

**TELECOMMUTING SYSTEM AND SERVICE DELIVERY OF OIL AND GAS COMPANIES IN LAGOS STATE
NIGERIA****IBINI, EMUEJE****DEPARTMENT OF BUSINESS ADMINISTRATION AND MARKETING, FACULTY OF MANAGEMENT
SCIENCES,****DELTA STATE UNIVERSITY, ASABA CAMPUS, NIGERIA****E-MAIL: ibinivoke@gmail.com, TEL: 08030737313****&****IZIMS, TOCHI****DEPARTMENT OF BUSINESS ADMINISTRATION AND MARKETING, FACULTY OF MANAGEMENT
SCIENCES,****DELTA STATE UNIVERSITY, ASABA CAMPUS, NIGERIA****E-MAIL: Izimstochi@gmail.com, TEL: 08068944788****Abstract**

The major objective of the study is to examine the effect of telecommuting system on service delivery of oil and gas companies in Lagos State, Nigeria. Cross sectional survey research design was used for the study. Out of the total population of 547 employees, 217 respondents were selected as the sample size for the study. The sampling method that was employed in this study was stratified random sampling. Data for the study was gathered from primary source. Structured questionnaire was employed to obtain relevant data from the respondents. The statistical techniques used include descriptive statistics and multiple regression analysis. The study found that information and communication technology (ICT) and flexible working arrangement (FWA) has significant positive relationship with service delivery, and job autonomy has no significant relationship with service delivery. The study concluded that telecommuting system has positive effect on service delivery. Flexible working arrangement has the highest positive effect on service delivery of oil and gas companies in Lagos State. Therefore, it was recommended that companies should ensure that they provide information and communication technology infrastructures that will aid service delivery. More alternative work arrangements like job sharing, part time etc can also be provided to telecommuters in order to enhance service delivery.

Keywords: Telecommuting system, Service Delivery, Information and Communication Technology, Flexible Working Arrangement, Job Autonomy

Introduction

Telecommuting has transformed the physical presence of workers at office to what they can deliver from home. Telecommunication technologies enable employees to render services outside the conventional workplace, for instance, from remote location, generally in a mobile setting or from home, etc (Anjum and Hadia, 2017). Brown (2010) opined that telecommuting is a relevant workplace innovation that enables a segment of the

organization work force to work from home or work at a place remote from the central workplace at least one-day a week. Some developed economies of the world have adopted telecommuting effectively because they are technologically strengthened. New information and communications technologies, such as tablet computers and smartphones, have transformed everyday work and life in the 21st Century

(Messenger, 2017). They create connection with office colleagues and supervisors; on the other hand, paid work may increasingly intrude into the time periods and physical spaces usually reserved for personal life. Crucial to this improvement is the detachment of work from company traditional office spaces. Internet connections often support 21st Century office work, and thus can be done from in essence anywhere and at any time (Messenger, 2017).

To fully understand the influence of ICTs on today's business operations, it is thus relevant to make a conceptual relationship between the early days of Telework/Telecommuting and such arrangements today. Technological advances are the drivers of change in this context, and they have enhanced the evolution of Telework in three distinct stages or "generations" (Messenger and Gschwind, 2016). First, fixed telephones and personal computers became an alternative for long commuting hours between home and the organization (home office); Secondly, mobile phones and laptop computers enabled wireless, office work "on the move" from locations other than home or the office, supported by a fast-growing dispersion of the Internet and the World Wide Web; this was the emergence of mobile working, (mobile office). The third is the online connections through radio links and the shrinking of transistors enabled the growth of New ICTs (e.g., tablet computers, smartphones). New ICTs supports the mobile, virtual connection of employees to the company from almost anywhere at any time; (virtual office) (Messenger and Gschwind, 2016).

Evaluating the advancements of technology and how they transform the evolution of telecommuting over these three

generations from the 1970s up to the present time sheds a new light on the term telecommuting/telework. Today's location-autonomy, technology-supported new ways of working, from the mobile full-time sales person to the occasional work-associated e-mail or phone call from home, are all part of the same transformation in the inter-relationship between paid work and personal life.

With rapid development of ICT, the possibility to have employees work from a different location than the central office is evident (Lila and Anjaneyulu, 2017). An argument that promotes the use of Telework is to remove distractions related to working at the regular office, for instance if a colleague drops by for a chat or other conversations from nearby workstations. However, this is argument is only viable if the new place of work (e.g. at home) has less factors of distraction (Van der Meulen, van Baalen and van Heck, 2012). Furthermore, Van der Meulen et al. (2012) posited that the productivity level of a teleworking employee increases slightly if the distraction levels are the same at the office as if the employee would Telework from home. More recent research argues, however, that monitoring employee behaviour is a challenge of managing teleworkers which promotes the use of output control (Bloom, Liang, Roberts and Ying, 2013). Teleworking is supported by technology and changes the way of traditional coordination and communication, with suitably executed information and communications technology, today's work can be carried out anytime and anywhere (Messenger and Gschwind, 2016; Lee, 2015).

