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The Influence of Transformational Leadership Style on ICT Adoption in the Nigerian Construction Industry

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Abstract

Information and communication technology provides construction organizations with new opportunities for improving the process of collaboration, managerial functions and maintenance of competitive advantage. Its adoption has however been faced with problem of incompetent organizational leadership. The purpose of this study, therefore, is to examine the influence of transformational leadership style on IT adoption in construction organizations. Structural equation modelling analytical approach was used to test the presence of a positive and direct relationship between transformational leadership style and IT adoption in organizations. Results strongly supported the hypothesis of a positive and direct relationship with a path coefficient of .79. Part of the recommendation of the study was for managers to diligently exhibit transformational leadership behaviours during technological change in their organizations by paying attention to the needs of their employees, providing ways and reasons for employees to comprehend and analyse problems in different ways, adequate employee motivation and building confidence and trust with employees.

Keywords: construction, construction organization, leadership style, transformational leadership, ICT adoption

1. Introduction

Information and communication technology provides a platform for businesses to flourish by enhancing increased competitiveness, improving processes, enabling access to new environment in addition to generation of new markets. Thus organizations from developed economies have attained a significant level of adoption leaving their counter parts from developing countries far behind and still struggling with its implementation challenges. Researchers examining the adoption barriers from developing country perspectives such as Nigeria (Apulu & Latham, 2009; Apulu & Ige, 2011; Ibironke et al., 2011; Eze et al., 2013), India (Ahuja et al., 2009), Malaysia (Jafari et al., 2006; Mui et al., 2002), Egypt (Aboelmaged, 2014), Iran (Sidawi et al., 2012), Brazil (Goedhuys & Veugelers, 2012), South Africa (Ogunyemi, & Johnston, 2012), Jordan (El-Mashaleh, 2007) have emphasized leadership (top management/CEOs) ineffectiveness as the major constrain to successful ICT adoption. Similarly, other studies (Martin & Hug, 2007; Ihua, 2009; Jung et al., 2003) have identified top management strategies toward managing employee behavioural change as another significant barrier to embracing technological change. Consequently, the decision by an organization to successfully adopt advanced ICT-based applications depends on leadership characteristics within that organization. Organizational leaders are expected to develop and motivate individual followers (Wang et al., 2012) by defining and shaping the work settings in which employees interact such that new knowledge and technology can be created which is fundamental to firm innovation and performance.

A vast amount of extant literatures have identified a transformational leader as an agent of change (Hallinger, 2003; Bass & Riggio, 2005; Yu et al., 2002), and innovation (Gumusluoglu & Ilsev, 2009; Jung et al., 2003; Jung et al., 2008). Transformational leaders are effective, productive and innovative leaders who are satisfying to followers as both parties strive towards the betterment of the organization boosted by shared visions, values, mutual trust and respect. This coincides with Bass, (1985) who noted that transformational leaders motivate followers to go beyond their self-interests for the sake of the organization and goal accomplishments. By inspiring and influencing subordinates, a transformational leader changes the basic value, beliefs and approaches of followers making them eager to accomplish beyond the levels originally identified by the organization.

According to Eisenbach et al. (1999), changing organizational processes and procedures for business improvement depends on leadership to be initiated. As such, transformational leaders possess leadership qualities that are capable of transforming their organizations from status quo to a desired future state of profitability.

According to Achuenu, (1999) and Oladapo, (2006), construction organizations in Nigeria use basic computer applications in executing construction management functions and operations. The use of advance ICT-based application packages such as computerized inventory control, advanced project management and scheduling systems, modelling and simulation technologies among others are grossly lacking as a result of unwillingness of organization managers to fully computerize their organizations. Other reasons, according to Oyediran & Kalu, (2009), are negative managerial attitude, illiteracy among employees and lack of upper management support. This trend of leadership among Nigerian construction organizations is harmful to the entire industry by keeping the industry out-of-date with the global developments in construction project execution and management.

