
Triple-win user innovation network and facilitated all-inclusive collective enterprise (TWUINFAICE): A postdoctoral research agenda for turning the youth bulge in Africa into blessing

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Abstract: Eradicating abject poverty, realising social development and environmental sustainability are among the core focus of the UN millennium development goals. In Africa, realising such triple-win outcomes poses running challenges due to persistent youth bulge and growing unemployment and their attendant youth violence and crimes. Notwithstanding, in all societies, youths generally have remarkable inherent qualities that befit entrepreneurship. Importantly, with youths' high degree of sociability, it is possible to use collaborative networks and network effect to channel those sterling youths' attributes and potentials towards realising triple-win entrepreneurship agenda. Most of all, continuing advances in computing, communication and social networking technologies and the widespread democratisation of tools of production and distribution, make it easier for youths to connect horizontally with peers and vertically with experts and institutions in order to individually and collectively innovate and reach their entrepreneurship goals easier and better. Yet, experts have noted that active participation of actors in collective process does not just happen; it requires a facilitator with requisite tools and strategies to initiate, control, manage and sustain the participation. Consequently, all-out triple-win entrepreneurship drive is advocated in this paper for African nations to turn the youth bulge into blessing. The work presented in this paper is a postdoctoral research agenda for community informatics social technologies embodied in the acronym TWUINFAICE and designed to facilitate triple-win development in the developing countries of Africa. Above all, TWUINFAICE upholds user innovation network and collective entrepreneurship that is built on scalable and reusable social network structures as the bedrock of its strategies for realising the triple-win objectives across Africa. Finally, this paper presents TWUINFAICE concepts, models and some selected areas of immediate application in the developing countries of Africa.

Keyword: Triple-Win, Social Network, Innovation Network, Network Effect, User Innovation, Collective Enterprise, Youth Bulge, Participatory Development, Community Development, Community Informatics, Urbanisation Youth Bulge

1. Introduction

Ever since the Millennium Development Goals (MDGs) were declared by the United Nations in September 2000, Africa has become hive of development activities [1, 2]. Series of success stories have also emerged from across the continent [3, 4]. However, recent MDG report of 2013 states that Africa is behind in all MDGs indicators [5]. Particularly, the rate of poverty reduction in Africa is insufficient to reach the target of halving extreme poverty by 2015 [6].

Furthermore, many African countries have youth-dominated population, otherwise called youth bulge [7, 8, and 9]. Moreover, there has been growing tension and youth-driven civil unrest in several countries of Africa due to the prevailing youth bulge accompanied with widespread poverty and growing unemployment [10, 11, 12, 13].

Notwithstanding, in all societies, youths generally have remarkable inherent qualities that befit entrepreneurship. Importantly, with youths' high degree of sociability, it is possible to use collaborative networks and network effect to

channel those sterling youths' attributes and potentials towards realising triple-win entrepreneurship agenda. Most of all, continuing advances in computing, communication and social networking technologies and the widespread democratisation of tools of production and distribution, make it easier for youths to connect horizontally with peers and vertically with experts and institutions in order to individually and collectively innovate and reach their entrepreneurship goals easier and better. Yet, experts have noted that active participation of actors in collective process does not just happen; it requires a facilitator with requisite tools and strategies to initiate, control, manage and sustain the participation.

Consequently, all-out triple-win entrepreneurship drive is advocated in this paper for African nations to turn the youth bulge into blessing. Particularly, in this paper, TWUINFAICE is proposed as a platform that uses appropriate network models to create and facilitate youth-driven reusable and scalable user innovation and collective entrepreneurship networks with triple-win outcomes in each of the local communities in the developing countries of Africa. The network is termed reusable and scalable because apart from entrepreneurship activities, the same network will be used to deliver other developmental agenda in each of the local communities, thereby scaling up the issues the network can address, as well as the population of community members and institutions the network supports. TWUINFAICE is a social technology solution that consists of repertoire of strategic and synergistic partnerships, along with ubiquitous entrepreneurship resources, opportunities, supports, strategies and service delivery. In all, TWUINFAICE initiative is focused on providing reusable and scalable social technology platform for locating, supporting, developing, implementing, promoting, enhancing, scaling and evaluating grassroots and youth-driven entrepreneurship initiatives and innovations in such ways that social development, economic development and environmental sustainability are realized. TWUINFAICE networks are based on a scalable hub-firm's hub-spoke network model called GeoHubNet. The GeoHubNet network model requires a facilitator firm called hubnet. The TWUINFAICE hubnet firm build and sustains the youth-driven social innovation and entrepreneurship network with robust backbone of experts, research institutions, donor agencies, CD organisations, community members in the Diaspora and other relevant triple-win development stakeholders from across the globe.

The work presented in this paper is a postdoctoral research agenda for community informatics social technologies embodied in the acronym TWUINFAICE and designed to facilitate triple-win development in the developing countries of Africa. Meanwhile, the researcher had earlier worked on a PhD research on the development of community informatics social network for community development in the Niger Delta region of Nigeria where there has been tension and civil unrest for over two decades due to perceived lack of development or poor

implementation of development programs. The PhD research focus was on facilitating active participation of the community members in the development initiatives in the Niger Delta region. Again, in the PhD research, a hub-firm GeoHubNet community governance structure was developed to create and manage online geo-community for each of the local communities in the Niger Delta region. Furthermore, online community hub was established for each of the online geo-communities. The online community hub was design as a tool for attracting and sustaining active participation of community members and other community development stakeholders.

