Effects of Electronic Sourcing Adoption on Supply Chain Efficiency in Telecommunication Industry: A Case Study of MTN Rwanda

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Abstract: *Before introduction of e-Sourcing, the Supply Chain was not proactive rather reactive. Several tasks in procurement were performed after a Purchase Requested for goods or services is made by the department. Also, procurement could negotiate a contract after it was already signed. This process was difficult because the supplier had zero incentive to meet any of procurement entity's demands. It is no longer this scenario where the seller controls the market. Today, technology has shifted the balance of power to buyers. By automating the procurement process and the sourcing of suppliers with company intelligence and market insights, e-Sourcing solutions are empowering businesses to take back control of supply chain. The main objective of this study is to investigate the effect of e-Sourcing adoption on Supply Chain Efficiency in the Rwanda Telecommunication industry; with MTN Rwanda as a case study and aimed at identifying the main adopted e-Sourcing technologies, areas of applicability of e-Sourcing and electronic auctions, and finally, the main benefits and criticalities for both buyers and sellers involved in the sourcing process. The researcher uses descriptive statistics and the population of the study consisted of 265 employees of MTN Rwanda randomly selected as a sampling technique of this research study. The study used a stratified sampling technique; the strata was derived from the various employment levels including top, middle and low-level management. The study used a sample of 20% from the population to select 53 respondents. The research based on primary and secondary data. Primary data was collected through open ended and closed ended questionnaires structured to meet the objectives of the study. To collect secondary data, books, literature review, journals, business magazines, internet and other relevant materials were used. With descriptive and inferential statistics in IBM SPSS Version 24, the researcher performed data entry and analysis using mean, frequency, and standard deviation. Furthermore, Pearson Chi-Square was used to measure the effect size of e-Sourcing Adoption on Supply Chain Efficiency. The outcome of the study was that MTN Rwanda adopted e-Sourcing to manage some of its Supply Chain operations though it has not been integrated with other systems working in silos. The integration with Spend Analysis Software and ERP would perfectly automate the overall Supply Chain operations thus resulting in supply Chain efficiency.*

1. Introduction

Achieving efficiency through automated processes such as supplier relations, lean (just in time) inventories, outsourcing, cycle time reduction, distribution, low cost purchasing and supply chain globalization in volatile markets is enabled by nothing other than e-Sourcing (Kimutai & Ismael, 2016). As a result, companies need e-Sourcing now more than ever before and these changes demand the procurement function to keep pace with business requirements. Barbara and Maxfield (2013) realized that, in order to compete and deliver against strategic objectives procurement must use best technologies including e-Sourcing. Farrington and Lysons (2012) define e-Sourcing as: the uses of internet to make decisions and form strategies regarding how and where services or products are obtained.

According to RURA Report (2017), the Rwanda telecommunications industry is made of three main telecom operators, six Internet Service Providers (ISPs), one wholesale network service provider, two network facility providers and fourteen Retail Internet Service Providers. As a result of a conducive Legal and Regulatory Framework in place, the ICT sector continues to experience a significant growth. This growth is mainly attributed to the use of mobile internet segment backed using smart devices. However, competition in Telecommunication has brought about price wars in the market and operators have started bundling their services, where one can buy a voice pack and be given free SMS, and internet packs, in addition to this it has been evidenced that calling packs have become so popular to mobile telephone users.

Thus, in this growing and competitive industry, identifying, evaluating and selecting new vendors can be a time-consuming endeavor for telecom companies if they don't adopt new technologies such as e-Sourcing; which makes it easier to quickly investigate, evaluate and select suppliers as the best partners to drive their business forward.

1.1. Statement of the Problem

In telecommunication industry, there is still a problem of realizing the benefits and effects of e-Sourcingadoption. Certainly, MTN Rwanda introduced e-Sourcing system in 2011 as a mandatory tool to be used in all RFQs, RFPs and tenders across the company. Accessible on web-based platform, MTN e-Sourcing ensuressmooth and clear communication, and it is a more profitable business tool for both suppliers and MTN. However, this system is neither covering some key areas in Supply Chain of MTN Rwanda such as the spend analysis, e-auctions, supplier management and contract management nor its adoption impact on the business (MTN Y'ello Book, 2015).

