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Trust: The Enabler of Knowledge-sharing Culture in an Informal Setting

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Abstract

Trust in an organization has been perceived as one of the key factors behind knowledge sharing mainly in an unstructured work environment. The study developed a framework for building trust in knowledge sharing in a virtual environment. The artifact called KAPE (Knowledge Acquisition, Processing, and Exchange) was developed to facilitate knowledge sharing using a web-based platform for Cassava farmers. A survey was conducted, data were collected from 382 farmers from 21 farming communities. Multiple regression techniques, Cronbach's Alpha reliability test; Tukey's Honestly significant difference (HSD) analysis; one-way Analysis of Variance (ANOVA) and trust acceptable measures (TAM) were used to test the hypotheses. The results show a significant difference when there is trust in knowledge sharing between farmers, those who have high trust levels of trust were differed in the model ($M = 3.66$ $SD = .93$) from with low trust acceptable values ($M = 2.08$ $SD = .28$), ($t(48) = 5.69$, $p = .00$). Furthermore, using the Cognitive Expectancy Theory showed that farmers with cognitive-consonance exhibited a higher level of trust and satisfaction with knowledge and information from KAPE, as compared with a low level of Cognitive-dissonance. These results imply that the adopted trust model (KAPE) shows a positive improvement in knowledge sharing activities in an informal environment amongst rural farmers.

Keywords: Trust, Knowledge, Sharing, KAPE, Unstructured, Informal

1. Introduction

Nigeria is known for the production of crude oil and crises related to that, agriculture remains the principal source of subsistence, income, and employment for the majority of those in the rural areas. Moreover, environmental concerns due to pollution from oil production and spillages have strengthened the case for greater focus on the agricultural sector. This study believes that ability to seamlessly gather and share knowledge on agricultural processes; particularly, in cassava farming would be critical to improved productivity, sustainability, better standard of living in the rural and the agricultural related sectors. Nigerian farmers, particularly cassava farmers, are senior citizens and mostly women.

Agriculture is a knowledge intensive and survival and or success depends on knowledge of farmers and agronomists the practitioners. Farmers must possess knowledge on the plantation, production, plant physiology, soil sciences, alleviating potential risks, managing production and others. Traditionally, farmers acquire such knowledge through long years of experiences and non-systematic means since the knowledge is not stored and organized for retrieval, update and enhance. This study deals with effective agricultural knowledge sharing for cassava farmers believe that effective sharing of knowledge within farm communities and amongst farmers is critical to human existence, food security and innovation. Research shows a positive association between trust, behavioral factors, and effective sharing of knowledge among people (Evans, 2015).

Knowledge management has become very popular with a growing number of studies, development, implementation, and customization for specific applications including agricultural domain (Mayer et al. 1995; Alsharo, 2013; Evans, 2015).

This study focuses on trust and its influence on knowledge sharing among farmers. Kabiru (2015) argued that knowledge and practices of farmers that were built through long years of experiences ought to be organized, stored and shared with the aid of Information and Communication Technology. However, in a situation where knowledge gathering and sharing for development of a community where most people do not know each other, the element of trust must be in place to enable knowledge sharing. Several studies relate knowledge sharing within formal and the informal organizations. (Maclean, Harvey and Clegg, 2016, Woolley, Aggarwal and Malone, 2015, Harvard Business Review, 2002 as cited in Maclean et al., 2016, Singh, Singh, and Pande, 2013).

Existing research has mainly focused on interpersonal attraction, culture, social group interrelation and knowledge sharing in organized settings (Chun-Ming, Meng-Hsiang and Yi-Jung, 2015). Woefully the influence of trust in a Web-based knowledge sharing in an informal organizational structure has been overlooked. In particular, some studies (Evans, 2015), highlighted the significance of trust, but there is no consensus on how to integrate it effectively in informal settings.

Scope & Focus of Study

This study is focused on trust in knowledge sharing in an unstructured rural farm community. An artifact which is based on trust to enable knowledge gathering, documentation, easy access and seamless sharing of the entire cassava production knowledge is presented.

The Significance of Study

The key difference in this study when compared to previous studies, is the focus on trust in a web-based platform in the informal environment, instead of trust in organizations through human surrogates.

In theory, the study contributes by developing a framework for regulating activities of knowledge sharing while considering trust-related issues and other factors known to inhibit or influence knowledge sharing in previous experiential studies. The research investigated the relationship or influence of trust on these factors and other knowledge sharing activities. This research extends previous studies by examining the direct and indirect influence of trust on knowledge sharing-related issues.

In practice, implementation of strategies that would promote all cognitive, social and trust factors found to positively affect knowledge sharing could be time-consuming and expensive. However, the artifacts (KAPE) of this research would provide easy access and help farmers understand various factors that facilitate and management of cassava productivity, the need for knowledge sharing, and most significantly, suggests framework and techniques to encourage, promote, and improve these factors. Thus, the significance of the study is described as primary emphasis and secondary emphasis.

Problem Statement

Several investigators (Kabiru, 2015; Teeken, et al., 2018) have shown that cassava farmers in the rural communities have limited information regarding the entire cassava plantation process. These inadequacies are due to the complex nature of the crop, both in implicit (pertaining to practical skill or expertise in managing cassava) and explicit (pertaining to the theoretical concept of cassava) knowledge (Teeken, et al., 2018). Above all, with the application of modern techniques to farming, that requires an extraordinary degree of skill, it is difficult for farmers who do not have access to vital agricultural information to succeed.