Most prior studies on transformational leadership examined cases from developed countries (García-Morales et al., 2008; Eisenbach et al., 1999; Wang et al., 2012) and Asia (Lo et al., 2010; Jung et al., 2008). Few studies of transformational leadership and its influence on ICT applications adoption were conducted on African region and no similar study particularly exists on Nigeria. This study, therefore, has two basic objectives. The first objective is to establish the factor structure of transformational leadership in construction organizations. The second objective is to examine the effect of transformational leadership style on the adoption of ICT applications among construction organizations and reflects upon its significance in the larger context of the construction industry. The study presents an opportunity to grasp the nature of effect of this leadership style on Nigeria considering the substantial difference in business environment and management practices between developed economies and a struggling African giant.

The paper begins by a brief review of literature on organizational and transformational leadership followed by the methodology adopted and presentation of results. The final phase highlights conclusion and the implications of the study findings.

2. Review of Organizational Leadership

Quality leadership is essential in transforming organizations as well as a variety of context. Leading a given organization requires certain qualities such as personality, charm, courage, intelligence and, to some extent, aggressiveness and persuasiveness. Organizational leaders play a key role in managing both organizational processes and its resources (Eisenbach et al., 1999) for creating a successful business venture. Leaders therefore take high quality decisions that are acceptable to subordinates in the organizations. Bruce et al. (1991) argue that in the current technology driven era, organizational leaders are expected to develop a workforce that is not only receptive to change but both ready and committed to remain competitive and relevant. The leadership literature is many and diverse but experts on leadership research suggest that leader effectiveness determines the success or failure of an organization (Ogbonna & Harris, 2000). This necessitates leaders to delegated huge responsibilities for running organizations. The leaders, in turn, develop followers to handle greater levels of responsibilities and uncertainties working closely and in alignment with organizational visions and goals.

2.1 Theory of Transformational Leadership

The theory of transformational leadership as introduced by Burns (1978) and subsequently developed by Bass and Avolio (1995), has attracted a lot of attention in the academic literature. Transformational leadership is a relationship such that a leader and a follower motivates each other to higher levels which led to a valuable, mutual and beneficial association for the benefits of the leader, follower and the organization. According to Bass and Riggio, (2006), there has been more empirical research on transformational leadership than in any other leadership theory. Bruce et al. (1991) described a transformational leader as more than just a manager. Such a leader develops followers, raises their need levels and uplifted them thus promoting positive changes in individuals, groups and organizations. The general consensus among researchers (Bass, 1997; Bass & Riggio, 2006; Jung et al., 2008; Follesdal & Hagtvet, 2013) is that a transformational leader is characterized as comprising of four distinct components of behaviours: *Idealized Influence* – creating trust, admiration, respect and loyalty among subordinates by displaying charismatic vision and behaviours thereby achieving complete confidence of the followers. *Inspirational Motivation* – inspiring followers through new ideas and goals by articulating a clear and appealing vision of the future. *Intellectual Stimulation* – raising their subordinates' awareness concerning problems and developing their abilities to confront and solve such problems in variety of ways. Lastly, *Individualized Consideration* – rather than treating each follower as an employee, a transformational leader treats each subordinate as a 'whole' individual and considers the individual's talents and level of knowledge and decides what fits him/her to reach a high level of achievement.

Supporters of transformational leadership style argue that through their behaviours, these leaders create personal and professional commitments towards self-esteem and self-actualization (Bass, 1985). By doing so, employees' intrinsic motivation is generally elevated which leads to organizational learning (García-Morales et al., 2008). Researchers (Calantone et al., 2002; Hurley & Hult, 1998; Cohen & Levintha, 1990) have recognized organizational learning as an important driver of employee creativity and firm innovation. Similarly, Lo et al. (2010) have empirically established that two dimensions of transformational leadership styles (idealized influence and intellectual stimulation) have significant effects on three dimensions of commitment to change i.e personal goals, capacity belief and context belief. Commitment to change, on the other hand, translates into execution of new objectives and change programmes which is a major necessity for numerous organizations (Jaros, 2010; Conner, 1992; Meyer et al., 2007). Similarly, (Bass, 1996) observed that charisma, individualized influence for subordinate development and a practice of intellectual stimulation by leaders is critical to leaders whose organizations are faced with needs for renewal and change.

