

# Application of Electronic Data Interchange in Logistics: A Case of Nas Hauliers, Rwanda

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**Abstract** This study investigated the application of Electronic Document Interchange (EDI) in Logistics at Nas Hauliers, Rwanda. It was guided by four specific objectives: To examine extent of management support in the application of EDI systems at Nas Hauliers; To investigate ICT objectives in the success of EDI application at Nas Hauliers; To investigate the organisational culture in the success of EDI application at Nas Hauliers and to examine resource availability in the success of EDI application at Nas Hauliers. The study adopted a descriptive research methodology. The study targeted a population of 350 employees of Nas Hauliers, who are the EDI end users. Simple random sampling was employed giving each employee a chance to participate in the study. Semi-structured questionnaires were used to collect data, and analysis was done using Statistical Package for Social Sciences (SPSS) Version 18. The data was summarised using descriptive statistics. Correlation analysis was used to test the relationships between the independent and dependent variables. The study revealed that management support for EDI application is lacking and that management didn't pay sufficient attention to problems that arose during EDI application implementation; and that top management didn't prioritise /emphasise EDI application support. This study recommends that the Logistic sector should invest in training and development of staff on skills needed in proper EDI application processes as this will lead to achieving staff productivity which will in turn ensure logistics efficiency.

**Keywords** Electronic Data Interchange, Logistics Management, ICT in logistics

## 1. Introduction

For several hundred years, commerce has relied upon the movement of written documents. These documents contained the information that one company needed to convey to another company in order to do business: invoices, credit notes, orders etc. However the documents were certainly not of any standard layout. They did not need to be because the recipient was always a human being and humans have the ability to read, interpret and rationalise. A business document like an invoice document, for example, would contain header information, relating to the parties involved, detail lines about the products, quantities, prices and finally some totalling information.

In the early 1950s, computers started to be used by large companies for accounting and payroll needs. Through the following decades, computers rapidly took over task after task until they were involved not only in accounting, but in production, administration and all other areas of commerce. However, one thing did not change: computers still produced printed documents in various non-standard formats. This

situation was not too bad for those sending a document but was much worse for the receiver. Numerous documents are sent from one company's computer to their trading partner's computer. However, due to lack of standard format, computers cannot easily transform data in the written documents into a format that can easily be interpreted and processed by the receiving company's computer. Therefore, the receiving company would have to employ personnel to re-key the information from the received documents into the company's computer system

Time factor was also a problem. The company sending the document had printed it in a few seconds, placed it in an envelope and then posted it. The document would probably take several days to reach the final destination (always with the possibility of accidental loss). It would be removed from the envelope and presented for keying in to another computer.

Today, many organisations use Information Technology (IT) in their arsenal of strategic weapons. Among these weapons are cooperative systems for exchanging information electronically within and across organisational boundaries. These intra and inter-organisational systems have both processing capabilities and communications links. They enable organisations to coordinate and share information when pursuing a common objective, representing a cooperative information system that can

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enhance competitive advantage (Swatman and Swatman, 1992). Electronic data interchange (EDI) is prime example of this type of system. EDI has strong implications for the design and operation of accounting systems, such as Accounts Receivable, Accounts Payable, and Inventory, among others.

At Nas Hauliers EDI implementation began in the year 2012. One EDI module has been implemented. i.e Proprietary Systems (One to Many) which involves an EDI system owned, managed, and maintained by a single company. The value added networks module yet to be implemented. Prior to the EDI implementation, the organisation operated with losses associated with inefficiencies. Thus, the adoption of EDI systems marked a major shift in the organisational approach towards improved performance.

Nas Hauliers Rwanda has invested heavily in EDI with the aim of getting huge time savings, rapid return on investment and improving customer service. The company recently began implementing an EDI system from Oracle that is being phased in to replace the company's transactional systems. The challenge for Nas Hauliers was to consolidate heterogeneous systems within the organisation. The company was using separate systems for its different divisions, such as finance, HR and payroll, supply chain and others.