On the other hand, the postdoctoral research agenda is meant to take advantage of the scalability and reusability of the community informatics social structures to address in more details the diverse developmental issues across Africa. Specifically, the community informatics social technology solution in the postdoctoral research agenda is embodied in the acronym TWUINFAICE which is designed to facilitate triple-win development in the developing countries of Africa. Above all, TWUINFAICE upholds user innovation network and collective entrepreneurship that is built on scalable and reusable social network structures as the bedrock of its strategies for realising the triple-win objectives across Africa. Essentially, in this paper the work entails, one, development of models showing the scalability of the online community hub and the hub-firm GeoHubNet community structure to be used for the TWUINFAICE social networks based solutions. Two, identify opportunities for triple-win initiatives in Africa and present brief high level description of activities that can be engaged to capture these opportunities. Three, briefly discuss some funding strategies. Finally, this paper explains the core concepts behind TWUINFAICE; presents the network models to be used in TWUINFAICE; and also presents some selected areas of immediate application of TWUINFAICE initiative in the developing countries of Africa.

2. Review of Relevant Literatures

2.1. Youth Bulge: The Challenges and the Way Forward

2.1.1. Youth Bulge and the Challenges

Youth bulge is defined as "extraordinarily large youth cohorts relative to the adult population" of a nation [14, 15]. A youth bulge exists when the age group between age 15 and 24 in a given society exceeds at least 20% of the population [10]. Youth bulge is characterized by situations where there are "too many young men with not enough to do" as such the youths tend to resort to violence, crimes and even terrorism [14, 16, 17, 15].

According to World Bank, the current cohort of young people in developing countries is the largest the world has ever seen [8,18]. The situation is even more pressing in war-torn nations, where youth cohorts challenge efforts to rebuild governments, societies, and peace [8]. The main argument is that youth bulge leads to an excess of young

males without perspectives for the future and thus creates a conflict prone environment [10, 11, 12, 13]. Even the UN High Panel on Security embraced this perspective in 2004: “while it may not reach the level of war, the combination of a surging youth population, poverty, urbanization and unemployment has resulted in increased gang violence in many cities of the developing world.” [10, 12, 13].

2.1.2. How Countries Can Address the Challenges Posed By Youth Bulge

Youth constitute not only a formidable demographic force, but also make up the next generation of parents, workers and leaders. Their well being, therefore, has implications not only for their own lives, but also for the societies they will build and maintain. Their ability to play these roles effectively depends on the support of their families, communities and on the commitment of their governments to their development [19].

Importantly, large youth bulge, presents a large pool of human capital which if used productively can usher growth and prosperity. If countries can take advantage of their youth bulge they can create a virtuous cycle of higher growth, higher incomes and savings. Failure to do so will result in a double jeopardy: the economic and social exclusion of youth drains growth and creates social strife [20]. The time for securing this double dividend is now. Sadly, experts have noted that although Africa has a youth-dominated population, African government policies are often not youth-centered and African governments and their international supporters are frequently under-informed about the priorities of most youth [8].

According to IMF publication [7], developing countries can address the youth bulge

- i. by broadening opportunities for the youths to develop human capital ;
- ii. by helping the youths to choose among those opportunities;
- iii. by developing the youths’ decision making ability ;
- iv. by providing the youths with second chances when the choices are missed or do not work. The program should consider those youths within the community and those in the Diaspora.

2.1.2.1. Broaden Opportunities for Young People [7]

- Improve the quality of basic education;
- Meet demands for higher skill levels demanded in the present day global economy;
- Ease labour market entry. Generally, many skills are acquired on the job, but young people, especially in the developing countries have a hard time getting started [7]. In this respect, youths in the developed countries, especially in the USA have a relatively smooth transition to adulthood compared to most developing countries. Particularly, such transitions to adulthood in the USA are facilitated in part because of the close integration between the education system and the labour market [20].

2.1.2.2. Enable Youths to Choose among Opportunities

Many young people enter adulthood without the information, resources, or experience to choose well among life’s opportunities. Governments can help youths to become more capable decision makers by [7]

- Providing the youth with relevant information and career guidance services,
- Providing the youth with resources, services and supports that enable the youths to get educated, trained on entrepreneurship and skill acquisition programs.

2.1.2.3. Develop Youths’ Decision Making Ability

Decision making is the act of making up one’s mind; the process of forming preferences, selecting actions, and evaluating outcomes, the process of generating and evaluating alternatives and making choices among them. This act of choosing an action from a number of alternatives if the outcome is uncertain is a complex process that is important in everyday life [21, 22, 23]. Furthermore, decision-making is defined as an intellectual process leading to a response to circumstances through selection among alternatives [24, 25]. Importantly, the skills needed to make sound decisions can be taught and practiced [24]. The youths need to be equipped with thinking and behavioural skills such as motivation, persistence, cooperation, team building, ability to manage risk and conflict that individuals need to process information and make wise decisions [7].

2.1.2.4. Provide Second Chances for Youths Including Those Youths within the Community and Those in the Diaspora

Inevitably, some young people will not be able to avail themselves of opportunities open to them. They may drop out of school, enter work too early, end up with jobs that lead nowhere, or be unable to find any job at all. This can result in an enormous missed opportunity for society as a whole. There is need to make provision for such young people to recover from bad choices or poor circumstances [7]

Furthermore, for several years now, it has been observed that many of the youths from developing countries migrate in large numbers to the developed countries in search of greener pastures. In many cases, these youths are cut up in bad situations that they do regret their trip to the foreign land. In that situation, such youth may find it difficult to return to their home country. There is need to provide a fail-safe platform for such category of youths involved in diverse adverse effects of wrong decisions they have taken at one point in their life.