2.2 Organizational Structure of Contracting and Consultancy Firms in Nigeria

Both contracting and consultancy firms are facing significant operational challenges in service delivery. These challenges are mostly as a result of advanced and intelligent client brief, inadequate IT adoption, globalization and a substantial level of competition with both peer and dominated foreign firms (Oyediran & Odusami, 2005). For instance, the general operational processes of both construction contracting and consultancy firms in Nigeria are paper-based. This makes it difficult for firms to meet the demands of client primarily due to Poor ICT infrastructural facilities in the country to warrant technological innovations implementation (Musa et al., 2010). Additional explanation is size of firms. The organizational structure of a middle-sized consultancy and contracting construction firm in Nigeria has variety of roles and responsibilities from departments/units such as administration, operation, finance and, to some extent, purchasing. Normally, authorities and communications flow from the CEO/Chairman/Business Owner to resident professionals/head of units. This trend is more pronounced in small firms. Naturally, the size of a firm determines its horizontal divisions/separations.

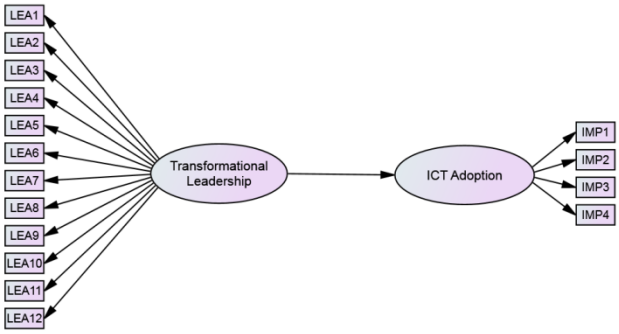

Figure 1. The hypothesized model of the study

3. Research Question and Methodology

This study aims at assessing the influence of transformational leadership style on ICT adoption in construction organizations. The study, therefore, pivots around the research question: "To what extent does a practice of transformational leadership behaviours by construction organization managers' impacts successful ICT adoption in their organizations"? To answer the research question, a structural equation modelling approach was adopted to test the hypothesized relationship between the predictor and the criterion.

3.1 Instrumentation Data Collection and Pilot Testing

Consistent with (Bass, 1985), the transformational leadership was assessed using Multifactor Leadership Questionnaire form. Three items were used each to measure the four dimensions of transformational leadership (idealized influence, inspirational motivation, intellectual stimulation and idealized consideration) on a 5-point likert-type scale ranging from 5 = strongly agree to 1 = strongly disagree. The ICT Adoption construct was measured using four custom-designed items guided by (Molla & Licker, 2004). To determine the suitability of the questionnaire items for the study context, a pilot study was conducted. Prior to the commencement of the pilot study, discussions with experts from both academic and construction industry were ensured. Both experts express satisfaction with the clarity and fit of the questionnaire items for the study's context. Consequently, the pilot study was initiated where a total of 115 questionnaires were administered to a sample of professionals from construction firms. A total of 79 questionnaires were returned and analysis was conducted on 68 valid responses.

After item scale reliability and validity were tested using SPSS version 22.0, modification to the survey instrument was not necessary since Cronbach's Alpha values were within the range of .71 and .84 exceeding the .50 cut off mark recommended by Hilton et al. (2004). Following the satisfactory validity evaluation, the final survey was conducted.

Using stratified random sampling procedure, 480 questionnaires were administered to construction organizations (engaged in both contracting and consultancy services) from six states of Northern Nigeria. A total of 345 questionnaires were returned and 306 were found to be valid for further analysis (Valid return rate = 63.75%). Of the respondents, 74% were male while 26% were female. Architects, Quantity surveyors, Builders, Estate Managers and Urban and Regional Planners comprised of 33%, 31%, 15%, 09% and 12% respectively. Respondents identifying themselves as top managers are 32%, whereas senior professionals normally regarded as middle managers and head of units are 58% leaving 10% for both junior professionals with lower academic qualifications. Firms engaged in consultancy services represent 63%, contracting 28% and 8% were into both contracting and consultancy. Education wise, 5%, 34%, 52% and 9% of the respondents hold PhD, Master Degree, Bachelor Degree and other lower qualifications respectively. The average age of respondents was 34 and the average years of experience in the construction industry was 17.