The path to a successful implementation and effective application of EDI continues to be a challenge to many cost conscious firms. Growth in EDI capability is a requirement for effectively servicing many large business customers (Furst and Nolle, 1998). However, implementation of EDI creates difficult and complex problems for organisations (Ngai and Gunasekaran, 2004). Thus, many companies have adopted EDI but have not received the anticipated results (Walton and Gupta, 1999). It is therefore obvious that a broader perspective of research in EDI is required in order to exploit its potential (McCubbery and Gricar, 1995). According to McCubbery and Gricar (1989), developing countries which cannot support EDI, risk losing business to companies located in more highly-developed countries. Rwanda being a developing country must therefore intensify its efforts in creating an EDI enabled environment. There is a need for further research and contribution in exploring the application of EDI and its implementation. In addressing this gap, this study examines EDI application implementation in Rwanda with Nas Hauliers as the case study.

## 2. A Case for EDI

EDI is the electronic, computer-to-computer exchange of business information in a structured format between business trading partners or between various units within an organisation (Ferguson Hill and Hansen, 1990). It is a high speed method of electronic communication that facilitates the exchange and processing of high volumes of business data from one computer to another. EDI is being used by

many companies to order and pay for goods from suppliers to arrange transportation with carriers to receive orders from customers to invoice customers, and to collect payments from customers. The application of EDI involves the conversion of written documents into structured, machine readable formats so that a computer in one company or functional unit can receive and process data from another company's or unit's computer. These documents relate to business events such as purchasing, sales, inventory management, accounts receivable and accounts payable.

In recent years, EDI has revolutionised the way in which businesses conduct their trading activities based on the establishment of trading partner relationships. EDI systems provide for a speedy, efficient and accurate means of electronically exchanging business transactions. Ranging from the manner in which purchases are made, to how payments are remitted, they can contribute to reducing paperwork, decreasing human error, increasing accuracy, and improving productivity.

Although the technology for EDI has been available for sometime, its full effects are still being studied (Clinkunbroomer, 1991), including those from an organisational coordination and control perspective (cf. Arunachalam, 1997). Specifically, even as there is growing popularity and potential underlying EDI, there appears to be insufficient insight into how organisations adapt their organisational operations in response to the inevitable business process re-engineering that occurs with EDI use. From a contingency perspective of management accounting system (MAS) design, the fit between organisational forms and EDI tasks, and processes is important as varying organisational forms can affect the realisation of EDI benefits.

### 2.1. Challenges in EDI Implementation

Companies already enabled with EDI are facing many challenges related to the management of their EDI application. Companies are experiencing:

- I. Limited solution options
- II. Inability to trade with their entire business community or meet compliance requirements.
- III. Low quality of services and high costs
- IV. Limited or poor customer service.

In addition, companies looking to implement EDI program often find that their options are limited. Other challenges include:

- I. Expensive solution that is not cost effective for their situation.
- II. Technology requirements beyond their capabilities.
- III. Limited support or implementation
- IV. Inability to meet trading partner

Implementation and application of EDI itself is not without its own uncertainties. According to Ngai and Gunasekaran (2004), uncertainties exist because many companies see only factors required for the successful

implementation of information technologies while implementing EDI. In doing so, they miss several issues that might cause bottlenecks in the implementation of EDI. These issues according to Ngai and Gunasekaran (2004), include lack of top management support, lack of motivation, inadequate technical knowledge, and under-investment in information technology, lack of confidence, skills and trust. Likewise, Kim and Umanath (1999) pointed out that EDI application achieves data integration but it is not adequate for enterprise and cross-enterprise incorporation as it has a number of drawbacks. Besides this, EDI application is unable to provide the flexibility and maintainability demanded by global business with comprehensive IT infrastructure that differentiate them from their competitors (Themistocleous, 2004).

According to the study by Murphy and Daley (1999), small service providers consider critical barrier to EDI as high setup costs, incompatibility of hardware and software, lack of standard formats, customer sophistication, and lack of awareness of EDI benefits.

EDI application requires substantial financial resources for the system itself, additional hardware and software to enhance communication links, and ongoing expenses during usage (Iacovou, Benbasat and Dexter, 1995). On the other hand, businesses are often concerned with the costs of implementation in comparison to the expected benefits. In today's profit focused market businesses, ICT business solutions have to be cost effective. Therefore, perceived costs and benefits of EDI become a challenge to its implementation and application.