2.2. Collective Entrepreneurship and the Need to Promote Entrepreneurship

2.2.1. Entrepreneurship and Entrepreneurship Education

Entrepreneurship can be used to create employment, increase investment and consumption of a nation, develop enterprising people and inculcate an attitude of self-reliance using appropriate learning processes [26, 27, 27]. In [29, 30]

entrepreneurship is defined as the process of increasing the supply of entrepreneurs or adding to the stock of existing small, medium and big enterprises available to a country by creating and promoting many capable entrepreneurs who can successfully run innovative enterprises, nurture them to growth and sustain them, with a view to achieving broad socio-economic development goals. Also, entrepreneur is defined as the ‘instigator of entrepreneurial events for so long as they occur’. [29,31]. Similarly, entrepreneur is defined as an individual who proactively seeks to generate value through expansion of economic activity and who creatively responds to challenges and needs encountered in the process of accomplishing this outcome. The terms “proactively seeks” and “creatively responds” capture the talent approach to entrepreneurship, which identifies areas of strength and weakness to assess the entrepreneurial potential of an individual. It clearly distinguishes those who have the entrepreneurial talent to succeed from those who do not [32]. Also, entrepreneurship is described as act of combining resources in new ways. In this wise, entrepreneurship is the creation of new businesses that do not exactly duplicate existing businesses but have some element of novelty [33]. The novelty may be in any form such as the location, the target market segment, or may be a novel method of distribution. In that case, merely creating a new businesses may not amount to entrepreneurship [33].

Furthermore, the Organisation for Economic Co-operation and Development defines entrepreneurship as human action in pursuit of new products, processes, or markets, while the World Bank describes entrepreneurship as commercial activities in the formal sector [32]. In addition, entrepreneurship can be defined as activity initiated to create value by providing products and services to a market, fulfilling an unsatisfied demand. The activity can include initiating and developing a new product/service (innovative) or replicating products/services that already exist, thus creating competition [32].

Entrepreneurship education means teaching people that they can either take or create a job. This will enable them to be self-employed and not relying on other job security. Entrepreneurship education seeks to prepare people particularly the youths to be responsible, enterprising individual who became entrepreneurs or entrepreneurial thinkers by immersing them in real life learning experience whereby they can take risks, manage result and learn from the outcome [34].

2.2.2. Collective Entrepreneurship

Collective entrepreneurship is a form of entrepreneurship where both opportunity identification and opportunity development are collective; the collective domain of alertness, deliberate search and testing rely on the communication and sharing of entrepreneurial knowledge [35]. Collective entrepreneurship combines business risk and capital investment with the social values of collective action. It is an event that exists when collective action aims for the economic and social betterment of a locality by

means of some transformation of social norms, values, and networks for the production of goods or services by an enterprise [36]. Collective entrepreneurship draws on multiple people to husband and shape an idea through initiation, design, and implementation into a full-blown innovation [37]

2.2.3. The Need to Promote Entrepreneurship

Unemployment is a situation where people who are ready and capable of working are unable to find suitable paid employment. The higher the unemployment rate in an economy the higher would be the poverty level and associated welfare challenges [29]. Entrepreneurship manifests itself in creative strategies, innovative tactics, uncanny perception of trends and market mood changes and courageous leadership. To the duo, ‘entrepreneurship’, when treated as ‘enterprise-creation’ helps develop new skills and experiences that can be applied to many other challenging areas in life [29]. Consequently, the need for promoting entrepreneurship culture among the youths is justified on the ground that youth in all societies have sterling qualities such as resourcefulness, initiative, drive, imagination, enthusiasm, zest, dash, ambition, energy, boldness, audacity and courage which are all valuable traits for entrepreneurship development [29]. The experts also assert that governments, NGOs and international bodies seeking to improve youth livelihoods could best pursue their empowerment objective by tapping into the dynamism of young people and build on their strong spirit of risk-taking through entrepreneurship development [29].

2.3. User Innovation and Innovation Networks

2.3.1. User Driven Innovation

Innovation entails combining technical information or knowledge (which embodies the “solution” knowledge) with knowledge of user needs and translating the combination into new products that the users want [38]. Innovation user and innovation manufacturer are the two general “functional” relationships between innovator and innovation. Users, in this case are firms or individual consumers that expect to benefit from *using* a product or a service. In contrast, manufacturers expect to benefit from *selling* a product or a service [39]. User innovation (or user-centred innovation) means that users of products and services—both firms and individual consumers—are increasingly able to innovate for themselves [39, 40]. User-centered innovation processes offer great advantages over the manufacturer-centric innovation development systems. Users that innovate can develop exactly what they want, rather than relying on manufacturers to act as their (often very imperfect) agents. Moreover, individual users do not have to develop everything they need on their own: they can benefit from innovations developed and freely shared by others [39]

Over the years, users of services and products have been recognized as an important source of knowledge, and user involvement has been recognized as a success factor in

developing commercially successful products or services [41, 26]. There are numerous studies on the role of users in innovation, from playing peripheral role of providing critical inputs that manufactures use to innovate and market products that better meet customers' needs, to the full scale user innovator who innovates products for their own personal use [38, 42, 26, 43,44, 45, 46]. The user's role in innovation is rapidly growing due to continuing advances in communication technology and the advanced tool kits available for users [42]. Most recently, the research on users as innovators has extended to areas as diverse as open source software, entrepreneurship, innovation communities, measurement, and policy [38, 47, 48 and 49]. Remarkably, the field of open-source software has demonstrated the role of communities of users in the innovation process policy [50, 51]

2.3.2. Types of User Driven Innovation

According to Salminen, and Konsti-Laakso, [41] user driven innovation can be divided in three different types: user information, user involvement and user innovators. In the user information type, the user is the target of intensive knowledge sourcing. The knowledge is about the user. In user involvement, users are co-creators: they are present and involved in some phases of the development process and act as knowledge sources and co-creators [41, 52]. In user driven innovation, the users tend to be interest-driven instead of entrepreneurship-driven. Their main goal is to receive the product as they need it [39].

