent variables (Fabrigar, Wegener, MacCallum, & Strahan, 1999). We propose a set of latent variables that explain the data and look for correlation between the SP implementation measures factors and barrier factors through regression analysis (cf. Brammer & Walker, 2011).

ANALYSIS OF FINDINGS

Table 3 displays the means of the “measure of SP implementation” items. The purpose of these items was to get a sense of the current state of SP in the UN, in terms of practitioners views on what practices are currently being followed, which guidance material is available, and what is the perception on some of the different dimensions of SP. The majority of respondents agree that their organisations are currently doing SP, and there is a very strong consensus among all respondents that they should be doing more. Most also agree that their organisations have a SP policy and that the topic is also covered by their manuals. These observations indicate that the basic groundwork of the creation of the policy architecture around SP seems to be in place. On the questions of the usage of SP criteria in solicitation documents and Whole-Life Costing techniques, the majority of answers fell in the neutral bracket. When it comes to the statement that SP means more expensive procurement, most respondents disagree, which is an encouraging finding in itself for SP implementation. Another encouraging finding is the fact that the lowest ranked measure is the question of whether SP would cause problems with their organisations’ suppliers. Unsurprisingly, most

TABLE 3
Measures of SP Implementation (n = 272)

Item	Mean	Most cited response	Std. Dev.	Policy-maker Mean	Practitioner Mean	Difference
My organization should be doing more SP	4.06	4	0.78	3.96	4.09	-0.13
My organization is currently doing SP	3.44	4	0.90	3.37	3.45	-0.09
Our procurement manual contains a section on SP	3.31	4	1.01	3.15	3.34	-0.20
My organization has a clear policy on SP	3.30	4	1.04	3.10	3.34	-0.24
Our solicitation documents include SP criteria	3.00	3	0.98	2.94	3.02	-0.08
My organization is willing to pay a higher price to do more SP	2.99	3	0.83	2.76	3.04	-0.28
We use Life Cycle Costing in our evaluation	2.92	3	0.98	2.90	2.93	-0.03
My organization takes steps to follow up and verify suppliers' reports on sustainability criteria	2.82	3	0.94	2.61	2.86	-0.25
Sustainable procurement means more expensive procurement	2.79	2	1.03	2.63	2.83	-0.20
Doing sustainable procurement could hurt our relationship with suppliers	2.34	2	0.86	2.08	2.40	-0.31

Notes: Scale of 1-5, where 5 equals "strongly agree."

respondents are unable to answer whether their organisations are willing to pay a premium to do more SP, as this decision does not typically lie in the domain of procurement staff. Finally, it does not seem that verification of suppliers' sustainability commitments is carried out systematically in the UN. Overall, the measures of SP implementation provide a picture of SP in the UN as well under way, but with full implementation still lacking, and an appetite to do more. These results constitute relevant background information when

proceeding to discuss our first research question: which barriers to SP implementation are the most important ones to overcome?

Main Barriers to SP in the UN

The results on the barrier items are displayed in Table 4 below, with the ten highest ranked barriers emphasized in bold. The most important barriers come very clearly from two categories: performance measurement and resources. This contradicts the previous findings of Hasselbalch, Costa, and Blecken (2014), which attributed very little importance to performance measurement and much more to higher-order items such as those having to do with policy and mandate. When looking at the mean values by category, the mandate/politics category is significantly lower than all other categories by a very large margin.

TABLE 4
Barrier Framework (Scale of 1-7, n = 272)

Category	Barrier	Mean	Std. Dev.	Policy-maker Mean	Practitioner Mean	Difference in means	Category Mean
Information	Lacking general information on SP (or lacking awareness)	4.39	1.78	4.20	4.43	-0.23	4.41
	Difficulty in defining environmental criteria	4.39	1.69	3.96	4.49	-0.53	
	Difficulty in defining social criteria	4.44	1.71	4.20	4.49	-0.29	
Tools	Lack of tools and guidelines to support SP	4.51	1.79	4.26	4.56	-0.30	4.36
	Procurement manual does not cover SP	3.99	1.87	4.30	3.92	0.38	
	Difficulty in applying SP tools and techniques such as Life Cycle Costing	4.58	1.69	4.44	4.61	-0.17	
Performance	Lack of monitoring/auditing of SP performance	4.78	1.75	4.80	4.77	0.03	4.81
Measurement	Lacking goals and targets for SP performance	4.80	1.73	4.84	4.79	0.05	
	Lacking sustainability benchmarks	4.86	1.70	4.84	4.86	-0.02	