Technical difficulties associated with EDI implementation and applications are common. These include difficulty in integrating existing computer systems with EDI, proliferation of standards, and risk of system instability (Minjoon and Shaohan, 2003). Similarly, full integration of EDI with an organization's internal computer systems and with those of trading partners is considerably a difficult task. This is principally due to the incompatibilities between EDI software and in-house applications, and the existence of several standards for information exchange of protocols, procedures, and data forms (Hendon et al., 1998). Effectiveness of any technology mainly depends on time and effort to learn and use it. Insufficient education and training for the managers and users can therefore be a grave barrier to EDI success (Banerjee and Golhar, 1994). Similarly, new technology often brings behavioral and organizational changes to an organization. This results to incompatibility of EDI with existing organizational culture, value, and work practices that occur and become one of the greatest barriers to EDI success (Premkumar and Ramamurthy, 1995).

A serious obstacle to EDI success may arise from the difficulty in getting trading partners to use EDI. This could include failure in reaching an agreement on trading terms associated with EDI use (Minjoon and Shaohan, 2003). Other impediment to advanced technologies implementation and innovative management include inaccurate data, existing systems infrastructure and entrenched business practices

(Anderson Consulting, 1994). Extending all these issues across trading partners gets murky.

In the study by Tuunainen (1998) on small businesses in the automotive industry, identified key challenges to EDI implementation include lack of EDI awareness, confounding standards, too high costs, low transaction volume, technical complexity and data security concerns. Likewise, Philip and Pedersen (1997) study on EDI implementation and application in Northern Ireland observed major problems. These included difficulties in quantifying the return on EDI investment, high volume of transactions needed to benefit from EDI, high implementation costs, lack of top management commitment, selection of message standards, impacts on the organisation, and legal issues.

Similarly, in the study by Reekers and Smithson (1994), it was determined that the variety of standards and the integration of EDI into the existing system are the most common difficulties for EDI users in Germany and the UK. Besides these, Ramaseshan (1997) found that the most frequently mentioned obstacle in EDI application is top management support, followed by threats to security of information, potential legal problems due to the lack of paper documentation, implementation costs, and technical problems. Angeles and Nath (2000) found that EDI success is most strongly associated with the availability of clear guidelines for EDI transaction agreements, and commitment and sense of ownership of the cross-functional EDI team. Such an environment is uncommon in most business setups.

### 3. Methods & Instruments

The study adopted a descriptive research design. The purpose was to enable the researcher to meaningfully describe a distribution of scores or measurements using a few indices or statistics.

This research design was appropriate since the objective of the study is to establish the relationships between hypothesised factors and EDI application success as they are. The population of this study was 350 employees of Nas Hauliers and was made up of management level employees and EDI users. Simple random sampling within each group was employed to give each employee a chance to participate in the study. A sample size of 10% respondent's equivalent to 35 employees in the company was used.

Questionnaires were administered to the respondents at their place of work. Cox (2000), argues that questionnaires are effective data collection instruments that allow respondents to give much of their opinions concerning the research problem (Cox, 2000). Since the research was conducted in one location, the researcher personally administered the questionnaires to the respondents. A semi-structured questionnaire was used to collect data. This is appropriate because it allows a participant to provide feedback that is slightly more expansive than a simple close-ended question, but that is much easier to quantify than a completely open-ended response (Cooper, 2009). The questionnaire contains both open-ended and

close-ended questions. The questionnaire was subjected to a pilot test before final administration to the respondents. A convenient sample of five (5) respondents (A mix of management and EDI users) were selected and given the questionnaire to fill in the presence of the researcher. The results were used to check for reliability and validity of the instrument. Cronbach's alpha was computed and since it was higher than 0.70, the instrument was considered as reliable. There is no rule to suggest that a Cronbach's alpha greater than 0.70 indicates a good instrument (Comer and Kelly 1982). However, it is commonly agreed among researchers that an alpha greater or equal to 0.7 shows that an instrument is reliable in measuring what it was intended to measure. The pilot test aided the researcher in clearing any ambiguities and in ensuring that the questions posed measure what was intended to measure.

Questionnaires were coded and examined for completeness. Those with too many missing entries were discarded. They were fed into the Statistical Package for Social Sciences (SPSS) version 18. Descriptive statistics was used to summarize the results for each of the main variables. These include mean, mode, and standard deviation. While measures of central tendency showed points of consensus, standard deviation showed the degree of variability of responses. Correlation analysis was used to determine the relationship between each of the five main variables with perceived EDI application.

## 4. Results & Discussion

35 out of the 35 sample respondents filled-in and returned the questionnaires making a response rate of 100%. This reasonable response rate was made a reality after the researcher made personal calls and visits to remind the respondents to fill-in and return the questionnaires.

