



# A comparative study of I.T. benefits in construction industry in Malaysia and Nigeria

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## ARTICLE INFO

### Article history:

Received: 3 August 2012;

Received in revised form:

9 November 2012;

Accepted: 9 November 2012;

### Keywords

Construction,  
IT Benefits,  
Malaysia,  
Nigeria.

## ABSTRACT

The study compared the IT benefits in Malaysia with Nigeria construction industry using data obtained from internet for information on Malaysia while it relied on primary survey to elicit information on Nigeria. SPSS 17.0 statistical package was used for the analysis to arrive at the result. The Descriptive Statistics (DS) showed a summary of the results from likert scales while Factor analysis showed the reduction of factors by combining the data. Tables were placed in sequence for both countries for easy comparison and quick deduction. The study showed awareness of IT benefits in the two countries with Malaysia a bit ahead of Nigeria. However, Investment in both countries is low; Component Principal Analysis in Malaysia revealed three components i.e. improving profitability, Improving Management and Increasing Flexibility. In Nigeria it is four with Increasing Market share. Literature also revealed that local construction industry in Malaysia was impeded by insufficient bandwidth, lack of training and unavailability of expert users. Whereas, this study showed 14 items as responsible factors affecting IT Facilities procurement in Nigeria with cost and erratic power supply on the lead with 4.851 and 3.914 mean scores respectively.

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## Introduction

Construction processes which span from land acquisition to documentation, design, construction and disposal or occupation are lengthy, disjointed and cumbersome (Nubi, 2007). Most often this results in delay in completion of work and eventually higher construction costs. In most cases this happens because of the way and manner the entire processes are managed. With Information Technology it is envisaged that the processes can be shortened. According to Sommerville and Craig (2006) in Hassan & Hassan (2011) the nature of construction companies is information based with the majority jobs related to projects.

The importance of Information and communication Technology cannot be underestimated in the present world of automaton where no activity can be performed successfully without it. With IT businesses are no longer as usual. Farag et al (2009) noted that IT is essential to businesses today including the construction industry. Due to the importance of the construction industry to a nation's economy it can no longer be treated with levity. Construction industry contributes to sustainable economic growth and development of a nation (Olalokun, 1987, ogunsemi, 2004) cited in Musa et. al (2010)

According to (Technology strategy board 2008-2011) ICT is said to be the backbone of digital economy while creating wealth in firms. Participants in construction industry are managers who engage in activities such as planning, forecasting, monitoring, influencing, co-ordinating, etc. While performing their day to day activities there is need for accurate, sufficient, timely and relevant information on the past, present and anticipated future activities. These tasks become easier with ICT. ICT impacts on professional practice by making jobs easier

for the professions, facilitating decision making and saving operating costs (Oladapo, 2006). The use of computer based processes such as computer aided design (CAD) spreadsheets, word processing and accounting has become normal practice within the construction industry. Cost, efficiency and time considerations have driven the change (Rowlinson & Croker, 2006).

The benefits associated with the use of information technology (IT) in an organizational environment are well established (Mitra, 2005; Bharadwaj, 2000). *IT enables organizations to manage organizational knowledge, to improve decision making, and to increase the effectiveness and efficiency of many crucial organizational processes* (Garud & Kumaraswamy, 2005; Barua, Konana, Whinstone, & Yin, 2004; Todd & Benbasat, 2000) as reiterated in Thouin (2007). It is in view of this that it is necessary to examine the level of these benefits in Nigeria and Malaysia.

ICT tools in the European construction industry (InPro internal report D2, 2007), revealed a lack of use of ICT tools in construction projects, especially in the early stages, despite several good alternatives available as expressed in Dehlin & Olofson (2008).

This study is imperative due to the importance of the construction to the Nigerian economy and the relevance of the ICT to the sector. The Nigeria construction industry is beset with myriad of problems instigating studies by many scholars. However, these studies mostly address materials used, workmanship, supervision and design with little or no mention given to IT benefits.