Agriculture is a knowledge intensive and flourishes on the facility of tried, tested and verified techniques (Teeken, et al., 2018). Agricultural researchers, environmental and soil scientists in collaboration with experienced farmers

spend valuable time in search of new high yield seeds, innovative crop production, soil and drought mitigation procedures; enhanced agricultural technologies and improve farming techniques (Yusuf, Balogun and Falegbe, 2015). These enhanced agricultural processes and Agric-technological advancements constitute novel knowledge that necessitates knowledge sharing. Some studies have posited that the knowledge sharing requires further attention, particularly, some key variables that could positively influence or hinder knowledge sharing in informal settings, such as; trust, technology, interpersonal relationships, and cultural consequences are unclear (Alsharo, 2013, Chun-Ming et al., (2015).

The foremost problems confronting the cassava farmers are:

- a. Limited knowledge of cassava varieties
- b. Limited use and improper application of fertilizers
- c. Nonexistence / limited knowledge on seed quality, soil quality and herbicides
- d. Limited information sharing on entire crop propagation and pest management
- e. Nonexistence / limited knowledge in the use of irrigation systems and seasonal farming
- f. Limited knowledge on pre / post-harvest processes
- g. High cost of labor, due to manual processing and
- h. Lack of, and /or limited use of machinery
- i. Limited knowledge sharing activities, due to lack of trust
- j. Limited knowledge of drought management
- k. Limited knowledge and management of land dilapidation
- l. Limited knowledge and management of crop failure
- m. Limited knowledge of technology use and other agronomic problems

Cassava is the leading source of food carbohydrates for the majority of people and a source for several industrial products. On the other hand, the majority of cassava farmers lack information on the numerous uses of cassava crop, other than for food (Ukpe et al., 2016). We believe cassava production and its management ought to be given the necessary consideration for food security, by seamlessly sharing of knowledge. This study strives to address the farmers' constraints as listed above and to understand how to increase the relationship between trust and Web-based knowledge sharing behavior in an unstructured setting by answering the overarching study question: *What are the critical factors that promote trust in knowledge sharing in a Web-Based platform of an informal organization?*

Research Questions and Hypothesis

In this study, trust is believed to foster a relationship of communal exchange; the willingness of an expert knowledge source to share knowledge effectively depends on the level of trust (Jain, Sandhu and Goh, 2015; Settle, Rumble, McCarty, and Taylor, 2017). The foremost challenge is the motivation for facilitating effective knowledge sharing between the seeker and the source of knowledge in informal settings, and ensuring that the process is understood and equitable for all involved. This researcher believes that without trust business and other economic activities in informal settings would not achieve their maximum potential with respect to the skills needed to increase value and performance. The research, therefore, addressed the following questions and hypothesis:

- RQ1. What are the critical factors that promote trust for the intended framework?
- RQ2. What factors do a knowledge seekers use to assess the trustworthiness of an expert information source?
- RQ3. How could a trust model be integrated in a Web-based knowledge sharing platform?
- RQ4. What kind of Web-based trust framework is needed to ensure knowledge sharing took place in unorganized setting?
- RQ5. What are the direct contributions of KAPE trust model in knowledge sharing in the rural community of practice amongst cassava growers?

Hypothesis

- H1: Factors that enable trust in knowledge sharing will positively facilitate knowledge sharing in the informal setting.
- H2: Existence of factors that validate knowledge source will positively promote acceptance of the knowledge that being shared.
- H3: A trust model (integrating all trust acceptable measures (TAM)) can be built on knowledge sharing, for the informal organization in an informal setting for workers who are not familiar with each other.
- H4: KAPE, knowledge sharing platform would facilitate knowledge sharing within the informal cassava grower communities, when farmers' access KAPE database for needed information on cassava crop.
- H5: There is no significant contributions of KAPE trust model in knowledge sharing in the rural community of practice amongst cassava growers.

Knowledge Sharing in Rural Agricultural Communities

Studies by various researchers showed that application of Information and Communication Technology (ICT) tools, particularly, the social media, provide enormous opportunities for agricultural knowledge sharing (Abdulsalam, Olaifa and Frederick, 2016; Tata and McNamara, 2018). ICT tools can be used to systematize a repository, for knowledge gathering, dissemination and sharing amongst farmers for the purpose of food security and sustainability. The practice of knowledge sharing among the farmers is important (Tata and McNamara, 2018) to preserve and share knowledge, teach among peers or acquaintance, learn in sharing knowledge sources and references. Based on various literatures, it is known that ICT has been used for knowledge sharing even among the farmers. However, we need to simplify the processes of knowledge gathering and sharing among farmers in the rural communities; by addressing likely limitations. Intrinsically, knowledge sharing poses various hindrances, which have been identified as resulting from several factors, which include; Culture, Knowledge Hoarding, Technology and Trust.

Factor 1: Culture. Culture provides the people, their belief system, with ways to intellectualize things, ways of hearing and interpreting issues; seeing and interpreting relationships (Ranucci and Souder, 2015). Evolving technologies make it conceivable for organizations to hire workers across the border to meet organizational needs. Zhang, Zhang, Lin and Du (2017) show that the diverse international workforce provides a great chance for innovative opportunities, but another study (Al-Kurdi, El-Haddadeh and Eldabi, 2018) shows how innovative approaches and opportunities are lost due to noted (language, religion, technology, education and trust) cultural problems, which are identified to hinder productivity. To effectively share knowledge in a community of people with different culture, these barriers require awareness, and techniques to mitigate such problem for effective knowledge sharing

Factor 2: Knowledge Hoarding. Knowledge hoarding barrier refers to hesitation or unwillingness of an individual to share knowledge towards the organizational goal or for a specific audience. In most cases, knowledge hoarders believe that sharing knowledge may devalue their worth to the organization, thereby, risking their jobs (Anaza and Nowlin, 2017). Some of the many ways, knowledge hoarding can be overcome are; awareness, organizational communication and ensuring knowledge sharing participants feel valued.