Easy Reg International a statistical programme was used as the tool of analysis to test the relationship between the dependent variable and the four independent variables as indicated in the table below. Cronbach's alpha of well above 0.7 implies that the instruments were sufficiently reliable for the measurement. As most item total correlations were reasonably high, the construct validity of

the instruments was considered reasonable.

**Table 1.** Reliability & Validity

Variable/ Construct	Item / Means	Standard Deviation	Coefficient Alpha Reliability
Management support	7.2	4.6	0.7
Clarity of strategic objectives	7.3	3.8	0.79
Organisational culture	6.9	3.1	0.85
Funds Availability	4.9	3.3	0.7

### 4.1. Demographics

From the findings, 53% of the respondents indicated that they were male while 47% of the respondents indicated that they were female.

53% of the respondents were university graduates, 22% of the respondents indicated that they were tertiary college graduates, 20.5% of the respondents indicated that they were university postgraduates while 4.5% of the respondents indicated that they had a secondary certificate.

60% of the respondents had worked at the NH for between 10-15 years, 24% of the respondents indicated that they had been employees at the NH for between 5-10 years while 8% of the respondents indicated that they had been employees at the NH for between 15-20 and 0-5 years respectively.

### 4.2. Management Support of EDI

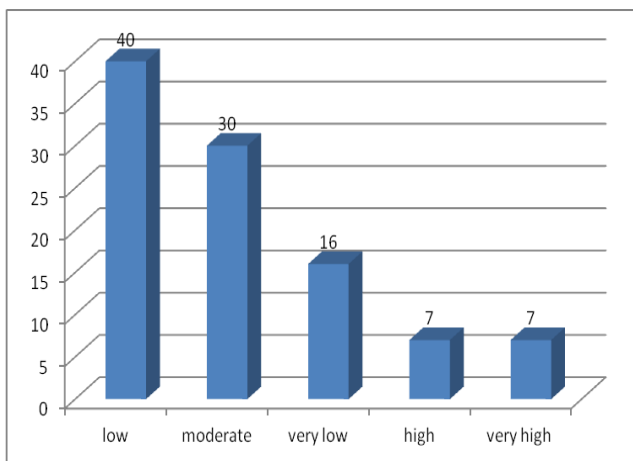
72% the respondents indicated that the management had not been very supportive to implementation of EDI application while 28% of the respondents indicated that the management had been very supportive to implementation EDI application.

The respondents strongly disagreed that management paid due attention to problems raised during EDI application and that top management prioritized/emphasized EDI application as indicated by a mean of 4.2 respectively, the respondents disagreed that management provided all necessary support to employees to ensure smooth EDI application as indicated by a mean of 3.9, the respondents disagreed that management had been very supportive in providing necessary training on EDI as indicated by a mean of 3.7.

**Table 2.** Extent of agreement that the management supports EDI implementation at Nas Hauliers

Variable/ Construct	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
Management provides all necessary support to employees to ensure smooth EDI application	35	46.1	2	6.8	0.1	3.9	1.9
Management has been very supportive in providing necessary training on EDI	35	44	8	10	3	3.7	0.5
Management pays due attention to problems raised during EDI application	48.1	40	7.9	1	3	4.2	0.2
Top management prioritizes/emphasizes EDI implementation	29.7	32.7	13.2	18.5	5.9	4.2	0.6

These findings agree with Loh and Koh (2004) who argues that effective change management is vital to manage and control the changes occurring during the application of EDI system. Further the study collate with the literature review where Nah et al. (2001) mentions that top management should initiate changes to the organisational structure and culture by: identifying and supporting new goals and objectives; communicating the shared organisational vision and the role of the new system to the staff; identifying and approving new organisational structures, roles and responsibilities; and approving codes of conduct for the use of the new system.



**Figure 1.** Perception on the level of management support for EDI

40% of the respondents rated the level of management support for EDI application as low, 30% of the respondents rated the level of management support for EDI application as moderate, 16% of the respondents rated the level of management support for EDI application as very low while 7% of the respondents rated the level of management support for EDI implementation as high and very high respectively. These findings relate to observations by Nah et al. (2001) who remarks that top management should initiate changes to the organisational structure and culture by: identifying and supporting new goals and objectives.

#### 4.3. ICT Strategic Objectives on EDI

There was need to find how ICT objectives influenced the success of EDI application at Nas Hauliers. Holland and Light (1999) and Nah et al. (2001) argue that the EDI software should be properly aligned with the business processes in order to come to a successful EDI application.