The aim of this study is to compare IT benefits in the Nigerian construction Industry with her Malaysian counterpart with a view to identifying IT benefits in both countries and draw lessons from the comparisons of the two countries for more efficient construction industry now and in the nearest future

### Case Studies

The case studies are Malaysia and Nigeria. Malaysia covers a total land area of 329,847 Sq. Km. comprising of 13 states and 3 federal territories. It is bordered on land by Thailand, Indonesia and Bruner while sharing maritime borders with Singapore, Vietnam and the Philippines. Its capital city is Kuala Lumpur.

As at 2010 its population exceeded 27.5 Million. Malaysia was restructured in 1948 and later became independent in August 31, 1957 but later united with Sabah, Sarawak and Singapore on 16<sup>th</sup> September, 1963. Malaysia since independence had the best economic record in Asia.

The country's infrastructure is one of the most developed in Asia. It has 118 Airports which consist seven International Airports. Malaysia road network covers 98,721 Sq. Km. Energy production is based on oil and natural gas. (Wikipedia, 2012)

The Federal Republic of Nigeria lies between latitudes 4<sup>0</sup> & 14<sup>0</sup> N and longitudes 2<sup>0</sup> and 15<sup>0</sup> East. It comprises of 36 states with its Federal Capital Territory at Abuja. Nigeria is bounded by the Republic of Benin in the West, Chad and Cameroun in the East, Niger, in its North and along the South Coast by Gulf of Guinea and the Atlantic Ocean. It has three major languages i.e. Yoruba, Igbo and Hausa. It has 3 major religions i.e. Christianity, Islam and the traditional religion. Nigeria is the most populous country in Africa and 7<sup>th</sup> most populous country in the World. She is a member of the Commonwealth of Nations. It occupies an area of 923,768km<sup>2</sup> and an estimated population of 167 Million. The country's per capital Income is 2589 Dollars.

Nigeria is also a member of the Organisation of Petroleum Exporting Country (OPEC) while it is ranked the world 37<sup>th</sup> in term of Gross Domestic Product (GDP). It is 12<sup>th</sup> largest producer of petroleum and has one of the fastest growing communications markets in the World (Wikipedia, 2012)

### Literature Review

ICT have been recognized as an emerging technology because of its robustness and has the capacity to deal with a multitude of communication problems between contractors and its subcontractors (Maqsood, Walker, & Finegan, 2003 ). This has an edge over conventional method of disseminating information. The later wastes time because information takes days to reach its destination. This is costly because it delays the delivery time of the project and sometimes may have financial implication in construction.

ICT has in the recent years provided a platform for easy and quick survey and retrieval of information. Zarli, Rezgui and Kazi, 2002 In Karzi, Zali & Rezgur (2003) summarised the areas where studies have been embarked in UK in construction industries. Their studies have shown that the UK construction industry is already taking full advantage of technology although they discovered the need for improved trust and social cohesion between stakeholders in the built environment and attitudinal problems and perceptions of the industry towards ICT. Also their study identified the need for improved reliability and security of data and information exchange. Talja (2005) emphasised the essence of computer literacy. Soh and Markus (1995) and Kholi and Sherer 2002 as cited in Sorrentino( 2004)

discussed efficiency and organisational performance and their relationship with ICT. However, as revealed by literatures many studies have been done on IT although each of them addressed specific areas such as e tendering, (Akintola & Oyediran, 2011). There is still low ICT uptake and ICT based developments in Europe (E Business Watch 2005) reported in Malaysia Business Times via Thomson Dialog News Edge (2007). The study observed that basic internet was established in the construction industry whereas ICT infrastructure is poorly developed particularly for SMEs in the construction industry. If UK has been benefitting in ICT there is no reason why Nigeria and Malaysia who are former colonies of Britain cannot tow the same line of their master.

