

## TELECOMMUTING MODEL FOR SMALL AND MEDIUM ENTERPRISES (SMES) IN KENYA

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**ABSTRACT:** *The aim of this study was to use adaptive structuration theory as a tool to come up with Telecommuting model that can be adopted by SMEs in Kenya. A survey was done to understand the extent of telecommuting and the available technological tools in the Kenyan SMEs. Data from this survey indicates that most of the workers have reliable and fast internet access away from the office and reliable information support team. These employees also reported improvement in quality and efficiency in terms of service delivery. This was attributed to the time available to concentrate on their tasks unlike in the office where there could be interruptions or meetings. A representative microfinance was chosen to understand the organizational structure and the information technology infrastructure available in a typical Kenyan SME. Results showed that the SME had both the IT infrastructure and personnel in place. Based on these findings, an AST derived model was developed and tested. Our study shows that adoption of the developed AST derived telecommuting model could lead to increased productivity, efficiency and quality of work. Findings from this study would assist stakeholders use the available infrastructure and personnel to allow formal telecommuting.*

**KEYWORDS:** Telecommuting, Cloud Computing, Adaptive Structuration Theory, Small and Medium Enterprises.

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### INTRODUCTION

Telecommuting ('telework' or 'teleworking') refers to a flexible work arrangement where an employee performs duties, responsibilities other authorized activities from an approved satellite centre or remote location away from the traditional office (Gray M., et al 1999; Yap, 1996; Mirchandani 1999; Ellis and Webster, 1999). Workers at the satellite centres remain in constant electronic communication with the central office. This kind of work arrangement requires technological equipment such as a networked computer, with a fast internet connection coupled to hardware and software support (Franks, J. 1998).

Cloud computing technology and coupled to fast internet have enabled access to remote servers using a combination of portable hardware and software. Portable devices such as tablets and smart phones allow increased mobility and instant communication through text messages, camera photos, and video clips from anywhere and at any time. Nowadays tasks such as data processing, accounting, computer programming, design, customer service, quality control, and health care can be performed from a remote location (Sharit et.al., 2009). Tangible quantifiable benefits include increased productivity, reduced facility and overhead costs, improved morale and motivation of employees, reduction/avoidance of telecommuting expenses and travel stress, greater work flexibility and autonomy, improved work-life balance and consequently improved quality of life (Sharit et.al., 2009). Whereas telecommuting is an established concept in the developed world, the same has not been well adopted in Africa (Chepken 2012).

**SMEs in Kenya.**

Small and medium-sized enterprises (SMEs; sometimes also small and medium enterprises) or small and medium-sized businesses (SMBs) are businesses whose personnel numbers fall below certain limits. In Kenya, “micro-enterprises” are those with 10 or fewer workers, “small enterprises” have from 10 to 50 workers, and “medium enterprises” have 51 to 100 workers (Gray, 2000). SMEs play a significant role in promoting economic growth in all countries of the world (Hayton, 2005) and are a key driver for economic development (Gatt, 2012). The sector has outperformed all others in the Kenyan economy, growing on average by approximately 20% since the year 2000. Mobile and internet penetration in Kenya are among the highest in Africa at 83% and 58% respectively of the 44.35 million population. The estimated number of internet users stands at 26.1 million, making Kenya the 21st most connected population in the world. Of those, 99.9% access their internet through mobile data. As of 2015, 58% (1.8m devices) of all phones sold in the country were smart phones (Zab S, 2015). However, SMEs in Kenya are yet to realize the enormous benefits of telecommuting despite the availability of enabling technologies such as smart phones, portable devices, fast internet and applications, mobile money transfer and payments. Utilization of these resources can increase the SMEs productivity, enhance growth and in the long run make them competitive in the market.

**AST in Relation to This Study**

AST provides a framework for examining organizational change that occurs as a result of the implementation and use of advanced technologies (DeSanctis & Poole, 1994). The adaptation of technology by organizations is a major component that brings forth an organizational change (Torraco, 2005). AST relates to this study because innovations in technology have enabled the use of virtual work arrangements. Technological innovations have allowed employees to perform work assignments from home or other off-site locations, previously only performed in a traditional work setting. The mode of IT related support has also changed from walk-in support to remote support by use of tools such as team viewer and other remote desktop connection technologies. The concept and acceptance of employees who work in a virtual work design brings changes to the social structure of organizations, which influences how organizations operate and communicate as well as how managers and subordinates interact with one another. A virtual work arrangement creates new rules, policies, and procedures to meet the work structure change of a virtual work design. The main objective of this study was to use adaptive structuration theory (which provides a framework for understanding and accommodating the organizational changes brought about by telecommuting) as a tool to come up with Telecommuting model that can be adopted by SMEs in Kenya in a resource limited setting.