Consequently, this research investigated and analyzedthe effects of e-Sourcing adoption on efficiency of MTN's Supply Chain such as cost reduction, optimised purchasing process, and improved supplier relations, and customer satisfaction.

1.2. Research Objective

This study contains the following general and specific objectives:

1.2.1. General Objective

The generalaim of this research was to investigatea case study in telecommunication industry and assess their e-Sourcingsystem in supporting the Supply Chain to achieve the company's overall performance.

1.2.2. Specific Objective

Therefore, the specific objectives of the study were:
a) To assess the impact of automatedspendanalysison supply chain efficiency of telecommunication companies in Rwanda;
b) To evaluate the impactof e-RFx on supply chain efficiency of telecommunication companies in Rwanda; and
c) To determine the effect of e-Auction on supply chain efficiency of telecommunication companies in Rwanda.

1.3. Research Questions

The central research question is: How and to what extent do the Information Communications Technologies used in telecommunication industry influence their Supply Chain operations? This question was addressed by four specific questions as indicated below:

Q_1: How does automated spend analysis impact on supply chain efficiency of telecommunication companies in Rwanda?

Q_2: How does e-RFx improve the supply chain of telecommunications in Rwanda; and

Q_3: How does e-Auction enable telecommunication Companies in Rwanda to achieve customer satisfaction within their Supply Chain?

2. Literature Review

2.1. Theoretical Framework

According to Colquitt (2007), a theory is simply a way of making sense of a disturbing situation. It is generally, an explanation as to why and how something occurs. In this case, a theory allows researchers to understand and predict the outcomes of a study (Colquitt, 2007). This section discusseson adoption theory, efficiency theory, supply chain and e-Sourcing theories, and then the benefits and effects of e-Sourcing adoption on supply chain efficiency.

2.1.1. Theory of Adoption

According to Bhasin (2018), the adoption theory has a simple objective – To observe new product adoptions and new product diffusion in the market to understand how and why as well as to what extent a new product is adopted by individuals or organizations.

As per the adoption theory, a new product which is being launched in the market, should have previous empirical data pointing towards the possible success of a product. It cannot be launch directly in the market to watch it fail. It is tested and then launched after. Any new product can be targeted towards either individuals or organizations.

According to TAM, there are two specific variables that are fundamental determinants of users' attitude toward using information technology and actual use of the system: perceived usefulness and perceived ease of use in relations with the new system components f. Usefulness is explained as the degree to which someone believes that using a certain system will improve his performance; and ease of use is as the degree to which a user believes that benefits of using a system much more than efforts for using it (Davis, 2009).

2.1.2. Theory of efficiency

According to Archer (2010), efficiency is defined as the measure of effectiveness that produces the minimum waste of time, effort, and skill. it is a term that recently has come to the forefront of the scientific world. Today, the world is having difficulties to accommodate the enormous growth in population and to manage the distribution of resources; therefore, the effort to make things more efficient has become increasingly more relevant. We talk about fuel efficiency in cars and energy efficiency in our homes. We strive to learn how to efficiently collect data, use space, recycle goods, and run a business. Nevertheless, somewhere in this vast search for efficiency we seem to have overlooked the most powerful set of systems and tools we have, ourselves. If we are truly in pursuit of maximum efficiency, we need to look at how efficient we are as a social whole.

Efficiency of supply chains is not only a task for which a Procurement department is responsible as it is a strategic decision taken by the management as regards the method of future company's operation. Decision-makers must always remember that a supply chain must first be planned in the most effective manner, considering numerous aspects influencing its operation. Disregarding the importance of the designing and strategicanalysis processes will surely make a supplychain less effective. In a company aware of its importance, supply chain management mayplay a key role exerting the same impact on itsperformance as sales, marketing or production (Lichocik & Sadowski, 2013).