Factor 3: Technology. Technology, here, refers to ICT tools, known to have the capability to facilitate and enhance knowledge sharing by reducing the temporal and distance barriers between knowledge holder, seeker and recipient. In this light, it is an undeniable fact that ICT is a useful enabler for knowledge sharing and maintaining explicit knowledge (Nonaka and Takeuchi, 1995). However, the adoption of ICT for knowledge sharing has its own barriers, which can be very challenging when human behavior is factored into the use of the technology. An encompassing viewpoint of ICT tools and its capability for knowledge sharing is further presented in the subsequent chapters.

Factor 4: Trust. Trust is defined as "an individual's willingness to be vulnerable to the actions of another person," (Robert Jr., Dennis, & Hung, 2009, p. 242, as cited in Alsharo, 2013). For the purpose of this study, trust is faith and confidence, an individual has in another to provide expertise on a subject matter. Trust factor provides ability and character assurances that expert opinion received is accurate and reliable (Settle, Rumble, McCarty, and Taylor, 2017). A mutual trust barrier in knowledge sharing, is when content received, is perceived unreliable, due to the

unknown sources of knowledge. One of the questions of this study addresses this issue of trusting the knowledge source.

2. Literature Review

Knowledge Management and Knowledge Sharing

The importance of knowledge in the organization has been discussed for decades (Drucker, 1985), but received little or no attention until the mid-nineties (Nonaka and Takeuchi, 1995) and when the dot-com era revolutionized the way of doing business. This revolution prompted the need to manage knowledge theoretically and practically (Ohiorenoya, 2014).

Knowledge in Organization

The most important believe and emphasis of this study is that knowledge sharing should be focused more on the willingness of individuals with the knowledge to share with others. Davenport and Prusak (1998) defined knowledge management as capturing knowledge, storing it for future use, sharing and using knowledge. Knowledge could be shared amongst people by direct communication or indirectly, using knowledge repositories; the key issue here is the willingness of the individual to share, since tacit, one of the most vital form of knowledge, mostly exist within individuals. This tacit knowledge remains unexposed and unrecognized by others unless the knowledge owner chooses to make the knowledge available. In practice, sharing of knowledge cannot be obligatory, hence the individual with knowledge should be encouraged, stimulated and enabled.