TABLE 4
Barrier Framework (Scale of 1-7, n = 272)

Category	Barrier	Mean	Std. Dev.	Policy-maker Mean	Practitioner Mean	Difference in means	Category Mean
Policy/ Strategy	Lacking SP policy	4.14	1.80	4.12	4.15	-0.03	4.24
	Procurement policies focused on cost-effectiveness only	4.47	1.88	4.34	4.50	-0.16	
	Need for more top management commitment	4.42	1.84	4.58	4.38	0.20	
	Lack of inter-agency collaboration on procurement issues	4.52	1.89	4.16	4.60	-0.44	
	Staff resistance to organisational change	3.65	1.79	3.76	3.62	0.14	
Mandate/	Lack of UN General Assembly endorsement of SP	3.58	1.77	3.50	3.60	-0.10	3.50
Politics	Lack of support/interest by Member States	3.68	1.72	3.68	3.68	0.00	
	SP does not support our efforts to meet our current mandate	3.31	1.67	3.36	3.29	0.07	
	Risk of damaging relations with developing countries	3.42	1.69	3.28	3.45	-0.17	
Supply	Sustainable goods/services unavailable in local markets	4.72	1.80	4.78	4.71	0.07	4.61
	Risk of limiting competition in our global supply base	4.50	1.76	4.14	4.58	-0.44	
Demand	Requisitioners do not demand SP	4.64	1.86	4.74	4.61	0.13	4.47
	Donors do not demand SP	4.27	1.89	4.40	4.24	0.16	
	Risk of limiting competition in our global supply base	4.49	1.93	4.56	4.48	0.08	
Resources	SP is too expensive in general	4.23	1.54	4.06	4.27	-0.21	4.59
	Inability to justify higher upfront costs	4.40	1.62	4.06	4.48	-0.42	
	SP takes too much time	4.15	1.63	3.98	4.19	-0.21	
	Training needs	5.14	1.68	5.00	5.18	-0.18	
	Lacking funds in our budget to do SP	4.80	1.72	4.68	4.83	-0.15	
	Lacking staff to support/implement SP	4.56	1.77	4.50	4.57	-0.07	
	Lacking in-house technical expertise	4.88	1.74	4.80	4.90	-0.10	

The performance measurement category items are all ranked very highly: “Lack of monitoring/auditing of SP performance, mean=4.78”, “Lacking goals and targets for SP performance, mean=4.80”, and “Lacking sustainability benchmarks, mean=4.86.” Combined with the lower ranking of the policy and manual barriers, this seems to be a strong indicator that the UN is at the stage where the background work for supporting SP has been completed, but the operationalization of SP into specific goals and targets that are measured against benchmarks has not. This insight also sits well with the emphasis on the need for training and for building expertise in the organisations that emerges from the Resources category, and supports the notion that the crucial next step is the operationalization of SP. In plain words, there are indications that there has been much talking about SP and very little doing. The fact that the barriers within the Information are ranked as medium instead of high barriers could be supporting this analysis.

The Resources category ranks high overall, but there are substantial differences between the different items within. The “Training needs, mean=5.14” barrier especially sticks out as the highest ranked item of all. There is a significant gap to the following barriers, even the second-highest ranked “Lacking in-house technical expertise, mean=4.88” barrier. What is noteworthy about both of them is that they measure the need for skill and expertise in SP. The “Lacking staff to support/implement SP, mean=4.56” barrier is substantially lower than both of these, and while it is still one of the high barriers, this seems to indicate that the problem cannot be solved by simply hiring more staff. The core problem is the need to upgrade the skills and expertise of existing staff, while making sure that new hires already have or will be given the required skills. Other Resource category items having to do with cost and time issues are lower than others within the category and are seemingly not as salient, except for “Lacking funds in our budget to do SP, mean=4.80”. This could be connected to the training and expertise issues, as building staff skills can be a costly affair, and procurement departments would have to allocate scarce funds towards these activities. In this context, it is interesting to note that the individual barrier dealing with the perception that “SP is too expensive in general, mean=4.23” does not figure as a particularly high barrier compared to the other items.