Gradually, there is a paradigm shift from the usual way of work to telework, also known as telecommuting. The drastic development of the internet and telecommunications tools together with the

rising speed of information exchange have become a main influence on the fashion for business to enable alternative working environment where employees of companies distantly perform their tasks, away from their company environment, which is permissible by the company's regulations (Ye, 2012). Ye (2012) affirmed that companies are now being required to create more flexible ways for the new corporate office owing to the employees now being able to access data. Voice and other internet supported services in their homes have made telecommuting a relevant business operations.

Some telecommunications companies, such as Yahoo, Vattenfall, Ericsson, Siemens and Telia in an effort to reduce workspace, have established flexible offices (Boell, Cecez, Kecmanovic, and Campbell, 2014). This telecommuting occurrence is likely to grow higher in degrees given the high concern of employees with view to their personal security, and the rise in the cost of transportation on the employees' side and the need to lessen workspace on the employers' side (Ansong and Boateng, 2017).

Telecommuting provides organizations and workers with advantages such as employee job flexibility, workforce empowerment and increased productivity; yet the purpose are not readily forthcoming as to why companies in West Africa have not taken advantage of it (Ansong and Boateng, 2017). Telecommuting does not only influence the employee and the work group style, but it also has an effect on the company in general. One key change deals with the creation of functions of support within the company. These supports have the capacity of offering the needed help to the different personnel and other workgroups spread in the locality. The

activities of the support group will even have to go beyond the normal working hours to offer the desired support to the workers in the different time zones (Ansong and Boateng, 2017). The company must be able to provide the equipment and other supplies for the employees who telecommute (Bose and Luo, 2011).

Telecommuting creates some form of issues to the companies who do not have the required funds and resources to support the employee who wish to telecommute. However, investments in ICT and network infrastructure are needed to be made to support telecommuting (Ansong and Boateng, 2017). Another issue that companies face is the development of comprehensive training workshops to provide the employees the vital skills to employ and practice telecommuting. Managers and supervisors for example will have to be trained on ways to manage the employees effectively from their isolated locations when telecommuting (Ansong and Boateng, 2017). The organization is also faced with the challenge of data security during telecommuting. The security of data has been a topical issue for organizations in recent times.

Recent studies have found evidence of higher levels of happiness among telecommuters (Gimenez-Nadal, Ignacio and Jorge, 2018) and higher levels of satisfaction among spouses whose partners work from home (Dockery and Bawa, 2018). These studies indicate the relevance of telecommuting to better work-life balance. Bloom, Liang, Roberts and Zhichun (2015) posit that working from home enhances the performance of call center employees. Dutcher (2012) affirmed that a telecommuting environment has positive effects on productivity for creative tasks but has negative influence on productivity for

dull tasks. Even though telecommuting has been an increasing practice in developed countries over the past decades, businesses in Africa and more specifically West Africa are yet to adopt the practice. Although there have been limited studies on the effects of telecommuting and they are still insufficient for drawing policy implications. In this respect, this study intends to contribute to the literature on telecommuting system. Therefore, the study aims to examine the effect of telecommuting system on service delivery of oil and gas companies in Lagos State.

Statement of Problem

New employees present a major challenge to the trust and socialization important to telecommuting. This is because they have little opportunity to learn from older employees.

In order to achieve maximum benefits from Information Technology, there is the need to surmount certain barriers, related to the IT user. Such barriers standing before the successful use of information technologies are related to the point of view, the intention and the competency of the personnel using them, and their subsequent support by a manager. Professional isolation has affected employees' face to face interaction with colleagues and managers show concern about employees' career and skill development. Such interactions could be interpersonal networking, transfer of tacit knowledge, informal conversations and mentoring from colleagues and supervisors. Teleworking employee's careers could be affected negatively as they perceived themselves as being a "lesser candidate" with regards to promotional offers as a result of not being physically present at the workplace. With regards to social isolation,

working distantly can lead to lack of social interactions and feeling of belonging.

Telecommuting employees may also have difficulties participating in group norms and values. With the virtual work arrangements comes a change in communication patterns, whereby the loss of daily face-to-face interaction forces the organization to adapt. This adaptation affects both employers and employees. Even though a lot has been written about how managers must be flexible enough to adjust where the need arise, not much has been written about the satisfaction of telecommuters based on how the organization adapt to this change. If employees feel isolated from the workplace, they are most likely to be outside the informal network and organization's socialization process and telecommuting presents a challenge to maintaining a corporate culture because those who telecommute can no longer be exposed to the organization's beliefs and values. And also organizations may find it challenging to transmit their culture to telecommuters.

It is evident that the more distant employees are from the vision of the organization, the less they understand the organization's strategy and are less able to execute their jobs without close supervision.

Objective of the Study

The major objective of the study is to examine the effect of telecommuting system on service delivery. The specific objectives are to:

- i. Determine how information and communication technology affect service delivery.
- ii. Determine the effect of flexible working arrangement on service delivery.