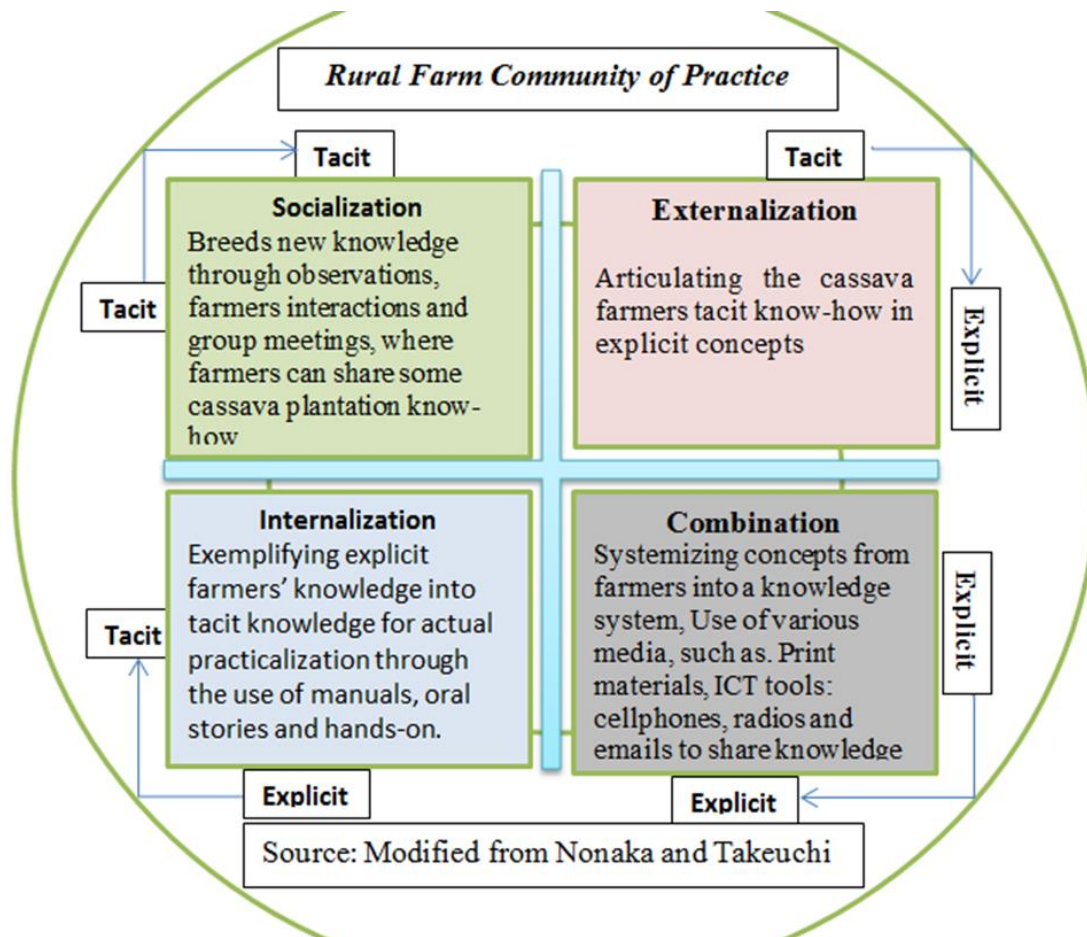
Necessity of Knowledge Sharing

Studies (Anaza and Nowlin, 2017) show, that knowledge hoarders can be a great disadvantage to our current knowledge economy and innovation. Resistance to share, may retard organization's ability to grow and maximize profit. Thus, the significance of knowledge sharing in a business setting, either formal or informal, cannot be disregarded. To withstand and gain competitive advantage, it is fundamental for an organization to develop their (skills set, cross train employees and knowledge bases) through knowledge sharing. We agree that specific expert farmer ideas are likely to be obsolete, but not the farmers know-how, skills, and competences that underlie unique and innovative processes. Deduce from the literature, we present some of the benefits of knowledge sharing as: Access to communal knowledge; Retain both tacit and explicit knowledge; Increase chances of innovation; and members of the CoP stay informed of new farming techniques.

Bridging the entire Cassava Plantation Process knowledge divide with SECI

In the SECI knowledge creation model, tacit knowledge is assumed to be a prerequisite to explicit knowledge. This study intends to bridge Cassava knowledge gap by adopting the knowledge creation model (*which encompasses socialization, externalization, combination and internalization*) to harness and manage knowledge.

Figure 3: SECI process of Knowledge Conversion in Rural Farm Community



Actual implementation of SECI in this study, where *Socialization* (tacit to tacit) was encouraged and effective amongst cassava farmers, for it breeds new knowledge through observations, individual interactions and group meetings, where farmers can share some cassava plantation know-how amongst themselves. In this phase, the scholar was a participant, observer and encourages discourse so as to learn of the tacit reasoning, why the farmers use certain practices.

Other studies on knowledge management showed that knowledge transfer is more vital to the internal processes of organizations (Nisula and Kianto, 2016) but advances in knowledge management and information sharing are expanding the effectiveness of knowledge transfer to include external stakeholders such as partners, customers and suppliers thereby pushing organizations to be innovative in reviewing their knowledge management models and methods (Nisula and Kianto, 2016). According to Karimikia, Safari and Singh (2018) a focus on Web 2.0 technologies is a major way organizations utilize broader knowledge assets, especially the social and collaborative aspects of the Web such as blogs and social networks. The goal is not only to capture information, but the activities and outcomes of experts and other knowledge workers. This view is supported by Forrester Research (Sigala, (2017) who stated that multinationals are major users of Web 2.0 tools which is a better tool for knowledge management applications. On the influence of Web 2.0, Yim & Warschauer, (2017) opined that collective intelligence has more impact on knowledge management. Collective Intelligence refers to all digital information available and accessible to an Organization including social network data.

Trust in Knowledge Sharing

Knowledge Sharing (KS) can be defined as an activity in which knowledge, (for example, in agronomy) is imparted or exchanged among co-workers, agronomists, experienced farmers, extension staff, and people in the farm community. Individuals and our collective knowledge are an essential resource for societal development and it is important that we share knowledge (Asrar-ul-Haq, Anwar, and Nisar, 2016). Prior studies (Tsung-Hsien, 2013; Bhati, 2015; Yang, Lee, Lee, Chung and Koo, 2016), show a positive connection between trust and effective knowledge sharing in organizations. However, sharing knowledge would not happen easily, because, the choice to share or not, is contingent on the knowledge holder and cannot be extracted by force. In practice, KS occurs when individuals exchange what they know (tacit/explicit) to cultivate a new knowledge (Hsu and Lee, 2015). Knowledge is the infinite, reliable and valuable source that an individual or group of people can exploit for survival.

Today, individuals, organizations and societal survival depend on their application of knowledge assets to provide products or services (Asrar-ul-Haq et al., 2016) and this equally applies to farmers. The study of trust in an informal organization (i.e. Virtual teaming) is relatively new especially as it relates to knowledge sharing (Lankton, McKnight, Harrison and Tripp, 2015). Scanty empirical evidence exists to comprehend the influence of trust, as well as other sociocultural factors, that inhibit knowledge sharing in agriculture. This study, therefore, intends to bridge this gap, especially with focus on knowledge sharing in unorganized organization specifically in rural farm communities. This study is necessary at this time due to aging farmers, youth migration from the rural to the cities, uncontrolled population growth, unpredictable global warming weather and for the purpose of food security.

Interpersonal trust and Impersonal trust

McAllister (1995) defined interpersonal trust as a degree to which an individual is confident in the actions, words and decisions of another and willing to act on that basis. McAllister further differentiates two kinds of trust, (1) the affective connections among people, which the author referred to as the affect-based trust and (2) the cognitive conclusions about an individual's reliability or competence, which the author referred to as the cognition-based trust. Various studies (McKnight, et al., 2008; Lu, Kong, Ferrin and Dirks, 2017) show that interpersonal trust is based on trust an individual has for his or her coworker. This study is hinged on interpersonal trust as essential for employees to be efficient, effective and aid organizations.