2.1.3. E-Sourcingin supply chain

According to Labs (2010); very simply put, a supply chain is a system of organizations, resources, activities, people, information and technology involved in moving a product from a supplier to a customer. Any manufacturer or producer typically performs five steps in the supply chain: planning, sourcing (finding suppliers), making (manufacturing), delivering and returning (taking back defective goods). Supply chain efficiency, therefore, is the measure of getting the right product to the right place at the right time at the least cost. While processors want to measure their own supply chain efficiency, it is often the customer who ultimately judges them.

A lack of end-to-end, real-time supply chain visibility, the inability to obtain actionable and up-to-date data, poor response from suppliers and collaboration with partners, and a lack of integration and seamless business process management are all critical hindrances that prevent supply

chain executives from improving their supply chains and meeting related objectives.

As the capabilities of the technologies have developed and the price of accessing an e-Sourcing platform has fallen with greater competition for cloud-based solutions such as Software as a Service (SaaS), business cases for e-Sourcing have proven its worth. Therefore, the issue is not about whether the purchasing teams should be using e-Sourcing rather about ensuring the successful adoption of the systemfor it to consistently deliver the value that its capable of. Furthermore, there are some interesting developments along the e-Sourcing technology roadmap known as "Collaborative Optimisation". E-Sourcing is increasingly moving from being focused on specifying something comprehensively for which suppliers can propose a price offer, towards a more collaborative model. This enables suppliers to propose alternatives to selected elements of customers' specifications known as "Expressive Bidding". The variety of options that this then presents needs some strong analytical horsepower to resolve what the optimum solution is, and this is known as "Advanced Optimization" (Interim Management Purchasing, 2012).

2.1.4. Effects of e-Sourcing on supply chain efficiency

According to Basta et all(2018), e-sourcing enables a company to work collaboratively to build, issue, and evaluate sourcing events via a secure online solution. From sourcing simplest products to complex categories, e-sourcing streamlines the way you do business, and lowers costs on both sides of the supply relationship. E-sourcing is a powerful end-to-end procurement management system that provides secure and compliant sourcing solution for organizations around the globe.

E-sourcing is basically transferring the sourcing paper process into internet-based process in which the organization will be publishing tenders and subsequently suppliers and venders will be responding and submitting their proposal online.

E-Sourcing improves the Supplier Relationsby bringing considerable improvements in transparency and openness between buyers and suppliers hence avoiding collusion as a bad practice. Such systems enable suppliers to see all tender opportunities thought a single platform. This platform clearly indicates the opportunity type with deadlines, their current statuses and the final outcomes all clearly presented.The system facilitates information sharing through interaction and collaboration hence speedy communication and effective feedback so that both suppliers andbuyers are aware of every single situation.

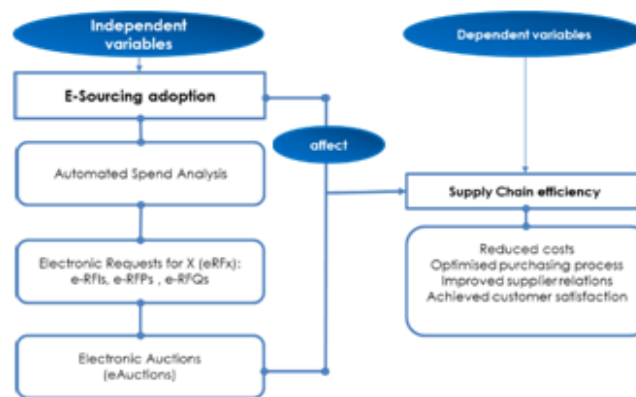## 2.2. Conceptual Framework

Figure 2.1: Conceptual Model

In this study the researcher measuredfour (4) independent variables of e-Sourcing adoption, which are the Electronic Request forInformation (eRFI), the Electronic Request for Quotation (eRFQ)/Proposals (eRFP), (eRFI), Electronic Reverse Auction He then studied the dependency (influence) of these variables vis-à-vis the supply chain efficiency.

