

**ELECTRONIC INVOICING AND COST CONTROL IN PUBLIC ORGANIZATIONS IN FCT ABUJA,  
NIGERIA**

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**Abstract**

*Electronic invoicing and cost reduction in public organizations is a research carried out to investigate the role of e-invoicing in the cost reduction effort of four public organizations in FCT, Abuja. The specific objectives of the research were to identify the effects of e-invoicing on waste minimization, time saving, labour control and overhead control. The methodology involved a simple random sampling of 139 respondents by means of structured questionnaire. The data were analyzed using version 20 of the SPSS for correlation and regression. The results showed that a significant positive relationship exists between e-invoicing and waste minimization, e-invoicing and time saving, e-invoicing and overhead control and e-invoicing and labour control. All the Pearson coefficients were proven to be significant at the 5% level. Similarly, the standardized beta coefficients of the regression model were all significant ( $b_1, b_2, b_3, b_4 > 0$ ), heading to the rejection of the research hypotheses that claimed null coefficient of multiple determination  $R^2=0.600$ , depicting the model as being accountable for 60% variation in the dependent variables. This led to the conclusion that e-invoicing as a hybrid technology in public procurement and supply chain management has significant positive effects on cost control. Based on this it was recommended that e-invoicing should be adopted by procurement agencies as a strategy to minimize material and time wasting; among other recommendations.*

**Keywords:** *E-invoicing, waste minimization, time saving, labour control, overhead control, cost control.*

**Introduction**

Electronic invoicing is an integral part of an e-procurement system. It is the process of automatically generating a payment invoice using a computer. In the context of digital procurement, an e-invoicing is automatically generated from the order information. It streamlines information processing, reduces errors, improves customer service, shortens the payment cycle-since the system automatically issues an invoice once an order has been filled – reduces processing and filing costs and eliminates bulky paper use, among other benefits. Being

a fundamental part of digital procurement, e-invoicing streamlines invoice management and simplifies how invoicing and compliance documents work together. By digitizing invoice data, e-invoicing reduces the risk of invoice errors and exceptions. It enables early payment discounts, optimizes work capital and cash flow management, avoids over payment and helps improve supplier's cash flow (Moath & Kriengsak, 2018).

E-invoicing methods are used by trading partners such as customers and their suppliers to present and monitor transactional documents between one another and ensure that the terms of their trading agreement are being met. These documents are not restricted to invoice alone but include debit notes, payment terms, credit notes, payment instructions and remittance slips. E-invoicing involves a number of different technologies and entry options and is used as an umbrella term to describe any method by which an invoice is electronically generated and presented to a customer.

E-invoices are usually generated using internet-based platforms. They can be exchanged in a number of ways and can be uploaded using e-mails, virtual printers or web applications. For example, the e-invoicing company may use imaging software to capture data from PDF or paper invoices and input them into an invoicing system. This streamlines the filing process while positively impacting sustainability efforts. While some organizations have their own in-house e-invoicing machinery, some companies hire a third party to implement the process.

Otundo and Martin (2021) note that various e-invoicing standards exist. The European Union Directive EUD (2014) on electronic invoicing in public procurement noted that several global, national, regional and proprietary standards are in use. However, the EUD is working to unify e-invoicing technique in the European continent. Moreover, to effect e-invoicing, there must be an existing method of viewing the transactions typically on an enterprise resource planning or accounting system.

With the aforementioned benefits and procedure of e-invoicing as a new development in digital procurement, it is worthwhile to evaluate its effect on organizational challenge variable like cost control. By cost control we mean the practice of identifying and reducing expenditure. Cost control is becoming increasingly important as astronomical rise in cost of input is diminishing the profit of firms in recent times in Nigeria (Subho 2022). Being a corrective function achieved through continuous process of analysis, cost reduction has multifaceted dimensions such as waste minimization, time saving, overhead control and labour control, among other techniques designed to achieve it. This study is designed to measure the effect of e-invoicing on waste minimization, time savings, overhead control and labour control using four public organizations in FCT Abuja as reference point.