SP is a multifaceted issue, and the barriers to its implementation are unlikely to fall neatly into one category or be explained straightforwardly. The supply and demand barriers testify to this fact. Whereas the previous barriers mostly dealt with internal organisational issues, the Supply and Demand categories test external factors. “Sustainable goods/services unavailable in local markets, mean=4.72” (or programme area markets), is one of the higher barriers. This finding is aligned with the conclusions from Hasselbalch, Costa, and Blecken (2014). The developing countries’ concern that stricter sustainability requirements could cut off their suppliers might be rightly placed. It is therefore of paramount importance that great care is taken in procurement operations to balance strict social or environmental criteria with the need to source from local markets and support capacity development for local suppliers. Since the operationalization stage of SP in the UN is still under way, there is still great scope to act on this concern.

The demand barriers show that compared to other stakeholders such as beneficiaries and donors, it is requisitioners (typically project managers) who have the lowest appetite for SP: “Requisitioners do not demand SP, mean=4.64”. Procurement is traditionally thought of as very process-oriented work. If procurers are not asked to score sustainability criteria, they are unlikely or even forbidden to do this of their own accord. This attitude may have to change if SP is to be implemented in the project management cycle, where a large share of procurement activities takes place. This finding concerning the demand barriers, supported by the indications coming from the supply barriers, tend to point out that in order to become successful, SP operationalization has to become a holistic affair, involving all stakeholders and especially project managers and local suppliers.

In the tools category, we see “Lack of tools and guidelines to support SP, mean=4.51” and “Difficulty in applying SP tools and techniques such as Life Cycle Costing, mean=4.58” as particularly high barriers, while “Procurement manual does not cover SP, mean=3.99” is lower than both of these. Staff are lacking SP-specific tools and especially assistance in applying these, even though the procurement manual may already cover SP. This observation lends more support to the notion that operationalization of SP through training and performance measurement is the crucial next step.

Another interesting barrier to consider is “Lack of inter-agency collaboration on procurement issues, mean=4.52”. This barrier also considers a factor that is external to the procuring organisation, and supports the idea put forward in the previous paragraph, that SP operationalization has to be holistic in the sense of drawing in and involving external stakeholders. There is a significant opportunity for the UN to combine procurement harmonization and collaboration with more sustainability requirements. This will allow the various UN entities to not only realize economies of scale, but also leverage each other’s expertise and pool resources to address the increased complexity of SP.

This overview concludes the outline of current state of SP in the UN, as well as the analysis of the most significant barriers to its implementation. In the following section, we deal with our second research question: how do UN procurement policymakers and practitioners differ in their understanding of the current state of SP and the barriers?

Differences between Procurement Policymakers and Practitioners

Of the 272 respondents, 50 identified themselves as procurement policymakers and 222 as procurement practitioners. Table 3 and Table 4 display the means of all variables for the policymaker and practitioner groups, respectively. The tables also present the calculated difference between the means. There is only one item showing a statistically significant difference ($p = 0.02$): it is the “measure of SP implementation” item stating that “Doing sustainable procurement could hurt our relationship with suppliers’ in Table 3. Here we see that policymakers tend to more strongly disagree with the statement. This could reflect the fact that practitioners work more closely with suppliers in their daily work, thereby having a more realistic idea of how suppliers would respond to more sustainability requirements. However, it is equally likely that practitioners are overestimating how suppliers will respond. This finding hints to the need of further researching the relationship with suppliers to reveal what are the underlying factors that can explain why the two groups differ. However, it should be noted that both groups still tend to disagree on the whole with the statement, even if practitioners show more concern than policymakers.