Table 1. Constructs conceptualization

Construct	Conceptualization	Indicators	Source
Transformational Leadership			
Idealized Influence	Subordinate attritions that the leader projects self-confidence and success, articulates goals and arouses followers' emotions	3	Bass, 1985 Bass, 2003
Inspirational Motivation	Behaviours where leaders articulate, in simple ways, shared goals and mutual understanding of what is right and important	3	
Intellectual Stimulation	Involves the support of subordinates' ideas, showing new ways of handling problems	3	
Individualized Consideration	Special attention from the leader that focuses on attending to the developmental needs of subordinates	3	
ICT Applications Adoption	Intention to achieve an interactive ICT-based Application status and subsequent institutionalization	4	Molla & Licker, 2004

3.2 Structural Equation Modelling

Structural equation modelling is a multivariate analytic procedure (Shah & Goldstein, 2006; Du, 2009) and a second generation statistical method (Naranjo-Gil, 2009; Aibinu & Al-Lawati, 2010) used in the analysis of interrelationships among variables in a model. The use of SEM seems appropriate in this study because it shows relationships among both observed and unobserved variables with the aim of providing a quantitative test of a theoretical model hypothesized by a researcher (Schumacker & Lomax, 2010). Furthermore, this study involved unobserved variables and hypothesized direct relationships between the constructs in the study. Unlike PLS-based SEM with path modelling parameter estimates generally known to be biased, this study employed a covariance-based SEM approach in the analysis of the hypothesized model specified *a priori.* Additionally, covariance-based SEM relies on maximum likelihood estimation which is the method used most often in SEM (Kline, 2011).

The two step approach suggested by (Anderson & Gerbing, 1982) was used in the model proposal process. In the one-stage or single stage approach, the aim is to carry out the analysis with simultaneous estimation of the measurement and structural models. On the other hand, the second-stage approach is targeted at processing the measurement model first (through confirmatory factor analysis) and then fixing the measurement model in the

second stage when the structural model is estimated. In essence, the measurement model is a confirmatory factor analysis whereby relations between unobserved variables and their indicators are defined (Schumacker & Lomax 2010; Byrne, 2010). All observed variables are allowed to load on their respective factors. According to (Schumacker & Lomax, 2010), in measurement model, the researcher is basically interested in answering these questions: (1) to what extent are the observed variables actually measuring the hypothesized latent variables? (2) to what extent are the observed variables actually measuring something other than the hypothesized latent variable? (3) which observed variable is the best measure of a particular latent variable. Structural model, on the other hand, defines relations among the unobserved variables i.e. it specifies the manner by which a certain latent variable influence other latent variables in the model (Kline, 2011).

Structural equation modelling goes through five basic and interrelated processes or steps (Lei & Pennsylvania, 2007; Schumacker & Lomax, 2010; Kline, 2011). The first process is *model specification*: where all available and relevant theory, research and other information are used to hypothesized the proposed model. *Model Identification*: identifying the parameters to be estimated by finding the most parsimonious summary of the interrelationships among both observed and unobserved variables. *Model Estimation*: this basically involves determining the values of the unknown parameters and the error terms related to the estimated values. *Model Evaluation:* this involves examining various fit indices to assess how well the data fits the model. The last process in structural equation modelling is *Model Modification:* since the initial model does not usually fits the data, this process is all about modifying the existing model and its subsequent evaluation to fit the data.

