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Impact of EDI on Non-Financial Performance

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Abstract: The main objective of this study is to investigate the influence of (EDI) on non-financial performance of Saudi industries. To fulfil such purpose as questionnaire was developed based on reviewing much literature related to the subject concerned to collect the necessary information. The questionnaire was distributed over 23 industries. Questionnaires were collected, coded and analyzed. The results indicated that the application of electronic Data interchange (EDI) is still limited in Saudi Arabia industries. Moreover the results indicated that there is a direct relationship between the non financial measures. Finally, the study recommended that the industries should give great attention to the application of electronic Data interchange (EDI) and such industries should come up with technological developments in order to be able to compete and earn profits with the modern technological developments.

Keywords: Financial, Performance, Electronic Data interchange (EDI).

1. INTRODUCTION

Last year's witnessed rapid changes in trade domain. Since it is changed from the traditional style to the electronic one. especially after the emergence of the Internets and the significant role it plays as being a media for competing commercial exchange transactions, money exchange, Such change was not limited only on the private sector but it expands to all governmental sectors. All of which aimed to improve the accuracy, and control base on non traditional methods, in purchase and selling transaction and industrying transfers in particular (Anderson, 2002). Quick transactions achievement becomes as competitive advantage between the companies (Smith, 1997).

Nowadays we found that many companies and institutions have the trends to have a web site on the Internet, for the purpose of achieving various goals, among them performing the e-commerce (Droge, 2000). There is no doubt that dealing with e-commerce has various impacts on organization's accounting system, since it includes operating process development and most of inputs and outputs. Such impact can be extended to include other areas such as productivity, profitability and control procedures against business

risks carried through the net (Anderson, 2002**)**. Romney defines electronic Data interchange (EDI)s as information exchange system that reduces transactions costs between the companies, since it leads to improve accuracy degree of work between the companies, reducing the forwarding costs, operations, And papers storage. The system is rooted to 1970s and was limited on the large companies only. By 1979 around 90 %of 500 large companies used EDI and 10% of small companies used it. The reason behind that was its high cost (Romney, 2006). Haag *et al.* (2002) explained that e- commerce can affect international business through many issues such as EDI, which will become of the requirements, since organizations and potential clients will transfer business requirements and their information files though electronic exchange . They add that many organizations do not perform business with suppliers and customers who are not linked electronically with them, such organizations need large investment in the technology to support electronic exchange (Banerjee, 1995).

Finally, it is worth while to mention that control tools should be available for the purpose of determination of safety electronic exchange, which ensure protection and prevention for the companies who are using it, which in its turn reduces the electronic documents cheating, since the control and checking is an essential issue for prevention. The traditional accounting system can be reached in the actual physical company's location, while in electronic exchange it is easy to be sure of any breach through special systems easy regardless the company's actual location (Evangelia, 2006).

FBI reported that checks cheating are more than 10 billion USD annually, while many companies reported more than that. (Moynihan, 1997).

2. RESEARCH BACKGROUND

Electronic Data interchange (EDI)s is defined as a "direct interchange of operations documents between a computer and other one such as purchasing, sale orders, and invoices" **(**Laudon, 2002). So estimates indicate that 7% of total industries expense is expenditure related to documents interchange. But it can be reduced to the half by using electronic Data interchange (EDI)". It can be defined as electronic channel between one computer and other one of industries information in the form of questionnaire between trading partners or between different units in a industry (Boockholdt, 1996).

Electronic channel is a quick method and could be used to transfer the transaction electronically by communication between a computer and other ones, since it is a communication process in an electronic standard form that is industries dealings with trade partners electronically (Son, 2005). General messages which is in a form of EDIFACT or EDI. The main three parts in this technology are: implementation service provides a link between work application and electronic channel. This service allows the user (person) to send or to receive documents. Translation service transfers the out documents from the industry from internal RDBM to external RDBM, and transfers the in documents from external RDBM to internal RDBM. The communication service sends and receives transformation files from and to trade partners either directly or by using value added net work. (VAN) (Chau, 2001).

Inter factor system (SOS) can be categorized as electronic channel if the following four basic features are available at least (Wang, 1995):

- The relation between two industries should exist.

- Data progress operation related to a transaction between two industries should be supported by implementation independent electronic channel systems had such merit alone.
- Electronic channel safety between Implementation systems for trade partners should be ensured by agreements with regarding to data coding an RBDMS working rules.
- Electronic channel should be made between implementation systems through telephone communications links (Interfaces).
- The relation between channel electronically and according information system by the following figure:

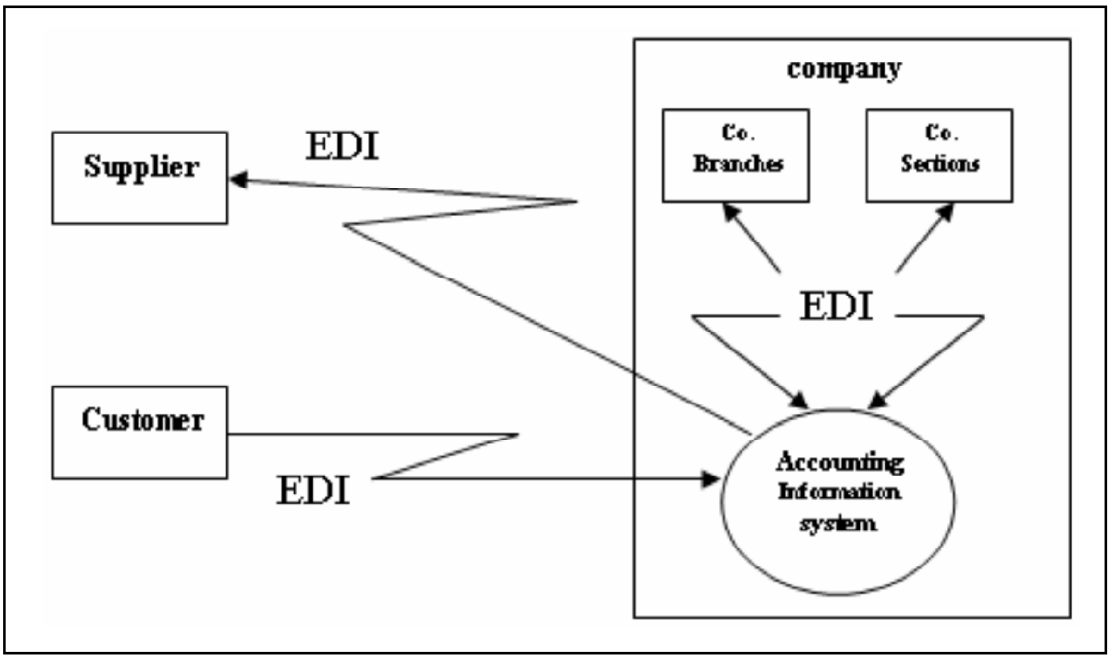


Figure 1: Proposed model for electronic channel relation with counting information system

It can be noticed from the above figure that the available accounting systems inside the factor needs the availability of electronic channel technology, for the purpose of connecting different department inside the factor and to connect industries different branches (Kumar, 2004), And also to connect suppliers with clients.

Using channel electronically

Electronic channel is a need which industries cannot avoid. From the point of view of researchers many large industries nowadays through working and for the purpose of completing the work with suppliers, electronic channel use is a must. All industries regardless their sizes will need electronic channel in the near future and the same will be a pre- request for communications inside the industry (Haag, 2000).

Researchers nowadays should pay an attention to improve electronic partnership because of two reasons:

The first: electronic channel differs from other inventions of information technology, since it cannot be adopted and used alone. Industries which already started using electronic channel should find similar

partners, or should convince or force their partners who are existed in the market to adopt this technology, and industries should continue in investing in technology (Iacovou**,** Dec1995).. The second: when technical network capacity is improved, the opportunities and challenges will be improved before managers who must balance between coordination advantages for quick information channel and to recall the most profitable and comprehensible data with its coordination costs that linked with more penetratable industries links. And when data channel easily between the industries, many may be known regarding a industry by another industry with respect to industries internal operations (Hart, 1997).

Electronic channel has its basic importance in international trade future by using it in board scope within small and medium industries in particular. If can be predicted that this technology will be the basic pillar for communication between the industries, and the trade size which will be achieved through this technology will increase with an average 7.7% annually during 2007(Deepak, 2005). Despite the increases of internet trade, but electronic channel will be the pillar of business between the industries. It is worthwhile to mention various models had been developed to explain the spread of electronic channel, since some researchers had found that adopting strategic systems directed to consumers depends on customers' awareness of need and support (Reich. 1990). Some other researchers had found the top management support, internal industry factors such as harmony and flexibility, industry policy factors such as the role of information technology and management risks, industries characteristics such as size and strategic planning. All of which impact the adoption of industry internal system based on computer (Grover 1993). Others argued that adoption of electronic channel has a relation with industry in internal variable, that is strength and competition press, which determines the depth of electronic channel. There are two regulating factors internal needs and internal management supports (Rekumar G. 1995). With respect to small and large industries, the original support, implementation operations, and control measures had a great importance in adopting electronic channel (Raymond . 1996).

Using technology of electronic channel provides many advantages either directly or indirectly as follows: (Iacovou**,** Dec1995)

- Direct benefit which includes costs reductions related to transportation, transactions, improving cash flow, stock level reduction, and enhancing information level.
- Indirect benefits which include operation activating, customer services improvement, competition capability improvement with other industries in the same sector. In addition it allows the industry to accelerate operation, and minimizing errors resulted by manual works.

Factors that affect using and adopting electronic channel technology can be summarized as follow :(Minjoon, 2000)

- Industries internal needs in using electronic channel and perceived advantages of the use by industries.
- Competitors' pressures and competition environment. Industries ability and readiness of adopting this technology.
- Technological issues related to electronic channel as security, integrating difficulty with existing training operations.
- Power and strength of industries which used this technology.
- Trust between users of electronic channel.

Dimension of electronic Data interchange (EDI)

It is the direct transfer from one computer to another of procedures, information content in fixed business files which consists of four dimensions: (Williams**,** 1998)

Electronics channels volume

Volume means number of channels document through (EDI), to number of channels trading document through EDI and traditional means between the industries. Increased percent of channels documents through EDI requires more integrated systems. (Minjoon, 2000).