- iii. Ascertain the influence of job autonomy on service delivery.

Review of Related Literature

Concept of Telecommuting System

Telecommuting is the process of commuting to work through communication links rather than through one's physical presence. Telecommuting is also known as teleworking', it means working either full- or part-time from home, from a 'telecentre' located close to home, or from other locations. Allen, Golden and Shockley (2015) posited that telecommuting is a work practice that involves employees of an company substituting a section of their usual work hours to perform their task away from a central workplace—usually mainly from home—using technology to interact with others as required to carry out work tasks. Henke, Benevent, Schulte, Rinehart, Crighton and Corcoran (2016) studied the influence of telecommuting intensity on employee health. In a longitudinal assessment from 2010 to 2011, various indicators of health risk status were used, including obesity, tobacco use and physical inactivity. Using a sample of over 2000 telecommuters and over 800 non-telecommuters from a database of employees with medical enrollment, Henke et al. (2016) found that non-telecommuters were at greater overall risk than telecommuters, but that it was moderate intensity telecommuters with lowest risk.

Welz and Wolf (2010) compiled data gathered from a survey answered by almost 30,000 employees regarding their working routines and the adoption of Telework within the EU and Norway in 2005. In the report it is shown that Telework has been adopted in almost all surveyed countries as a plausible working method. However, the data gathered from survey only considers

employees' working from home as teleworkers, which deviates from the definition of Telework where all work performed outside of the company premises, is defined as Telework. Furthermore, Welz and Wolf (2010) consider the deviation of gathered data compared to the definition as negligible as most teleworkers, according to national and sectoral statistics, do their work from home at the time.

Fonner and Roloff (2010) conducted a study involving 89 teleworking employees working at least three days a week away from the regular workplace and 103 office-based employees were examined. Findings indicated that employees overall job satisfaction increased when teleworking, based on reduced information exchange frequency, general politics, work life conflict and stress from interruptions. Furthermore, Partnership for Public Service and Deloitte (2011) identified significant positive results on job satisfaction as result of having the choice to telework. Moreover, having the option to telework increased the performance of the employees whether they chose to telework or not, in comparison to the employees in the study that did not have the option to telework (Deloitte, 2011).

Bloom, Liang, Roberts and Ying (2015) study, has focused basically on the effects of working from home, in which the worker may conceivably still be living within commuting distance of the office. In recent years, however, another form of remote work—work-from-anywhere has begun to emerge (Prithwiraj, Cirrus and Larson, 2019). Here, employees are no longer mandated to live in the same geographic area as the company and have greater flexibility to choose where to live. Anjum and Hadia (2017) explored the current usage, possible benefits and impact of telecommuting along

with the hindrances in development of this phenomenon in Pakistan. This study utilizes structured interview technique. By using judgmental sampling method, data was gathered from sample of 54 telecommuters from Lahore. It was fascinating to know that employees who practice telecommuting are unfamiliarity with the concept. The study showed that telecommuting is the valuable and latest business technique that provides comfortable working environment along with the financial benefits to the employers but due to lack of awareness, it is not being employed widely in the country.

By adopting this technology, workers may enjoy benefits, such as flexibility and avoid a work journey far from the office (Tuntas, Djabir, Mahlia and Nurdin, 2016). Hence, companies further will benefit from increased productivity and minimize the costs related with the office. Tuntas *et al* (2016) stated that the reasons why telecommuting become popular are as follows: (a) minimizing environmental pollution; (b) employees can minimize their frustration toward traffic congestion and lessen their expenses to go to the workplace; (c) lessen the costs of office; (d) the availability of a large range of alternatives and capabilities obtainable by electronic communications technology and the internet; and (e) curtailing traffic congestion.

Information and Communication Technology (ICT) and Service Delivery

Information technology (IT) has a strong influence on the way the organization operates. IT enabled organizational structure that will allow the creation of tasks and reporting relationships of new types of employment among people who are connected electronically and supports communication between superiors and subordinates (Herwiyanti, 2015). One type of

the relationship that enabled IT organizations that have important implication for organizational learning and knowledge management is the decision-making, sharing and integration of expertise within and between functions and divisions through real-time, i.e., interconnected IT (Herwiyanti, 2015). Technical ability exclusively explains the relevant essential source of competitive advantage and higher performance in a competitive market technologically (Tyler, 2001). Technology capabilities support the organization's ability to identify and apply novel external knowledge to expand the development of competencies, which can result in better performance (Herwiyanti, 2015).

ICT includes "hardware, software, networks, and media collection, storage, processing, transmission, and presentation of information (text, voice, data and images). Pradhan, Mallik and Bagchi (2018) opined that information and communication technology infrastructure connotes the digital telephone network, Internet servers, mobile phones, Internet capability and fixed broadband and other technologies. Speedy expansion of ICT is of critical relevance for economic growth for several reasons: the use of this technology supports the diverse user in economic and social life to have fast and easy access to information and knowledge (Sepehrdoust, 2018); ICT aids organizations to communicate more rapidly and better so they lessen production costs and enhance productivity (Meijers, 2014); ICT also give access to emerging markets, lower capital costs as a result of increasing the efficiency of the functioning of financial markets, reduces regional discrepancies in incomes and productivity, allows access to human capital through tele-networking (Pradhan, et al 2018); the use of ICT, in particular, Internet access, can promote the

sustainable development of entrepreneurship and small and micro businesses because it reduces the difficulty of financing them by mitigating information asymmetry and reducing agency cost (Chen, Gong, Chu and Cao, 2018).