Impersonal Trust

Impersonal trust, also known as institutional or system trust refers to the management's ability to cultivate relationships with other employees, outside those frequently interacted with by a handful of people, at the top of the organizational chart, responsible for organization control and decision making (Lu et al., 2017, McKnight, Cummings & Chervany, 2008, Sztompka (1999).

Social features of Knowledge Sharing

The study proposes a theoretical model which stipulates a connection between trust, willingness to share, collaboration and knowledge sharing effectiveness in informal settings. Trust, in this study, includes the propensity to trust members in the community of practice and ability to trust using ICT tools. Some knowledge sharing activities within these rural agricultural settings requires face-to-face interaction, which is swayed by interpersonal trust and for online communication, the trust is influenced by impersonal trust (Lu et al., 2017).

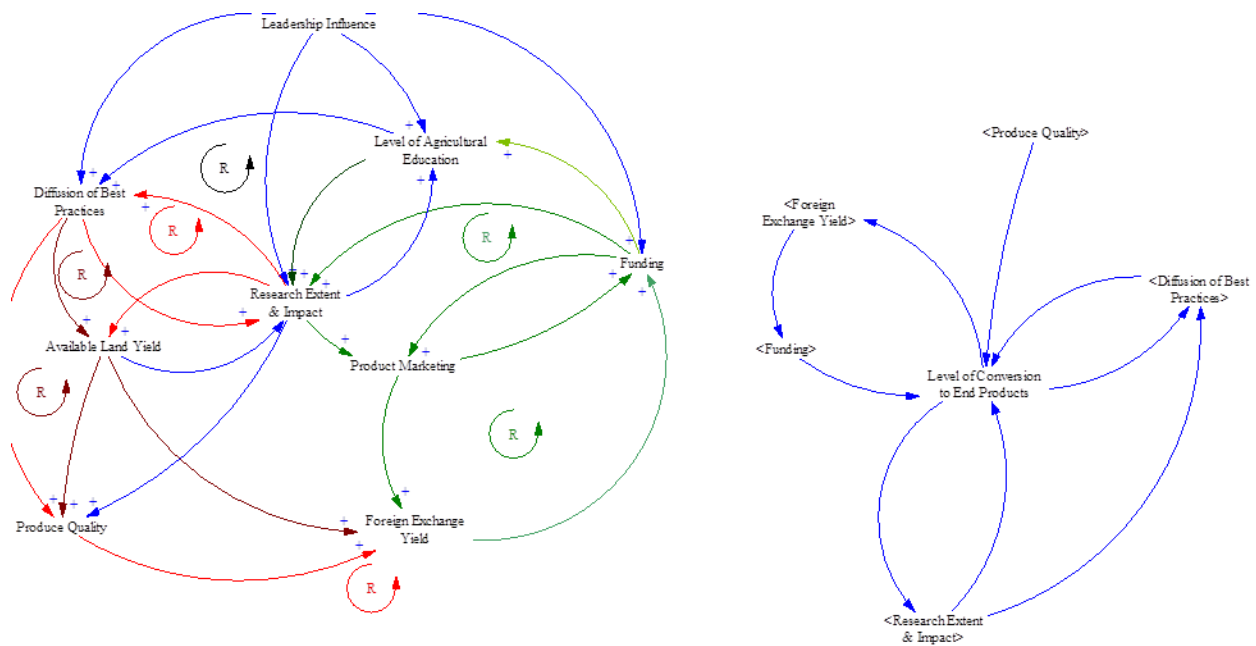
Knowledge Sharing Framework among the Cassava Farmers

Ukpe and Mustapha (2016) Abdulsalam, Olaifa and Frederick, 2016; Ukpe and Mustapha 2016) assert that knowledge and practices of farmers have sustained humans for thousands of years and this tacit knowledge ought to be organized, documented and shared with future generations. Other studies have shown that agricultural researchers have ignored rural farm communities in acquiring and developing crop knowledge, with the assumption that knowledge is completely generated by scientists in the University laboratories and distributed by extension staff for farmers' adoption. These assumptions and other impressions make it difficult for important knowledge in crop

propagation, the tacit knowledge and other knowledge resources in the community, to be integrated with the rural knowledge, due to improper knowledge gathering and sharing (Abdulsalam et al., 2016). Nigerian farmers, particularly, cassava farmers are suffering from limited information on the entire cassava plantation process, including post-harvest information (Ofuoku, 2015).

To mitigate food insecurity and famine, it is crucial to apply knowledge management and sharing principles in agricultural information gathering from the expert farmers (to capture knowledge, document and disseminate; to make, create and innovate) in the rural farm communities, before we completely lost these opportunities, due to the expiration of lives and youth migration to the cities. In addition to urban migration, the Nigerian agricultural sector, along with, other developing countries, faces potential problems, such as; overpopulation, which can lead to probable food shortages and imminent famine, as a result of agricultural land which is seriously degraded, as a result of climate change, illegal oil production and oil slips which comes with substantial and a terrible environmental burden. This environmental disaster and health risk that could wreak havoc on the ecosystems of affected communities kills indiscriminately. For these reasons, there is a need to capture, document and share knowledge on (entire cassava plantation processes on how to salvage degraded agricultural land due to drought and other environmental crisis) from expert farmers, especially the cassava growers. Thus, knowledge sharing in agriculture domain is vital to ensure farmers understand and comprehend the realities of various effective methods to produce the Cassava crop. Nigerian farmers, particularly, the cassava farmers are suffering from limited information on the entire cassava plantation process, including post-harvest information (Ofuoku, 2015).

