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Joseph Mpeera Ntayi Ephraim Mugume

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A taxonomy of strategic sourcing for defense forces in sub-Saharan Africa

Defense forces
in sub-Saharan
Africa

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Joseph Mpeera Ntayi
*Faculty of Computing and Management Science,
Makerere University of Business School, Kampala, Uganda, and*
Ephraim Mugume
Peoples Defence Force (UPDF), Kampala, Uganda

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Abstract

Purpose – The purpose of this paper is to provide a taxonomy of strategic sourcing using the defense forces from a developing world context as a testing ground. This study builds upon the current resource-based conceptualization of strategic sourcing as a construct to introduce the institutional orientation.

Design/methodology/approach – This study adopts a descriptive and analytical research design of cross-sectional nature to collect data from a sample of 120 respondents to examine the taxonomy of strategic sourcing for defense forces in sub-Saharan Africa. Data were collected using an interviewee administered questionnaire and analysed using a confirmatory factor analysis (CFA). The conceptualization of strategic sourcing is presented using a CFA.

Findings – Findings reveal that strategic sourcing is a multidimensional construct composed of information sharing and risk management, strategic purchasing, institutions for sourcing, internal integration and performance assessment, supplier management and sourcing professionalism and ethics.

Research limitations/implications – The study used cross-sectional research design which limits monitoring behaviour over time. Cross-sectional data do not allow control in the analysis for residual heterogeneity. Additionally, all item scales adapted in this study were developed in either manufacturing or profit-oriented sector.

Originality/value – A taxonomy for strategic sourcing within the defense forces is presented. This study is based on the observation that despite increased research, there remains a certain level of confusion surrounding the conceptualization of “strategic sourcing”. Researchers attach a startling diversity of definitions and measures to the strategic sourcing concept. Its conceptualization and stability remains an important task for scholars to undertake. Besides, much research in strategic sourcing, are conceptual frameworks identifying key elements and procedures or processes to implement strategic sourcing with sparse empirical studies. The results of the study will be used for further research on strategic sourcing in the defense forces in sub-Saharan Africa.

Keywords Ethics, Supply chain management, Developing countries, Strategic sourcing

Paper type Research paper

Background

Strong pressure from the international donor community and aid agencies to cut costs, improve service delivery and accountability of public resources has awakened the government of Uganda to professionalize, modernize and restructure the army, defense logistics and sourcing (Government of Uganda, 2004a). In an effort to support the reorganization of the armed forces’ service composition, force posture, deployment and geographic concentration, the Uganda Peoples Defence Forces (UPDFs) has changed its orientation from mere sourcing to strategic sourcing. This approach is meant to build institutional competence and accountability in public procurement. The public procurement spend on security by the Ministry of Defense (MOD) averages 2 per cent



GDP per annum (Government of Uganda, 2004a). Such a huge public procurement requires a clear conceptualization of the strategic sourcing construct whose importance has increased over time (Krause *et al.*, 2001). The importance of strategic sourcing is supported by Zhou and Benton (2007).

A review of extant literature reveals that, the construct of strategic sourcing has received wide attention from supply chain literature (e.g. Henderson, 1975; Hill, 1975; Boffey, 1975) but with little shared precise understanding of its meaning and its constituents (Rawlinson and Howie, 2007). For example, Carr and Pearson (1999) define strategic sourcing as the recognition of the strategic role of suppliers as a source of competitive advantage, while Lang *et al.* (2002) summarize strategic sourcing as a combination of supplier selection, supplier evaluation and supplier development. Such conceptual differences influence construct validity, makes research findings incomparable and organizations run a risk of ending up with a series of tactical operating models that may deliver short-term cost benefits but that lock in existing inefficiencies and fail to address the root causes of poor performance (Rawlinson and Howie, 2007, p. 2). Additionally, studies conducted from the public sector specifically from the defense forces can easily be assessed using instruments that may not always reflect properties of a specific sample. A review of practice reveals that strategic sourcing of military equipment in Uganda has proven to be problematic, resulting into cases of unreliable and wrong supply of ammunition, uniforms, drugs, food and other essential supplies that have hampered the progress of operations and force sustainability.

This state of affairs could be attributed to the fact that most of the spending under this sector is classified, meaning that their audits are not made public. This raises the question of efficiency and effectiveness in the utilization of public funds allocated to the defense sector. For instance, an official audit done in 2004 showed that the UPDF was up to 20 per cent below its authorized strength due to corruption of officers claiming the pay of over 10,000 non-existing soldiers (ghost soldiers) and “air-supplies” (literally meaning non-existent supplies) (Lukwago, 2010, p. 3). Additional information reveals that in 1998, Uganda purchased four faulty MI-24 helicopters (commonly referred to as “junk choppers”) together with their spares and ammunition at a cost of \$12 million. According to <http://williamkituuka.blogspot.com/2011/06/president-musevenishs17trillion.html>, there have been a myriad military equipment purchases that have cost the taxpayer millions of dollars, including a consignment of malfunctioning guns from South Korea and an order of undersize army uniforms. The army also bought 90 tanks from Bulgaria, only ten of which proved operational.