### **Statement of the Problem**

It is an expressed wish of every government to enable transparent procedures and outcomes in every aspect of procurement. This aim may be achievable with the use of e-invoicing hybrid technology instead of the manual prototype. However, many public organizations that

claim to have religiously embraced digital procurement may not have effectively employed the core e-invoicing strategy or competences in their procurement practice. This may adversely affects organizational performance indicators in the current environment of technological digitization. Many public procurement studies could not examine e-invoicing independently as a key player in achieving procurement digitization. Chang (2017); Antoun, Kassem, Harb & Beana (2019); Yelna and Makson (2022); Demircioglu and Vivona (2021); Ogunsanya, Aigbavboa, Thwala and Edwards (2019) are some researches in that regard. This study attempts to bridge the gap by evaluating e-invoicing in a relationship with organizational cost control.

### **Objectives of the study**

The main objective of the study is to examine the relationship between electronic invoicing and cost control. The specific objectives are to;

1. examine the effects of e-invoicing on waste minimization.
2. evaluate the relationship between e-invoicing and time saving.
3. determine the effects of e-invoicing on labour control.
4. identify the effects of e-invoicing and overhead cost control.

### **Research Question**

To provide solution to the objectives, the following questions were asked in the course of the study.

1. What are the effects of e-invoicing on waste minimization?
2. What is the relationship between e-invoicing and time saving?
3. What are the effects of e-invoicing on labour control?
4. To what extent does e-invoicing have a relationship with overhead control?

### **Research Hypotheses**

The hypotheses formulated to guide the study are stated in null forms as follows:

**Ho<sub>1</sub>:** Electronic invoicing has no significant effect on waste minimization.

**Ho<sub>2</sub>:** There is no significant relationship between e-invoicing and transaction time saving.

**Ho<sub>3</sub>:** Electronic invoicing has no significant effect on labour control.

**Ho<sub>4</sub>:** There is no significant relationship between e-invoicing and overhead cost control.

### **Scope of the Study**

The content scope of the study is coverage of electronic Invoicing and cost control. Specific measures of cost control covered are waste minimization, transaction time saving, labour control, and overhead cost control.

The geographical scope of the study is FCT Abuja, from where four public organizations were studied as reference point.

The unit scope, focused on all the functional units of the study organizations. The functional units include Accounting/Finance, Personnel/ Human Resourcing, Stores, Marketing, Project and Procurement units etc.

## **Review of Related Literature**

### **Conceptual Review**

#### **Electronic Invoicing**

Yelna and Makson (2022) defined e-invoicing as the use of computer to generate a transaction invoice usually through the internet. Koch & Homey (2018) defined it as a billing process by which an invoice is electronically presented to a customer for payment. According to Hill, Koch and Hommey, e-invoicing methods are used by the trading partners, such as customers and suppliers, to present and monitor transactional documents between one another and ensure that the terms of their trading agreements are being met. Otundo and Martin (2021) describes the e-invoice documents as structured invoice, debit note, credit note, payment terms, remittance slips and payment instructions issued on electronic data interchange or any other format, possibly through the internet.

E-invoicing documents can be exchanged in a number of ways and can be uploaded using emails, virtual printers or web applications. As Otundo and Martin (2021) pointed out, the e-invoicing company may use imaging software to capture data from Portable Document Format (PDF) or paper invoices and input it into their invoicing system. This streamlines the filing process while positively impacting on sustainability efforts.

To effect e-invoicing, there must be an existing method of viewing the transactions, typically, an Enterprise Resource Planning Accounting System (ERPAS). The rules are established in a project specification, invoicing members of the accounts payable and procurement departments. Routing is established to the system and validation rule is set up to reduce the quantity of invoice exceptions. Further validation is set-up to automatically reject errors. Validations can notify users of acceptances or rejections. Once an e-invoicing specification is finalized and testing completed, the business suppliers are connected electronically, indicating that the e-invoicing system is ready for use.

#### **Cost Control**

Lawal (2017) defines cost control as the practice of identifying and reducing expenditure. It is a corrective function by continuous process of analysis of costs. The Chartered Institute of Management Accountants, London defines cost control as the achievement of real and permanent decrease in the unit cost of goods manufactured without impairing suitability for the use intended.

Lawal (2017) posit that real cost control comes from greater productivity or efficiency in the procurement of inputs. Greater productivity may come from obtaining a large quantity of production from the same facilities or using materials of lower price and of different quality without sacrificing the quality of the finished products. This means reducing cost through the process of input substitution. Ogunnaike (2010) also outline that cost control can be achieved through simplifying the process of manufacture as well as by changing the features of the product suitably, without covering the quality of the product.