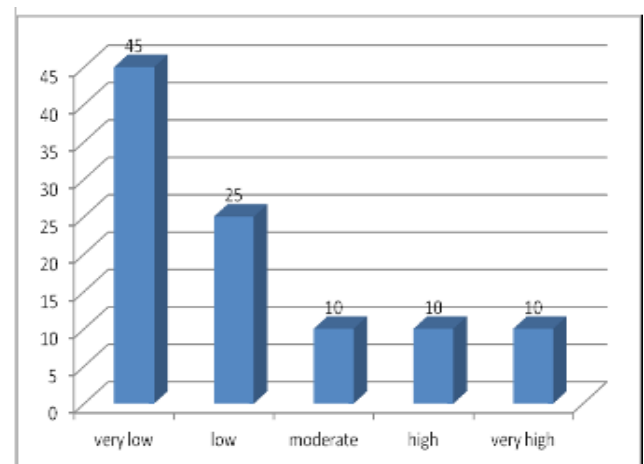
Findings reveal that 63% of the respondents indicated that NH did not have well defined ICT objectives with regard to EDI while 37% of the respondents indicated that the NH have well defined strategic objectives with regard to EDI.

These findings tie in with observations of Sum et al (1997) who states that project champions are identified as linked to the success of technological innovations as project champion performs the crucial function of transformational leadership.

#### 4.4. Clarity of ICT Objectives at Nas Hauliers

Respondents strongly disagreed that the project scope and time-frames were properly communicated in good time to all staff involved and that EDI application objectives were well aligned with overall corporate objectives as indicated by a mean of 4.7 respectively, the respondents disagreed that all employees understood the need for transformation from old systems to EDI as indicated by a mean of 4.3, finally the respondents disagreed that users fully understood the performance expectations and activities of EDI implementation as indicated by a mean of 3.9.

These findings correspond with the opinion of Umble et al (2003) who notes that communication leads to a clear understanding of strategic goals.



**Figure 2.** Perception on clarity of ICT objectives

From the findings, 45% of the respondents rated the clarity of ICT objectives among employees at NH as very low, 25% of the respondents rated the clarity of ICT objectives among employees at NH as low while 10% of the respondents rated the clarity of ICT objectives among employees at NH as moderately, high and very high respectively.

#### 4.5. Organisational Culture on EDI Implementation at NH

There was need to examine how organization culture influenced the success of EDI implementation in the Logistics Nas Hauliers. This relates with the observations of Holland and Light (1999) who states that a stable methodology is vital to the implementation success. They propose three basic methodological approaches: The skeleton approach, where the project starts with implementing the core of the EDI or only a limited number of functionalities, which are expanded in subsequent versions.

Findings revealed that 67% of the respondents believed that staff were not fully supportive of the introduction of EDI while 33% of the respondents indicated that staff were fully supportive of the introduction of EDI.

These findings correspond with Wee (2000) who argues that EDI implementations requires key people throughout the organisation to create a clear, compelling vision of how it should operate in order to satisfy customers, empower employees, and facilitate suppliers.

The respondents strongly disagreed that employees at NH were supportive of adoption of new Information Technologies as indicated by a mean of 4.1, the respondents were neutral on the statements that NH has a strong culture of shared values and common goals; there is an atmosphere of collaboration and teamwork in NH implementation and that Employees at NH easily embrace change and are supportive of new ideas as indicated by a mean of 2.8, 2.6 and 2.5 respectively.

The findings correspond with factors such as teamwork and composition (Wee, 2000), effective communication (Wee, 2000), appropriate business and legacy systems (e.g. Holland and Light, 1999), interdepartmental co-operation, interdepartmental communication, and management of expectations (Somers and Nelson, 2001) are identified as critical in EDI application.

From the findings, 33% of the respondents rated the extent to which organisational culture had been supportive of EDI application as very low and low respectively, 21% of the respondents rated the extent to which organisational culture had been supportive of EDI application as moderate, 11% of the respondents rated the extent to which organisational culture had been supportive of EDI application as very high while 2% of the respondents rated the extent to which organisational culture had been supportive of EDI application as high.