This study aims at developing a framework of what constitutes strategic sourcing for public institutions that want to improve efficiency and effectiveness in service delivery. This study builds upon the current resource-based conceptualization of strategic sourcing as a construct and introduces an institutional orientation that has been largely ignored in previous studies in strategic sourcing. It is then within the scope of this study to add information and utility to the conceptualization of strategic sourcing. In examining the taxonomy of strategic sourcing, key theoretical underpinnings and methods from previous scholars are utilized. This is necessitated by the fact that strategic sourcing has continued to increase in importance (Krause *et al.*, 2001) and so is the need to enhance the extant body of knowledge to offer theoretical and pragmatic insights. This need is supported by the Stockholm International Peace Research Institute (2003) which reveals that reliable military expenditure data promote democratic discussion of: resource allocation, security needs, the role and tasks of the military and feedback mechanism for strategic management of the defense forces.

Literature review and hypotheses development

This section presents a review of related literature that has attempted to conceptualize and provide a hierarchical structure of the construct of strategic sourcing. The review is guided by the institutional theory, since sourcing in Ugandan procuring and disposing entities (PDEs) is highly regulated by the Public Procurement and Disposal of Assets Authority Act of 2003 (PPDA) and reviewed in 2011. We use the results of the review to construct hypotheses that we later test empirically.

Institutional theory and strategic sourcing

Given the increased cost of doing business in developing countries arising out of uncertainty, inefficiencies, teleological orientations and transaction costs in government departments, national government design and implement formal laws, rules and regulations structuring human behaviour and action. In many developing countries, institutions play a major role in regulating behaviour and actions of public servants who are accountable to the citizens. This view is supported by North (1990) who defines institutions broadly, as “the humanly devised constraints that shape human interaction”. These constraints can be classified into: formal explicit institutions such as laws; informal institutions, which are conventions, norms of behaviour and self-imposed codes of conduct, and the enforcement mechanisms associated with these norms (North, 1995). According to Scott (1995), the regulative, normative and cognitive institutions legitimize organizational strategies. It is these institutions that force organizations to adapt its sourcing to conform to the organization’s environment. March and Olsen (1984) observe that institutional pressures may cause the organization to adopt sourcing strategies that conform to its environment.

Public service organizations continue to experience increased pressure from its clients arising out of inefficiencies, bureaucratic red tape and the continuous comparison with the private sector. All government departments are expected to be efficient by ensuring value for taxpayers’ money. Efficiency encompasses the qualitative and value-laden expectations of the society. Many government departments in sub-Saharan Africa have been restructured to pave way for improved efficiency, reduce costs, introduce new managerial concepts and tools and urged to be more responsive to citizens (Pollitt, 2009). This has put such departments on pressure to accept and implement market-oriented mechanisms and competitive arrangements. However, as revealed by Stiglitz (2002), this is done amidst long-lasting fiscal stress. This observation support the genesis of procurement reforms in Africa, which were largely driven by the international donor and aid agencies. The democratic desire for greater efficiency, integrity and accountability in governance and the increased involvement of international financial institutions created institutions for procurement which were largely modelled on UNCITRAL Model Law on Procurement. Such institutional arrangements legitimizes firms to obtain resources of higher quality at more favourable terms (Deephouse, 1999). We therefore hypothesize that:

H1. Strategic sourcing is a necessity in institutionalized public procurement in UPDFs.

Conceptualization of strategic sourcing

Literature is replete with conceptual frameworks presenting elements and procedures of implementing strategic sourcing in manufacturing organizations (Engel, 2003; Greaver, 1999; Banfield, 1999; Anderson and Katz, 1998; Quelin and Duhamel, 2003).

The application of strategic sourcing construct in developing and implementing procurement strategies in the commercial sector is fairly obvious. Organizations continue to operate in an environment characterized by economic disruptions that severely impact the source, cost, quality and delivery of their supplies. Surviving in this kind of market requires organizations to restructure their sourcing function and establish a competitive position in the market. Whereas this concern is valid for commercial enterprises, it is not clear whether the same construct would carry similar meaning and weight in public service organizations, which are highly regulated by formal institutions. Despite increased research, there remains a certain level of confusion surrounding the use of the term “strategic sourcing”. Researchers attach a startling diversity of definitions and measures to the strategic sourcing concept.

According to Rendon (2005, p. 9) “strategic sourcing involves taking a strategic approach to the selection of suppliers – an approach that is more aligned with the organization’s competitive strategy”. This approach means that organizations strategic plan precedes strategic sourcing. Unfortunately, Otengei and Bakunda (2010), using data from Uganda demonstrated that Ugandan managers are not very keen at strategic planning. Such a planning behaviour would render the construct of strategic sourcing untenable. However, Rendon (2005, p. 12) indicates that “strategic sourcing and specifically, commodity strategies are elements of a total purchasing transformation effort that has laid the groundwork for tremendous cost reductions, increases in productivity, quality improvement, and return on investment”. Despite the high-level conceptualization, Rendon’s (2005) paper was conceptual in nature and therefore unable to articulate practically what constitutes strategic sourcing. The battle to unravel the strategic sourcing construct was joined by Gottfredson *et al.* (2005), who provide a conceptual orientation of strategic sourcing. They contend that strategic sourcing is a process through which sourcing evolves into a strategic process for organizing and fine-tuning the value chain. This in the long run improves “a company’s strategic position by reducing costs, streamlining the organization, and improving quality” (Gottfredson *et al.*, 2005, p. 9). This approach too does not extricate the strategic sourcing constructs. As Chen *et al.* (2007, p. 777) have noted, “there is much research in strategic sourcing, such as Engel (2003), Greaver (1999), Banfield (1999), Anderson and Katz (1998) and Quelin and Duhamel (2003) that are conceptual frameworks identifying (modification of the italicized word is mine) key elements and procedures or processes to implement strategic sourcing”.