User-developed innovations are for the most part developed by lead users. Lead users are users with two distinguishing characteristics: they experience the emerging needs of many users early and expect relatively high benefits from obtaining a solution to their need. A lack of solutions on the market and high expectations may result in innovation by lead users [49].

2.3.3. User Innovation Networks and User Entrepreneurs

User driven innovation, like innovation activities in general, rarely happens in isolation. Social networks play important role in user innovation and Granovetter [53] noted that such network do require facilitation and network management [54]. Innovation development, production, distribution and consumption networks that are distributed horizontally across many software users exist in the field of "free" and "open source" software projects, and in many other fields as well [42].

According to experts, innovation networks are all forms of organisations that serve the exchange of information, knowledge and resources and by suitable learning among at least three partners help to bring about innovation are based on confidence and stable cooperation relations [55]. In innovation networks innovation activities are coordinated; legally independent enterprises pool their business relations as far as their innovations potentials are concerned; stable relations are formed between enterprises and other players (training and research institutions, political players, etc, in order to gain competition advantages jointly and in a

cooperative way; and the joint efforts yield innovative products, processes and services [55].

User innovation networks mean user nodes interconnected by information transfer links which may involve face-to-face, electronic or any other form of communication. User networks can exist within the boundaries of a membership group but need not. User innovation networks also may, but need not, incorporate the qualities of user "communities" for participants, where these are defined as "...networks of interpersonal ties that provide sociability, support, information, a sense of belonging, and social identity." [42].

User innovation can take place in a distributed way whereby users share their innovations with other users and with producers [42, 56]. It has also been noted that user innovators do commercialize their innovations by becoming "user-entrepreneurs" [48] or otherwise give rise to a new market niche or industry [47]. For example, [48] show that users can collectively develop and commercialize their innovations within the social context of user communities, while [47] show that innovative users and user communities can affect the future organization of an industry and give rise to a dominant design.

Finally, when users form horizontal (user) innovation networks, they are able to produce innovations independent of manufacturers. However, the conditions for such innovation networks are that some users innovate, that some users freely reveal their innovations and that the users can self-manufacture their innovations at relatively low costs [42].

3. Methodology

In view of the multidisciplinary nature of TWUINFAICE social technology platform, it is considered in this paper as software intensive system. As such, the ideas presented in this TWUINFAICE research agenda are generated through evolutionary development methodology for software intensive systems. Importantly, the evolutionary development methodology is iterative and a Rapid Assessment Process (RAP) team was engaged to assist in both the collection and analysis of data. The justification for using RAP is that it is a rapid research method used to investigate complicated situations in which issues are not yet well defined and where there is not sufficient time or other resources for long-term, traditional qualitative research [57]. According to [57], RAP uses intensive team interaction in both the collection and analysis of data to quickly develop a preliminary understanding of a situation from the insider's perspective [58, 59]. Specifically, during the evolutionary requirement engineering phase of the TWUINFAICE's research agenda, literature survey and interview were used within the RAP framework to collect and analyse data. The focus in the RAP for TWUINFAICE research agenda includes;

- One, identify opportunities for triple-win initiatives in Africa and present high level description of

activities that can be engaged to capture these opportunities. However, definition of barriers to the effective implementation of these activities and efforts to remove these barriers will be considered during the detailed research work on the development and implementation of each set of activities. In addition, requisite policy issues associated with each set of activities will also be considered during the detailed research on each set of activities and for each country the TWUINFAICE program will be implemented.

- Two, design network models that will be used to create and coordinate the TWUINFAICE geo-community networks in each local community in the African counties where the TWUINFAICE program will be implemented.
- Three, discuss a typical user innovation network targeted at populating the TWUINFAICE network with active youth population.
- Four, briefly discuss some funding strategies.

Furthermore, during the system model design phase, low fidelity prototyping technique along with RAP team discussions were used to develop the scalability models for the online community hub and the hub-firm's hub-spoke GeoHubNet community structure. In addition, the relationship and applications of those models are delineated along with strategic alliance for carrying out the research project across Africa.

4. TWUINFAICE Networks and the Network Models

4.1. TWUINFAICE Geo-Community Networks

Precisely, every community consists of social networks of individuals, groups and institutions and these social networks can be active or passive. Passive networks are networks where the individuals, groups or institutions mind their own business and are not eager to explore and exploit the inter-dependencies that exist between them and other groups. In a social network, inter-independence between two nodes A and B means that there are things that node A would benefit from node B if they connect and interact; likewise, there are also things node B would benefit from node A through the same interconnection and interaction. In passive social networks, the individuals, groups and institutions are contented with their individualities and are not eager to take advantage of the interdependencies that are inherent in diversity. Active social networks on the other hand, are those networks where individuals, groups and institutions strive to identify relevant individuals, groups and institutions they can connect with and then take advantage of the inter-dependencies that exist therein.

Importantly, a strong community is a community with active networks. However, active participation of people in collective processes like active networks do not just happen; it requires a facilitator with requisite tools and strategies.

Consequently, the first strategy towards addressing the challenges to development in Africa is the development of strong and active community development network in every local community in Africa where the TWUINFAICE program is implemented. Specifically, strategic online and offline community network weaving will be employed along with some network governance models presented in this paper.