Moreover, the so called new ICT, e.g. smartphones, tablets and the widespread of internet (ITU, 2017) believes to enable teleworking employees to stay connected with colleagues all the time (Messenger and Gschwind, 2016). It is believed that videoconferencing is a key enabler for Telework (Sánchez and Carro, 2017) and can be performed with software such as Skype and Zoom (Finney, 2013; Ryder and Moon, 2017). Moreover, software thought to enhance virtual teams' communication and information sharing is Slack, which allows real-time communication and file sharing through messaging (Ryder and Moon, 2017). Further technology that favors communication and information sharing are argued, by authors Jaramillo and Richardson (2016) to be:

For file sharing and storage: Google Drive, Dropbox, Evernote and Box,

For organization and collaboration: Basecamp, Asana, Trello and Teamwork Projects

For communication: GoToMeeting, Google Hangouts, Uber Conference and Join.me.

Lee (2015) further reasons that mastering ICT is a necessary condition for a successful teleworking program. But how is ICT connected to telework? Information and communications technology does pretty much what is given by its name; it provides technology to assist the flow of information and communication between employees, managers, supervisors and the organization as a whole. Thus:

H₁: There is a significant relationship between information and communication technology and service delivery.

Flexible Working Arrangement (FWA) and Service Delivery

There is high demand for remote work and other flexible work arrangements (Gallup, Inc., 2017) and the value that workers place on remote work arrangements is driven in large part by the costs of commuting, eldercare and childcare faced by a population increasing that is made of dual-career families (Council of Economic Advisers, 2010). Today, it is common in families that both parents are full-time workers (Romer, 2011). Further, their parents are becoming older with generations generally having longer lives, which make the generation currently at work feel an urge to take care of their older relatives as well. With more obligations put into the personal life, employees feel that it is harder to deal with the balance of work and family life responsibilities (Romer, 2011).

According to a report by EY (2015) after competitive pay and benefits, full-time employees ranked Flexibility the highest when it comes to what is most important at the workplace, especially amongst millennial employees. Flexibility refers to time, amount and location, where an employee has freedom over the working schedule, to what extent they chose to work and the chosen workplace. This means that the employee can work hours that are most personally suitable, and not necessarily during the regular work hours "nine to five". Furthermore, controlling the extent that the employee works (e.g. after childbirth or life events where full-time employments are disadvantageous) has also shown to be a demand from employees, where job sharing has allowed employees to work part-time in

order to cope with their life situation. Location flexibility means that the employee can work at locations that are most suitable, or at least more suitable than the regular office space (Romer, 2011).

Providing and managing flexibility within an organization has shown to reduce absence from work, lowering turnover, increased employee health and increase productivity. Furthermore, teleworking is recorded to be a working method that can cope with flexibility, allowing the employee to structure schedules accordingly, work at suitable locations and improve its time management and hence obtain a sustainable work-life balance (Romer, 2011).

In a study by Baxter (2011) parents who were allowed flexible schedules were studied to understand if allowing flexible working hours would result in parents spending more time with their children. The findings indicate that being able to utilize a flexible schedule does not directly mean that more time is spent with their children. However, the use of flexible working hours is determined to reduce the work time being transferred to private time, which leads to that the quality of parent-children time is increased (Baxter, 2011). Therefore:

H₂: There is a significant relationship between flexible working arrangement and service delivery.

Job Autonomy (JA) and Service Delivery

In a high-autonomous job, workers can decide what, how and when to carry out their assigned tasks. Prior study has indicated that high job autonomy could give workers time, energy and freedom to display certain behaviours, thereby enhancing their willingness and motivation to create and plan ahead (Humphrey, Nahrgang and Morgeson, 2007). Studies have indicated

that autonomy, relatedness and competence are key psychological needs ought to be fulfilled so as to create the sense of self-determining (Pavot and Diener, 2013). Among the three, autonomy plays a more fundamental role. Particularly, since job autonomy helps employees to assign their time and energy in work independently, gives them the liberty to select working methods and to choose the regularity of interactions with other member of staff, it could predict self-development from the following perspective (Qiwei, Qian and Shiyang, 2019).

First, when employees perceive that they have a higher level of autonomy and independence in deciding how to carry out their work, they may feel higher level of self-determination and perceive the job to be their own business (Qiwei, *et al* 2019). Accordingly, they would feel more internally motivated and be aroused of higher passion at work. They may behave more actively and discover more ideas valuable to their own and company's long-term development (Qiwei, *et al* 2019).