**Cloud computing and telecommuting**

Cloud computing, also referred to as cloud, is a concept that began roughly in the 2007. The rise of the term of cloud computing was discussed at such a rate that over time it began to be regarded as a buzzword (Houser, 2008). Over the last few years a lot has changed and the concept of cloud computing has naturalized in the parlance of information communication technology (ICT) professionals. Organizations are nowadays implementing and expanding cloud solutions as an ideal technology to support telecommuting as an alternative work arrangements. The cloud technology provides broad network access, resource pooling, rapid elasticity and measurability of service. This helps organizations meet their business

continuity and disaster recovery needs, and supports remote employees by providing them with a secure way to access corporate data even if the corporate headquarters is affected by a manmade or natural disaster.

## METHODOLOGY

In this study, a mixed study design was used whereby both qualitative and quantitative data was collected. Qualitative data was collected using in-depth interviews whereas quantitative data was collected using an online questionnaire designed in Google forms. A total of 84 employees from different SMES were sampled to identify those who carry work home on a regular basis, their role in the organization and what technology they use. Responses from the participants who carry work home was used to understand the technology used, the commitment in task completion, and social interaction tools they use to keep in touch with others while working away from the office. The data was organized and analyzed using SPSS version 22. In order to come up with a model that can be adopted in the Kenyan context, existing successful telecommuting models (AT&T and Boeing) were evaluated. In both companies, the success of their telecommuting programs has been due to incorporation of teleconferencing as a key enabling technology in their operations.

Similar approaches have been employed previously by companies such as Apple Computer of Cupertino, Blue Cross/Blue Shield of South Carolina and Aetna Life and Casualty Company in the USA (Thomas B. 2015). Another example of successful telecommuting model that was evaluated is CTrip; China's largest travel agency (Bloom et al., 2013). The concept was developed to allow CTrip's Shanghai call center employees to work from home in order to reduce office rental costs which were increasing due to the booming real estate market (Bloom et al., 2013). AST was adopted as a conceptual framework for this research. The propositions advanced by AST were used to define study variables.

## RESULTS AND DISCUSSION

A total of 84 employees from different SMES responded to our online survey. It was found out that 40.5% worked from home on a regular basis. This group (working from home) comprised of different careers paths and their main tasks are summarized in Table 1.

**Table 1: A summary of the tasks carried out by the respondents while working from home.**

<b>Task</b>	<b>Number</b>	<b>Percentage</b>	<b>Cumulative (%)</b>
Financial analysis	4	12	12
financial Audit	1	3	15
programming	1	3	18
Reporting and analysis	16	47	65
Technical support	7	20	85
User support	5	15	<b>100.0</b>
<b>Total</b>	<b>34</b>	<b>100</b>	

Among those working from home, 85% have a laptop whereas the rest have a desktop that they can use to carry out their tasks. This is a good indication that advances in technology have been accepted which consequently has changed the style of working. Safaricom modems were the most popular (52%) as a means of internet access among the telecommuters as shown on

Table 2. While working away from the office, 44% of the telecommuters use Email, WhatsApp and SMS to ask for support from the IT team at the central office (Table 3).

Style of interaction is an important component of AST and is defined as how and what you use to interact with others. From our study, 44% of the respondents use a combination of WhatsApp, Emails and SMS to interact with one another (Table 3). Owing to the fact that majority of workers have smart phones, the respondents indicated that their social interaction with colleagues has not been interrupted in any way while working from home.