Fig: 1. A Causal Loop Model of the impact of Cassava production on the Nigerian economy



The causal loop diagram depicts a set of feedback structures tying together a few influence factors, including the one of interest in this research, cassava economic impact. It is this feedback structure that drives the dynamics affecting the impact of cassava to Nigeria economy. All the feedback loops in the system are positive feedback loops shown with the R (reinforcing loop indicator) at the center of each loop. From systems dynamics studies (Senge, 2008) positive feedback loops can either create exponential growth or exponential decay in the system.

A move from poverty to extreme poverty is obviously the case of exponential decay with the economic ability of individuals or families to cope as they compete for increasingly scarce resources. Several other positive feedback loops directly identified for the impact of cassava in Nigeria economy are:

1. From Level of Research Extent & Impact to Diffusion of Best Practices back to Level of Research Extent & Impact.

2. Level of Research Extent & Impact to Level of Agricultural Education back to Level of Research Extent & Impact.
3. Level of Research Extent & Impact to Level of Available Land Yield to back to Level of Research Extent & Impact.
4. Level of Funding to Research Extent & Impact of Product Marketing and back to Level of funding
5. Level of Research Extent & Impact to Diffusion of Best Practices for Product Quality of Foreign Exchange Yield, to Funding and back to Level of Research Extent & Impact
6. Leadership Influence to Diffusion of Best Practices to Research Extent & Impact to Level of Agricultural Education back to Leadership Influence
7. Level of Conversion to End Products, to Foreign Exchange Yield to Funding and back to Level of Conversion to End Products
8. Level of Conversion to End Products, to Research Extent & Impacts to Diffusion of Best Practices and back to Level of Conversion to End Products

According to Senge 2008, any combination of these positive feedback loops will explain the accelerating incline in economic welfare measured by a country Gross Domestic Product (GDP). Oil rich Nigeria, current GDP ranks 59 in the world, as a result of knowledge deficit as addressed by this research, corruption, inadequate infrastructure, poor macroeconomic management, and leadership influence (NBS, 2018). Interestingly, in this model we see that factors such as Product Quality, Product Marketing, and Foreign Exchange Yield, which can easily be identified as causal factors on the Impact of Cassava in the Nigerian Economy, actually have no direct impact, but rather indirect ones through their impacts on other factors such as Level of Agricultural Education, Research Extent & Impact, Available Land Yield, Diffusion of Best Practices, and Leadership Influence.

The direct influences such as Level of Research Extent & Impact, Level of Agricultural Education, Diffusion of Best Practices, Available Land Yield and Funding in their separate feedback loops with Leadership Influence can drive the economy up or down. Higher levels of Agricultural Education, Research Extent & Impact, Available Land Yield and Funding with all things being equal can drive the economy up. Conversely, a lowering in these Levels will drive the economy down. The same is true for the loop with Diffusion of Best Practices. Thus leverage lies in driving one or more dominant positive feedback loop/s linking Level of Agricultural Education in a way that creates accelerating improvement in the Nigeria economy. This will happen when direct influences such as Level of Conversion to End Products are pushed upwards. We believe some positive leverage could be achieved with KAPE and other similar models.

3. Research Gap

Knowledge sharing is an important process or technique which improves the level of knowledge of employees while facilitating organizational success. However, limited studies have been conducted focusing on trust as an influencing factor in increasing the level of knowledge sharing among the employees in an organization, especially in an unstructured working environment. This study has been conducted to fill this gap and answers (Alsharo, 2013; Alsharo, 2017) call "... for additional research on the importance of trust on team effectiveness in other virtual team environments, such as the trust in Web-based knowledge sharing in the rural farm communities as well as that for examination of knowledge sharing contributory factors identified as "affect-based and cognition-based trust" in a different settings and contexts (Analoui, 2015).

Thus, there is a need to develop an effective organizational culture under which knowledge is shared efficaciously for all organizational types, particularly the informal work settings. There are quite a number of literature gaps in trust, technology and knowledge sharing, which gave room for this research to make a scholarly contribution. To understand factors that could influence knowledge sharing behavior in informal settings, we explore the extant literature and various theories to conceptualize KAPE Conceptual Framework model for this study.