Soh and Markus 1995 as contained in Sorrentino (2004 ) while explaining the relationship between organisation and performance and IT is of the opinion that the demand for hardware, software and IT services is a feature of every organisation and maintains that only a part of the investment is transformed into assets. They argued that only appropriate use of IT assets produce positive organisational impacts

ICT has been accepted to international communities and has also begun to gain ground in developing countries.

It does so by:

- Promoting the use and efficient deployment of ICTs to contribute to a highly competitive European Construction networked economy.
- Reinforcing collaboration with Standardisation bodies (a CEN/ISSS rolling workshop on e-Construction has already been instantiated) to ensure coherence in European technology deployment and in creation of a new open framework for fair competition and fast innovation (Zarli, et al., 2002). Mangini & Pelli (2003) summarised the benefits of Automatic Engineering Service Provider which includes
  1. An information level where the user provides to the system the information about the service he needs as well as the data available to him.
  2. An "on-line" service level where the user starts a free of charge interaction with the system obtaining some preliminary results that he can use as precious feed-back in order to decide whether he actually needs the "off line" specialized service.
  3. An "offline" service level where the consulting service is carried out at the central Design Office following a negotiation conducted between the client and the consulting company by means of a negotiation tool which is part of AESP.

According to Andresen et al., (2000) , Suwardy et al., (2003) , Love et al., (2004) and Eadie et al.(2010), cited in Hassan & Abu (2011) construction companies have enjoyed benefits such as improved management, competitive advantage, improved business success criteria, improved information quality, improved organization growth, improved work relationships and reduced work time. However, these are not so with some small construction companies which are yet to realise some of the benefits.

Other studies such as Brewer, Gajendran & Chen, nd, Oladapo, 2006; Oyediran and Akintol, 2011 identified the following barriers.

- Legal ramifications of electronic communications
- Misunderstanding of security capabilities
- Ownership of intellectual property
- Capturing/ management of the knowledge generated during the project
- Matters related to trust and the organisation

- Copy rights issues
- Technological capabilities of organisations and the
- Organisation area of concentration within the supply chain.

#### Research Method

The study compares Malaysia with Nigeria because of the similarities between the two countries that were former colonies of Britain and both now belong to the Commonwealth of Nations. The two countries are regarded as developing nations and had their independence about the same time. Malaysia's independence was in 1957 and Nigeria in 1960.

This study relied on a previous work by Abdul Kareem and Abu Bakar (2011) for Malaysia from where information was distilled for the comparison. It talked about Grade 7 (G7) construction companies. According to the paper G7 company is a company of at least two persons.

For Nigeria, a self administered questionnaire survey that contains common and related set of questions with some additional questions adapted to the Nigerian environment. The questionnaire adapted from several works such as Oyediran & Akintola (2011) and Oladapo (2006).

The choice of Lagos is based on the fact that it accounts for 60% of professional clients that patronise construction industry in Nigeria (Ajanlekoko, 2001) as contained in Wahab & Lawal (2011). The questionnaires were divided into four sections. Section A Background information of the respondents firms/ individuals. Section B, IT Benefits and Section C is on Level of IT Facilities and Section D is on Factors affecting IT Facilities procurement. The questionnaire is attached as appendix.

The research used the SPSS software 17.0 to analyse the questionnaire using a combination of descriptive statistics (DS), Factor analysis and a One Way Analysis of Variance The Descriptive analysis is used to show the mean values for results from likert scales while Factor analysis showed the reduction of factors by combining the data.

The ANOVA tests compared the mean values of the combined factors of IT benefits with reference to the demographic data of both the respondents and companies. The final result is then compared with the Malaysian experience to make our deduction.

#### Results and Discussions

From Table 1a Amount of Investment in IT in Malaysia showed Respondents investing 7(7%) of their total investment falling within RM < 2500, while 47 (46%) companies were those who invested RM 2500-12,500.

There is thus a clear indication of low investment in IT. The position in Nigeria in Table 2b seems similar because the percentage of IT Investment in Nigeria shows the highest investors falling within N132, 000.00-N675, 500.00 i.e. 17(35%). The situation therefore is same as in Malaysia.