3. Methodology

3.1. Target population

The population comprised of 265 employees of MTN Rwanda. Hence, due to finance and time constraints against the short period of carrying out the research, a representative sample of 20% of total employees were selected randomly. In itsreport of 2017, RURA states thatthe Rwanda telecommunications industry is made of three main telecom operators, six Internet Service Providers (ISPs), one wholesale network service provider, two network facility providers and fourteen Retail Internet Service Providers. The main telecom operators include MTN Rwanda, Airtel-Tigo,Korean Telecom Rwanda Network (KTRN), Broadband Systems Corporation (BSC), and Liquid Telecom. The study targetedonly MTN Rwanda to assess the effects of e-Sourcingadoption in supply chain among the leading telecoms in Rwanda.

3.2. Sampling techniques

The sample used is 20% representative of the total population of 265 employees of MTN Rwanda. The sample was selected randomly using stratified classes. That is from top level management, through middle management to lower level operations of the company.

Table 3.1: Determining the Sample size

N	Department	Number of Employees	Sample Size
1	Procurement	8	8
2	ICT	20	4
3	Operations	75	15
4	Sales &Marketing	75	15
5	Other	86	11
	Total	265	53

3.3. Data Collection procedures

Primary data is information gathered directly from respondents (Kombo & Tromp, 2006) and for this study the researcher used a questionnaire. The questionnaire had both closed-ended and open questions. Secondary data was collected for this study; therefore, these data were collected and analysed from published materials and information from other sources such as journals, annual reports and internet. The researcher administered the questionnaire individually to all respondents of the study using a drop and pick later method.

3.4. Data Processing and Analysis

Since the data collected was quantitative in nature, the researcher analysed them using descriptive analysis techniques. The descriptive statistical tools such as Statistical Package for Social Sciences (SPSS) and MS Excel was used by the researcher to describe the data and determine the extent used.

3.4.1. Validity and Reliability of Measures

The researcher used the Pearson Chi Square Test to establish the validity and reliability of data through the current version of SPSS software, IBM SPSS Statistics 24. The researcher also used frequencies, percentages, means and other central tendencies. Tables and charts were explained to summarize responses for further analysis and facilitate comparison and correlation of variables.

4. Findings and Discussion

4.1. Introduction

This chapter covers data analysis, discussions and findings of the research. The main objective of the study was to investigate the effects of Electronic Sourcing adoption on Supply Chain Efficiency in Telecommunication Companies of Rwanda, with MTN Rwanda as a case study. The study achieved a 90.6% response rate with 48 respondents out of the 53 respondents which were targeted responding.

The data collected were further entered and analyzed using IBM SPSS Statistics, Version 24 to measure the validity and reliability of the research. Quantitative data were summarized using descriptive statistics which include mean, mode, standard deviations, frequencies and percentages. The Pearson Chi-Square was used to measure the effect size of e-Sourcing Adoption on Supply Chain Efficiency.

Table 4.1: Descriptive Statistics of the Questionnaire

Description	N	Min	Max	Mean	Std. Deviation
Number of Respondent	53	1	53	27.00	15.443
Questionnaire type	53	1	2	1.09	0.295
Gender	53	0	2	1.30	0.638
Department	53	0	5	3.00	1.629
Period of use	53	0	4	1.89	0.725
Valid N (listwise)	53				

Source : Questionnaire (Primary Data, SPSS)

The questionnaire was administered to 53 respondents out of 265 total number of MTN staff. Some of the questionnaire was filled and returned whereas others were not filled. The researched distributed the questionnaire considering the gender balance (male and female participation) and the five departments were categorized to facilitate the response validity and reliability of the study.

Table 4-2: Respondents Department

Department	Frequency	Percent	Valid Percent	Cumulative Percent
Procurement	8	16.7	16.7	16.7
ICT	4	8.3	8.3	25.0
Operations	12	25.0	25.0	50.0
Sales &Marketing	13	27.1	27.1	77.1
Other	11	22.9	22.9	100.0
Total	48	100.0	100.0	

Source : Questionnaire (Primary Data, SPSS)

The distribution of the respondents regarding their departments indicated that the Procurement Department was made of 8 staff and all of them responded the questionnaire at a rate of 16.7% whereas ICT had 22 staff but only those associated with e-Sourcing answered making 8.3% contribution. Operations and Sales & marketing departments responded at a rate of 27% and 25% respectively as they are the departments with a considerable number of staff at MTN Rwanda. Also, about 23% response rate came from other department such as Administration and Warehouse to make a representative sample associated with the study topic.