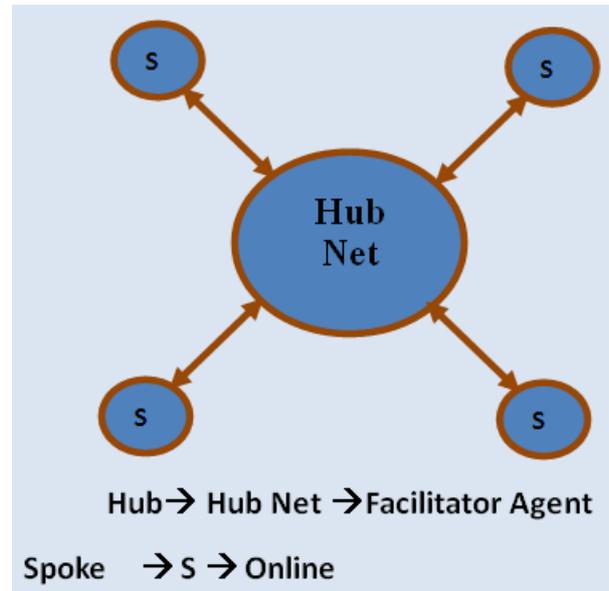


Figure 1b: Hub Spoke Model of GeoHubNet

The foremost target of TWUINFAICE project is to attract and sustain active participation of local community members and institutions in collective processes in their various localities. The TWUINFAICE facilitator organisation (that is, the HubNet) will use both online and offline community network weaving strategies to build and sustain active local community network (otherwise called geo-community). Although, the entire Africa is the ultimate target of the TWUINFAICE initiative, however, with the use of the network governance models presented in this paper, the program will consider a state at a time. With time, the whole states in any given country will be covered. Those models that will be used for the community network weaving and network governance are presented in the next section.

4.2. The Online Geo-Community Models

The online geo-communities supported on the TWUINFAICE network will be organized according to the hub-firm's hub-spoke organizational structure of Fig1a. In this paper, the hub-firm's hub-spoke organizational structure is referred to as GeoHubNet model for online network governance. The hub spoke model of the GeoHubNet is shown in Fig1b and Fig 3b.

The building block of the GeoHubNet is geo-community which is a community defined by its geographical location and boundaries. Geo-community can be regional, state-wide,

nationwide or worldwide. Regional community, in this case, is a geographic area consisting of one or more urban areas in a given state plus the surrounding rural areas and small towns. Each regional community will be identified by the name of the most prominent urban area in the region. Contents are generated and moderated in the regional geo-communities and the private communities created within the geo-communities. Within each regional geo-community are individual community members, group community members and a community facilitator (and perhaps with co-facilitator) who moderate the connections and interactions among the various members of the geo-community.

The entire network shown in Fig1a depicts the online community structure for a given state, (for instance, Akwa Ibom state in Nigeria). The inner circles with dotted outlines are the various regional geo-communities within the given state, (for instance, Uyo , Eket, Abak and Ikot Ekpene, regional geo-communities, all in Akwa Ibom state in Nigeria). The inner circle with thick outline, otherwise called HubNet community, is the community of the network facilitators. The network facilitators moderate the connections and interactions in the various regional communities in the state.

Basically, the HubNet may be a CD organization or group of social innovators or group of change agents that is championing the CD process in the local communities. Each of the geo-community can be public community or private community. However, by design, the regional, state-wide, nationwide and worldwide communities are usually public communities.

Public Community: In the public community, membership, access and participation in the community is open and free for everyone registered on the social network. Ordinarily, in CD the wider society is segmented into communities that are defined in terms of geographic areas, and hence the public communities include various geo-communities that varies with respect to their geographical coverage. They include; Global Community, Nationwide Community , State-wide Community and Regional Community.

Private Community: The Private communities are the various social groups that exists within any given geo-community such as, women groups, HIV/AIDS patients group, religious groups, dance groups , football clubs, students association, CD organization groups, etc. Membership, access and participation in the private community are restricted and as such, they are not open to everyone registered on the social network. The private community moderator must approve a membership request from intending new member before he/she can be admitted as a member of the private community. Furthermore, private community is treated as a community member with group membership status.

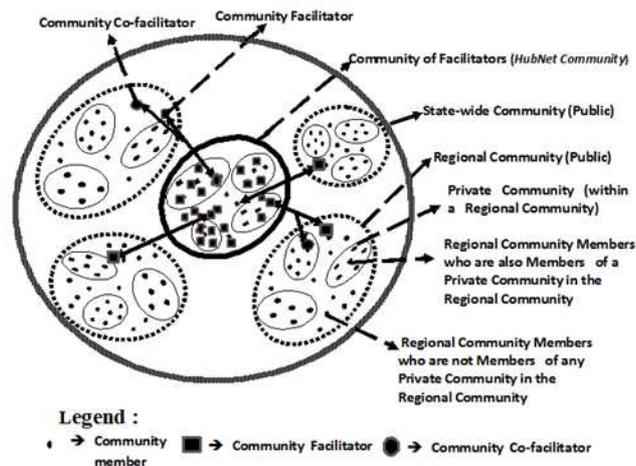


Figure 1a: The GeoHubNet Community Structure

As soon as the TWUINFAICE social network is hosted on the web, the HubNet community members create and moderate various regional geo-communities, such as Uyo Community, Eket Community, Abak Community, Ikot Ekpene Community, etc. These geo-communities are public communities. As such, every registered member in the social network is a member of all these public geo-communities. However, when a new member registers on the social network he/she will be assigned a default regional geo-community with respect to the region where he/she resides. Hence, whenever the member logs in he/she is located within the default geo-community. However, the member can navigate to other public geo-community as well as select a number of favorite geo-communities that he/she will visit frequently.