The criteria normally used to test the structural model are the overall goodness-of-fit indices for explaining the variance in the dependent variable and significance level of the model path coefficients. There is no agreement among researchers on the model fit indices to be reported. However, (Hair et al., 1995; 2012) as well as Holmes-Smith, (2006) suggested the use of atleast three model fit indices by reporting atleast one test statistics from each of the three category of model fit indexes: (a) absolute fit index (b) incremental fit index and (c) parsimonious fit index. In this study, therefore, the chi-square (x^2), the goodness-of-fit index (GFI) and the root mean square error of approximation (RAMSEA) were reported from the absolute fit index category. Adjusted-goodness-of-fit index (AGFI), comparative fit index (CFI), normed fit index (NFI) and the Tuker-Lewis index (TLI) were reported from the incremental fit index category. Lastly, normed chi-square index (x^2/df) were considered in the parsimonious category of model fit index. As a guide for a good, parsimonious and acceptable model, the AGF, AGFI, CFI, NFI and the TLI are pegged at ≥ .90 (Segars et al., 1993; Browne et al., 1993; Hair et al., 1998). In accordance to Wheaton et al. (1977), the normed chi-square index (x^2/df) value of ≤ 5.0 is acceptable.

Reliability and validity of measures were assessed for both the measurement and structural models. In the case of internal consistency reliability which measures the extent to which the multiple indicators for a construct measure that specific construct, Cronbach's alpha coefficients was calculated using SPSS for Windows version 22.0. A minimum cut-off mark of .70 recommended by (Nunnally and Bernstein 1994) was adopted. Composite reliability was also calculated to capture the degree to which a set of indicators reflect the common latent construct (Holmes-Smith et al., 2006; Phillips, 2014). For construct reliability, the commonly acceptable threshold value is ≥ .70 although values less than .70 are considered acceptable Hair et al. (2006).

In the case of validity, both convergent and discriminant validities were assessed using confirmatory factor analysis (Malhotra, 2010; Hair et al., 2011). Convergent validity examines the extent to which indicators of the same construct are correlated. According to Holmes-Smith et al. (2006), for evidence of convergent validity, the extent of the direct relationship between the indicators and latent variable (construct) should be statistically different from zero. Thus, evidence of convergent validity is noticed when a significant t-value is observed for each indicator (Bollen, 1989; Joreskog & Sorbom, 1989) and a high factor loading of atleast .50 or greater for each indicator (Hair et al., 2006). Discriminant vaidity, on the other hand, is assessed by examining the correlations among constructs. These correlations, according to Kline, (2011), should not be greater than .85. Therefore, where two constructs exhibit high correlation greater than .85, redundant items should be deleted or constrained (Awang, 2012).

For statistical significance in this paper, Cohen's (1988) recommendation was used as a guide. Consequently, a correlation value (path coefficient) less than .20 is considered weak, value between .20 and .50 moderate and a correlation greater than .50 is regarded as strong.

3.3 Data Analysis

Prior to SEM analysis, the data was screened and checked for normality of distribution. Normality distribution analysis was conducted using SPSS descriptive statistical test for skewness and kurtosis. All values ranged

between -1.05 and +.87 indicating an acceptable level of normality of distribution. Many authors (West et al., 1995; Yuan & Bentler, 1999; Lei & Lomax, 2005) recommended absolute values of 3.0 for skewness and 7.0 for kurtosis. Following the normality test, subsequent analyses were carried out.

Table 2. Goodness-of-fit indices for measurement models

Construct	No. of Items	$\chi 2$	df	P-value	$\chi 2$/df	GFI	AGFI	NNFI	CFI	RAMSEA
Trans. Lead. *Initial Model*	12	260.65	54	.000	4.72	.90	.85	.84	.87	.096
Trans. Lead. *Modified Model*	9	125.93	27	.000	4.66	.94	.90	.89	.92	.094
Trans. Lead. *Final Model*	7	51.62	14	.000	3.69	.97	.93	.94	.96	.08
ICT Adoption *Final Model*	3	32.57	2	.000	16.29	.96	.90	.88	.89	.092
Recommended Values					≤ 5.0	≥ .90	≥ .90	≥ .90	≥ .90	≤ .10

Measurement models were first assessed individually before the final structural model. Table 2.0 shows the various goodness-of-fit indices obtained in all stages of measurement model development (initial, modified and final parsimonious and acceptable model). The models were iteratively revised based on standardized parameter estimates and examination of modification indices. As can be seen from the table, all parameter estimates were statistically significant.