In addition, it is important to note that the 43 respondents included top managers at a rate of 4.2%, 10.4 % of middle level managers, 16.7 % of supervisors, and executives at 68.7%.

4.2. Adoption of e-Sourcing in supply chain of telecommunications

Table 4.3: Period of e-Sourcing adoption by MTN Rwanda

Period	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 5 years	1	2.1	2.1	2.1
Between 5 and 10 years	43	89.6	89.6	91.7
Between 10 and 15 years	3	6.3	6.3	97.9
Between 15 and 20 years	1	2.1	2.1	100.0
Total	48	100.0	100.0	

Source: Questionnaire (Primary Data, SPSS)

As seen on the table and chart above, most of the respondent believe that MTN Rwanda has adopted E-Sourcing between 5 and 10 years ago. This is indicated by 89.6% response rate whereas the remaining 6.3% of respondents agreed to that MTN has adopted e-Sourcing between 10 and 15 years ago. Whereas 2.1% agreed that e-Sourcing was adopted in less than 5 years and in 20 years ago respectively. Therefore, the researcher concluded that the e-Sourcing was adopted and applied in supply chain activities by MTN Rwanda ten (10) years ago.

Table 4.4: Extent of e-Sourcing application in Supply Chain

Activity	N	Min	Max	Mean	Std. Deviation
Spend analysis	48	4	5	4.92	0.279
Needs Assessment	48	1	2	1.04	0.202
Suppliers Identification	48	4	5	4.75	0.438
Preparation of Bidding Document	48	1	2	1.27	0.449
Design Specifications	48	1	3	1.75	0.887
Invitation for bid	48	4	5	4.92	0.279
Opening of Bids	48	4	5	4.85	0.357
Prequalification of bidders	48	3	5	4.69	0.589
Evaluation of bids	48	3	5	4.65	0.601
Negotiations	48	4	5	4.75	0.438
Award and Signing of contract	48	1	3	1.17	0.476
Contract Administration	48	1	2	1.06	0.245
Reverse Auction	48	3	5	4.85	0.461
Risk Assessment	48	1	2	1.02	0.144
Valid N (listwise)	48	2.5	3.8	3.26	0.418

Source: Questionnaire (Primary Data, SPSS)

In order to understand the extent to which MTN uses e-Sourcing in Supply Chain operations, the researcher used Mean and Standard Deviation to measure the validity of the response rate. Therefore, answers were derived from question 6 of Section B in the questionnaire. The findings of the study showed that in all 48 respondents felt that the adopted e-Sourcing is currently used at very large extent in MTN Rwanda. The results show that e-Sourcing is used in most activities of Supply Chain at a very large extent where the average score was 3.8 out of 5 with a Mean of 3.26 and Standard Deviation of 0.42. The activities with high average score represented by a Mean of 4.92 are Spend analysis and Invitation for bid, while Reverse Auction, Suppliers Identification, Negotiations, Opening of Bids, Prequalification of bidders are represented by a Mean of 4.85, 4.75, 4.75, 4.85, 4.69 and 4.65 respectively. However, Evaluation of bids, Award and Signing of contract, Contract Administration, and Risk Assessment have a Mean below 2. Meaning that their average score is below 2 out of 5. Henceforth, this brings the research to the conclusion that the system is used at no extent for Needs Assessment, Preparation of Bidding Document, Design Specifications, Selection of procurement method, Award and Signing of contract, Contract Administration, and Risk Assessment represented by a Mean of 2.66. The explanations are that MTN Rwanda is performing these activities manually using paper-based processes.