Second, when employees are given the high autonomy to conduct their tasks, it means that they will have more time and flexibility to decide the following steps and working procedures (Qiwei, *et al* 2019). It may trigger them to reflect on their past behaviors, adjust the procedures and set developmental goals to meet further requirements. Third, job autonomy allows employees to generate more ideas and thoughts to modify their work (Qiwei, *et al* 2019). This idea-generation and innovation process is also beneficial for employee's development in the long run. Finally, job autonomy also provides workers with more freedom and opportunities to exchange information with their colleagues (Qiwei, *et al* 2019). In this vein, workers would know

better about the external information and the results others have achieved, which motivates them to set up greater and developmental goals for themselves and keep track of the goal attainment process.

Thus:

H₃: Job autonomy has a significant relationship with service delivery.

Service Delivery

Service delivery in organizations all over the world has become so critical that organizations have resorted to employing skilled individuals in order for them to carry out this function successfully. The quality of service delivered in an organization has the capacity to give the organization competitive advantage over other competing firms. Employees' ability to deliver and differentiate good customer service will have impact on how customers will perceive a particular service. Service delivery is centered on the end user or customer service and effectiveness (Ewuim, Igbokwe-Ibeto and Nkomah, 2016). Effectiveness in customer service connotes doing the right things and measures elements like customer satisfaction, through speed, service quality, human interaction and timing (Ewuim, *et al* 2016). A service is effective when its outcome is suitable to the consumers. Quality of work is measured by exceeding or meeting the standard that is set by the company. Speed of work attainment is measured by the time length of work accomplished.

Theoretical Review

Media Richness Theory

Media Richness Theory, sometimes called information richness theory or MRT, is a term used to describe a communication channel's ability to replicate the information sent over it. It was introduced by Daft and Lengel in 1986 as an extension of

information processing theory. MRT is used to rank and weigh the richness of certain communication channel, such as phone calls, video conferencing, and email. For instance, a phone call cannot replicate visual social notions such as body signal which makes it a less rich communication media than video conferencing, which supports and sustains the transmission of gestures and body language. Based on Contingency Theory and information processing theory, MRT explains that richer, personal communication channels are widely more effective for the communication of ambiguous subjects than succinct and less rich channels.

Relying on information processing theory for its theoretical background, MRT was originally developed to describe and weigh communication channels within organizations. In presenting media richness theory, Daft and Lengel (1986) sought to assist organizations to cope with communication challenges, such as vague or confusing messages, or differing interpretations of messages. Media Richness Theory has been retroactively adjusted to include new media communication channels, such as better quality video and online teleconferencing. Although media richness theory have connection with media use than media option, investigative studies of the theory have frequently studied what channel a manager would prefer to communicate over, and not the effects of media adoption (Dennis, and Kinney, 1998).

Since inception, media richness theory has been functional outside of organizational and business communication contexts. Information richness is seen as the dependability of information to change understanding within certain time duration (*Daft and Lengel, 1986*). Media richness theory posited that all communication media differ in their ability to empower employees

to communicate and to switch information (Dennis and Valacich, 1999). The dimension of this ability is known as a medium's richness. MRT places all communication media on a permanent scale based on their dependability in effectively communicate a compounded message (Carlson and Zmud, 1999). Media that can sufficiently defeat different frames of reference and simplify vague or confusing subjects are deemed to be richer than communication channel that require more time to transmit understanding (Considered less rich).

The principal purpose of choosing a communication channel for a particular message is to reduce the ambiguity or possible misinterpretations of the message (Dennis and Valacich, 1999). If a message is confusing, it is inexplicit and thus more difficult for the receiver to decode. The vaguer a message, the more cues and data needed to properly interpret it. For instance, a simple message with the intention to schedule an appointment and place could be communicated via short email, but more detailed information about a person's work expectations and performance would be better communicated through face-to-face interaction.

The theory incorporates a structure with axes pointing from low to high equivocality and low to high uncertainty. Low equivocality and low uncertainty corresponds to a comprehensive and well-defined standpoint; high equivocality and high uncertainty indicates ambiguous occurrence that will require clarification by managers. Daft and Lengel (1986) also stressed that message clarity may be jeopardized when multiple departments are communicating with each other, as the various work units may be trained on different skill sets or have conflicting communication norms.

Research Methodology

A cross sectional survey research method was used for the study. It was adopted because data for the study was collected from the responded at a particular point in time. The population of this study is made up of 547 employees across the operational offices of Seplat Petroleum Development Company (SPDC) (135) and Exxon Mobil Nigeria (412) in Lagos (Source: Human Resource Department, 2020). The sample size for this study was determined by using Krejcie and Morgan (as cited in Kenpro, 2012) sample size determination table. To make up this subset, the approximate number was two hundred and seventeen (217). The sampling method that was employed in this study was stratified random sampling. **Stratified random sampling** is the process of dividing the population into homogeneous subgroups and then taking a simple random sample in each subgroup. The justification for adopting **stratified random sampling techniques was that** it helps the researcher to be able to represent not only the overall population, but also key subgroups of the population, especially small minority groups.