Despite the importance of the strategic sourcing construct, its conceptualization and stability remains an important task for scholars to undertake. Empirical research include the strategic sourcing framework by Humphreys *et al.* (2000) who limit the scope to “Buy or Make” decision and Lo and Yeung’s (2004) strategic alliance framework who prefer to integrate total quality management philosophies into supplier alliances. Chan *et al.* (2007) using data from the Hong Kong Toy Industry conceptualize strategic sourcing in terms of core values and key success factors. Their model is built upon a set of interrelated core values. They aver that strategic sourcing is a composite of visionary leadership in strategic sourcing, supplier management system and continuous improvement.

In addition to this conceptualization, Desouza (2008) emphasizes the security dimension in sourcing agreements. His study was triggered by the lack of care and consideration given to security elements in the sourcing efforts (Power *et al.*, 2004, 2006). Desouza (2008) reveals that most organizations do not do thorough background checks on employees who are going to be involved in outsourcing efforts resulting into

costly, especially when the outsourcing efforts are of a strategic nature and involve the intellectual assets of the firm.

Khan and Pillania (2008) studied strategic sourcing for supply chain agility and firms' performance of Indian manufacturing sector and found four factors constituting strategic sourcing. These factors were strategic supplier partnership, supply flexibility, supplier evaluation, and trust in supply chain members. However, these factors parallels the ones revealed by Chiang *et al.* (2011). Chiang *et al.* (2011) conceptualized strategic sourcing using survey items for adopted from Kocabasoglu and Suresh (2006). Chiang *et al.* (2011) found four sub-constructs of strategic purchasing, internal integration, information sharing, and supplier development. We therefore hypothesize that:

- H2.* Strategic sourcing is a multidimensional construct composed of supplier management, strategic purchasing, internal integration and supplier development.

Methodology

This study utilizes a descriptive and analytical research design of cross-sectional nature. Data were obtained from the MOD Headquarters at Mbuya, Land Forces Headquarters – Bombo, Air Defence – Nakasongola, Armored Brigade – Masaka, Marine Unit – Entebbe, Artillery – Masindi, Mortorised – Nakasonola and most Infantry units. Simple random sampling was used to select a sample of 120 respondents out of a population of 250. Data were collected using an interviewee administered questionnaire.

Measurements

Strategic sourcing was measured using constructs derived from previous studies. These constructs were kept close to the strategic objectives of UPDF strategic plans related to equippedness, training and the ability of the force (UPDF defence forces) to support combat and peace operations, logistical strength of the force while on an operation. Measurement constructs used include: supplier development (Besterfield *et al.*, 2003; Talluri and Narasimhan, 2004), supplier collaboration (Lajara and Lillo, 2004; McIvor and Humphreys, 2004), supplier monitoring (Gunasekaran *et al.*, 2004) and supplier selection and evaluation (Pooler and Pooler, 2004). Additional sub-constructs of strategic purchasing are derived from Kocabasoglu and Suresh (2006) as: internal integration, information sharing and supplier development. These were added to the total pool of measurement items. Special care was taken to avoid presenting duplicated items that measure the same construct. All measurement items were anchored on a seven-point Likert scale with “1” = strongly disagree and “7” = strongly agree. Sample items included: certifying supplier through formal supplier performance assessment; developing partnership with certified suppliers; transferring best practices among suppliers by education and training; willingness to share technological information and long-term demand forecast with suppliers; setting up collaborative team with suppliers to enable early supplier involvement in NPD; assessing supplier performance through formal supplier evaluation programme to measure the effectiveness of supplier and provide feedback for improvement; qualifying suppliers with satisfactory assessment of selection criteria; UPDF has goals and targets in place to maximize value for the quality and cost of goods and services purchased; there are procedures in place for solicitation, bidding and a supplier screening process; UPDF procurement frequently conducts market assessments in

relation to issues like pricing, availability or supply of all their products and services; UPDF procurement has processes to efficiently handle *ad hoc* demand requirements for of all their critical products and services; UPDF procurement has an established system and process in place for identifying the new or potential suppliers; UPDF procurement frequently reviews the current supply base to assess the performance of the existing suppliers for all their products and/or services; UPDF in its strategic sourcing approach is geared towards sustainable cost reductions; UPDF in its strategic sourcing approach has led to minimization of supply risks; UPDF has a minor level of responsibility to its suppliers; UPDF considers internationally accepted standards in their sourcing practices; procurement has been effective on service delivery in UPDF; there is planning, evaluation and quality control considerations in the sourcing activities by the UPDF; the procurement process in UPDF leads to reduced lead time and improving on-time delivery.

Analysis

An exploratory factor analysis (EFA) was conducted to detect the factor dimensions of strategic sourcing. EFA was preferred because common items are allowed to hang on a common factor. Additionally, the method enables researchers to reduce items to fewer constructs which were then used for further analysis. This study revealed a sufficiently large Kaiser-Meyer-Olkin (KMO) sampling adequacy to justify factor analysis (KMO = 0.757). KMO tests whether the partial correlations among variables are small. The results of the factor analysis of strategic sourcing yielded six dimensions. The six factors explain 53.4 per cent of the variables' variance. The six (6) factors corresponding to strategic sourcing include: information sharing, strategic purchasing, formal institutions for sourcing, internal integration and performance assessment, supplier management and sourcing professionalism and ethics.