It is also interesting to note that although we do not find statistically significant difference in the means of any other items at the 95% confidence level, a few additional items do fall within the 90% confidence interval (the “My organization is willing to pay a higher price to do more SP” and “My organization takes steps to follow up and verify suppliers’ reports on sustainability criteria” items; and the barrier “Difficulty in defining environmental criteria”), and in all cases they are rated higher by practitioners. It could be argued that the practitioner score is more realistic, simply due to the larger sample size. Further analysis could reveal whether policymakers are systematically underestimating some of the measures of SP implementation and barrier items. Our results imply that this might be the case, but we cannot make this conclusion with certainty at this stage. On the whole, however, there seems to be remarkable agreement between policymakers and practitioners on the relative importance of the barrier items. A larger sample size is unlikely to yield new insights in this regard.

The Relationship between Measures of SP Implementation and Barrier Items

The final stage of the analysis concerns our third research question: is there a relationship between the barriers that staff report and the SP practices they are currently engaged in? As a first step, we conducted exploratory factor analysis (EFA) in the R software environment (we made use of the “fa” function in the “psych” package in R). The purpose of EFA is to make sense of large data sets by looking for latent (hidden and unmeasured) variables that can account for the variance in several of the measured variables simultaneously (Fabrigar et al., 1999). Thereby, the number of variables is reduced and the underlying structure of the data set can be deduced. The heuristic benefit of this exercise is that it allows us to look for correlation between multiple sets of variables simultaneously. Hence, we can discover whether and how the various SP measure items are correlated with the barrier items. We also considered confirmatory factor analysis or structural equation modelling, but opted for EFA because the state of research into SP in the UN is still in its infancy, and we have yet to identify strongly theorized causal relationships between our variables. Although EFA is generally conducted on continuous, normally distributed variables, it is not without precedent in the literature to apply the method for

ordinal, Likert-type items such as survey data (Muthen & Kaplan, 1985; Brammer & Walker, 2011).

There are various strategies for determining the number of factors to extract (Jackson, 1993). The scree plot graphs the number of factors by each factor's eigenvalue. A heuristic approach is to use the scree plot to determine graphically where the plot flattens out, signifying a drop in the marginal benefit of including further factors. Non-graphical solutions include the Kaiser-Guttman criterion, which states that all factors with eigenvalues above 1 should be included. Parallel analysis is another popular technique, whereby the eigenvalues of the data set are compared to those of a random data set. All three of these techniques were carried out in R on both the SP measures and barriers data sets. For the SP measure items, we decide to extract two factors as this is the solution given by both parallel analysis and the scree plot.² For the barrier items, parallel analysis and the scree plot suggest 3 factors, while 6 factors have eigenvalues above 1. Here we opt for 6 factors since a reduction from 30 variables to 3 factors risks oversimplifying the data or making it less interpretable. Since we assume that there will be correlation between the individual variables, we opt for an oblique rotation method rather than an orthogonal. Direct Oblimin is the default choice. We also apply the software's recommended factoring method of Ordinary Least Squares to find the minimum residual solution (Revelle, 2013). We dealt with the 12 cases of missing data in the SP measures items by using the method of single imputation to replace missing values with variable means (Raghunathan, 2004). There was no missing data on the barrier framework, since these questions required answers in the survey.

The results of the factor analyses are displayed in Tables 5 and 6 below. To ease the overview of the factor analysis we have deleted from the table all loadings below 0.30. This is also a cut-off level recommended in the literature, because a loading of 0.32 suggests an overlap of 10% or more in variance among the factors (Tabachnick & Fidell, 2007).

Starting with the measures of SP implementation (Table 5), the two factors suggested by the analysis distribute the variables neatly into two categories: a category describing good SP practices (MR1) and one describing problems and negative perceptions of SP (MR2).