Data for the study was gathered from primary source. Structured questionnaire was employed to obtain relevant data from the respondents. The researcher used the likert five scale question type. Copies of validated questionnaire were delivered to the respondents by hand. The objective of the study and the need for reliable information from them were carefully explained. Copies of the questionnaire were given to the respondents for one week before it was retrieved for analysis.

Content validity was adopted for the study. To validate the instrument for data

collection, the questionnaire was given to a group of experts in management sciences to review the content. This aimed at establishing the content of the instrument. Consequently, adjustments and corrections were effected to ensure that it elicits the desired information. Test re-test reliability method was adopted for the study. The Cronbach alpha reliability estimation means was adopted to test the consistency of the questionnaire item.

The outcome of which is the result for different items of the same constructs within the measure. A reliability coefficient of 0.7 and above, are high and is acceptable while a reliability coefficient 0.6 and below shows poor reliability (Sekaran, 2003). The reliability coefficient of information and communication technology, flexible working arrangement and job autonomy are 0.723, 0.712 and 0.705. It can be observed that the

reliability coefficients are above the 0.7 benchmark, that is favourable reliable scores were obtained from all the items in general. The statistical techniques of data analysis that was used include descriptive statistics and multiple regression analysis. Multiple regression was found appropriate because it establishes a relationship between the independent and dependent variables. The hypotheses stated for this study was tested using regression analysis.

Results Of Data Analysis

Out of the 217 copies of questionnaire distributed to the selected companies a total of 205 were collected, out of which 4 resulted as not valid because due to their incompleteness, 201 copies of the questionnaire were used for data analysis representing 93% response rate.

Table 1: Regression Analysis of Telecommuting System and Service Delivery Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.569	.832		-.683	.495
	Information and communication technology	.500	.059	.426	8.436	.000
	Flexible working arrangement	.418	.056	.429	7.417	.000
	Job autonomy	.102	.057	.107	1.797	.074

a. Dependent Variable: Service delivery

The general form of the equation to predict SD= $\beta_0 + \beta_1\text{ICT} + \beta_2\text{FWA} + \beta_3\text{JA} + \epsilon$
 $\text{SD} = -.569 + (0.500 \times \text{ICT}) + (0.418 \times \text{FWA}) + (0.102 \times \text{JA})$

Table 1 indicated that the regression analysis result for telecommuting system and service delivery.

The table exhibited that information and communication technology which is the first variable has positive effect on service delivery ($\beta = 0.426$, $P < 0.01$). Similarly flexible working

arrangement which is the second variable has positive effect on service delivery ($\beta = 0.429$, $P < 0.01$). The result also showed that job autonomy which is the last variable has positive effect on service delivery ($\beta = .107$, $P < 0.01$).

Table 2: Fitness of the Model

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	180.059	3	60.020	189.763	.000 ^b
	Residual	62.309	197	.316		
	Total	242.368	200			

a. Dependent Variable: Service delivery

b. Predictors: (Constant), Information and communication technology , Job autonomy , Flexible working arrangement

The *F*-ratio in table 2 exhibited that telecommuting system statistically significantly predict service delivery, $F(3, 197) = 189.763$, $p < 0.05$ (This implies that the regression model is a good fit of the data).

Table 3: Variability of the Dependent Variable

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.862 ^a	.743	.739	.5624

a. Predictors: (Constant), Information and communication technology , Flexible working arrangement, Job autonomy

Table 3 indicated what percentage of variability in the service delivery is accounted for by telecommuting system. It showed that change in service delivery is brought about by the variables of telecommuting system by 74% (0.739) as exhibited by the Adjusted R^2 value. This implies that the information and communication technology, flexible working arrangement and job autonomy explain 74% of the variability of service delivery.

Discussion of Results

The study indicated on the gender composition that 115 of the respondents representing 57% of the sample were males while 86 being 43% were females. The age bracket of the respondents indicated that 52 respondents being 26% were below 30years of age, while the remaining 149 respondents representing 74% were above 31years of age. The marital composition of the respondents showed that; 87 respondents were single being 43%. While 114 other respondents being 57% were married. On the educational background of the sample,

the results showed that majority of the respondents were HND/BSc holders (115 respondents representing 57%).

Table 1 exhibited that information and communication technology has positive effect on service delivery ($\beta = 0.426, P < 0.01$). The p value calculated in table 1 was lesser than the critical level of significance ($0.000 < 0.05$), implying that there is a significant relationship between information and communication technology and service delivery.

In table 1, flexible working arrangement has the highest positive effect on service delivery ($\beta = 0.429, P < 0.01$). The p value calculated in table 1 was lesser than the critical level of significance ($0.000 < 0.05$), it implies that there is a significant relationship between flexible working arrangement and service delivery.

The result in table 1, also showed that job autonomy has the least positive effect on service delivery ($\beta = .107, P < 0.01$). The p value calculated in table 1 was greater than the critical level of significance ($.074 > 0.05$), implying that job autonomy has no significant relationship with service delivery.