Electronic Data interchange (EDI) diversity

It is defined as different types of standard industry work document, Such as purchasing orders shipping tables that are supported by electronic channel, and it is the size of using electronic channel for all possible, Since using electronic channel for different purposes does not mean that the industry use of heavenly for each purpose, and it is measured by percent of treated data through using electronic channel, with respect to treated data number through traditional system (that is without using electronic channel) for one purpose. (Hart, 1998).

Depth of Electronic Data interchanges (EDI)

Depth refers to four levels linked with using electronic channel, which are ranged from the level to the Depth one as follows: (1) Converting computer file in the industry (2) Converting application to application in the industry (3) Data basic connect with (4) doubled work environments where routine activities within the two industries are automatic (Ferguson, 1990).

Breadth of Electronic Data interchanges (EDI)

It is the used range in electronic channel, and it is the percent of trading models in which the industry through it shares information by EDI, that is industry percent that deal with the industry by using EDI (Hart, 1998).

Non-Financial performance measurements

The emerge of information technology and the opening of new international markets for the industries to change many assumption, mainly the industries developed their salves by defending on tangible assets, Since information age and its industrial sector environment require new capabilities to face competition successfully, and as a result industries capability to utilize and moving non tangible assets become more important to make competitive advantage. Studies show that non tangible resource enables the industry to (Haag, 2000):

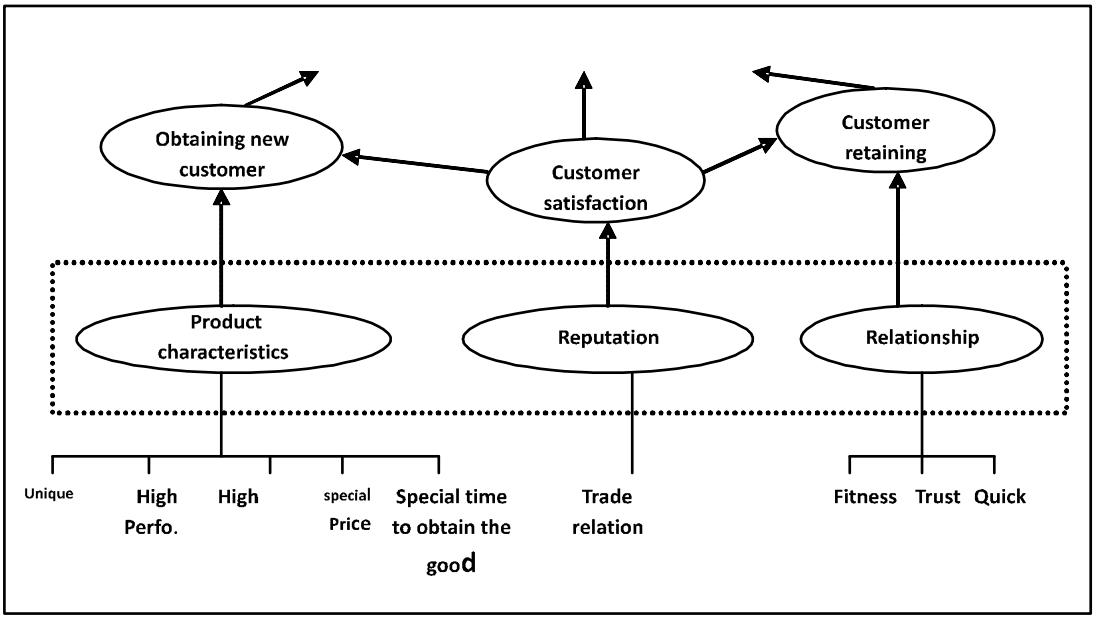
- To develop the relation with consumers and creating a high degree of loyalty.
- To serve new markets and sectors.
- To present new services and develop products.
- To produce products of high quality from the consumer point of view in less cost and time.
- To motivate employees skilled for continues improvement in quality, capabilities, and time needed.

We found that financial managers defend before on annual financial reports to measure industry performance, but nowadays there is the bad needs to extend performance evaluating models to include evaluation on non tangible assets which include good distinguish skill Employees motivation, distinguished capabilities and consumers of high loyalty.

Therefore in this sector we will discuss the non-financial performance measure, which include: Customers relationship, learning and development and internal operations.

Customer relationship

Through the concept of customer relationship, managers know the customers, and segment the market that may work and compete in, and also know the targeted market either the current ones or the future ones (Garrison, 2003). And then they develop new measure to specify business unit capability to create customer satisfaction and high loyalty, such as customer satisfaction retaining the customers, and attracting new customers, customer profitability, and market share in the targeted market. Kaplan and Atkinson explained the characteristic that should be available in industry on the following figure (Kaplan, 1998).



Due to the fact that industrying has traditionally operated in relatively stable environment for decades, but today industrying is facing an extensive competition .Therefore industries had concentrated their own efforts towards the customers through adopting customer relationship management in order to become more customer focused to face the increasing competition (Kaplan, 2000).

- **Product characteristic:** It means the most distinguished features of the products in terms of considering the product unique, high operational performance, good quality, suitable price for quality, and the degree of consumer obtaining the product quickly and with no effort (Fess, 2004).
- **Customers Relationship:** It refers to customers rest in dealing with the industry, customers trust, and industry responsiveness for any requirement (Boulding, 2005).