From table 3.0, Cronbach's alpha coefficients reliability assessment for all scales exceeded the minimum cut-off point of .70. This indicates sufficient internal reliability of the scales (Nunnally, 1978). Additionally, composite reliability estimates was calculated based on the formula suggested by Fornell & Larcker (1981) below.

$$(\sum \lambda i)^2/(\sum \lambda i)^2 + (\sum \varepsilon i)$$

Where λi is the standardised factor loading for each observed variable, εi is the error variance associated with each observed variable

Table 3. Reliability and validity evaluation of constructs

Constructs	**Indicators**	**Factor Loading**	**Cronbach's Alpha**	**C.R**	**C.R z-value**	**P-value**
Transformational Leadership			.84	.84		***
	LEA1	.79			11.27	
	LEA2	.80			11.28	
	LEA3	.66			10.28	
	LEA4	.58			9.37	
	LEA5	.62			9.70	
	LEA9	.55			9.00	
ICT Adoption	LEA12	.57			9.23	
			.71	.73		***
	IMP1	.85			12.34	
	IMP2	.58			11.36	
	IMP3	.62			10.77	

Both composite reliability values exceeded the minimum threshold of .60 recommended by Bagozzi and Yi (1988). This supports the reliability of constructs in the study. With regards to convergent validity, results have shown all standardized factor loadings for items measuring a particular construct are statistically significant

significant (Anderson & Gerbing, 1988; Lin & Ding, 2005; Holmes-Smith et al., 2006; De Von et al., 2007; Bollen, 1989; Joreskog & Sorbom, 1989) at .001 level. Discriminant validity was also evident since the correlation between the constructs (.79) is not greater than .85 recommended by Kline, (2011).

3.4 Results of the Study

Iterative sequence was conducted and redundant indicators were dropped one at a time until a more parsimonious model was achieved. All deleted and retained items were presented in appendix A. The model's

overall fit with the data was subsequently evaluated using the previously explained conventional model fit indices. The aim of the evaluation was to determine whether the associations among the variables (both observed and unobserved) in the estimated model sufficiently reflect the observed associations in the data (Weston, 2006). All fit indices meet the minimum threshold for an acceptable and parsimonious model. For instance, the chi-square test statistic, which is a measure of the compatibility of the data with the hypothesis, was (x^2 = 125.212 with 34 degrees of freedom, P = 0.000, N = 306). The GFI index, which assesses how well a model fits the observed data, was .94. The RAMSEA, which corrects for model's complexity, was .080. Considering the significance and strengths of the parameter estimates in the model, the variance accounted for in both observed and unobserved variables and the extent to which the overall model fits the observed data as indicated by a variety of fit indices, it can be deducted that the model is parsimonious.

Table 4. Transformational leadership factor structure

Original Item	Item Label	Deleted Items
Idealized Influence		
I make others feel good to be around me	LEA1	
Others have complete faith in me	LEA2	
Others are proud to be associated with me	LEA3	
Inspirational Motivation		
I express with a few simple words what we could and should do	LEA4	
I provide appealing images about what we can do	LEA5	
I help others find meaning in their work	LEA6	Deleted
Intellectual Stimulation		
I enable others to think about old problems in new ways	LEA7	Deleted
I provide others with new ways of looking at puzzling things	LEA8	Deleted
I get others to rethink ideas that they had never questioned before	LEA9	
Individualized Consideration		
I help others develop themselves	LEA10	Deleted
I let others know how I think they are doing	LEA11	Deleted
I give personal attention to others who seem rejected	LEA12	

Assessing the path of the structural model in Figure 2, the hypothesis of the study was sufficiently supported based on the conventional significance level of .05. The finding suggests that transformational leadership directly and positively affects ICT adoption in construction organizations. This is indicated by a positive and strong beta value of .79 and C.R (t-value) of 10.39. Furthermore, the result shows that the model has accounted for a large proportion of the variance in the observed and unobserved variables.