4.3. The Online Geo-Community Hub

Online Geo-Community Hub (OGCH) is created for each of the online geo-community. The components of the TWUINFAICE Geo-Community Hub are shown in Fig 2. Basically, Online Geo-Community Hub (OGCH) is a virtual space on the internet where community members, groups and institutions; community information, discussions and supports; as well as opportunities, services, resources, etc available in each local community are made visible and accessible. OGCH is built through the use of Facilitated Community Volunteered Information System (FCVIS) and Volunteers Management System (VMS). FCVIS includes Facilitated Volunteered Geographic Information System (FVGIS) which in this case, works with Google Maps mashup applications to enable volunteered geographic information to be rendered on localised community Google Maps. The Online Geo-Community Hub model is shown in Fig 2.

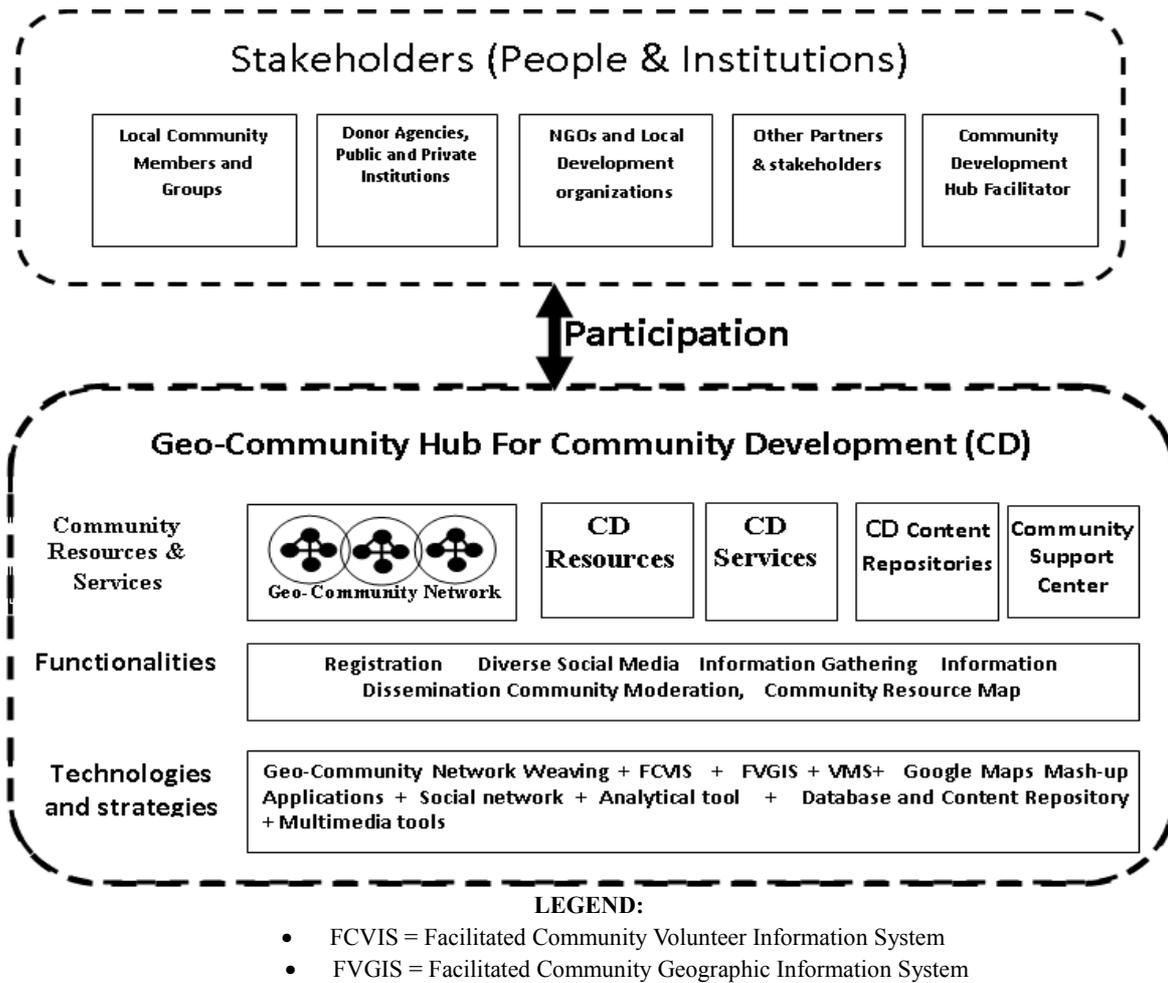


Figure 2: Model For Single Purpose TTWUINFAICE Community Hub

4.4. Scalability of the Online Geo-Community and the Online Geo-Community Hub

TWUINFAICE program will be extended to various countries in Africa by taking advantage of the reusability of the network groups and the scalability of the operating network models for geo-community networks, namely; the online GeoHubNet community Model of Fig 1a and the online geo-community hub model of Fig 2. The Online GeoHubNet community model of Fig 1a represents a single-purpose single-state hub-spoke model, as shown in Fig 3a. In that case, the model of Fig 1a (and also represented in the hub-spoke model in Fig 3a) is used to organise the local community members and institutions in a given state for a particular aspect of the multifarious concerns of community development. For instance, the single purpose can be entrepreneurship and the single state can be Akwa Ibom state in Nigeria.

Fig 3b represents a single-purpose multiple-state (and or multiple-nations) hub-spoke model for online GeoHubNet community structure. Again, the single purpose can be entrepreneurship, the multiple states can be the various states in Nigeria, and the multiple nations can be the various countries in Africa. Furthermore, the hub-spoke model can

be scaled to accommodate multiple purposes along with multiple states and nations as show in Fig 4.

A multi-purpose single-state hub-spoke model is shown in Fig 4a. In that case, the model of Fig 4a can be used to organise the local community members and institutions in a given state for different aspect of the multifarious concerns of community development. For instance, the multiple purposes may include entrepreneurship, education, community policing, environmental disaster management, roll-back malaria program.