**Table 1a Malaysia**

Variable	Frequency	Percentage
RM < 2,500	7	6.8
RM 2,500 – 12,500	47	45.6
RM 15,000- 25,000	14	13.6
RM 27,500 -50,000	10	9.7
>RM 50,000	13	12.6
Undefined	12	11.7

**Source: Abu Kareem & Abu Bakar, 2011**

Table 2 shows the Mean Value of IT benefits in Nigeria and Malaysia respectively. Where Improving Information quality takes the highest mean score of 4.3404 in Nigeria, improving business criteria ranks 1<sup>st</sup> in Malaysia with a score of 4.09, Reducing work time is next in ranking in Nigeria while Improving Management assumes the second position in

Malaysia. Where increasing work flexibility takes the 8<sup>th</sup> position in Nigeria. There is a slight difference in Malaysia where increasing responding rate and increasing market share are both in the 8<sup>th</sup> position. At the 12<sup>th</sup> position is Increasing Market share in Nigeria. However, cost reduction occupies the last ranking at the 11<sup>th</sup> position.

**Table 1b Nigeria**

Description	Frequency	Percentage
Amount of Investment		
Below N132,000 = RM < 2,500	5	10.4
N132,000-N657,5000 = RM 2,500-12,500	17	35.4
N658,000-N1,315,000= RM 15,000-25,000	7	14.6
N1,316,000-N2,630,000 = RM 27,500-50,000	4	8.3
Above N2,630,000 = > RM 50,000	3	6.3
Undefined	12	25.0
Total	48	100

**Source: Authors' Field Survey, 2012**

In Table 3a &3b, Table 4a &4b; and Table 5a the significance level was set at  $p < 0.05$  with ANOVA Tests conducted for a series of ANOVA tests to investigate the hypothesis there were no significant differences between the mean values of the scores for improving management, increasing flexibility and increasing profitability with regard to respondents' background.

Based on Pallant (2001) in Abdul Kareem and Abu Bakar (2011) "the variances are homogeneous if the significant values of Levene's test are greater than 0.05.

In Malaysia the result showed the respective tests revealed no significant differences. The same variables revealed no significant differences in Nigeria except for respondent education where the Variance Test for IT on improving management and increasing profitability with respect to respondent education showed a result of  $p = 0.018$  respectively meaning it is significant.

For overall IT Benefits in Table 5b, a significant difference was found for construction year of experience and IT investment. People with higher level of experience attributed high regards to overall IT benefits. With increase in IT investment, the Overall level of IT benefit increases. For other background information, no significant difference is found for overall IT benefits.

As revealed by Yussuf and Osman(2008) cited in Abdul Kareem et al (2011) local construction industry in Malaysia was impeded by insufficient bandwidth, lack of training and unavailability of expert users. Table 12 reveals the position in Nigeria. 14 out of the 15 items showed the respondents' mean scores of above average as responsible factors affecting IT Facilities procurement.

The issue of cost and erratic power supply are on the lead with 4.851 and 3.9149 respectively while fear of ICT making the professional redundant is at the least position with a mean of 2.5745. Inadequate ICT legislation was unanimously seen as not a responsible factor affecting IT facilities procurement.

#### Discussion

The results of both countries revealed that construction companies in Malaysia and Nigeria respectively have enjoyed IT benefits in their operations although it is not all the benefits that have been realised. This has been summarised into four by Abdul Kareem et al (2011) in their conceptual framework. It includes IT Project selection, IT Project Planning, IT Implementation and IT Evaluation.