Studies carried out by Henke et al. 2016; Deloitte, 2011; Messenger and Gschwind, 2016 had similar findings with the study analysis results. Henke et al. (2016) found that non-telecommuters were at greater overall risk than telecommuters, but that it was moderate intensity telecommuters with lowest risk. Moreover, Deloitte (2011) found that by having the option to telework increased the performance of the employees whether they chose to telework or not, in comparison to the employees in the study that did not have the option to telework. Messenger and Gschwind (2016) found that new ICTs support the mobile, virtual connection of employees to the company

from almost anywhere at any time; (virtual office).

Table 3 showed that information technology, flexible working arrangement and job autonomy as dimensions of telecommuting system explain 74% of the variability of service delivery.

In summary the test of the three hypotheses showed that information and communication technology, flexible working arrangement has significant relationship with service delivery except job autonomy.

Conclusion

The study concluded that telecommuting system has positive effect on service delivery. Flexible working arrangement has the highest positive effect on service delivery. The study found that information and communication technology, flexible working arrangement has significant positive relationship with service delivery, and job autonomy has no significant relationship with service delivery.

Recommendations

The study therefore recommended that:

- i. Companies should ensure that they provide information and communication technology infrastructures that will aid service delivery.
- ii. More alternative work arrangements like job sharing, part time etc can also be provided to telecommuters in order to enhance service delivery.
- iii. Experienced employees should be considered to telework, trustworthy and self motivated employees who are willing for telecommuting should also be given the opportunity.

References

- Allen, T. D., Golden, T. D., & Shockley, K. M. (2015). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological Science in the Public Interest*, 16(2): 40-68.
- Anjum, Z. & Hadia, B.(2017). Impact of telecommuting on the financial and social life of telecommuters in Pakistan. *Pakistan Economic and Social Review*, 55(1): 185-199.
- Ansong, E. & Boateng, R. (2017). Organizational adoption of telecommuting: Evidence from a developing country. John Wiley & Sons Ltd, 1-15.
- Baxter, J., (2011). Flexible work hours and other job factors in parental time with children. *Social Indicators Research*, 101(2): 239-242.
- Bloom, N. Liang, J. Roberts, J. & Zhichun, J. Y. (2015). Does working from home work? Evidence from a Chinese experiment," *Quarterly Journal of Economics*, 130(1): 165–218.
- Bloom, N., Liang, J., Roberts, J. & Ying, Z. J., (2013). *Does working from home work? Evidence from a Chinese experiment*, London: Centre for Economic Performance.
- Bloom, N., Liang, J., Roberts, J., & Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese Experiment. *The Quarterly Journal of Economics*, 130(1): 165–218.
- Boell, S., Cecez-Kecmanovic, & Campbell, J. (2014). Telework and the nature of work: An assessment of different aspects of work and the role of technology. Twenty Second European Conference on Information Systems, 1–15.
- Bose, R., & Luo, X. (2011). Integrative framework for assessing firms' potential to undertake Green IT initiatives via virtualization—A theoretical perspective. *Journal of Strategic Information Systems*, 20(1): 38–54.
- Carlson, J. R. & Zmud, R. W. (1999). Channel expansion theory and the experiential nature of media richness perceptions. *Academy of Management Journal* 42 (2): 153–170.
- Chen, Y.; Gong, X.; Chu, C.C. & Cao, Y. (2018). Access to the internet and access to finance: Theory and evidence. *Sustainability*, 10: 2534.
- Council of Economic Advisers. (2010). *Work-life balance and the economics of workplace flexibility*. Washington, D.C.: Executive Office of the President, Council of Economic Advisers.
- Daft, R.L.; Lengel, R.H. (1986). *Organizational information requirements, media richness and structural design*. *Management Science*. 32 (5): 554–571.
- Deloitte, A.U, (2011). *Next generation telework: A literature review*, s.l.: Department of Broadband, Communications and the Digital Economy.
- Dennis, A.R. & Kinney, S.T. (1998). Testing media richness theory in new media: The effects of cues, feedback, and task equivocality. *Information Systems Research*, 9 (3): 256–274.