A confirmatory factor analysis (CFA) was conducted to examine the hierarchical structure of the strategic sourcing components derived from literature and EFA to confirm the observed and latent variables in the UPDFs sample. We used CFA models in which every indicator loaded only on one factor and there were no correlations between measurement errors. The results of CFA indicated that the primary model, fit the data well with $\chi^2 = 90.953$, degrees of freedom = 89 and probability level = 0.423. The probability level of 0.423 means that the departure of the data from the model is not significant at the 0.05 level. The incremental fit index = 0.992, Tucker-Lewis index = 0.987; comparative fit index = 0.990; root mean square error of approximation = 0.016; GFI = 0.889. These results support *H1* and *H2*.

Results

Descriptive statistics

The study covered the procurement, logistics and strategic planning staff working with the MOD which is made up of the Land Forces (headquarters is in Bombo) and the Air Forces (headquarters is at Entebbe) reporting to the strategic headquarters in Mbuya in Kampala. Most of the respondents were mainly from policy and planning department (60.5 per cent), procurement (10.5 per cent), and logistics (9.3 per cent) while others constituted 19.8 per cent. Respondents from the land forces belonged to motorized (60.5 per cent), infantry (9.3 per cent), marine (9.3 per cent), armour (4.7 per cent), artillery (3.5 per cent), air defense (2.3 per cent) with other units constituting 10.5 per cent. Most departments in the MOD had been in operation for a period of six to ten years (27.9 per cent). Other departments which had been in

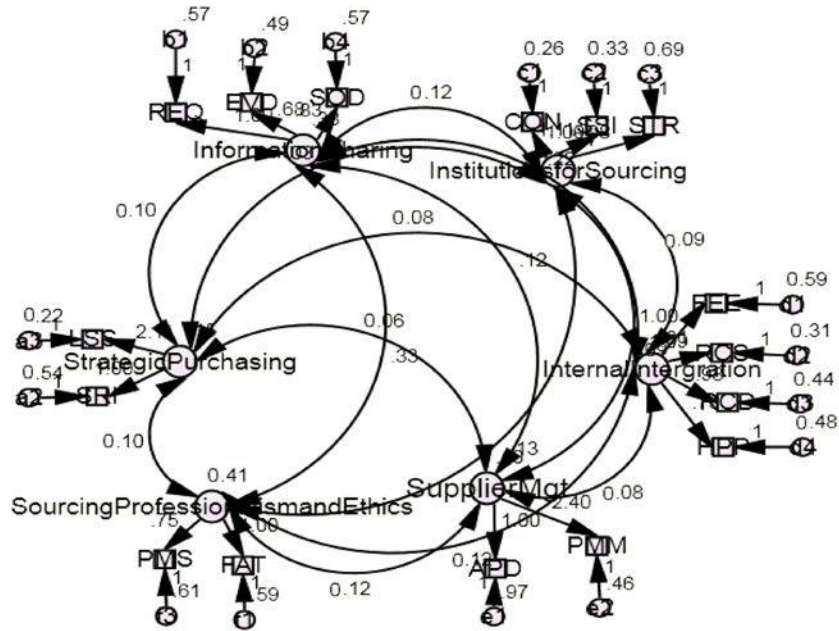
operation for less than five, 11-15, 16-20, 21-25 and 26-30 years accounted for 10.5, 16.3, 16.3, 12.8 and 16.3 per cent, respectively.

As regards the job level, sampled respondents were at the level of officer (46.5 per cent), senior officer (44.2 per cent), commissioner (1.2 per cent), principal (4.7 per cent) and assistant commissioner (3.5 per cent). Male respondents constituted 70.9 per cent of the respondents while the remaining 29.1 per cent were females. These results are not surprising since historically army recruitment in Uganda used to target males only. However, recent developments have seen women joining the forces, though the culture and social/opinion of the profession still favours men. Additionally, respondents were aged between 31 and 40 years (62.8 per cent), 20 and 30 age (19.8 per cent), 41 and above years (16.3 per cent) while those below 20 years accounted for (1.2 per cent). 70.9 per cent of the respondents were married, 20.9 per cent single, 4.7 per cent widowed and 3.5 per cent divorced. Majority of respondents were degree holders (44.2 per cent), followed by diploma holders (25.6 per cent) and masters (24.4 per cent). 1.2 and 4.7 per cent of the respondents had attained Uganda certificate of education and Uganda advanced certificate of education, respectively. As regards job tenure, majority of the respondents had worked for a period of 1-4 years (39.5 per cent), followed by 5-9 years (29.1 per cent), 10-14 years (18.6 per cent) and 15 years and above (12.8 per cent).

Table I presents descriptive statistics for the observed/manifest variables while Figure 1 depicts the CFA for the latent and manifest variables. All item measures for the constructs were anchored on a five-point Likert-type scale with “1 = strongly disagree” and “7 = strongly agree”. Consistent with *H1*, results reveals the middling presence of: requisition documents (REQ) (mean = 3.84, SD = 0.98); solicitation documents (SOD) (mean = 3.93, SD = 0.98); standardized process (EVD) (mean = 3.99, SD = 0.82); professional management and sourcing (PMS) (mean = 3.98, SD = 0.92); fair and transparent sourcing process (FAT) (mean = 3.65, SD = 1.00); presence of performance metrics (PMM) (mean = 3.62, SD = 1.02); feedback from internal stakeholders (FEE) (mean = 3.73, SD = 0.95); demand analysis and forecasting (RCD) (mean = 3.88, SD = 0.86); spend analysis (RCS) (mean = 3.74, SD = 0.83); integrated