#### 4.6. Funding on EDI Implementation at NH

Findings reveal that the majority respondents strongly disagreed that NH had acquired all the required equipment for smooth roll out of EDI and that adequate funds were allocated to training of staff on the use of EDI as indicated by a mean of 2.4 respectively, the respondents disagreed that sufficient funds were always provided to cater for every phase of EDI implementation as indicated by a mean of 2.3 ,finally the respondents disagreed that NH provided for adequate funds for maintenance of EDI as indicated by a mean of 2.2.

From the findings, 37% of the respondents rated the accessibility of funds for EDI application as inaccessible, 26% of the respondents rated the accessibility of funds for EDI application as very inaccessible, 19% of the respondents rated the accessibility of funds for EDI application as moderate accessible while 9% of the respondents rated the accessibility of funds for EDI application as accessible and very accessible respectively.

These findings relate with the literature review where Wee (2000) argues that successful EDI applications require excellent project management through funding.

#### 4.7. EDI Application in Logistics at NH

Yusuf et al (2004) argues that EDI products have their specific preferred business model, which dictates the manner of doing business. The existing organizational structure, culture and processes found in many firms may not be compatible with the structure, tools, and types of information provided by the EDI system. This study sought to investigate how EDI is applied at NH.

Findings revealed that respondents rated the success of EDI application with respect to information availability and inventory management as very poor as indicated by a mean of 1.4 respectively, the respondents rated the success of EDI application with respect to business processes integration , information quality and flexibility towards customers as poor as indicated by a mean of 2.4 respectively, the respondents rated the success of EDI application with respect to financial management and supplier management as poor as indicated by a mean of 2.3 respectively, finally, the respondents rated the success of EDI application with respect to human resources management and IT cost improvement as poor as indicated by a mean of 2.2 respectively.

#### 4.8. Regression Analysis

Multiple regression analysis was conducted so as to determine the relative importance of each of the variables with respect to the factors influencing the application of EDI in Logistics at NH. The researcher applied the statistical package Easy Reg International to code, enter and compute the measurements of the multiple regressions for the study.

**Table 3.** Model Summary

Model	R	R Square	Adjusted Square	Std. Error of the estimate
1	.933 <sup>a</sup>	.802	.921	.534

- I. Predictors: (Constant), management support, strategic objectives, organisation culture and Funding
- II. Dependent Variable: EDI application success

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (EDI application success) that is explained by all the 5 independent variables (management support, strategic objectives, organisation culture and Funding).

The four independent variables that were studied, explain 80.2% of variance in EDI application success as represented by the  $R^2$ . This therefore means that other factors not studied in this research contribute 19.8% of variance in the dependent variable. Therefore, further research should be conducted to investigate the factors influencing the success of EDI application in the Logistic sector in Rwanda.

**Table 4.** Anova (Analysis of Variance)

Model	Sum of squares	DF	Mean Square	F	Sig
Regression	29.295	5.000	0.453	54.000	.001 <sup>a</sup>
Residual	7.454	30.000	0.262		
Total	36.749	35.000			

I. Predictors: (Constant), management support, strategic objectives organisation culture and Funding

II. Dependent Variable: EDI application success.

The F critical at 5% level of significance was 6.21. Since F calculated is greater than the F critical (value = 54.0), this shows that the overall model was significant. The significance is less than 0.05, thus indicating that the predictor variables), explain the variation in the dependent variable which is EDI application success. Subsequently management support, strategic objectives, organisation culture and Funding. We reject the hypothesis that all the population values for the regression coefficients are 0. Conversely, if the significance value of F was larger than 0.05 then the independent variables would not explain the variation in the dependent variable.

**Table 5.** Multiple Regression Analysis

Model	Unstandardised coefficients		Standardised coefficient	t	Sig
	B	Std. Error	Beta		
Constant	3.987	.990	.453	5.786	.006
.243.642.453.005 Management Support	2.564	.454	.342	0.56	.025
Organisation culture 2.091 Strategic objectives	1.654	.574	.352	.184	.003
Funding	.698	.434	.226	.374	.002

From the regression findings, the substitution of the equation ( $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4$ ) becomes:

$$Y = 3.987 + 2.564X_1 + 2.091X_2 + 1.654X_3 + 0.698X_4$$

Where Y is the dependent variable (EDI application success),  $X_1$  is management support variable,  $X_2$  is strategic objectives,  $X_3$  is organisation culture and  $X_4$  the Funding variable.