- **Reputation and good will:** It refers to the knowledge of brand value, trade name of the industry in the market through doing research and studies to know customers opinion in the name and the brand (Pandey, 1999).

Internal Operation

Managers specify the important operation for internal work. When through it the strategy is executed by many activities which take in consideration various dimension represent (Ross, 1998).

- Provide high value which can attract the largest number of consumers while retaining the current customers in the targeted market.
- Satisfying share holders through high profiles development and innovation operations are represented by producing the markets demand through knowing market need frequently, and knowing new markets and satisfying the customers demand. This requires market researches frequently. This goal can be measured through industries arrangement standards, sales market share as a percent. The operational and execution operations include all activities through which production is made and introducing the product to the market. Japanese industries had developed the new measures Such as quality measures which include damage average, output, rework, revenues and operations percent, and time measure which are related with time required for the product to reach the market, and the time needed by customer to get the good, and cost measures (Reinartz, 2004).

Learning & Growth

Learning and growth determines the infrastructure which industry should improve to create the improvement on the long run, since variables related to the customer and internal environment determine the current and future success factors, but it is not possible that business can be able to face market variables in the long run mainly in the light of technological changes and market development. Therefore competitive industries should in the light of globalization ensure industry continues improvement and development to face the international competition. Such development should be linked with capabilities and technology, and representing high value the customer and share holders. Learning and growth can be to obtain by three elements. Persons, systems and industry procedures, and by considering the financial performance and customer relationship, and internal operation, this will lead to gap existence between current capabilities and the required ones to achieve the objective related with distinguished analyses. To fill such gap industries should invest in employees training and enhancing technology, system and measurements (Robert, 2000).

3. RESEARCH HYPOTHESES

The current study examines the following hypothesis :

- Saudi Arabia industries don't have electronic Data interchange (EDI).
- There is no significant relationship between electronic Data interchange (EDI) and customer relationship in Saudi Arabia industries.
- There is no significant relationship between electronic Data interchange (EDI) and learning & growth in Saudi Arabia industries.

- There is no significant relationship between electronic Data interchange (EDI) and internal operation in Saudi Arabia industries.

4. METHODOLOGY

The study population consists of all industries on Saudi Arabia, a sample amounting twenty three industries. 85 questionnaires were distributed; 74 were received.

The data is collected by using a self administrated questionnaire that measures the electronic Data interchange (EDI) and non-financial performance, the questionnaire was designed after a preliminary observation on the practice and reviewing the available literature.

The questionnaire includes three section; the first collects general information abut the manager of industries wile the second measures the electronic Data interchange (EDI). Lastly, to measures non financial performance.

The following statistical tools were used in this research (Bereenson, 2001):

- Cronbach's alpha to check questionnaire reliability and stability for all of components.
- Z-test for preparation, we test a hypothesis pertaining to population P of values that are in particular category rather than the population mean value. A random sample can be selected from the population and sample proportion, $P_s = X/n$, can be computed. The value of this statistic is then compared to the hypothesized value of the parameter P so that decision can be made about the hypothesis, can be used:

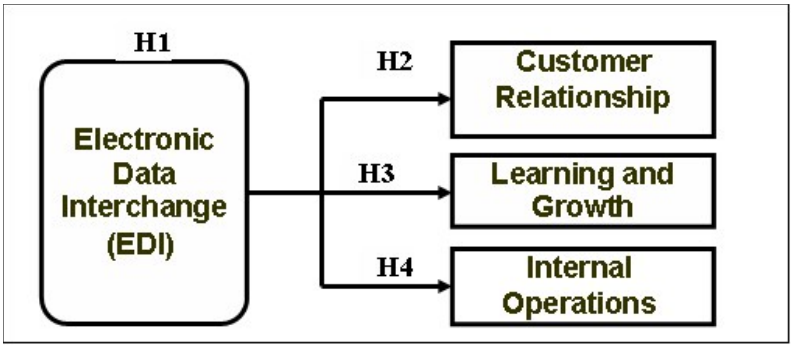
$$Z = \frac{P_s - P}{\sqrt{\frac{P(1-P)}{n}}}$$

Were

$$P_s = \frac{x}{n}$$

- Linear Regression, that investigates the straight-line relationship of the type ($Y = a + bX$) where Y electronic Data interchange (EDI)) is the independent variables, and X non-financial performance (Customer relationship, Internal Operation, Learning & Growth) is the dependent variables.

5. RESEARCH MODEL



6. RESULTS

The analysis of the data gathered through the self administrated questionnaire of the responding sample revealed the following results in terms of sample, gender, age, educational level, marital status and job:

Table 1
Sample's Demographic Profile

Gender	*Frequency*	*Percentage*
Male	69	93.2 %
Female	5	6.8 %
Total	74	100 %
	Job Title	
Operation Manager	37	50 %
Computer Manager	37	50 %
Others	0	0%
Total	74	100 %
	Total Years of Experience	
Less than one year	0	0%
One year to less than 5 years	9	12.2%
5 years to less than 10 years	28	37.8%
10 years +	37	50%
Total	74	100%
	Years of Experience in the industry	
Less than one year	5	6.8%
One year to less than 5 years	25	33.8%
5 years to less than 10 years	24	32.4%
10 years +	20	27%
Total	74	100%
	Educational level	
Less than Bachelor	2	2.7%
Bachelor	65	87.8%
MsC.	6	8.1%
PhD	1	1.4%
Other	0	0%
Total	74	100%

Table (1) indicates the following:

- In terms of gender 93.2% of the respondents were male while 6.8% were females
- When asked about their job title, 50% of the respondents were operations managers while the other 50% of the respondents were computer managers.