	Mean	SD	Minimum	Maximum
Requisition documents (REQ)	3.84	0.98	1.00	7.00
Solicitation documents (SOD)	3.93	0.98	1.00	7.00
Standardized process (EVD)	3.99	0.82	1.00	7.00
Professional management and sourcing (PMS)	3.98	0.92	1.00	7.00
Fair and transparent sourcing process (FAT)	3.65	1.00	1.00	7.00
Suppliers advise UPDF on product design (APD)	3.38	1.04	1.00	7.00
Performance metrics in place (PMM)	3.62	1.02	1.00	7.00
Feedback from internal stakeholders (FEE)	3.73	0.95	1.00	7.00
Demand analysis and forecasting (RCD)	3.88	0.86	1.00	7.00
Spend analysis (RCS)	3.74	0.83	1.00	7.00
Integrated with plan and budget (HPP)	4.09	0.81	1.00	7.00
Sourcing and bidding information (SSI)	4.10	0.80	1.00	7.00
Supplier contractual relationship (CON)	4.22	0.71	1.00	7.00
Institutional arrangements (STR)	3.99	0.96	1.00	7.00
Sourcing reputation and image (SRI)	3.95	0.84	1.00	7.00
Long-term supply stability (LSS)	3.86	0.95	1.00	7.00

Table I.
Observed (manifest)
constructs



Chi-Square = 90.953; Degrees of freedom (DF) = 89; Probability (P) = .423;
 Incremental Fit Index (IFI) = .992; Tucker-Lewis Index (TLI) = .987;
 Comparative Fit Index (CFI) = .990
 Root Mean Square Error of Approximation (RMSEA) = .016
 Parsimony-Adjusted Measures = PNFI = .534; PCFI = .735

KEY

1. INFORMATION SHARING AND RISK MANAGEMENT:
 REQ = Requisition Documents;
 SOD = Solicitation Documents;
 EVD = Standardised Porcess;
2. STRATEGIC PURCHASING:
 SRI = Sourcing reputation and image; LSS = Long-term supply stability;
3. INSTITUTIONS FOR SOURCING:
 SSI = Sourcing and bidding Information; CON = Supplier contractual relationship;
 STR = Sourcing institutional arrangements are in place;
4. INTERNAL INTEGRATION AND PERFORMANCE ASSESSMENT:
 FEE = Feedback from internal stakeholders;
 RCD = Demand analysis and forecasts;
 RCS = Spend analysis; HPP = integrated with plan and budget;
5. SUPPLIER MANAGEMENT:
 PMM = performance metrics in place; APD = Supplier advise;
6. SOURCING PROFESSIONALISM AND ETHICS
 FAT = Fair and transparent sourcing process; PMS = Professional management for sourcing.

Figure 1.
 CFA for strategic sourcing
 in Ugandan defense forces

plan with budget (HPP) (mean = 4.09, SD = 0.81); sourcing and bidding information (SSI) (mean = 4.10, SD = 0.80); supplier contractual relationship (CON) (mean = 4.22, SD = 0.71); institutional arrangements (STR) (mean = 3.99, SD = 0.96); sourcing reputation and image (SRI) (mean = 3.95, SD = 0.84); long-term supply stability (LSS) (mean = 3.86, SD = 0.95). However, respondents slightly disagree with the aspect that suppliers advise UPDF on product design (APD) (mean = 3.38; SD = 1.04).

Results of strategic sourcing

Results of the study presented in Table II reveal that an improvement in strategic purchasing initiatives by 1 standard deviation results into improved SRI by 0.465 standard deviations. The regression weight for strategic purchasing in the prediction of LSS is significantly different from zero at the 0.05 level. When strategic purchasing initiatives go up by 1 standard deviation, LSS goes up by 0.868 standard deviations. Additionally, when information sharing and risk management improves by 1 standard deviation, use of REQ improves by 0.634 standard deviations. The regression weight for information sharing and risk management in the prediction of EVD is significantly different from zero at the 0.001 level with a prediction potential of 0.513. Increased information sharing and risk management by 1 standard deviation will result into increased use of SOD by 0.559. A positive improvement in institutions for sourcing results into improved CON by 0.692. Institutions for sourcing significantly predicts availability of SSI ($\beta = 0.687, p \leq 0.001$) and use of sourcing STR ($\beta = 0.497, p \leq 0.01$).

The study further reveals that improved internal integration and performance assessment by 1 standard deviation will result into improved FEE by 0.585 standard deviations. When internal integration and performance assessment goes up by 1 standard deviation, RCS, RCD and HPP go up by 0.733, 0.632 and 0.503 standard deviations, respectively. Improved supplier management by 1 standard deviation results into improved supplier advice (APD) by 0.301 standard deviations. Table II further reveals that the probability of getting a critical ratio as large as 1.796 in absolute value is 0.072. In other words, the regression weight for supplier management in the prediction of having performance metrics in place (PMM) is not significantly different from zero at the 0.05 level. Improved supplier management by 1 standard deviation, results into having improved performance metrics in place (PMM) by 0.738 standard deviations. When sourcing professionalism and ethics go up by 1 standard deviation, FAT goes up by 0.639 standard deviations. The regression weight for sourcing professionalism and ethics in the prediction of PMS is significantly different from zero at the 0.001 level. This means that when sourcing professionalism and ethics up by 1 standard deviation, PMS goes up by 0.525 standard deviations.