According to the equation, taking all factors (management support, strategic objectives, organisation culture and Funding) constant at zero, EDI application success will be 3.987. The data findings also show that a unit increase in management support variable will lead to a 2.564 increase in EDI application success; a unit increase in strategic objectives will lead to a 2.091 increase in EDI application success; a unit increase in organisation culture will lead to a

1.654 increase in EDI application success and a unit increase in Funding will lead to a 0.698 increase in EDI application success. This means that the most significant factor is management support followed strategic objectives.

At 5% level of significance and 95% level of confidence, management support 0.025 level of significance; strategic objectives had a 0.005, organisation culture had a 0.003 level of significance and Funding had 0.004 level of significance while EDI application had a 0.002 level of significance, implying that the most significant factor is management support followed by strategic objectives.

#### 4.9. Discussion of Results

This study revealed that the management has not been sufficiently supportive of EDI application. Respondents strongly disagreed that management paid adequate attention to problems raised during EDI application and that top management prioritised /emphasised EDI application, the respondents disagreed that management provided all necessary support to employees to ensure smooth EDI application, and the respondents disagreed that management had been supportive in providing necessary training on EDI.

This study also found out that majority of the respondents indicated that NH did not have well defined strategic objectives with regard to EDI. In addition, the respondents strongly disagreed that the project scope and time-frames were properly communicated in good time to all staff involved and that EDI implementation objectives were well aligned with overall corporate objectives; the respondents disagreed that all employees understood the need for transformation from old systems to EDI, finally the respondents disagreed that users fully understood the performance expectations and activities of EDI implementation.

This study also found out that one could classify strategies into organisational, technical, and people strategies. Organisational strategies for promoting EDI implementation success include change strategy development and deployment, change management techniques, project management, organisational structure and resources, managerial style and ideology, communication and coordination.

Moreover, the study revealed that the the respondents strongly disagreed that NH had acquired all the required equipment for smooth roll out of EDI and that adequate funds were allocated to training of staff on the use of EDI, the respondents disagreed that sufficient funds were always provided to cater for every phase of EDI application, finally the respondents disagreed that NH provided for adequate funds for maintenance of EDI as indicated by a mean of 2.1.

Finally, the respondents rated the success of EDI application with respect to information availability and inventory management as very poor, the respondents rated the success of EDI application with respect to business processes integration , information quality and flexibility towards customers as poor, the respondents rated the success of EDI application with respect to financial management and

supplier management as poor, finally, the respondents rated the success of EDI application with respect to human resources management and IT cost improvement as poor.

## 5. Conclusions

The study concludes that the management had not been very supportive of EDI application and that that management didn't pay sufficient attention to problems that arose during EDI application. In addition, the study revealed that top management didn't prioritise / emphasise EDI application.

The study further concludes that NH did not have well defined strategic objectives with regard to EDI (at the time of the study) and that the project scope and time-frames were not properly communicated in good time to all staff involved and that EDI application objectives weren't well aligned with overall corporate objectives.

Additionally, the study concludes that staff were not fully supportive of the introduction of EDI and that employees at NH were not fully supportive of adoption of new Information Technologies.

Moreover, the study concludes that NH had not acquired all the required equipment for smooth roll out of EDI and that adequate funds were not allocated to training of staff on the use of EDI. Improvement strategies, such as EDI application, commonly involve change. Hence, responsiveness to internal customers is critical for an organisation to avoid the difficulties associated with this change. To assist top management with the complex organisational problem of workers' resistance to EDI application, the researchers suggest an integrated, process-oriented conceptual framework consisting of three phases; knowledge formulation, strategy implementation, and status evaluation.

Finally, the study concludes that the success of EDI application with respect to information availability and inventory management was very poor and that the success of EDI application with respect to business processes integration, information quality and flexibility towards customers was poor.

This study recommends that the Logistic sector should invest in training and development of staff as this will lead to achieving staff productivity which will in turn ensure proper skills needed in the EDI application processes and an increased understanding of the skills to be incorporated in the implementation process.

This study also recommends that the organisation should invest in a strong strategic reward management team so as to ensure that the staff is rewarded in accordance with their value to the institution by giving them monetary incentives which are needed to encourage and improve staff competencies.

Finally, the study further recommends that that Employees should get involved in developing requirement, designing and testing of the EDI application systems and that there should be sufficient awareness and training for end-users.

This study has investigated the application of EDI in the Logistic sector in Rwanda. There is need for further studies to assess challenges facing EDI application in the Logistics sector in Rwanda.

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