TABLE 5
Factor Analysis: Measures of SP Implementation

	MR1 (Enablers)	MR2 (Problems)	h ²	u ²
My organization is currently doing SP	0.68		0.46	0.54
My organization should be doing more SP			0.03	0.97
My organization has a clear policy on SP	0.82		0.67	0.33
Our procurement manual contains a section on SP	0.66		0.44	0.56
Our solicitation documents include SP criteria	0.76		0.59	0.41
We use Life Cycle Costing (or Whole-Life Costing) in our evaluation	0.55		0.31	0.69
Sustainable procurement means more expensive procurement		0.51	0.26	0.74
My organization is willing to pay a higher price to do more SP			0.06	0.94
Doing sustainable procurement could hurt our relationship with suppliers		0.70	0.49	0.51
My organization takes steps to follow up and verify suppliers' reports on sustainability criteria	0.65		0.43	0.57
<i>SS loadings</i>	2.96	0.77		
<i>Proportion Var</i>	0.30	0.08		
<i>Cumulative Var</i>	0.30	0.38		

The MR1 factor can be interpreted as capturing the policies and practices that support sustainable procurement, such as the existence of SP policies and manuals and the use of sustainability criteria and whole-life costing. We therefore re-label this factor “Enablers” to illustrate the need for an enabling environment to support SP. MR2 captures two attitudes towards SP that describe some of the problems that are often associated with the concept, namely that it is more expensive and that it can strain relationships with suppliers. We therefore re-label the MR2 factor as “Problems.”

TABLE 6
Factor Analysis: Barrier Framework

	MR6 (Politics & Management)	MR1 (Performance measurement)	MR2 (Demand)	MR4 (Resources)	MR3 (Knowledge)	MR5 (Tools)	h2	u2
Lacking general information on SP (or lacking awareness)					0.38	0.33	0.56	0.44
Difficulty in defining environmental criteria					0.99		0.94	0.06
Difficulty in defining social criteria					0.87		0.82	0.18
Lack of tools and guidelines to support SP						0.48	0.68	0.32
Procurement manual does not cover SP						0.64	0.66	0.34
Difficulty in applying SP tools and techniques such as Life Cycle Costing					0.43		0.58	0.42
Lack of monitoring/auditing of SP performance		0.85					0.83	0.17
Lacking goals and targets for SP performance		1.00					0.94	0.07
Lacking sustainability benchmarks		0.75					0.82	0.18
Lacking SP policy						0.54	0.65	0.35
Procurement policies focused on cost-effectiveness only						0.31	0.51	0.49
Need for more top management commitment							0.48	0.52
Lack of inter-agency collaboration on procurement issues	0.33						0.43	0.57
Staff resistance to organisational change	0.42						0.25	0.75
Lack of UN General Assembly endorsement of SP	0.63					0.32	0.66	0.34

TABLE 6 (Continued)

	MR6	MR1	MR2	MR4	MR3	MR5	h2	u2
	(Politics & Management)	(Performance measurement)	(Demand)	(Resources)	(Knowledge)	(Tools)		
Lack of support/interest by Member States.	0.75						0.67	0.33
SP does not support our efforts to meet our current mandate	0.69						0.54	0.46
Risk of damaging relations with developing countries	0.72						0.54	0.46
Sustainable goods/services unavailable in local markets.						-0.35	0.33	0.67
Risk of limiting competition in our global supply base							0.41	0.59
Requisitioners do not demand SP			0.83				0.80	0.20
Donors do not demand SP			0.87				0.83	0.17
Beneficiaries do not demand SP			0.97				0.92	0.08
SP is too expensive in general	0.39						0.45	0.55
Inability to justify higher upfront costs	0.47						0.64	0.37
SP takes too much time	0.33			0.32			0.46	0.54
Training needs				0.35			0.40	0.60
Lacking funds in our budget to do SP				0.60			0.57	0.43
Lacking staff to support/implement SP				0.93			0.77	0.23
Lacking in-house technical expertise				0.79			0.75	0.25