**Table 2 Mean Value of IT Benefits for Responded Companies (Malaysia & Nigeria)**

Description	Mean Nigeria	Ranking Nigeria	Description	Mean Malaysia	Ranking Malaysia
Improving information quality	4.3404	1 <sup>st</sup>	Improving business criteria	4.09	1 <sup>st</sup>
Reducing work time	4.2708	2 <sup>nd</sup>	Improving Mgt.	4.08	2 <sup>nd</sup>
Improving management	4.2500	3 <sup>rd</sup>	Competitive advantage	3.97	3 <sup>rd</sup>
Client satisfaction	4.2292	4 <sup>th</sup>	Improving Information Technology	3.94	4 <sup>th</sup>
Improving business success criteria	4.2128	5 <sup>th</sup>	Improving Growth	3.88	5 <sup>th</sup>
Improving organizational growth	4.1957	6 <sup>th</sup>	Improving Work Relationship	3.64	6 <sup>th</sup>
Increasing response rate	4.1702	7 <sup>th</sup>	Increasing Work Flexibility	3.49	7 <sup>th</sup>
Increasing work flexibility	4.1304	8 <sup>th</sup>	Increasing Responding rate	3.42	8 <sup>th</sup>
Improving work relation	4.0652	9 <sup>th</sup>	Increasing Mkt. Share	3.42	8 <sup>th</sup>
Cost reduction	4.0208	10 <sup>th</sup>	Reducing Work time	3.15	9 <sup>th</sup>
Competitive advantage	3.9149	11 <sup>th</sup>	Client Satisfaction	3.13	10 <sup>th</sup>
Increase market share	3.6905	12 <sup>th</sup>	Cost Reduction	2.96	11 <sup>th</sup>

Source : Abu Kareem &amp; Abu Bakar, 2011 &amp; Authors' Field Survey, 2012

**Table 3a Results of ANOVA Tests for Benefit of Improving Management with Regard to Demography (Malaysia)**

Demography		N	Mean	Std. Deviation	Results of ANOVA
Respondent Position	IT User	27	30.37	6.17	F(53.11, 35.06)=1.51 P=0.22
	Engineer	16	33.62	3.98	
	Managing Director	31	29.94	6.96	
	Project Manager	29	30.45	5.32	
	Total	103	30.77	5.97	
Respondent Education	Diploma	29	29.10	8.23	F(57.57, 35.15)=1.64 P=0.20
	Bachelor	55	31.55	4.91	
	Postgraduate	19	31.05	4.20	
	Total	103	30.77	5.97	
Respondent Experience	< 5	20	29.10	3.43	F(48.83, 35.33)=1.38 P=0.26
	5-10	31	31.55	6.22	
	>10	52	31.05	6.49	
	Total	103	30.77	5.97	
Company Category	Mechanical and Electrical	9	27.67	9.58	F(37.25, 35.52)=1.05 P=0.39
	Building	25	31.00	3.81	
	Civil Engineering	17	31.71	6.48	
	Building & Civil Engineering	42	30.43	6.05	
	Building, Civil Engineering and Mechanical and Electrical	10	32.80	5.03	
Company Region	Central	103	30.77	5.97	F(20.35,36.21)=0.56 P=0.69
	Northern	45	30.09	7.52	
	East Coast	25	32.12	5.09	
	Southern	11	29.73	3.90	
	Bornco	11	31.18	2.60	
	Total	11	31.09	4.70	
		103	30.77	5.97	

Source: Abu Kareem &amp; Abu Bakar, 2011

**Table 3b Variance test for IT Benefit, Improving Management with Regard to Background Information (Nigeria)**

Background Information		N	Mean	Std. Deviation	Results of ANOVA
Respondent position	Engineer	10	4.13	0.549	F(3, 40) = 0.706; p = 0.554
	Managing director	10	3.87	0.422	
	Project manager	13	4.13	0.617	
	Any other	11	4.18	0.545	
	Total	44	4.08	0.539	
Respondent Education	Bachelor	27	4.21	0.563	t(45) = 2.457, p = 0.018
	Postgraduate	20	3.83	0.452	
Respondent Experience	< 5 years	12	3.81	0.577	F(2, 43) = 2.542; p = 0.090
	5-10 years	20	4.03	0.561	
	> 10 years	15	4.27	0.440	
	Total	47	4.05	0.547	
Company Category	Mechanical & Electrical	2	4.00	0.000	F(3, 41) = 2.299; p = 0.092
	Building	9	4.04	0.539	
	Building & Civil Engineering	26	3.94	0.581	
	Building, Civil, Mechanical & Electrical	8	4.50	0.356	
	Total	45	4.06	0.556	
IT Investment	Below N132,000	5	3.80	0.606	F(4, 30) = 0.775; p = 0.550
	N132,000-N657,500	17	3.92	0.547	
	N658,000-N1,315,000	7	4.14	0.573	
	N1,316,000-N2,630,000	3	4.33	0.333	
	Above N2,630,000	3	4.22	0.509	
	Total	35	4.01	0.539	