- When asked about their total experience, 87.8 % of the respondents had total experience which exceeds five years
- With respect to respondents experience in the industry , more than half of the sample 59.4% had an experience that exceeds five years in the industry. This indicates that the respondents had sufficient experience which leads to increase reliability and credibility of the obtained responses.
- As for the educational level of the respondents, 87.8 percent Bachelor degree, and 9.5 percent had higher education. This indicates the majority of the sample had university degree

Hypothesis test

- Saudi Arabia industries don't have electronic Data interchange (EDI).

  Upon the results of Z test with significant level (0.05), null hypothesis should not be rejected, which states that there is application of electronic channel in Jordan industries because Z value =1.162476, this means that it is within acceptance field (1.96-> Z>1.96), moreover $p=0.245$, which is more than the required significant level 0.05
- There is no significant relationship between electronic Data interchange (EDI) and customer relationship.

  Through the results of simple regression shown on tables (2, 3, and 4) we find the following results

Table 2
Model Summary (b) for customer relationship

Std. Error of the Estimate	*Adjusted R Square*	*R Square*	*R*	*Model*
.10328	.043	.056	.236(a)	1

a) Predictors: (Constant), EDTp
b) Dependent Variable: CRp

Table 3
ANOVA (b) for customer relationship

Sig.	*F*	*Mean Square*	*Df*	*Sum of Squares*		*Model*
.043(a)	4.241	.045	1	.045	Regression	1
		.011	72	.768	Residual	
			73	.813	Total	

a) Predictors: (Constant), EDTp
b) Dependent Variable: CRp

Table 4
Coefficients (a) for customer relationship

Sig.	*t*	*Standardized Coefficients*	*Un standardized Coefficients*			*Model*
		Beta	*Std. Error*	*B*		
.000	17.378		.040	.696	(Constant)	1
.043	2.059	.236	.071	.147	EDTp	

a) Dependent Variable: CRp

- It can be noticed that the correlation between independent variable and dependent variable= 23.6%, further more F= 4.241 and *P =0.043* which is less than the required significant level (0.05) , therefore the null hypothesis is rejected , and the alternative one is accepted, this means that there is a significant relationship between application of electronic channel technology and customers relationship in Saudi Arabia industries. The researchers reserve on the obtained regression results because one of the assumptions of this test regarding Homoscedasticity was not achieved
- There is no significant relationship between electronic Data interchange (EDI) and internal operation.

First : Normality of error

Table (5) indicates that P value for customer relationship is 0. 432 which is more than 0.05 and Z = 0.873. furthermore P value for electronic channel level is 0.594 and Z value = 0.770 . this means the normality of error.

Table 5
One-Sample Kolmogorov-Smirnov Test for internal operation

IPTp	*EDTp*		
74	74	N	
0.79	.5366	Mean	Normal Parameters (a, b)
0.06338	.16985	Std. Deviation	
0.101	.089	Absolute	Most Extreme
0.076	.089	Positive	Differences
-0.101	-.075	Negative	
0.873	.770	Kolmogorov-Smirnov Z	
0.432	.594	Asymp. Sig. (2-tailed)	

a) Test distribution is Normal.
b) Calculated from data.

It is also clear that the normality of error through the figures (2) and (3) as follows:

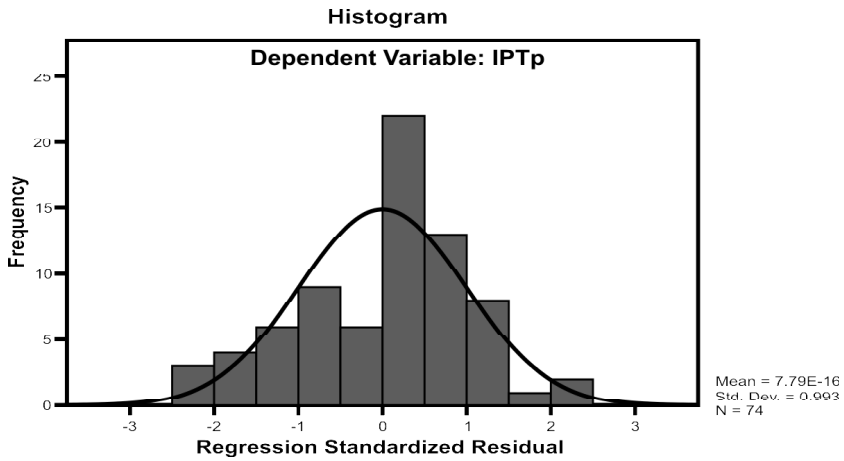


Figure 2: Internal Operations Residuals frequency

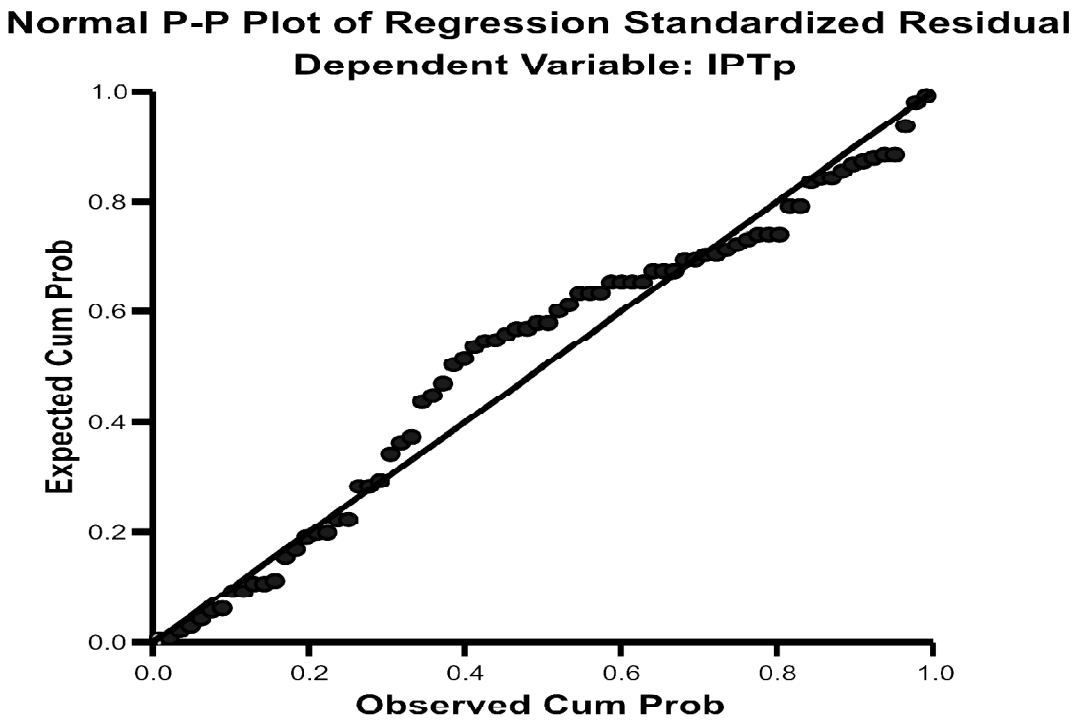


Figure 3: Internal Operations Residuals Normality of Error

Second: Homoscedasticity

It can be noticed through figure (4) that there is a linear relation between the two independent and dependent variables, since the impact of data electronic channel impact on internal operations can be noticed.

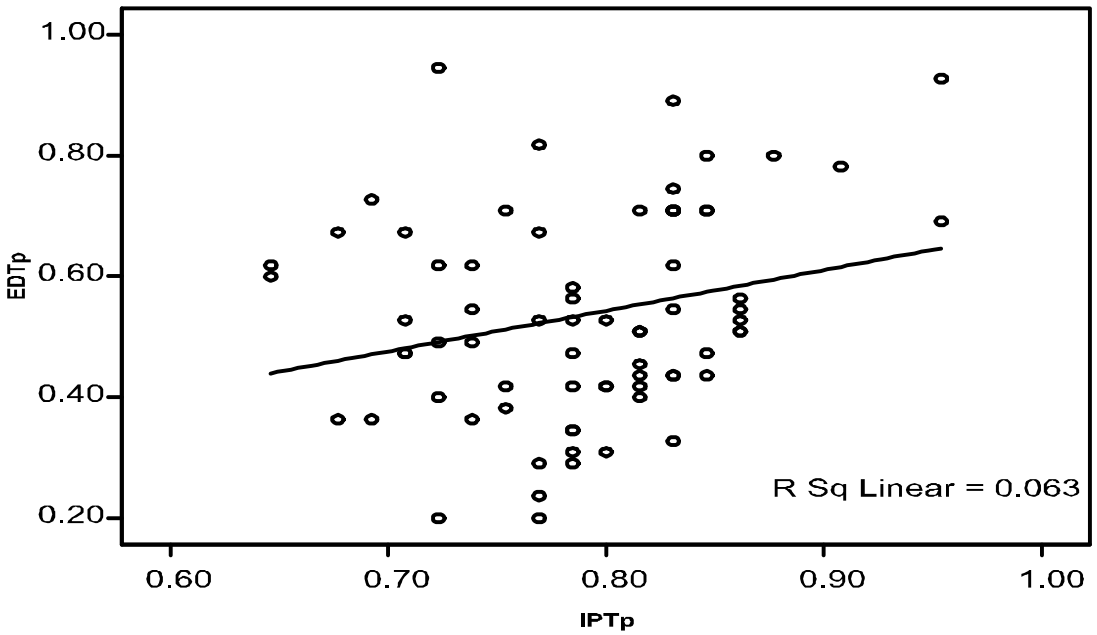


Figure 4: Spread form of data electronic interchange and internal operations

- **There is no significant relationship between electronic Data interchange (EDI) and internal operation.**

Third : Simple Linear Regression

Through the results of simple regression shown on tables (6, 7, and 8) we find the following results