Estimated covariance and correlation results are presented in Table III. Consistent with our hypotheses Table III reveals that there is a significant positive correlation between information sharing and risk management and:

- (1) institutions for sourcing ($r = 0.397, p \leq 0.05$);
- (2) internal integration ($r = 0.629, p \leq 0.01$); and
- (3) sourcing professionalism and ethics ($r = 0.847, p \leq 0.001$).

Additionally, institutions for sourcing is significantly and positively correlated with internal integration ($r = 0.333, p \leq 0.05$) and sourcing professionalism and ethics ($r = 0.426, p \leq 0.05$).

Additionally, there is no significant positive correlation between strategic purchasing and:

- (1) information sharing and risk management ($r = 0.428, p \geq 0.05$);
- (2) sourcing professionalism and ethics ($r = 0.393, p \geq 0.05$);
- (3) institutions for sourcing ($r = 0.146, p \geq 0.05$);
- (4) internal integration and performance assessment ($r = 0.357, p \geq 0.05$); and
- (5) supplier management ($r = 0.490, p \geq 0.05$).

Table II.
Maximum likelihood
estimates – regression
weights

	Estimate (B)	Standardized estimate (β)	SE	CR	p	Estimated R ²
SRI ←	1.000	0.465				0.545
LSS ←	2.106	0.868	1.004	2.097	*	0.276
REQ ←	1.000	0.634				0.409
EVD ←	0.676	0.513	0.184	3.667	***	0.090
SOD ←	0.826	0.559	0.245	3.376	***	0.253
CON ←	1.000	0.692				0.399
SSI ←	1.115	0.687	0.249	4.484	***	0.538
STR ←	0.976	0.497	0.365	2.677	**	0.343
FEE ←	1.000	0.585				0.247
RCS ←	1.092	0.733	0.256	4.264	***	0.472
RCD ←	0.976	0.632	0.246	3.973	***	0.479
HPP ←	0.728	0.503	0.210	3.473	***	0.313
APD ←	1.000	0.301				0.263
FAT ←	1.000	0.639				0.401
PMS ←	0.754	0.525	0.237	3.184	**	0.753
PMW ←	2.398	0.738	1.335	1.796	ns	0.216

Notes: ns, not significant; regression is significant at * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

		Estimated covariances	Estimated correlations	SE	CR	<i>p</i>
Strategic purchasing	↔	Information sharing + risk mgt	0.428	0.060	1.698	ns
Information sharing + risk mgt	↔	Institutions for sourcing	0.397	0.058	2.074	*
Institutions for sourcing	↔	Internal integration and performance assessment	0.333	0.046	1.977	*
Internal integration and performance assessment	↔	Supplier management	0.471	0.054	1.498	ns
Supplier management	↔	Sourcing professionalism and ethics	0.586	0.071	1.632	ns
Strategic purchasing	↔	Sourcing professionalism and ethics	0.393	0.064	1.523	ns
Strategic purchasing	↔	Institutions for sourcing	0.146	0.033	0.851	ns
Strategic purchasing	↔	Internal integration and performance assessment	0.357	0.048	1.610	ns
Strategic purchasing	↔	Supplier management	0.490	0.050	1.193	ns
Information sharing + risk	↔	Internal integration and performance assessment	0.629	0.075	2.874	**
Information sharing + risk	↔	Supplier management	0.650	0.070	1.777	ns
Information sharing + risk	↔	Sourcing professionalism and ethics	0.847	0.100	3.350	***
Institutions for sourcing	↔	Supplier management	0.573	0.053	1.633	ns
Institutions for sourcing	↔	Sourcing professionalism and ethics	0.426	0.066	2.022	ns
Internal integration and performance assessment	↔	Sourcing professionalism and ethics	0.341	0.069	1.740	ns

Notes: ns, not significant; correlation is significant at * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Supplier management was not significantly positively correlated with:

- (1) internal integration and performance assessment ($r = 0.471, p \geq 0.05$);
- (2) sourcing professionalism and ethics ($r = 0.586, p \geq 0.05$);
- (3) information sharing and risk management ($r = 0.650, p \geq 0.05$); and
- (4) institutions for sourcing ($r = 0.573, p \geq 0.05$).

Internal integration and performance assessment and sourcing professionalism and ethics were not significantly positively correlated ($r = 0.341, p \geq 0.05$).

Discussion, implications and conclusion

Consistent with *H1* and *H2*, this study has revealed that strategic sourcing is a multi-dimensional construct consisting of: information sharing and risk management, strategic purchasing, formal institution for sourcing, internal integration and performance assessment, supplier management, sourcing professionalism and ethics.

Internal integration and performance assessment

Contrary to the results of previous studies, the construct of internal integration was modified to include performance assessment thus creating a new variable termed “internal integration and performance assessment”. Respondents from UPDF revealed the importance of integrating procurement within the overall organizational activities and develop a feedback mechanism to track sourcing progress. This finding supports the work of Narver and Slater (1990) who argued that inter-functional integration and coordination among the organization’s departments is necessary for the performance of the Ugandan PDEs. Coordination brings different elements of a complex activity into a harmonious relationship. Coordination formalizes actions, reduces undesired variation, and promotes performance management and control (March and Simon, 1958; Mintzberg, 1983; Thompson, 1967). Integration requires gathering relevant, timely and up-to-date internal and external information on a continuous basis. It involves, assembling information related to the needs of all user departments, monitor and analyse external factors impacting the PDE. This is especially necessary since successful strategic sourcing requires the input of all PDE personnel and stakeholders.