Source: Authors' Field Survey, 2012

**Table 4a Results of ANOVA Tests for Benefit of Increasing Profit with Regard to Demography (Malaysia)**

Demography		N	Mean	Std. Deviation	Results of ANOVA
Respondent Position	IT User	27	6.81	1.94	F(1.02, 4.10)=0.25 P=0.86
	Engineer	16	7.25	1.73	
	Managing Director	31	6.74	2.11	
	Project Manager	29	6.97	2.15	
	Total	103	6.90	2.00	
Respondent Education	Diploma	29	6.55	2.43	F(2.99, 4.03)=0.74 P=0.48
	Bachelor	55	7.11	1.81	
	Post graduated	19	6.84	1.83	
	Total	103	6.90	2.00	
Respondent Experience	< 5	20	7.10	1.89	F(1.26,4.07)=0.31 P=0.73
	5-10	31	7.03	2.06	
	>10	52	6.75	2.04	
	Total	103	6.90	2.00	
Company Category	Mechanical and Electrical	9	6.89	1.83	F(5.83,3.94)=1.48 P=0.21
	Building				
	Civil Engineering	25	6.20	1.89	
	Building & Civil Engineering	17	7.06	2.28	
	Building, Civil Engineering and Mechanical and Electrical	42	7.02	2.05	
	Total	10	7.90	1.37	
Company Region	Central				F(4.20, 4.00)=1.05 P=0.39
	Northern	103	6.90	2.00	
	East Coast				
	Southern	45	6.62	2.28	
	Bornco	25	7.20	1.76	
	Total	11	7.09	1.81	
		11	7.73	1.68	
		11	6.36	1.80	
		103	6.90	2.00	

Source: Abu Kareem &amp; Abu Bakar, 2011

**Table 4b** Variance test for IT Benefit, Improving Profitability with Regard to Background Information (Nigeria)

Background Information		N	Mean	Std. Deviation	Results of ANOVA
Respondent Position	Engineer	10	4.22	0.520	F(3, 39) = 0.103; p = 0.958
	Managing director	10	4.32	0.413	
	Project manager	13	4.25	0.612	
	Any other	10	4.20	0.471	
	Total	43	4.25	0.501	
Respondent Education	Bachelor	26	4.27	0.452	t(44) = 0.95; p = 0.431
	Post graduate	20	4.15	0.565	
Respondent Experience	<5 years	11	3.85	0.594	F(2, 43) = 4.393; p = 0.018
	5-10 years	20	4.31	0.456	
	>10 years	15	4.36	0.372	
	Total	46	4.22	0.502	
Company Category	Mechanical & Electrical	2	4.10	0.141	F(3, 40) = 1.194; p = 0.324
	Building	9	4.36	0.517	
	Building & Civil Engineering	25	4.14	0.519	
	Building, Civil, Mechanical & Electrical	8	4.48	0.399	
	Total	44	4.24	0.497	
IT Investment	Below N132,000	5	3.72	0.729	F(4, 29) = 2.365; p = 0.076
	N132,000-N657,500	16	4.34	0.299	
	N658,000-N1,315,000	7	4.37	0.509	
	N1,316,000-N2,630,000	3	4.13	0.115	
	Above N2,630,000	3	4.47	0.503	
	Total	34	4.25	0.472	