Table 6
Model Summary (b) for internal operations

Std. Error of the Estimate	*Adjusted R Square*	*R Square*	*R*	*Model*
0.06177	0.05	0.063	.251(a)	1

a) Predictors: (Constant), EDTp

b) Dependent Variable: IPTp

Table 7
ANOVA (b)) for internal operations

Sig.	*F*	*Mean Square*	*Df*	*Sum of Squares*		*Model*
.031(a)	4.849	0.019	1	0.019	Regression	1
		0.004	72	0.275	Residual	
			73	0.293	Total	

a Predictors: (Constant), EDTp
b Dependent Variable: IPTp

Table 8
Coefficients (a) for internal operations

Sig.	*t*	*Standardized Coefficients*	*Un standardized Coefficients*			*Model*
		Beta	*Std. Error*	*B*		
0	30.895		0.024	0.74	(Constant)	1
0.031	2.202	0.251	0.043	0.094	EDTp	

a) Dependent Variable: IPTp

It can be noticed that the correlation between independent variable and dependent variable= 25.1%, further more F= 4.849 and *P =0.031* which is less than the required significant level (0.05) , therefore the null hypothesis is rejected , and the alternative one is accepted, this means that there is a significant relationship between application of electronic channel technology and internal operations in Saudi Arabia industries. The researchers reserve on the obtained regression results because one of the assumptions of this test regarding Homoscedasticity was not achieved.

- **There is no significant relationship between electronic Data interchange (EDI) and learning & growth.**

First : Normality of error

Table (9) indicates that P value for customer relationship is 0. 067 which is more than 0.05 and Z = 1.303 .furthermore P value for electronic channel level is 0.594 and Z value = 0.770 . this means the normality of error.

Table 9
One-Sample Kolmogorov-Smirnov Test for learning & growth

LGTp	*EDTp*		
74	74		N
0.7486	.5366	Mean	Normal
0.12593	.16985	Std. Deviation	Parameters (a, b)
0.151	.089	Absolute	Most Extreme
0.115	.089	Positive	Differences
-0.151	-.075	Negative	
1.303	.770		Kolmogorov-Smirnov Z
0.067	.594		Asymp. Sig. (2-tailed)

a) Test distribution is Normal.

b) Calculated from data

It is also clear that the normality of error through the figures (5) and (6) as follows:

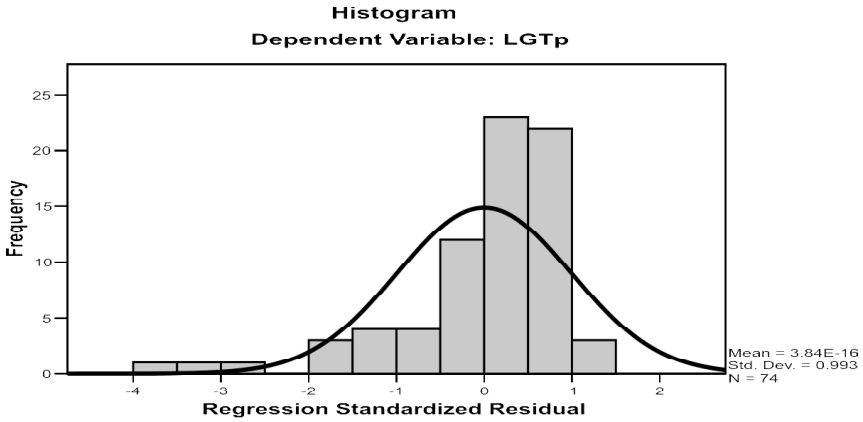


Figure 5: Learning & growth Residuals frequency

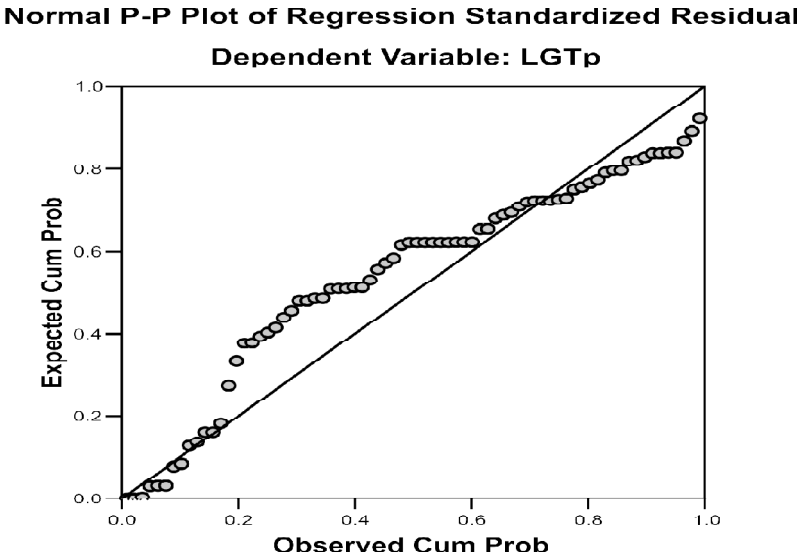


Figure 6: Learning & growth Normality of error

Second: Homoscedasticity

It can be noticed through figure (7) that there is a linear relation between the two independent and dependent variables, since the impact of data electronic channel impact on learning and growth can be noticed.