- Dennis, Alan R.; & Valacich, Joseph S. (1999). *Rethinking media richness: Towards a theory of media synchronicity*. [CiteSeerX 10.1.1.108.7118](#).
- Dockery, A.M. & Sherry, B. (2018). When two worlds collude: Working from home and family functioning, *International Labor Review*, forthcoming.
- Dutcher, E. G. (2012). The effects of telecommuting on productivity: An experimental examination. The role of dull and creative tasks, *Journal of Economic Behavior & Organization*, 84(1): 355–363.
- Ewuim, N. C, Igbokwe-Ibeto, C J & Nkomah, B. B, (2016). Information and communication technology and public service delivery in Amuwo -Odofin Local Government Council of Lagos State, Nigeria. *Singaporean Journal Of Business Economics, And Management Studies*, 5(1): 11-23.
- EY, (2015). *Global generations*, London: Ernst & Young Global Limited.
- Fagan, C. & Walthery, P. (2011). Job quality and the perceived work-life balance fit between work hours and personal commitments: A comparison of parents and older workers in Europe, in Drobnič, S. and A.M. Guillén Rodríguez (eds), *Job quality and tensions between work and private life* (Palgrave).
- Finney, M. I., (2012). *The truth about getting the best from people*. s.l.:FT Press.
- Fonner, K. L. & Roloff, M. E., (2010). Why teleworkers are more satisfied with their jobs than are office-based workers: When less contact is beneficial. *Journal of Applied Communication Research*, 38(4): 336-361.
- Gallup, Inc. (2017). *State of the American workplace 2017*. Washington, D.C.: Gallup, Inc.
- Giménez-Nadal, J. Ignacio, J. A. M. & Jorge, V. (2018). Telework, the timing of work, and instantaneous well-being: Evidence from Time Use Data,” IZA Discussion Paper, 11271.
- Henke, R. M., Benevent, R., Schulte, P., Rinehart, C., Crighton, K. A., & Corcoran, M. (2016). The effects of telecommuting intensity on employee health. *American Journal of Health Promotion*, 30(8): 604-613.
- Herwiyanti, E. (2015). The effect of information technology capability and quality of management accounting information with technological uncertainty as moderating variable. *The International Technology Management Review*, 5(1): 11-17.
- Humphrey, S.E.; Nahrgang, J.D. & Morgeson, F.P. (2007). Integrating motivational, social, and contextual work design features: A meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology*, 92: 1332–1356.
- ITU, (2017). *Facts and Figures*, Geneva: ITU.
- Jaramillo, S. & Richardson, T., (2016). *Agile engagement: How to drive lasting results by cultivating a flexible, responsive, and collaborative culture*. s.l.:John Wiley & Sons.
- Lee, J., (2015). *The Impact of ICT on Work*. s.l.:Springer.
- Lila, P. C. & Anjaneyulu, M. V., (2017). Network wide impact of telework in urban areas: Case Study of Bangalore, India. *Journal of Transport*

- and Engineering, Part A: Systems*, 143(8): 21-30.
- Meijers, H. (2014). Does the Internet generate economic growth, international trade, or both? international economies. *Economic Policy*, 11: 137–163.
- Messenger, J. & Gschwind, I., (2016). Three generations of telework: New ICTs and the (r)evolution from home office to virtual office. *New Technology, Work and Employment*, 31(3) 195–208.
- Messenger, J.C. (2017). *Working anytime, anywhere: The effects on the world of work*, Publications Office of the European Union, Luxembourg, and the International Labour Office, Geneva, 301-312.
- Pavot, W. & Diener, E. (2013). Happiness experienced: The science of subjective well-being. In Oxford Handbook of Happiness; David, S., Boniwell, I., Ayers, A.C., Eds.; Oxford University Press: Oxford, UK.
- Pradhan, R.P. Mallik, G. & Bagchi, T.P. (2018). Information communication technology (ICT) infrastructure and economic growth: A causality evinced by cross-country panel data. *IIMB Management Review*, 30: 91–103.
- Prithwiraj, C. Cirrus, F, & Larson, B. (2019). Work-from-anywhere: The productivity effects of geographic flexibility. Working papers, 1-49.
- Qiwei, Z. Qian, L. & Shiyang, G. (2019). How job autonomy promotes employee's sustainable development? A moderated mediation model, *Sustainability*, 11:1-14.
- Romer, C., (2011). *Work-life balance and the economics of workplace flexibility*. s.l.:DIANE Publishing.
- Sánchez, A. & Carro, B., (2017). *Digital services in the 21st century: A strategic and business perspective*. s.l.: John Wiley & Sons.
- Sekaran, U. (2003). *Research method for business* (4th Ed.). Hoboken, NJ: John Wiley & Sons.
- Sepehrdoust, H. (2018). Impact of information and communication technology and financial development on economic growth of OPEC developing economies. *Journal of Social Science*, 5(3): 32-40.
- Tuntas, W. S. Djabir, H. Mahlia, M. & Nurdin, B. (2016). The influence of telecommuting systems, self-efficacy and the quality of management on work productivity and the competitiveness of organizational perspectives in multinational companies in Jakarta, Indonesia. *Scientific Research Journal*, 4(3): 43-52.
- Tyler B.B. (2001). The complementarity of cooperative and technological competencies: A Resource-based Perspective, *Journal of Engineering and Technology Management*, 18(1): 1-27.

Van der Meulen, N., van Baalen, P. & van Heck, E., (2012). *Please, do not disturb. Telework, distractions, and the productivity of the knowledge worker*, s.l.: Rotterdam School of Management.

Welz, C. & Wolf, F., (2010). *Telework in the European Union*, Dublin: Eurofund.

Ye, L. R. (2012). Telecommuting: Implementation for success. *International Journal of Business and Social Science*, 3(15): 20–29.