Ogunnaike (2010) posit that cost control must be genuine and should aim at the elimination of wasteful elements in methods of doing things. It should not be at the expense of quality and it should be a continuous process of critically examining various elements of costs and each aspect of the business, procedures, methods, products, management, market and finance. Ogunnaike (2010) add that cost control in the context of procurement requires higher efficiency in sourcing, rendering, informing, invoicing and tendering.

Subho (2019) identified the various techniques for achieving cost control to include budgetary control, standard costing, standardization of products, tools and equipment; variety reduction and simplification, improvement in design, material control, labour control, overhead control, production planning, automation, operations research, market research, financial control, value analysis, quality research and measurement; cost-benefit analysis, contribution analysis, programme evaluation and review technique and job evaluation among others. In this study, the chosen dimensions of cost control in a supposed relationship with e-invoicing are waste minimization, time saving, labour control and overhead control.

### **Waste Minimization**

Waste minimization as a set of practices intended to reduce the amount of waste material generated in the course of production or service rendering. By reducing or eliminating the generation of waste, waste minimization supports efforts to promote a more environmental friendly production while saving costs for the organization. Cost saving through waste minimization stem from two dimensions – cost of material being wasted and cost of managing the waste

Waste minimization involves redesigning products and services or changing societal pattern of consumption and production. Viewed from this perspective, e-invoicing is supposed to have a positive effect on waste minimization in that it eliminates excessive paper work thereby saving paper and other stationary materials that go into manual invoicing. (Davidson,2012)

### **Time Saving**

Brown (2022) explains time saving in the field of business as reducing the amount of time needed to accomplish a task. He argues that time is the second most important asset of the organization after human resource. According to Dickson (2022), to save time is to save money, to waste time is to waste money. Hall & Nathan (2019) had likened time saving to opportunity creation and identification. Kristi (2022) has identified strategies of time saving in business operations as follows: carry out time audit to know what consumes most time in the business, utilize wait time and routine free periods, plan business transactions in advance, allocate time to every task and eliminate repetitive tasks, among other clues. Electronic invoicing is supposed to support transaction time saving since it works at the speed of light.

### **Labour Control**

Premalatha (2022) describe labour control as techniques adopted to bring down labour costs to acceptable level. Labour cost is one of the major costs of production. It may increase unnecessarily due to inefficiency of workers, wastage of materials by workers, idle time, unusual overtime work and high labour turnover. Hence, the management should device effective techniques for controlling labour cost to ensure maximum outputs of better quality at low cost through proper utilization of the labour force. Labour cost control involves such systems,

procedures, techniques and tools used by the management in order to keep the labour cost as minimum as possible.

### **Overhead cost Control**

Jason (2015) defines overhead as an expense that cannot be conveniently identified with a specific product or service. According to Jason (2015), overhead is an indirect and indivisible part of producing a product or service. Overhead costs can include administrative and rent expenses, transport expenses, subcontracting utilities, office supplies and depreciation.

Overhead cost controlling allows the management to collect and analyze costs that cannot be directly assigned to production. As overhead grows, the proportion of directly assignable production costs shrinks. Consequently, it is becoming increasingly important to analyze and control overhead costs. It is the purpose of overhead cost controlling to take costs that cannot be assigned directly to a product manufacture and allocate them as far as possible to their cause or reduce them to the barest. Digitizing the production process could be one way of achieving this.(Jason,2015)

### **Theoretical Review**

#### **Transaction Cost Incentive Theory**

Bajari and Tadelis (2011) propounded the theory of incentive versus transaction costs. The theory brings awareness on provision of incentives and reduction of transaction costs in the public sector. The theory holds that cost- plus contracts are preferred to fixed price contracts. According to Bajari and Tadelis, in fixed-price contracts, the buyer offers the seller a pre-specified price for completing the supply project. A cost-plus contract does not specify the price but rather reimburses the contractors stipulated fee for cost-plus. Either the contractor or the buyer has private information at the onset of a procurement project and both shared uncertainty about many important changes that may occur after signing the contract and beginning the process. These uncertainties include design failure, unanticipated site and environmental conditions, and changes in government regulation.

#### **Contract Theory of Procurement**

The contract theory of procurement was propounded by Tanner Edward in 1993. Tanner (1993) states that the typical procurement and supply chain management process is grounded on institutional economics for contracting. According to Tanner, the implication of the economics of contracting for procurement and supply claim management practice is that suppliers can (and actually do) exhibit various forms of opportunistic behavior which can damage the value for the money received by the buyer.