**Table 2: Internet options available for telecommuters.**

<b>Internet access</b>	<b>Frequency</b>	<b>Percent</b>	<b>Cumulative %</b>
Safaricom modem	18	52.9	52.9
Airtel modem	3	8.8	61.8
Orange modem	2	5.9	67.6
WiMAX Wireless	6	17.6	85.3
Safaricom and wireless	Wimax 2	5.9	91.2
Airtel Modem, wireless	Wimax 1	2.9	94.1
no access	2	5.9	<b>100.0</b>
<b>Total</b>	<b>34</b>	<b>100.0</b>	

**Table 3: Style of Interaction with colleagues while working from home**

<b>Interaction tools</b>	<b>Frequency</b>	<b>Percent</b>	<b>Cumulative %</b>
Sms	1	2.9	2.9
Email	7	20.6	23.5
WhatsApp	3	8.8	32.4
Email, WhatsApp, SMS	15	44.1	76.5
SMS, WhatsApp	3	8.8	85.3
Email, WhatsApp	5	14.7	<b>100.0</b>
<b>Total</b>	<b>34</b>	<b>100.0</b>	

Available data shows that mobile and internet penetration in Kenya are among the highest in Africa at 83% and 58% respectively. The estimated number of internet users stands at 26.1 million, making Kenya the 21st most connected population in the world. Of those, 99.9% access their internet through mobile data. As of 2015, 58% (1.8m devices) of all phones sold in the country were smart phones (Zab S, 2015).

It has been postulated that telecommuting can result in increased of job satisfaction, loyalty and commitment in employees (Sanchuli et al., 2014). Respondents who work from home indicated that working extra time was a clear indication that they were fully committed to completing their tasks in time in order to give clients the best services. When asked about the improved productivity since they started working from home, 82% of the participants noted that their productivity had increased significantly since they are able to complete tasks on time (Table 4).

**Table 4: Improvement in efficiency, quality and productivity while working from home.**

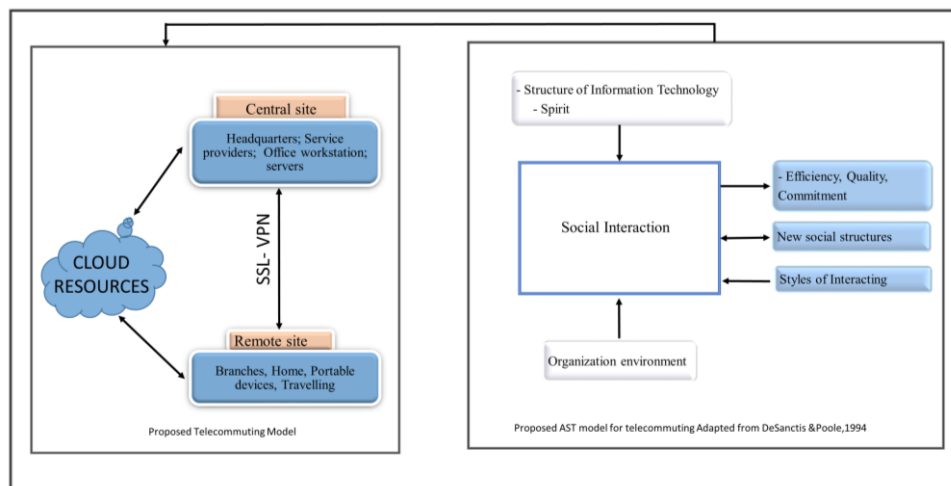
<b>Improvement</b>	<b>Efficiency (%)</b>	<b>Quality (%)</b>	<b>Productivity (%)</b>
A little improvement	41.2	52.9	41.2
A lot of improvement	47.1	47.1	41.2
No improvement	11.8	0.0	17.6
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

### Case study

An in-depth discussion was held with the respondents from one of the microfinance to better understand the social aspects of interaction. When these respondents were asked whether working remotely improved the quality of their work, 52% responded in the affirmative. The major reason given was that working away from the office allows more time to accomplish tasks. While in the office, a lot of time is spent on meetings and consultations. This makes it very difficult to concentrate on a task such as scrutinizing the clients' documents in the systems before approval by the different managers. The organisation has a reliable IT support team who are always willing to help whenever a user is in need. This is achieved using Team Viewer; a remote support tool. The IT support team can log in to user machines anytime and assist when a software error occurs. The use of freely available cloud services such as Google drive has enabled documents sharing among managers and supervisors. This has increased not only the quality but also the efficiency of document processing and sharing.

### The proposed Telecommuting model

Based on the organizational structure of the selected microfinance and the employee interviews, we developed a model that integrates central site and branch infrastructure to allow employees work away from their desks using remote access technologies (Figure 1).