4.3. Effects of e-Sourcing adoption on supply chain efficiency

Table 4.5: Operations before e-Sourcing adoption by MTN Rwanda

Extent	Frequency	Percent	Valid Percent	Cumulative Percent
Excellent	0	0	0	0
Very Good	1	2.1	2.1	2.1
Good	7	14.5	14.5	16.6
Moderate	27	56.3	56.3	72.9
Poor	13	27.1	27.1	100
Total	48	100	100	

Source: Questionnaire (Primary Data, SPSS)

At a rate of 56%, the respondents agreed that supply chain operations were moderate before introduction of e-Sourcing, and 27.1% agreed that the operations were poor and 14.5% said they were good. However, none of the respondents agreed that the operations were excellent by that time.

This clearly explains the effect that the adoption of e-Sourcing system has had on business of MTN Rwanda since it has streamlined the procurement process and enabled the company to save money and time, thus satisfying its customers.

Table 4.6: Effect of e-Sourcing on Supply Chain operations

Activity	N	Mini	Max	Mean	Std. Deviation	Variance
Reducing the paper work	48	3	5	4.56	0.580	0.336
Reducing costs	48	2	5	4.10	1.036	1.074
Improving supplier relations	48	3	5	4.60	0.644	0.414
Enhanced iinformation sharing	48	3	5	4.60	0.574	0.329
Increasing the perfor. of the function	48	3	5	4.50	0.619	0.383
Achieving customer satisfaction	48	3	5	4.48	0.618	0.383
Meeting the company requirements	48	3	5	4.40	0.707	0.500
Valid N (listwise)	48					

Source: Questionnaire (Primary Data, SPSS)

Globally, the effect of e-Sourcing on Supply Chain operations was measured by extent (a score of 1-5), which e-Sourcing had on operations in supply chain of MTN Rwanda. This was evident in the table above, where the respondents agreed that after adoption of e-Sourcing by MTN, the system had an impact by reducing the paper work (automating process) with Mean of 4.56 and Standard Deviation of 0.58, reducing costs with Mean of 4.10 and Standard Deviation of 1.036, improving supplier relations with Mean of 4.60 and Standard Deviation of 0.64, sharing information with Mean of 4.60 and Standard Deviation of 0.57, meeting the company requirements with Mean of 4.40 and Standard Deviation of 0.70, increasing the performance of the function with Mean of 4.50 and Standard Deviation of 0.61, and finally achieving customer satisfaction with Mean of 4.48 and Standard Deviation of 0.61.

Table 4.7: e-Sourcing reduced the paper work

Extent	Frequency	Percent	Valid Percent	Cumulative Percent
Moderate Extent	4	8.3	8.3	8.3
Large Extent	11	22.9	22.9	31.3
Very Large Extent	33	68.8	68.8	100
Total	48	100	100	

Source: Questionnaire (Primary Data, SPSS)

Since its adoption, e-Sourcing and Spend Analysis are perceived to have had a very big impact on reducing paper work. MTN staff believe that the e-Sourcing has affected the Supply Chain operations at Very Large Extent as shown by a frequency of 60.4% of respondents.e-Sourcing has sped up MTN Rwanda procurement process by significantly reducing paper and the time it used to take to manage suppliers and their bids.

4.4. Data Analysis

Table 4.8: Pearson Chi-Square Tests

Test	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	96.000ª	94	.000
Likelihood Ratio	92.861	94	1.000
Linear-by-Linear Association	37.155	1	.000
N of Valid Cases	48		
a. 144 cells (100.0%) have expected count less than 5. The minimumexpected count is .02.			

Source: Questionnaire (Primary Data, SPSS)

In the Table 4-17, the results of the Chi Square exhibited a significant effect size of e-Sourcing adoption by MTN Rwanda on its Supply Chain efficiency, ($\chi2$ = 96.000ª, P = 0.00 < 0.05). This means that change in e-Sourcing would significantly affect the supply Chain efficiency of telecommunication industry. Therefore, Automated Spend Analysis, Electronic Request for Information (eRFI), Electronic Request for Quotation (eRFQ), Electronic Request for Proposal (eRFP), and Electronic Auction (e-Auction) when embraced by organisations, they can be a pillar of Supply Chain transformation towards achieving organizational goals.