Moving on to the barrier solution, the analysis here produced six cross-category factors that represent six distinct dimensions of SP barriers that are intuitive even in the cases where they do not follow

our theoretical categorization. The factors are presented in Table 6 in the order of the proportion of total variance that they respectively explain. “MR6=Politics & Management” captures mainly the category of mandate and politics barriers (which have the highest loadings on the factor), but includes also “Lack of inter-agency collaboration on procurement issues” and “Staff resistance to organisational change,” as well as the first three resource barriers concerning expense and time constraints. Seen together, the variables seem to signify difficulties experienced mainly at the political, executive or managerial level. While there is an evident logic in the grouping of barriers related to political challenges, it is more interesting to note how time and cost barriers are hereby associated. It could be argued that organisations are reluctant to the choice of investing time and scarce resources in sustainable procurement, especially in terms of short term investments to reap future benefits, unless a clear political commitment is secured. Procurers who experiment higher political challenge tend therefore to see also cost and time investment as significant issues.

“MR1=Performance management” and “MR2=Demand” align perfectly with the existing categories of Performance measurements and Demand. “MR4=Resources” captures the resource barriers from “SP takes too much time” to “Lacking in-house technical expertise”, but loads very highly on “Lacking staff to support/implement SP” and “Lacking in-house technical expertise”. There is an indication here that the lack of investment in human resources for SP purposes takes the form of not only lack of technical expertise (a gap that can potentially be filled through training) but also of a scarcity of dedicated staff time. “MR3=Knowledge” has to do with information and knowledge issues and includes difficulties with applying SP techniques. The use of specific techniques such as whole-life costing seems to be more connected with general knowledge and awareness barriers.

Finally, one last cross-category factor is labelled “MR5=Tools”, and it loads the highest on the “Lacking SP policy” and “Procurement manual does not cover SP” barriers and seems to speak to the availability and applicability of different tools to support SP. “MR5=Tools” appears to be a composite factor, gathering a wide range of residual barriers that span over a range of SP barriers from

macro to micro level: from lack of General Assembly endorsement down to lack of individual awareness of SP.

The factors in general fall into very comprehensible categories that seem to be measuring distinct underlying dimensions. The identification of the new factor categories has the purpose of expanding our understanding of linkages among barriers that may have not been fully appreciated at first sight, and may otherwise have diverted the focus of the analysis. The new factor categorisation that emerges here also provides us with a more accurate and evidence-based framework of analysis for some of the barriers that we have previously discussed. For example, it makes sense to consider SP policy together with the procurement manual and other guidance material as representing the practical tools available to procurement staff. In the same way, analysing together the political barrier and the perception of SP as a costly endeavour sheds light on the common foundation of these two barriers.

The next step in the analysis was to extract the factor scores for each respondent on the two measures of SP factors and the six barrier factors. The factor scores were estimated by the software's recommended "ten Berge" method for oblique factor solutions (Revelle, 2013). Having extracted the scores, we used these as the basis for analysing the regression of the six barrier factors on each of the two SP measure factors. The results are displayed in Table 7.

On the Enablers factor, we find significant correlation with the Performance Measurement, Demand and Tools barrier factors. This implies that respondents that rate more highly each of the barriers associated with the Performance Measurement, Demand and Tools factors, are likely to deem their organizational environment as significantly less supportive or enabling of SP. This finding can be interpreted as suggesting a model enabling environment for sustainable procurement: few well defined higher level policy enablers (a mandate from the General Assembly and SP policy support), paired with a clear demand for SP coming from both internal and external sources, and a general availability of tools and guidelines.

The Tools factor is the most significant correlation here. This is not surprising given that the issues of SP policy and manual figure on both factors. However, the Enablers factor also measures the degree

TABLE 7
Results of the Regression Analysis

	Enablers				Problems			
	Estimate	Std. Error	t value	Pr(> t)	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.000	0.047	0.000	1.000	0.000	0.045	0.000	1.000
Politics	0.080	0.069	1.156	0.249	0.174 ²	0.066	2.635	0.009
Performance	-0.182 ¹	0.071	-2.545	0.011	-0.003	0.069	-0.043	0.966
Demand	-0.183 ²	0.066	-2.773	0.006	-0.084	0.064	-1.329	0.185
Resources	-0.075	0.067	-1.113	0.267	0.025	0.065	0.386	0.700
Information	0.028	0.064	0.438	0.661	0.039	0.062	0.638	0.524
Tools	-0.381 ³	0.057	-6.708	0.000	-0.092	0.055	-1.680	0.094
Residual Std. Error	0.776				0.746			
Multiple R ²	0.319				0.047			
Adjusted R ²	0.304				0.025			
F statistic	20.690				2.161			
P-value	0.000				0.047			