Similarly, Fig 4b represents multi-purpose multiple-state (and or multiple-nations) hub-spoke model for Online GeoHubNet Community structure. In all, as the community development agenda increases, additional community members and institutions are attracted to the community network and the hub-firm organisation that facilitate the development program within the given state. In line with the hub-spoke model, the online community hub scales along as the community development agenda is increased.

Basically, the TWUINFAICE online community hub consists of two major components, the stakeholders and the geo-community hub, as shown in the collapsed model of Fig 5 which is for Single Purpose TWUINFAICE community Hub.

The collapsed model for multi-purpose TWUINFAICE community hub is shown in Fig 6. Essentially, in Fig 6, community network population scales up as more aspects of community development agenda are integrated into the hub. In addition, community hub functionalities, technologies, resources, services, supports, concerns, etc scale up as more aspects of community development agenda are integrated into the hub.

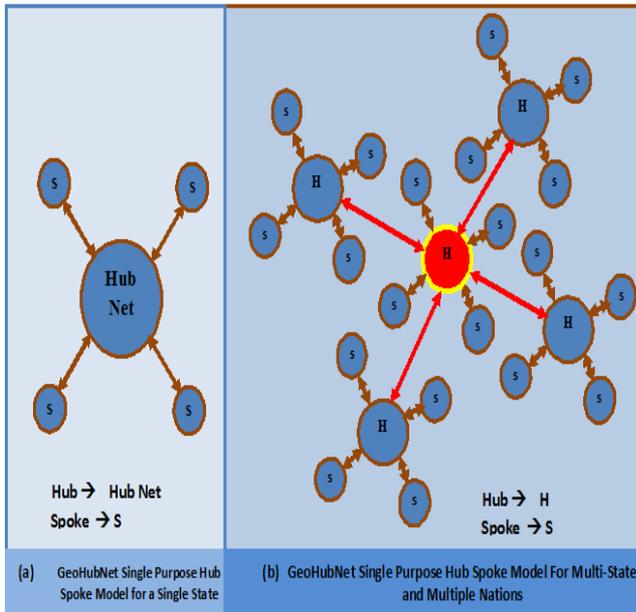


Figure 3: GeoHubNet Single Purpose Hub Spoke: (a) For a state (b) For multiple states

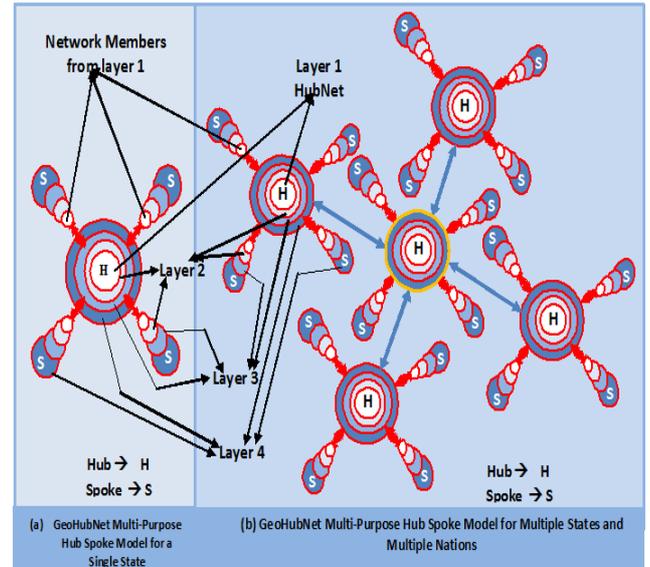


Figure 4: GeoHubNet Multi-Purpose Hub-Spoke: (a) For a state (b) For multiple states or multiple nations