4. Conceptual Framework

KAPE Background

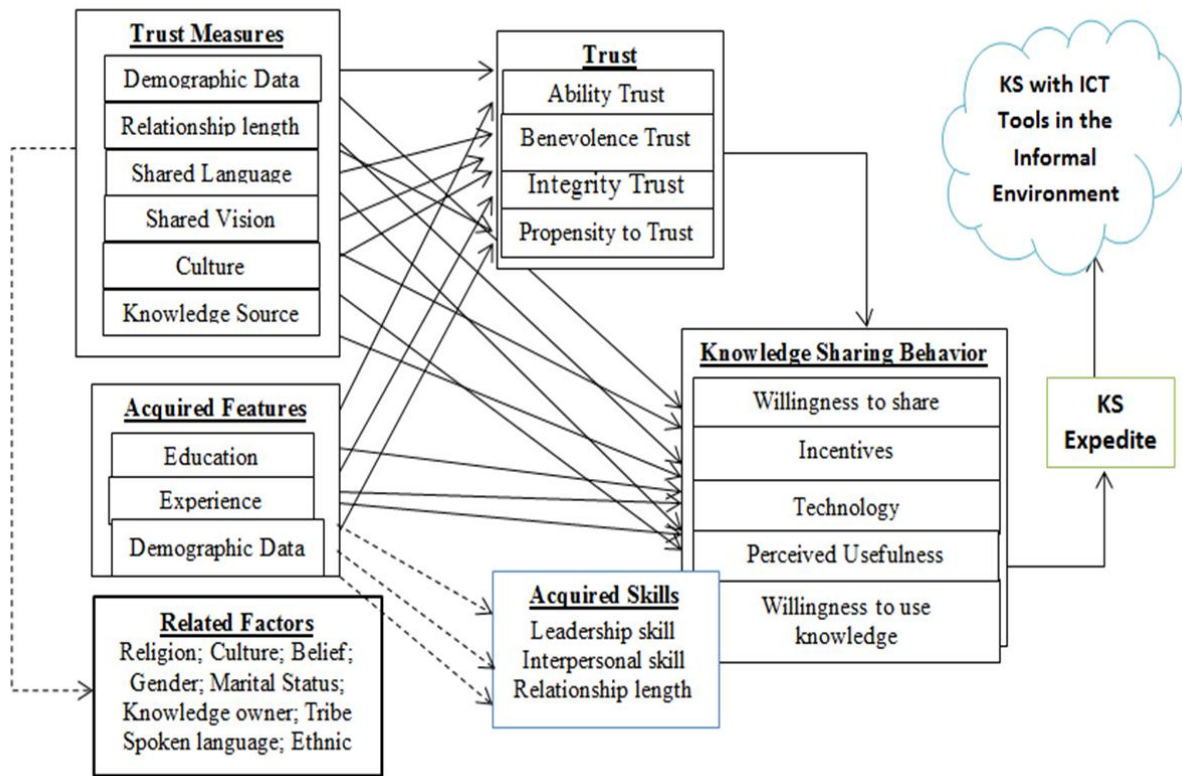
We present KAPE conceptual framework for exploring the effect of Culture, Knowledge Hoarding, Technology and Trust have on knowledge sharing behavior in informal settings. KAPE framework is grounded in research studies described in preceding sections of the association between knowledge sharing factors, behavior and trust.

The KAPE framework is designed in an effort to cultivate trust and develop relationships in the informal settings. To analyze and validate KAPE, our frame of reference relied on relevant studies from computer science, psychology, sociology, IT, economics, and human computer interaction (contextual properties, such as; user time-based and social motivations and intrinsic properties i.e users' internalized ability). We describe KAPE, as a behavior-driven trust in the knowledge sharing framework, constructed for both agriculture experts and the novice. KAPE is a web-based platform, with collaboration with farmers and experts on various interoperating stages.

Though, a considerable amount of this study focuses on trust in knowledge sharing, we present KAPE with a slant towards issues that promote trustworthy behavior. We contend the importance of a systemic viewpoint, which would encourage trustworthy behavior within a well-placed trust platform, for example; the need to ascertain contextual (*time-based, institution and socially entrenched*); and intrinsic (*skill, motivation centered on values, patterns of culture and disposition toward bettering others*) properties of the system users. Extant studies in psychological, sociological, ICT, computer science and human computer interaction (HCI) backgrounds has shown interest in trust as a phenomenon that requires a deeper understanding as the Internet progressively becomes ubiquitous in our society (Qundus, Paschke, Kumar and Gupta, 2019).

5. KAPE Trust Architecture

Figure 2.11: KAPE Conceptual Framework



The KAPE trust framework for knowledge sharing is user-initiated, permission based, online knowledge sharing platform on the entire cassava plantation information and knowledge. KAPE is designed with user agreements, rules governing the procedure on the platform and standards which all users must abide by. All users (which may include several entities, for instance, cassava farmers, research scholars, Agric-businesses, other businesses, individuals, and government agencies) on the platform become a trusted associate, through KAPE accreditation process. The accreditation offers members with assurances that knowledge shared on the platform has been validated with greater trust. KAPE framework was collectively designed to ensure the user's privacy, validation and protection of data and information provided are secured and trusted.

Although there are existing other knowledge sharing frameworks, the KAPE trust framework is distinctively different in the following significant ways:

- ✓ It is unique and first of its kind in the informal setting
- ✓ It encompasses trust. Privacy, security and continuing sustainability related issues
- ✓ It enables individuals to safely and easily accomplish knowledge sharing activities in their own comfort
- ✓ It's secure individual personal data and ensures privacy
- ✓ It enables the growth within rural communities due to a positive result from adoption and operation
- ✓ KAPE platform improves protection to avoid cyber-crisis and violation of privacy
- ✓ It reduces unnecessary costs of buying sophisticated IT tools or visiting the Internet café, by providing the system users with ease of design and accessibility via the mobile App, for easy download.

KAPE framework is designed to cultivate trust and develop relationships in an informal setting. The relationship in these informal settings can give rise to contrasting character of implicit risks, for instance; a farmer seeking self-interest and other opportunistic behaviors. To counteract these risks, the trust, fostering mechanisms must be engaged by a conscientious selection and efficient management of the farmers and other experts. The embedded trust mechanisms are:

1. KAPE user is asked to register and provide basic information, which would be validated by a user's phone number

2. Extension staff and crop experts will validate the farmers' input
3. Involvement of local community elders and sensitization of the rural farmers via local information centers, radio, places of worship and other even centers
4. The use of trust seal
5. Currency of the information
6. Accuracy of information
7. Privacy policy and
8. Use of Google transparency report.