Notes: ¹ is significant at the 0.05 level; ² at the 0.01 level, and ³ at the 0.001 level.

to which respondents agree that they are doing SP and using sustainability criteria and techniques. The new Tools factor includes a range of instruments going from information and awareness, to policy and guidelines and even to General Assembly endorsement. This finding therefore shows the importance of having policy documents and guidance material in place at all levels of the chain of operations. The correlation with the Demand factor implies that working to boost the demand for SP from requisitioners, donors and beneficiaries may be a very effective way of advancing SP in the procuring organisations. Finally, the Performance Measurement factor likewise implies that putting into effect some concrete goals, targets and indicators of SP and measuring these against sustainability benchmarks should foster SP practices and leave practitioners feeling more enabled and supported in SP by their organisations. It is remarkable that some of the barriers scoring highest in the first

phase of the analysis – namely the lack of training and of in-house technical expertise – are not figuring among the determining factors by the regression analysis. This outcome is only superficially contradictory, if we consider that technical capacity and its initiator (training) are usually not considered policy levers *per se*. While lack of technical expertise and training emerged as factual limitations, the regression analysis shows that it is impractical to boost expertise and training in a policy and guidance vacuum.

On the Problems factor, we see a significant relationship with the Politics factor. If respondents rate the Politics barriers more highly, they are likely to perceive SP as more expensive and straining relationships with suppliers. This suggests that much of the negative perception and attitude towards SP may stem from the unresolved political issues around the legitimacy of SP. Although the political barriers were rated the lowest in the first part of the analysis, the regression revealed a relationship between these barriers and the factor describing problems with SP, such as the perception that SP is more expensive and it strains relations with suppliers. A full UN-wide endorsement of SP given by the General Assembly could prove instrumental in dispelling and resolving these problems.

CONCLUSION

In this paper we reported the findings of a first-of-its-kind survey of sustainable procurement in the UN. Basing our approach on the study of Brammer and Walker (2011), we have tried to address one of the research opportunities identified by the authors, namely that of carrying out an analysis of SP within an individual organisation, even an internally diversified one such as the UN. The purpose was to address three connected research questions: to gauge the perception of the most important barriers to overcome for implementing SP in the UN; to determine whether there were significant differences in this perceptions between policymakers and practitioners; and finally to explore the relationship between the perceived barriers and the SP practices that staff engage in. The research questions were addressed each in turn in the analysis of the survey data. We found that respondents deemed SP implementation to be under way in terms of the construction of the policy architecture to support SP, such as SP policies and manuals, but lacking in regards to the operationalization of SP into daily work flows through concrete and

measurable performance targets and criteria. The most important barriers were identified to be pertaining to resources (especially training needs and lack of in-house expertise), performance measurement and supply and demand questions. We found very little significant difference in how policymakers and practitioners viewed SP issues, and there seems to be agreement especially in terms of the relative significance of the barriers. Finally, in order to explore the connection between the perceived levels of SP implementation and the reported barriers, we carried out an exploratory factor analysis of both data sets and used the factor scores for the generated constructs to do regression analysis. Thereby we discovered a significant negative correlation between the factor describing good SP practices with the demand, performance measurement and tools categories. In other words, respondents that do not feel they are applying SP good practices or do not feel supported by their organizational environment in doing so, will also tend to rate higher the barriers captured by the Demand, Performance Measurement and Tools factors.