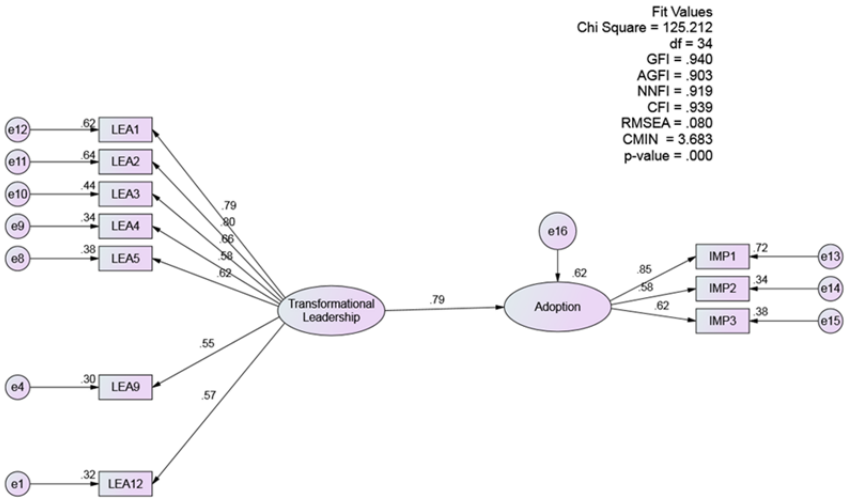

Figure 2. Final structural model of transformational leadership on ICT adoption

4. Results and Discussion

The two major objectives of this study are, first, to establish the factor structure of transformational leadership and, second, to examine its influence on ICT adoption in construction organizations. Result from confirmatory factor analysis confirmed transformational leadership as a seven-item construct. Furthermore, path coefficient from the structural model shows that transformational leadership behaviours are very essential in ICT implementation in construction organizations. This implies that for a successful ICT adoption, exhibition of transformational leadership style is critical. The finding is consistent with the previous findings of several researchers (García-Morales et al., 2008; Gumusluoglu & Ilsev, 2009; Jung et al., 2003; 2008) who found that transformational leadership behaviours effects organizational innovation and performance. An innovative organization easily adapt to technological change for improvement in both processes and products. Research findings have indicated short comings with leadership competencies of construction managers in Nigerian construction organizations. These problems include inadequate staff training, motivation and support (Oyediran & Odusami, 2005; Oladapo, 2006; Apulu & Latham, 2009) and illiteracy among employees Apulu and Latham, (2011). Practicing transformational leadership behaviours by the organizational managers can solve those problems and pave the way for a cordial relationship between top managers and subordinates. Managers can then capitalize on these harmonious relationships to build trust, introduce change and technological innovation for speedy and efficient processes of building their organization.

4.1 Implications of the Study

The study has both theoretical and practical implications. Theoretically, this is the first study to establish the factor structure of transformational leadership in construction organization from developing country perspective. The factor structure and the research findings serve as a starting point for researchers within the study's context to further explore similar problems in other industries. Practically, the study shows that transformational leadership behaviours are significant in technological adoption. Organizational managers can thus embed those behaviours by specifically establishing individual connections with employees, training for consistent innovation, clarifying how the organization will change over time, creating trust and confidence in employees. Those and similar behaviours are prerequisite to successful ICT adoption in organizations. To successfully compete in global arena, managers must exhibit innovative and change-adaptive behaviours.

4.2 Limitations of the Study

This study is not immune to certain limitations. Firstly, the study considered only transformational leadership style in predicting ICT applications adoption in construction organizations. In developing countries, other factors within and outside the firm's environment can also be significant such as employees' resistance to change, firm readiness and firm's external environment (e.g. government support, availability of social amenities in form of adequate supply of electricity etc). Though a substantial sample size (N >300) was used, caution must be exercised in generalization since only northern Nigeria was considered.

4.3 Areas for Further Research

Future studies should consider simultaneous assessment of transformational leadership construct with other constructs such as effects of external environment, employees' resistance in ICT implementation and the general firm and national readiness. Furthermore, data should be collected from all the six geo-political zones of the country (rather than three as in this study) to guarantee generalization of findings.

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