Source: Authors' Field Survey, 2012

**Table 5a** Results of ANOVA Tests for Overall IT Benefits with Regard to Demography (Malaysia)

Demography		N	Mean	Std. Deviation	Results of ANOVA
Respondent Position	IT User	27	43.04	7.37	F(97.89, 55.02) = 1.78 P= 0.16
	Engineer	16	47.50	5.14	
	Managing Director	31	42.42	9.59	
	Project Manager	29	43.79	5.61	
	Total	103	43.76	7.50	
Respondent Education	Diploma	29	41.21	10.74	F(136.70, 54.68) = 2.50 P= 0.09
	Bachelor	55	44.98	5.34	
	Post graduated	19	44.11	6.24	
	Total	103	43.76	7.50	
Respondent Experience	< 5	20	45.65	5.15	F(45.60, 56.50) = 0.81 P= 0.45
	5-10	31	43.52	6.93	
	>10	52	43.17	8.52	
	Total	103	43.76	7.50	
Company Category	Mechanical and Electrical	9	40.33	10.01	F(49.92, 56.54) = 0.88 P= 0.48
	Building	25	44.00	4.36	
	Civil Engineering	17	44.71	6.99	
	Building & Civil Engineering	42	43.33	8.80	
	Building, Civil Engineering and Mechanical and Electrical	10	46.40	6.00	
	Total	103	43.76	7.50	
Company Region	Central	45	42.69	9.49	F(51.59, 56.48) = 0.91 P= 0.46
	Northern	25	45.80	5.60	
	East Coast	11	42.45	2.73	
	Southern	11	45.36	3.88	
	Bornco	11	43.18	7.72	
	Total	103	43.76	7.50	

Source: Abu Kareem &amp; Abu Bakar, 2011



**Table 5b: Variance test for Overall IT Benefit with Regard to Background Information (Nigeria)**

Background Information		N	Mean	Std. Deviation	Results of ANOVA
Respondent position	Engineer	8	16.44	1.831	F(3, 35) = 0.188; p = 0.904
	Managing director	10	16.29	1.627	
	Project manager	12	16.66	1.649	
	Any other	9	16.81	1.486	
	Total	39	16.55	1.593	
Respondent Education	Bachelor	22	16.55	1.732	t(39) = 0.652, p = 0.518
	Post graduate	19	16.18	1.810	
Respondent Experience	< 5 years	11	15.32	1.511	F(2, 38) = 3.214; p = 0.051
	5-10 years	15	16.57	1.904	
	>10 years	15	16.96	1.509	
	Total	41	16.38	1.756	
Company Category	Mechanical & Electrical	2	16.10	0.141	F(3, 36) = 1.736; p = 0.177
	Building	8	16.66	1.880	
	Building & Civil Engineering	22	16.08	1.475	
	Building, Civil, Mechanical & Electrical	8	17.54	1.660	
	Total	40	16.49	1.623	
IT Investment	Below N132,000	5	15.42	1.161	F(4, 24) = 3.655; p = 0.018
	N132,000-N657,500	15	16.18	1.322	
	N658,000-N1,315,000	5	17.42	1.193	
	N1,316,000-N2,630,000	3	17.13	0.996	
	Above N2,630,000	1	19.67	-	
	Total	29	16.48	1.469	

Source: Authors' Field Survey, 2012

**Table 6 Factors Affecting IT Facilities Procurement (Nigeria)**

	N	Std	Mean
concerns over cost of ICT procurement	47	1.03902	4.0851
erratic power supply	47	1.31595	3.9149
high cost of ICT maintenance	46	1.25898	3.7174
level of ICT literacy knowledge of staff	46	1.16718	3.5652
uncertainty over business benefits	46	1.34560	3.4783
concern over ICT security	46	1.14904	3.4565
high cost of engaging competent staff	47	1.09831	3.4255
job size/fees	46	1.25744	3.4130
lack of internal IT experts	47	1.14733	3.3404
concern over attitudes of staff	47	1.09747	3.2766
fear of virus attacks	46	1.31012	3.1957
low return on ICT investment	46	1.38731	3.1739
scarcity of professional software expert	47	1.31032	3.0213
fear of ICT making professional redundant	47	1.29790	2.5745
Inadequate ICT legislations	47	1.26066	2.3830