Table 4.9: Supply Chain Efficiency

Extent	Frequency	Percent	Valid Percent	Cumulative Percent
Little Extent	1	2.1	2.1	2.1
Moderate Extent	4	8.3	8.3	10.4
Large Extent	16	33.3	33.3	43.8
Very Large Extent	27	56.3	56.3	100.0
Total	48	100.0	100.0	

Source: Questionnaire (Primary Data, SPSS)

Overall, the respondents agreed that since its introduction, e-Sourcing has transformed the business by reducing paper work (automated process), improving the supplier relations, increasing the performance and meeting customer satisfaction thus meeting the company requirements.

In the table 4-18, the respondents agreed at 56.3%, 33.3%, 8.3% and 2.1% respectively that the e-sourcing has had an impact on the procurement performance and Supply Chain as a whole. By adopting e-Sourcing, MTN leveraged on strategic sourcing initiatives to improve purchasing, supplier relations and the company's level of performance.

However, it is important to note that MTN Rwanda uses other systems apart from e-Sourcing and they are specific to certain activities such requests, order processing, stock management and logistics where they use ERP Sage X3; a separate spend analysis system called SIEVO, a warehouse management by a third party using a Vendor Management System (VMS), Customer Relationship Management (CRM) System called Technotree.

Spend Analysis in e-Sourcing is used by MTN Rwanda as a group solution responsible for managing all matters related to spending for both small and large contracts of MTN Group. The solution used is separate from e-Sourcing, however, it has been implemented in all matters related to purchasing,

suppliers and contract. The respondents agreed at that spend analysis data have enabled the company considerably in decreasing costs, reducing paper work, and improving supplier relationships. The most tremendous effect is that it has improved the spending visibility by mapping it into corporate spend hence driving performance improvement, contract compliance, and most importantly, cost savings.

Regarding e-RFI, e-RFP and e-RFQ, the impact on business, e-Sourcing system has enabled to streamlet and automate RFx-to-award cycles hence improving efficiencies in managing supplier events and supplier awards.

4.5. Challenges in e-Sourcing Adoption

About challenges faced by companies when adopting e-Sourcing in supply chain of telecommunication industry, the study found out that most of these challenges are related to resistance to changes and lack of knowledge of new technologies. It is a scenario where people take time to realize the benefits in improvements or changes brought by new tools.

Table 4.10: Challenges in adopting e-Sourcing in Supply Chain

Challenge	N	Min	Max	Mean	Std. Deviation
Lack of top management support and leadership	48	1	5	3.56	1.472
Resistance to change (Internal & External)	48	1	5	4.00	1.473
Lack of involvement of all stakeholders	48	1	5	3.35	1.550
Inadequate skills on the systems	48	1	5	3.87	1.511
Valid N (listwise)	48	1	5	3.70	1.502

Source: Questionnaire (Primary Data, SPSS)

The results of the research showed that the respondents agreed that the adoption of e-Sourcing encountered challenges and issues that are associated with resistance to change with an average score of 4 out of 5.

Generally, the adoption of e-Sourcing technologies in supply chain is limited by lack of top management support and leadership, lack of involvement of all SC stakeholders, and inadequate skills (especially knowledge on new technologies). The respondents also highlighted some other issues related to system failure (breakdown) due to technical malfunctioning.

5. Summary, Conclusions & Recommendations

The researcher found out that some processes are still manual and certain documents are processed in a paper-based approach. Thus, thinking of overall automation of the process to avoid collusion, save time and money is highly recommended. Also, Spend Analysis and ERP Sage X3 are tools used differently. Therefore, integrating e-Sourcing with Spend Analysis and ERP Sage X3 would be a great achievement since spend analysis, orders, requests and stock are managed separately in these two systems hence

overlapping the whole process of planning, spend analysis, needs identifications and purchasing within the company.

In conclusion, it is important to note that a successful strategic sourcing requires a holistic process that automates the entire sourcing process, including spend analysis, order planning, RFQ generation and distribution, RFQ evaluation, offer formulation, offer evaluation and selection, negotiation, settlement, order execution, electronic auction, supplier management, and contract management. Simply, sourcing is a continuous process of analyzing expenditure flow, vendor performance, user requirements and market conditions to optimize the total value.