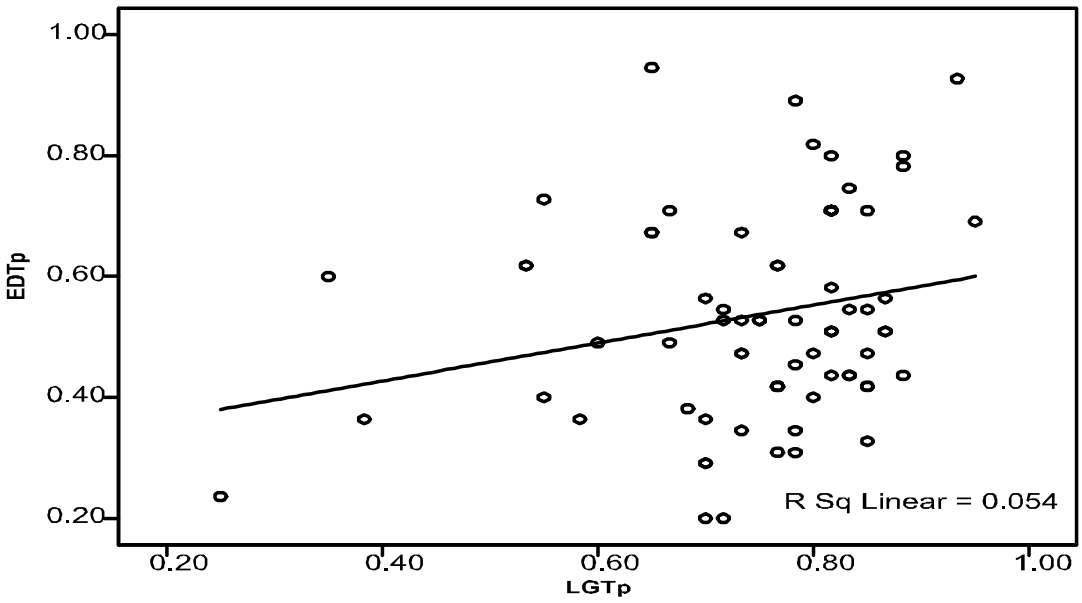


Figure 7: Spread form of electronic channel and learning and growth in the industry

Third : Simple Linear Regression

Through the results of simple regression shown on tables (10, 11, and 12) we find the following results:

Table 10
Model Summary (b) for learning and growth

Std. Error of the Estimate	*Adjusted R Square*	*R Square*	*R*	*Model*
.12331	.041	.054	.233(a)	1

a) Predictors: (Constant), EDTp

b) Dependent Variable: LGTp

Table 11
ANOVA (b) for learning and growth

Sig.	*F*	*Mean Square*	*Df*	*Sum of Squares*		*Model*
.046(a)	4.137	.063	1	.063	Regression	1
		.015	72	1.095	Residual	
			73	1.158	Total	

a) Predictors: (Constant), EDTp

b) Dependent Variable: LGTp

Table 12
Coefficients (a) for learning and growth

Sig.	*t*	*Standardized Coefficients*	*Un standardized Coefficients*			*Model*
		Beta	*Std. Error*	*B*		
.000	13.723		.048	.657	(Constant)	1
.046	2.034	.233	.085	.173	EDTp	

a) Dependent Variable: LGTp

It can be noticed that the correlation between independent variable and dependent variable= 23.3%, further more F= 4.137 and *P =0.046* which is less than the required significant level (0.05) , therefore the null hypothesis is rejected , and the alternative one is accepted, this means that there is a significant relationship between application of electronic channel technology and learning and growth in Saudi Arabia industries. The researchers reserve on the obtained regression results because one of the assumptions of this test regarding Homoscedasticity was not achieved.

7. CONCLUSIONS

Based on above analysis, the research concludes the following results:

(a) Industries in Saudi Arabia do not apply electronic channel either between the internal units of the industry or with other industries, which can be deemed as weakness point since such technology will help the industries to face the high competition with foreign industries. Although Saudi Arabia industries do not apply or use electronic Data interchange (EDI) in their daily services, but the sample recognize the advantages of electronic Data interchange (EDI) in terms of customer relations and improving the industries non financial performance.

- There is no significant relationship between electronic Data interchange (EDI) and customer relationship.***
- Analysis indicated that there is a significant relationship between application of electronic channel technology and customers relationship in Saudi Arabia industries. This can attributed to the fact the electronic Data interchange (EDI) speed up the industrying services required by customers and give them an access to contact the concerned regarding any service they need, which in its turn enhance the relations between the industries and the customers. It is worthwhile to mention that customer relationship is a new tool that helps industries to face competition.

* Analysis also indicated that there is a significant relationship between application of electronic channel technology and internal operations in Saudi Arabia industries. This means that using electronic Data interchange (EDI) wick speed up and enhance internal contacts between industries units, which in its turn improve the internal operations.

* Furthermore it was found that there is a significant relationship between application of electronic channel technology and learning and growth in Saudi Arabia industries. This can be attributed to the well known idea that electronic Data interchange (EDI) will transfer new technology and new experiences the local industries needs in their daily works.

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