Source: Authors' Field Survey, 2012

The cluster of the benefits in Malaysia include Client Satisfaction, Cost reduction, Improving Management, Competitive Advantages, Improving Business Success Criteria, Increasing Response Rate, Increasing Work flexibility, Increasing Market Share, Improving Information Quality, Improving Organisational Growth, Improving Work Relation and Reducing Working Time. In Nigeria, For Overall IT Benefits in Table 7b earlier shown above, a significant difference was found for construction year of experience and IT investment unlike in Malaysia where the result is contrary i.e. People with higher level of experience attributed high regards to overall IT benefits. Oladapo(2006) in a previous study revealed the benefits to include makes professional job easier, facilitates decision making, saves operating costs, improves public image of users, gives users competitive advantage, enhances productivity, saves time and improves document presentation. Thus, our study showed that all the benefits have not been realised. This agrees with an earlier study such as Oyediran & Akintola (2011) where it was reiterated that there is lack of basic hardware and software facilities, low proficiency by

professionals in the use of ICT , average knowledge about electronic tendering etc .

The study also exhumed the fact that there is deficiency in IT procurement in Nigeria. All the respondents affirmed this. There is lack of IT facilities i.e. they are grossly inadequate.

### Conclusion/Recommendation

IT benefits in G7 Construction companies in Malaysia is at a preliminary stage (Yusuf and Osman (2008) and Yoke et al. (2002) in Abdul Kareem et al, 2011). However, it is a bit ahead of its Nigerian counterpart. As revealed, office internet is used to simplify and speed up data while phones and emails serve as connection tools between projects and offices. Blackberry is a common device for communication. The Nigerian construction team should emulate their colleagues in Malaysia with the use of sophisticated hardware to enhance communication and also imbibe the use of internet. All companies should register their staff for the VPN facilities provided by telephone service providers. Every staff member should have Modem with Laptop. In Malaysia, IT benefits were classified into three main groups i.e. increased work flexibility using software facilities like Microsoft Office, AutoCAD and Primavera. The second

classification of IT benefits is increasing profitability; study showed the response of respondents as negative but rather sees IT as a tool for solving problem although it recognised that in the long run it will increase profit. The last group is that IT brings improved management process via cash flow, project flow and MS project software. The Nigerian situation confirmed the relevance of the three classifications but with an addition of Increased Market share.

In both countries investment in IT is still very low, efforts should be made to improve it. In particular, this is necessary for the Nigerian construction industry in order to increase its market share. As both share common colonial heritage, there is need for collaboration between them in construction to learn from each other.

The Malaysian study is not elaborate as per the factors affecting IT facilities procurement, but the literature revealed insufficient bandwidth, lack of training and the unavailability of expert users. Whereas, In Nigeria, our study identified 14 items with their means score ranging from 3.02 to 4.08. These include concern over costs of ICT procurement, erratic power supply, high cost of ICT maintenance, level of ICT literacy knowledge of staff, uncertainty over business benefit, concern over ICT security, high cost of engaging competent staff, job size fees, lack of internal experts, concern over attitude of staff, fear of virus attacks, low return on ICT Investment, security of professional software expert and fear of ICT making professional redundant. Realising the situation of electricity in Nigeria and its impact on business generally which has defied solutions the Nigerian construction industry can use alternative source of energy such as inverter, solar energy etc to keep their hardware working. There is no need to exercise any fear on ICT but rather manage the situation. The issue of ICT security is a global issue, thus they only need to exercise caution during usage. Some of the ICT services such as maintenance should be outsourced to reduce costs. There is also a need for the respective professional bodies like Council of Registered Engineers (COREN), Council of Registered Builders of Nigerian (CORBON) etc to continue to educate their members on the benefits of IT in today's construction industry.

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