Therefore, once spend analysis, sourcing tools and ERP SageX3 are integrated, standardized, and automated, they will be an unbreakable force for procurement teams of MTN Rwanda. They will be actionable intelligence tools used to make sound and sustainable buying decisions.

References

[1] Archer, T.S. (2010). The Efficiency Theory. ISBN: 1-4563-2007-6

[2] Barbara, A. & Maxfield D. (2013). Revolutionizing e-Sourcing Adoption, available from http://www.qad.com. Accessed on 16th February 2019

[3] Bartolini, A. (November 30, 2015). Best of 2015: Spend Analysis & Sourcing: Connecting the Sourcing Dots for Greater Value. Retrieved from http://cporising.com. Accessed on 03rd February 2019

[4] Basta, T., Aziz, K., Chamout, A. (2018). Adoption and Outcomes of a Strategic E-sourcing System at Bravo solution. College of Engineering and Computing, Al Ghurair University, Dubai, UAE, Tejari/BravoSolution, Dubai, UAE

[5] Beal, C.A. (April 1, 2007). E-Sourcing Best Practices: Lay the Groundwork for Automated, Integrated Procurement. SAP Insider: The intelligent enterprise and workforce of the future.

[6] Busch, J. & Lamoureux, M. (June 21, 2017). What You Should Expect from Best-in-Class E-Sourcing User Experience and Functionality [PRO]. Retrieved from http://spendmatters.com. Accessed on 01st February 2019

[7] Davis, F. D. (2009). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*. 38, (3), 475–487

[8] Ericsson (2019). E-sourcing. Retrieved from https://www.ericsson.com. Accessed on 01st February 2019

[9] Hodess, R. (2009). The Implementation of Integrated Financial Information Management Systems (IFMIS). *Transparency International*, 2(1), 23-79.

[10] Jagdale, A. & Rajmane, P. (2016). An Review of Reverse Auctions. International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169, Volume: 4 Issue: 1 269 - 273

[11] Keelvar, A.H. (March 14, 2018). E-Sourcing is Dead, Long Live Intelligent Sourcing Systems. Retrieved from http://spendmatters.com. Accessed on 01st February 2019

[12] Kimutai, B. & Ismael, N. S. (2016). Role of strategic e-sourcing practices on supply chain performance in state corporations in Kenya: A case of Kenya Electricity Generating Company Ltd. International Academic Journal of Procurement and Supply Chain Management, 2 (2), 113

[13] Lee, J.V., Bichler, M., Verma, S., & Lee, H.S. (2014). Design and implementation of an interactive visual analysis system for e-sourcing. IBM T. J. Watson Research Center, P. O. Box 218, Yorktown Heights, NY 10598

[14] Lee, R. (2015). eSourcing and eRFx: Procurement terms to know. Retrieved from https://www.determine.com/blog. Accessed on 09th February 2019

[15] Lichocik, G. & Sadowski, A. (2013). Efficiency of supply chain management. strategic and operational approach. *Scientific Journal of Logistics*. 2013, 9 (2), 119-125.p-ISSN 1895-2038

[16] Limberakis, C. G. (March, 2012). Spend Analysis: Lessons from. Supply Chain Management Review March/April 2012. Aberdeen Group in its report of September 2012

[17] Moszoro, M. (2014). Efficient public-private capital structures. *Annuls of public and cooperative economics*, 85(1), 103-126.

[18] Mutori, D.N. (2016). E-procurement implementation and performance of commercial state corporations in Kenya

[19] ProcurePort. (January 30, 2019). How Spend Analytics Software is Transforming Procurement Financials. Retrieved from https://blog.procureport.com. Accessed on 09th February 2019

[20] Trade Interchange (2019). eRFx: Streamline and improve the online tendering process through intuitive sourcing software. Retrieved from https://tradeinterchange.com. Accessed on 09th February 2019

[21] Wong, W. P. & Wong, K.Y. (2008). A review on benchmarking of supply chain performance measures. *Benchmarking: An International Journal 15*. Retrieved from Emeraldinsight.com/doi/abs/10.1108/146357708108543 35.133