This finding further supports Armstrong (2000), who argues that performance management is a means of getting better results from the whole organization or functional units within an agreed framework of planned goals and standards. Performance management recognizes the fact that when people act in organizations, they create and recreate fundamental elements of social interaction: meaning, power and norms which need to be managed (Giddens, 1979). This observation is consistent with the findings of Alvarez and Busenitz (2001) who posit that without coordination PDE data and information is most times dispersed, fragmented and contradictory. These results have implications for UPDF. UPDF needs to undertake measures aimed at integrating its strategic, operational and tactical sustenance in order to support the UPDF in its missions and tasks. The emphasis is on scheduling the mobilization and deployment of units, personnel, equipment and supplies in support of the employment concept, particularly the ability to adequately sustain the individual, and welfare support on operations. However, most wars/campaigns were either prolonged (e.g. Kony, ADF, Lakwena) and or/failed due to an insufficiently sustainable force. Sourcing is expected to integrate with both internal (Narasimhan and Das, 2001) and external

(Frohlich and Westbrook, 2001) functions and to align with their supply chain activities. Indeed as Pagell (2004) has noted, poor integration of purchasing with the activities of other functions often results in slow problem solving, poor information exchange and low levels of service delivery. Results further reveal the importance of demand analysis and forecasts in the UPDF. This means that there are processes to frequently review UPDF current demand forecasts and estimates of all user departments. This process is accompanied with processes aimed at frequently reviewing the current spend for each category of products and services.

Strategic purchasing

The study reveals that strategic purchasing is a component of strategic sourcing. The strategic purchasing construct brings together observed variables of pro-activeness with PDEs goals and having an integrative procurement system with a long-term focus. This in essence means establishing rational and pragmatic steps to upgrade purchasing to meet company goals. It involves planning for LSS and being mindful of the SRI. Sourcing reputation is specifically important because Uganda is a member of the United Nations. Widespread terrorists' activities require careful scrutiny of the UPDF suppliers not to be classified as terrorists' collaborators. Military sourcing reputation requires that Uganda takes a proactive approach to avoid negative comments. This, however, requires a long-term strategic orientation of integrating purchasing within the overall UPDF strategic plan. As revealed by Reck and Long (1988), this finding helps to balance the position we accord a firm's purchasing function which may be operating at a non-strategic level or strategic or somewhere in between. A non-strategic level purchasing function reveals that purchasing is not important, contribution to the firm's long-term goals is insignificant and purchasing is relegated to a clerical position.

Strategic purchasing should be viewed by UPDF management as an important resource to the organization (Keough, 1994). Strategic purchasing should be involved in the firm's strategic planning process, and purchasing performance evaluation measures be developed. This requires developing and utilizing an integrated purchasing information system. These findings have both managerial and policy implications for UPDF sustainability. UPDF needs to be supported with adequate equipment to conduct its operations (Government of Uganda, 2004a). Sustainability aims at ensuring strategic procurement where UPDF has sufficient combat supplies of food, ammunition and fuel in order to sustain the required tempo of military operations. Such strategic sourcing activities would ensure that UPDF is properly equipped; the equipment is maintained in good working conditions, whilst introducing improvements in the management of facilities (Government of Uganda, 2004b). Improvements in the strategic sourcing can be achieved through: establishment of a robust service unit that will guarantee steady supply of combat supplies (ration, equipment, spares and other petrol oil and lubricants products), improvements in maintenance and repair facilities, the provision of improved storage facilities, provision of field medical service support, provision of improved personal field equipment and ensuring that the morale of soldiers is reinforced through access to information and resting grounds.

Information sharing and risk management

This study reveals the presence of information sharing and risk management as a key strategic sourcing component. The construct emphasizes continuous communication interactions and information sharing in the UPDF in order to create, develop and

maintain mutually beneficial long-term relationships with both internal and external stakeholders (Stank *et al.*, 1999; Paulraj *et al.*, 2008). Information sharing allows cost reductions, reduces waste and ensures quality (Fawcett and Birou, 1992), supply flexibility and improved supplier responsiveness (Tachizawa and Thomsen, 2007). Information sharing is essential for the UPDF given the risk supplies suffer from as a result of political disruptions, breakdowns and macroeconomic changes (Norrman and Jansson, 2004; Mantuj and Mentzer, 2008). This would enable UPDF to synchronize its plans, reduce the cost of supplier failure and manage the constraints of the suppliers and the probability of supplier failure (Chen *et al.*, 2004; Carter and Narasimhan, 1996). Synchronization of plans and sourcing decision are a result of information sharing and risk management between suppliers and the buying firm.

The information sharing construct brought together the observed variables of having a clearly articulated sourcing mechanism, presence of SOD and standardized sourcing process. This finding is consistent with the results of Kohli and Jaworski (1990) who observed that intelligence generation, dissemination and responsiveness is a requirement for quick firm response to key strategic decisions. Such a practice would prevent the emergency situations which have become chronic in the Uganda public procurement. According to Henk and Rupiya, “emergency and sensitive” procurements are frequently cited in the UPDF. UPDF has been under spotlight for purchase of expired drugs and rations, disguised under the cover of “emergency” sourcing. This has a policy implication for the UPDF. We recommend UPDF to institute – augmented agility through better information sharing with all organizational units and its actual and potential suppliers (Ledyard and Keough, 2007). This is especially necessary since lack of effective communication between the stakeholder groups can be detrimental to strategic sourcing, leading to a poor fit between the procurement function and the needs of the user departments (Schilling and Hill, 1998). Additionally, Pinto and Pinto (1990) have suggested that both external and cross-functional communications are critical to the successful implementation of sourcing.