If we combine the conclusions from the different parts of the analysis, some novel insights can be reached. While the lack of training and in-house expertise were rated as very high barriers, it is not immediately apparent whether the provision of more and better SP training or the development or hiring of in-house expertise in SP will lead to increased SP activity. Judging from the regression analysis, it seems that the levers of the demand, tools and performance measurement factors are the ones to pull to increase good SP practices. The respondents that reported lower barriers in these three cases would also tend to be in higher agreement with the assertion of following good SP practices. While the political barriers may seem insignificant at first glance, their connection to shaping or contributing towards negative perceptions on other aspects of SP is an important issue to consider. Dismantling the political barriers may be the most effective way of addressing negative perceptions on SP, and they should therefore not be ignored.

We found substantial differences when comparing our results with those of precedent qualitative studies on SP in the UN. In previous studies (Hasselbalch, Costa, & Blecken, 2014), the picture of SP that emerged was one of a very politically tense environment that constrained the choices available to policymakers and even kept

practitioners from pursuing aspects of SP. It seemed necessary to tackle higher-order barriers having to do with political, strategic and policy issues in order to progress. In the present study, however, these issues are downplayed significantly. Instead it is lower-order, practical issues such as performance measurement and capacity development that seem to be figuring highly. One possible explanation is that the rapid evolution of the political environment has brought about in a short timeframe wider acceptance for the concept of SP and that the significance of previously noteworthy barriers has been demoted. Another explanation of this is the composition of the sample. In comparison to previous studies that targeted a smaller group of respondents, selected on the basis of their familiarity with the SP concept, the present study examines responses from 50 policymakers and 222 practitioners from procurement communities at large. Practitioners are typically far removed from the strategic and political processes, which can explain why they rate these issues as less important. The sheer sample size of the present study suggests that the barriers identified here are significant for a large share of the UN procurement community.

The current state of SP as represented by the survey results seems overly positive. Most respondents agreed that they are currently doing SP and that it is covered by their policies and manuals. However, seeing as the authors are active in the procurement communities in the UN, we know that actual cases of sustainable procurement are far from the norm. There is probably an element of social desirability bias (Levy, 1981), (Zerbe & Palhaus, 1987) making respondents report too positive values on the SP implementation items. It is also very likely that many respondents lacked information on whether their organizations use whole-life-costing or are verifying suppliers, and therefore answered the neutral option when the "correct" answer would have been disagreement.

This research and analysis contributes to both the academic and the practitioners' field, inasmuch as it constitutes a first well-documented attempt to systematise the main constraints that international public organisations face in the actual implementation of SP principles. Considering the scarcity of previous enquires of perceived barriers to SP in the public sector - with the exception of Preuss and Walker (2011) - it is hard to make comparisons. Nevertheless, we can attempt some generalisations: our findings are

aligned with Brammer and Walker (2011) in that the enabling policy environment mediated by contextual factors seems to be a key feature for public organisations successfully investing in SP. A specific contribution of our research is that it is paramount to recognise latent linkages among variables that are at the root of the investigated problems, or else the risk is to confuse some manifestations of the issue with the issue itself. From a managerial perspective, the conclusion to be inferred is that the most effective leverages for SP operationalization are stimulating internal and external demand, but also providing practitioners with the necessary tools - from the more practical to the higher policy level; setting targets and monitoring results.

The limitations of the current study especially lie in the fact that it is a survey of opinions on SP, and we are using opinions as proxies for making claims about the reality of SP in the UN. Further studies should attempt to reconcile how these perceptions about the state of SP implementation and the relative significance of the barriers correspond to real-world cases and examples of SP in the organizations. Secondly, this study focuses on the views of UN practitioners only. As some of our findings point out, SP implementation seems to be a collective affair. Other upstream and downstream members of the supply chain – donors, beneficiaries and suppliers to mention few - may have peculiar views and attitudes on what constitutes a barrier to SP. Future work that incorporates the views of these stakeholders will add considerably to our understanding of success and failure in the implementation of SP in large international organisations.

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NOTES

1. The High Level Committee on Management – Procurement Network, counting 37 member organisations; the Operations Management Teams in all UN programme countries; and the UN Development Group as access platform to Resident Coordinators.
2. The Kaiser-Guttman criterion suggests 3 factors for the SP measures items, but has a tendency to overestimate (Jackson, 1993).

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