**Figure 1: Proposed AST based Telecommuting model.**

Adaptive structuration theory (AST) proposed by DeSanctis and Poole (1994) provides a framework for examining organizational change that occurs as a result of the implementation and use of advanced technologies (DeSanctis & Poole, 1994). The relationship between the new work arrangement and the AST model is shown in Figure 1. Our model

was tested using the employees who work away from the office 2-3 days a week. There are three options for an employee to accomplish the tasks: working from home, at the satellite centre or branches and on the road. The employees were able to access the central site resources by use of Virtual private network (VPN) which is installed in the laptops provided by the organisation. Employees can also use cloud resources such as Google drive and drop box, as an alternative way of accessing and sharing documents without necessarily connecting to the VPN as shown in Figure 1. If fully adopted and implemented, the model can lead to more efficiency and quality of work within any SME due to the flexibility offered to the telecommuters.

## CONCLUSION

In this study the main objective was to provide an AST based telecommuting model that can be adopted by Kenyan SMEs as an alternative work arrangement. This research provides an insight into available technologies in SMEs that can facilitate a telecommuting model and the extent of informal telecommuting in Kenyan SMEs. The study shows that adoption and implementation of the proposed telecommuting model would require minimal resources. Addressing the issue of trust and campaigns to create awareness on the importance of telecommuting will be a major drive for adoption of the proposed work arrangements for Kenyan SMEs.

## REFERENCES

- Chepken, C. (2012). Telecommuting in the developing world: a case of the day-labour market. PhD thesis, University of Cape Town, SA.
- Chin, W., Gopal, A. and Salisbury, W. (1997) Advancing the Theory of Adaptive Structuration: The Development of a Scale to Measure Faithfulness of Appropriation. *Information Systems Research*, 8,4, 342-367.
- DeSanctis, G. and Poole, M. S. (1994) Capturing the complexity in advanced technology use: Adaptive structuration theory. *Organization Science*, 5,2, 121-147.
- Ellis, T. S. and Webster, R. L. (1999) "Innovativeness of information systems managers toward telecommuting: A structural equation model." *Journal of Computer Information Systems*, 39,3, 92-98.
- Franks, J. (1998). The Virtual Organisation. *Emerald Insights*. 47,4, 130-134. <http://www.emeraldinsight.com>
- Gatt L., (2012) SMEs in Africa: Growth despite constraints. Consultancy Africa Intelligence September. <http://www.consultancyafrica.com>
- Gray, M., Hodson, N., & Gordon, G. Teleworking explained. New York: Wiley, 1993.
- Hayton J.C. (2005). Promoting Corporate Entrepreneurship through Human Resource Management Practices: A Review of Empirical Research. *Human Resource Management Review* 15, 21- 41.
- Hill, NS., Bartol, KM., Tesluk, PE. And Langa, GA. (2009) Organizational context and face-to-face interaction: Influences on the development of trust and collaborative behaviors in computer-mediated groups. *Organizational Behavior and Human Decision Processes*, 108,2, 187-201.



- Hugos, M.H., Hulitzky, D., (2011). Business in the Cloud: What Every Business Needs to Know About Cloud Computing. John Wiley & Sons, Inc.
- Mirchandani, K. (1999) "Legitimizing work: Telework and the gendered reification of work non work dichotomy." *The Canadian Review of Sociology and Anthropology*, 36,1, 87-103.
- Sanchuli, S., Razavi, HR and Emamgholizadehm S. (2014) The Relationship between Teleworking, Employee Loyalty and Organizational Commitment from the Perspective of Medical Experts of Golestan Province. *International Research Journal of Management Sciences*. Vol., 2 (1), 16-22
- Sharit, J., Czaja, S.J., Hernandez, M.A. & Nair, N.S. (2009). The Employability of Older Workers as Teleworkers: An Appraisal of Issues and an Empirical Study. *Human Factors and Ergonomics in Manufacturing*, 19,5, 457–477.
- Thomas B.C. (2015) The Future Technology of Working Green.
- Torraco, R. J. (2005) Work design theory: A review and critique with implications for human resource development. *Human Resource Development Quarterly*, 16,1, 85-109.
- Yap, C. S. (1996) "Does telecommuting make economic sense for companies?" *Proceedings of the Annual Hawaii International Conference on System Sciences*, pp. 386-395.