Supplier management

Consistent with hypotheses (*H1* and *H2*), this study reveals manifest variables of having well integrated suppliers in the UPDF’s strategic sourcing activities, PMM for measuring, tracking and monitoring suppliers on an ongoing basis and supplier advise on sourcing. Supplier management involves, interacting with both existing and new suppliers. Pooler and Pooler (2004) have grouped four key success factors in strategic sourcing related to management of suppliers. These are supplier evaluation and selection, supplier monitoring, supplier development and supplier collaboration. Pooler and Pooler (2004) have emphasized the importance of selecting the right suppliers in the sourcing process. This is followed by articulating a performance measurement metric to monitor supplier performance and decide on the future courses of action (Gunasekaran *et al.*, 2004). Such a system would help prevent committing mistakes related to sourcing items which do not conform to standards. UPDF has in the past sourced undersized uniforms from China without any serious justification despite the existence of a significant textile industry in Uganda. Consistent with Talluri and Narasimhan (2004), UPDF is recommend to develop good suppliers with high and reliable performance record. This practice eventually result into supplier collaboration in which information sharing is a necessity. Once developed well, this can easily result into strategic alliance (Stuart and McCutcheon, 1995).

Sourcing professionalism and ethics

The study produced a factor of sourcing professionalism and ethics as a dimension of strategic sourcing. The study produced observed variables of having a cadre of highly developed sourcing professionals. Another construct that significantly loaded include – the presence of a fair and transparent process that is not subject to fraud and violation of policy which is used for submission of bids and capturing solicitation responses from suppliers. This finding is similar to that of Zhang *et al.* (2002, 2003) who developed a sourcing strategy based on competence and capability theory. Their model contained competence constructs of machine, labor, material handling and routing flexibility. The capability construct was operationalized in terms of volume flexibility and mix flexibility. Chiang *et al.* assert that “more specifically, strategic sourcing is considered a structural asset for external linkages in dynamic capabilities and, thus, has an important bearing on how competencies and capabilities co-evolve and develop”. Additionally, force sustainability can be achieved by having sourcing staff who display a high-level sense of ethical behaviour. Ethics involves achieving a certain level of equippedness, training and the ability of the force to support combat and peace operations, achieving a minimum level of deploy ability of the force in terms of speed and equipment anywhere within the country and abroad. It is only through ethics that the force would be able to participate in joint/combined operations to measure its sustainability.

Institutions for sourcing

The study reveals that availability of formal arrangements for sharing bidding information, developing formal supplier contractual arrangements constitute institutions for sourcing. UPDF sourcing department always informs suppliers of the outcome of the bidding process through standard and formally written documentation. Additionally, UPDF procurement always enters contractual relationships with its entire award winning suppliers of products and services. Sourcing strategies have been put in place to deal with technical requirements, budgetary restraints, number of suppliers and/or the risks involved. This finding is consistent with the rich and diverse theoretical foundation given by Shook *et al.* (2009) to foster future theory-building activities in strategic sourcing and supply management research. Shook *et al.* (2009, p. 4) utilized institutional theory to premise that “external forces pressure firms to behave in certain ways and not behave in others” and to demonstrate that “firms should use a sourcing approach only if the approach matches the firm’s strategy, not just because the approach is used by others”. They aver that institutional pressures may cause the organization to adopt sourcing strategies that conform to its environment. This is true for public institutions where pressure for accountability from both citizens and international organizations force governments to develop sourcing laws, rules and procedures (see PPDA for details). As revealed by Scott (1995), regulative mechanisms in form of government policies and regulations, institutionalize legitimize sourcing strategies.

Limitations of the study

This research is subject to limitations that affect the interpretation of results. First, the study generated a cross-sectional data set which cannot be used to monitor behaviour over time. Additionally, cross-sectional data does not allow control in the analysis for residual heterogeneity. Residual heterogeneity refers to the omission of either unmeasured or un-measurable variables in the analysis. Cross-sectional data allow us to undertake analysis between individual cases yet in the data set there might be

individuals with similar characteristics but behaving differently at different time points (Davies, 1994; Plewis, 1985; Ruspini, 2000; Taris, 2000). Additionally, all item scales adapted in this study were developed in either manufacturing or profit-oriented sector with a different research purpose. There is need to develop measurement scales to cater for the public sector.

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About the authors

Joseph Mpeera Ntayi, PhD, is a Professor of Procurement and Logistics Management and Dean, Faculty of Computing and Management Science, Makerere University Business School (Uganda). His teaching and research interests are in public procurement, managing contracts, business ethics, industrial marketing, purchasing and supply chain management. He is a Public Procurement and Marketing Consultant, a certified WTO/ITC Trainer in textiles and clothing and former Project Manager for the Netherlands Programme for the Institutional Strengthening of Post-secondary Education and Training Capacity (NPT/UGA/040) – support for institutional Capacity Development in Public and Private Procurement Management in Uganda; Director, Uganda National Marketers Forum – Uganda; formerly pioneer – Faculty Advisor, MUBS-Global Business Case Competition (GBCC); Chair and Coordinator for Makerere University Business School case writing committee. Professor Joseph Mpeera Ntayi is the corresponding author and can be contacted at: ntayius@gmail.com

Ephraim Mugume is a Lieutenant Colonel in the Uganda Peoples Defence Force (UPDF). He is finalizing a Master of Science in Procurement and Logistics Management (Msc PLM) at the Makerere University. He bears a wealth of experience in procurement and logistics management.