To analyze and validate KAPE, our frame of reference relied on relevant studies from computer science, psychology, sociology, IT, economics, and human computer interaction (contextual properties, such as; user time-based and social motivations and intrinsic properties i.e users' internalized ability).

6. Research Method

Activity theory provides a framework that establishes a relationship between humans, their actions and tools used in an individual or organizational setting (Widén-Wulff & Davenport, 2007). Activity theory, adopted as a theoretical framework, argues that there is a need to study information and knowledge discipline in a broader perspective.

We used a survey research design and stratified sampling techniques in data collection from farmers in farming communities in 7 States of Nigeria were selected for the study. Three hundred and eight (308) surveys and interviews (consisting of 44 individuals from each of the seven states) were interviewed. The exploration scheme and data collection methods complemented the objectives of the study by through identification and explanation of trust factors capable of influencing knowledge sharing amongst farmers who do not know each other in the rural areas of study.

6.1 Data Analysis Technique

Questionnaires were the key instrument used for data collection and quantitative analysis was used for extrapolation. To test the proposed research model, data was collected using interviews and survey methods with online questionnaires; and implemented cleaning of the collected data by checking for completeness, unambiguous, uniformity and reliability. Analysis of data includes both demographics and descriptive information review. Using Cronbach's alpha, the model is tested for reliability. The validity of the model is measured by evaluating content cogency, convergent and discriminant validity. The data analysis provided vital information regarding participant profiles and essential variables required for this study.

6.2 Data Analysis

H1: *Identification and management of factors that enable trust in knowledge sharing would positively facilitate knowledge sharing in the informal setting.* Logistic regression was completed to test that identification and management of factors that enable trust in knowledge sharing would positively facilitate knowledge sharing in the informal setting. The result showed that, all factors that enable trust in knowledge sharing (Religion, Stranger, Culture, and Expert) contributed significantly to the model to predict knowledge sharing in an organization with positively increasing the odds at $P < .05$, predicting 27% of the dependent variable.

H2: *Existence of factors that validate knowledge source, would positively promote acceptance.* The result shows that the calculated f-value of 2.267 was found to be greater than the critical f-ratio of 2.01 needed for significance at the 0.05 alpha level of significance with 7 and 307 degrees of freedom,. With this result, the hypotheses are retained. This implies that Existence of factors that validate knowledge source, would positively promote acceptance. This result suggests that Willingness, Trust, Incentives, Culture, Technology, Language, Gender, and Age are all statistically significantly different.

H3: *Positively, a trust model (integrating all trust acceptable measures (TAM)) can be built on knowledge sharing, for the informal organization in an informal setting for workers who are not familiar with each other.* To test the

hypothesis, the multiple regression technique was used, to test the model. The overall model was found to be statistically significant with $F(3, 307) = 32.455$, $p < .05$. Hence, hypothesis 3 is retained.

H4: *KAPE, knowledge sharing platform would facilitate knowledge sharing within the informal cassava grower communities, when farmers' access KAPE database for needed information on cassava crop.* To test this hypothesis, a pre-test/post-test quasi experimental design was applied, where 50 farmers took part in a pre-knowledge test on Cassava plantation, nutrition, taxonomy, pest and diseases, and yield. The result shows a statistically significant increase in knowledge of cassava crop scores from pretest ($M = 2.42$, $SD = 1.090$) to post-test [$M = 3.18$, $SD = 0.825$, $t(49) = 4.892$, $p < .05$]. The eta squared statistic (.32) indicated a large effect size.

H5: *There is no significant effect on KAPE trust model in knowledge sharing in the rural community of practice amongst cassava growers.* The Independent sample test result shows a significant difference in the trust in knowledge sharing between farmers high on trust acceptable factors found in the model ($M = 3.66$ $SD = .93$) and farmers low on trust acceptable factors ($M = 2.08$ $SD = .28$), ($t(48) = 5.69$, $p = .00$). The result implies that the adopted trust model (TAM) improved positively trust in knowledge sharing amongst rural farmers.

7. Discussion of Findings & Conclusion

The results show that sharing of cassava knowledge is not prominent amongst the rural cassava farm communities in this study. This is due to the fact that no cassava or other crops knowledge platform has been introduced to these communities and there was no evidence of any of the farmers not sharing tacit, explicit or indigenous cassava processing knowledge amongst other farmers. The KAPE model identified most of the significant factors ascertained to influence knowledge sharing behavior in an informal setting, either indirectly or directly through a trust. Specific factors surveyed, with trust, included participant demographic, relationship length, culture, knowledge source, shared language and vision. The study provides significant inferences for both practice and research. In the research area, this dissertation calls for a wide-ranging understanding of web-based trust, culture and other social aspects influencing knowledge sharing within various informal domains.

In practice, this study provides noteworthy inferences concerning the significance of trust, social relationships and characteristics among the cassava farmers in the rural farm communities, where most individuals do not know each other, but were willing to collaborate for common interest and similar vision, with the hope of fostering a knowledge sharing environment in the informal setting. In conclusion, we posit that these positive results would facilitate the construction of other well-structured knowledge management platform for a related issue in the broader domain of agriculture. This study will bridge a gap in research on knowledge sharing in an informal environment by expanding theories of knowledge sharing in different contexts.

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