Key strands of this theory draw from the agency theory. Agency theory applies broadly to circumstances in which one actor (the principal) delegates responsibility for the execution of valued activities to another (the agent). The principal ensures that these activities are undertaken in a way that serves his interests, rather than those of the agent. It is perhaps best known as the basis for understanding issues of ownership and control within business organizations where managers are expected to act as agents on behalf of owners. This principal-agent relationship can also be seen when a buyer (principal) engages as supplier (agent) to deliver a good or service.

From the basic assumption of the contract theory that suppliers can and do exhibit various forms of opportunistic behaviours which can damage the value for money received by the buyer.

Opportunism is defined by Tanner (1993) as self-interest seeking behavior, which extends the notion that actors simply aim to maximize their self-interest in an open and honest way to include blatant and subtle strategic behavior. This theory therefore focuses attention on the behavioural hazards that can arise when a buyer engages an external supplier to deliver a product. The theory is underpinned with the assumption that both buyer and supplier are utility maximizers; and that, consequently, the latter is not likely to always act in the interest of the former. The implication of this theory to the e-invoicing hybrid technology is that self-interest maximizing behaviours can be controlled by end-to-end e-invoicing, such that the malpractices of middle agents (who also influence the manual invoice) are eliminated.

### **Empirical Review**

Mustapha and Saidu (2021) examined prospects of E-Procurement implementation in the Federal Capital Territory, Abuja. The study involved 143 samples drawn from six construction companies by situated technique through questionnaire. Percentages, mean score and Kruskal – Wallis statistic were used to analyze the data. The results showed that there was no significant difference among responses provided by the research subjects and that e-procurement had significant prospects to encourage transparency in public sector projects.

Hepp and Haubner (2021) studied the adoption and routinization of digital procurement in German building industry. 255 craftsmen responded to the survey which was analyzed using linear regression. Contextual factors (technology and demographic) were a constant in adoption of digital procurement. The scholars claimed that their study contributed to and validated an existing empirical framework in an industry that is slow in the adoption of e-business practices in comparison with other industries.

Afolabi (2020) evaluated the grey areas in the Nigeria procurement system using e-invoicing technology. The study sampled 75% from six geopolitical zones of Nigeria using questionnaire. Analysis of the data by the SPSS revealed some blind spots and grey areas that the deployment of e-invoicing can help eradicate. The conclusion was that the digital divide that pervades public sector procurement can be reduced by employing digital solutions.

Egbide (2019) examined cost reduction strategies and the growth of selected manufacturing companies in Nigeria. The study used secondary data purposively sampled from 40 quoted companies between the period 2012 to 2016. Labour costs and administrative overhead changes were the variables used for cost reduction. Multiple regression and correlation were employed to analyze the data. The result showed that cost reduction had significant positive relationship with growth of firms.

Oyedokun, Tomomewo and Owolabi (2019) examined cost control and profitability of selected manufacturing companies in Nigeria. Judgemental technique was used to select 23 manufacturing companies in South West Nigeria, listed in the Nigeria Stock Exchange. The study made use of secondary data generated in the period 2005 to 2017, from audited financial statements of the companies. Descriptive and inferential statistical techniques were applied on the data and result showed that there was a significant negative relationship between raw material cost and pretax profit among the companies.

### **Methodology**

The study employed descriptive survey research design which involved the use of structured questionnaire aimed at eliciting responses towards electronic invoicing and cost

control in four public organizations in FCT Abuja. The population of the study was 214 employees, from which 139 were selected by simple random technique (for equity) using the Taro Yamene formula for small samples as a guide. Copies of the questionnaire were administered to the respondents at their offices after validation and reliability tests had been carried out on the questionnaire. The validation was done by research professionals in Management who ascertain the correctness of the question items in measuring e-invoicing and cost control in public corporations. The reliability test was carried out using the test-retest method that involved a pilot study in which a Cronbach alpha statistic of 0.964 was determined, indicating a very high degree of reliability. Analysis of the data was carried out using both inferential and descriptive statistics from the SPSS. The decision rule was that the null hypothesis would be rejected if the calculated test statistic falls into the pre-established critical region.

**Results**

**Table 4.1: Correlations**

	EI	WM	TS	OC	LC
EI	1.000				
WM	.598	1.000			
TS	.009		1.000		
OC	.429			1.000	
LC	.230	.054			1.000
	.341	0.29	.035	-	
	.023	.435	.420		
	.327	.274	.003	.418	
	.095	.56	.493	.006	

Source: Researcher’s Computation (2023) using SPSS version 20.

- EI - Electronic Invoicing
- WM - Waste Minimization
- TS - Time Saving
- OC - Overhead Control
- LC - Labour Control

**Table 4.2: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate ( $\alpha$ )

1.	.775	.600	.547	1.80489
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\* Predictor: (Constant, EI

**Table 4.3:** Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sign.	Collinearity Statistics	
	$\beta$	Std Error				Beta	Tolerance
(Const.)	24.924	3.995		6.238	.600	.828	1.208
WM	5.976	1.268	2.598	4.713	.701	.918	1.109
TS	4.03	0.003	3.012	5.098	1.004	.803	1.245
OC	1.061	.217	1.631	4.891	1.023	.739	1.353
LC	1.270	.055	3.655	4.877	.300	.598	1.162

Dependent Variables: WM, TS, OC, LC.

## Discussion

First, the test for multicollinearity was carried out before the regression analysis. The test was necessary because multicollinearity can affect the parameters of a regression model (Field, 2015; Uwaigbe & Damola, 2020). Gupta (2012) suggests that a tolerance value less than 0.1 indicates a serious multicollinearity problem among the variables. Table 4.3 shows that the tolerance factors are all greater than 0.1, indicating an insignificant multicollinearity in each case. Similarly, Myers (1990) suggests that a Variance Inflation Factor (VIF) greater than 10 calls for concern. Table 4.3 shows that all VIFs are less than 10.

Moreover, table 4.2 of the model summary shows  $R^2$  (known as coefficient of multiple determinations of the variables as 0.600). The  $R^2$  which measures the overall fitness of the model indicates that the model is capable of explaining about 60% of the variability in Waste Minimization, (Wm), Time Saving (TS), Overhead Control (OC) and Labour Control (LC). The correlation result in table 4.1 shows that a significant positive relationship exists between e-invoicing (EI) and waste minimization (WM) ( $r = .598$ ), Time Saving (TS)  $r = .429$ ), Overhead Control (OC) ( $r = 0.341$ ) and Labour Cost Control (LC)  $r = 0.327$ ).

In table 4.3 the standardized beta coefficients are all greater than zero and significant at the 5% level. This led to the rejection of the null hypotheses ( $H_{01}$ ,  $H_{02}$ ,  $H_{03}$ ,  $H_{04}$ ) that claimed no significant relationship between e-invoicing and WM, TS, OC and LC respectively. These results are in one accord with those of Hepp & Hanbner (2021), Mustapha & Saidu (2021), Afolabi (2020), Egbide (2019) and Oyedekun, Tomomewo & Owolabi (2019). Hepp and Haubnar (2021) found a p-ratio of 0.592 between digital procurement procedures and organizational performance. This is similar to  $R^2=0.600$  found in this study. Mustapha & Saidu (2021) discovered that digital

procurement dimensions (e-invoicing, e-tendering, e-informing and e-ordering) have a 60% prospect of enhancing transparency in the public procurement system of developing countries.

### **Conclusion**

Electronic invoicing as a process of digital procurement has significant positive effects on organization's cost control. E-invoicing is significantly related with waste minimization ( $r=0.598$ ), time saving ( $r=0.429$ ), Overhead control ( $r=0.341$ ) and labour cost control ( $r=0.327$ ). About 60% variability in waste minimization, time saving, overhead control and labour cost control, can be explained by model fitted for the purpose. All standardized coefficients from such model and Fisher's ratio from the accompanying analysis of variance showed significance at the 5% level. The null hypotheses that claimed insignificant effect between the predictive and dependent variables rejected. It is thus concluded that electronic invoicing has a significant positive relationship with procurement cost control.

### **Recommendations**

1. Electronic invoicing should be used as a strategic tool to minimize material waste in the digital procurement practice of corporations.
2. Time wasting usually associated with manual documentation should be curtailed by adopting electronic technology involving e-invoicing.
3. Managers can use e-invoicing to cut down cost of labour in supply chains, thereby encouraging higher organizational performance.
4. Procurement agencies that are encountering excessive overheads should adopt electronic invoicing or re-visit their digital system for upgrades if they already have one.

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