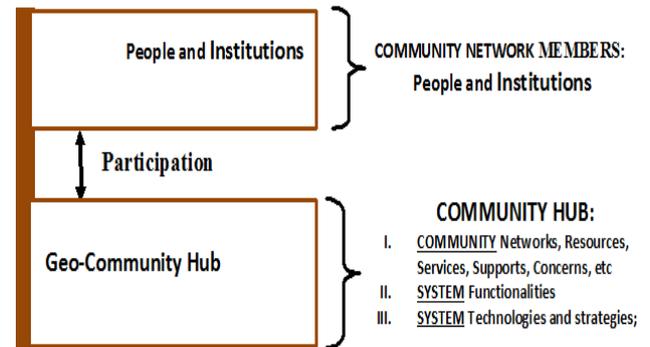


Figure 5: The Collapsed Model For Single Purpose TWUINFAICE Community Hub

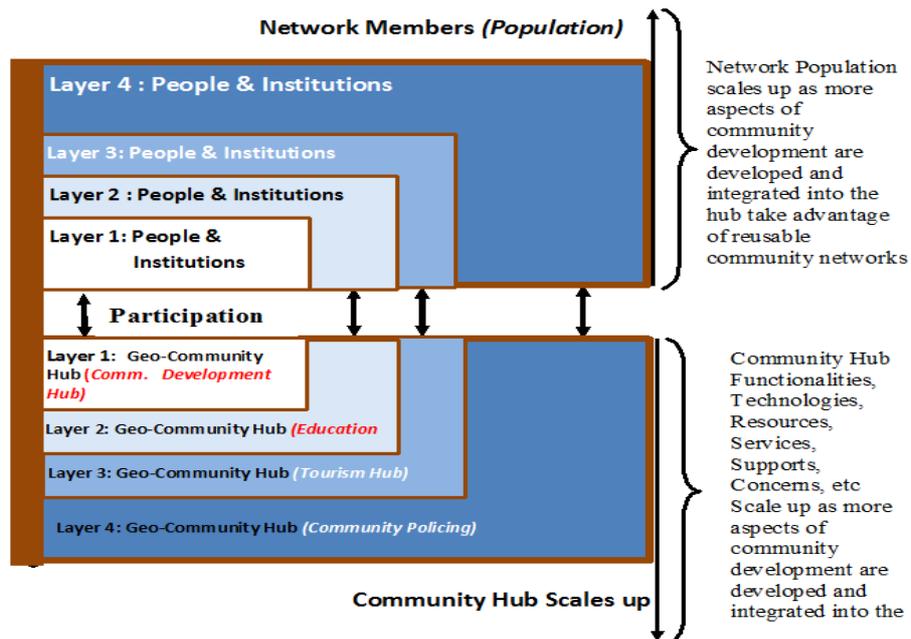


Figure 6: Collapsed Model For Multi-Purpose TWUINFAICE Community Hub

4.5. Populating the TWUINFAICE Network with Youths

4.5.1. The Grassroots Sports, Entertainment and Creative Arts Hub (G-SPEACAH) Initiative

Youths generally love and engage in sports, entertainments and various creative arts. Consequently, in order to get buy-in from the youths and hence populate the TWUINFAICE network with youths. The TWUINFAICE HubNet (that is, the TWUINFAICE facilitator organisation) will embark on all-out development of grassroots’ amateur, recreational and novitiate sports, entertainment and creative arts industry as they hold many opportunities for the teeming youth population. Specifically, TWUINFAICE HubNet in each state will create and run state-wide Grassroots Sports, Entertainment and Creative Arts Hub (G-SPEACAH). The G-SPEACAH will be used to locate, motivate, train, develop and profitable promote the creative and sporting potentials of large population of youths. G-SPEACAH will also provide recreational opportunities for the local community members who wish to hang out or participate for other nonfinancial gains.

Particularly, regular G-SPEACAH events such as competitions, concerts, exhibitions, workshops, awards, etc will be organised in the local communities. Initial funding of such programs is expected to come from sponsorship through philanthropic Corporate Social Responsibility (CSR) contributions from responsive corporate bodies within and outside the community. This approach is adopted because in most of the developing countries of Africa, CSR is mainly philanthropic whereby the corporate bodies sponsor community projects or community initiatives. At the same time the corporate bodies advertise their products and also boost their corporate social image in their host community.

Presently such grassroots and amateur, recreational, or novitiate platform for sports, entertainment and creative arts is rarely championed by the business oriented promoters in Africa. As such, millions of African youths are cut off from their passion due to lack of opportunity to showcase their talents. Although, there are many talent hunt programs but due to the competitive nature of such programs, majority of the youths in the amateur and novitiate categories are left out or they even excuse themselves from such opportunities due to poor self esteem. Rather, TWUINFAICE’s G-SPEACAH use collective entrepreneurship approach to create local ownership of the production and promotion processes, thereby lowering the entry conditions to make it conducive for amateurs or novitiates to participate actively. In all, eliminating barriers to participation is the guiding principle of TWUINFAICE’s strategies.

4.5.2. The G-SPEACAH User Innovation and Collective Entrepreneurship Initiative: The Philosophy and the Strategies

The popular Pareto’s 80/20 principle [60, 61, 62] and additional rough data obtained from survey, were used to develop a rough model of the market segments for the sports, entertainment and creative arts industries in the developing

countries of Africa (especially, Nigeria). Although the industries are booming and growing in many developing countries of Africa, the facts remains that only a small portion of the people who are and who ought to have been in the industries are actually making it and are earning the bulk of the benefits from the industries. Accordingly, the model (Fig 7) captures the distribution of those that love and have passion for the products , services or prospects in the industry and who to some extent participate in the industry either;

- i. as practitioners who are already earning reasonable amount of income and other benefits from the industry, (Category A);
- ii. as armatures, novitiates, etc who are still searching for meaningful benefits from the industry, (Category B);
- iii. as fans who have given up on searching for financial benefit but still patronise the products and services the industry has to offer, (Category C);

According to the market segment model of Fig 7, out of the whole people that love to partake in the listed industries with different degrees of prospects, only about 20% (Category A) are well off or are actually earning decent living or are deriving appreciable level of satisfaction in the industry compared with their actual expectations. Invariably, this top 20% fall under the professionals, semi-professionals, career practitioners, those that run the industry, and those that get the attention of producers, promoters, fans, celebrities, etc.

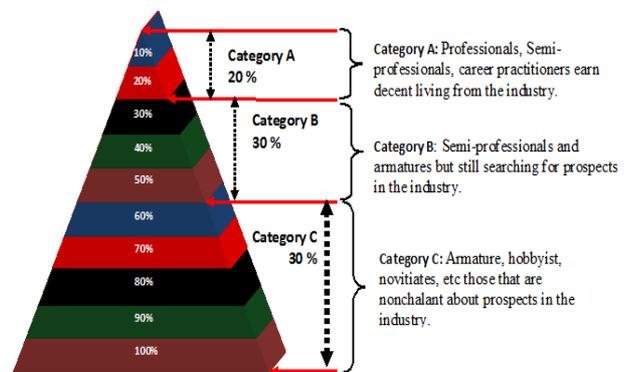


Figure 7: A Rough Market Segments Model For The Sports, Entertainment and Creative Arts Industries In The Developing Countries, Especially, Nigeria.

The next category in Fig 7 is Category B which forms about 30% of the total population. Category B consists of semi-professionals, armatures and novitiates that believe in the industry and are still searching for prospects in the industry. This category are the majority when it comes to seeking and taking advantage of any window of opportunity to learn , develop or showcase their skills and potentials for the industry. They top the list of those that engage in talent hunt programs. They are ready to invest their personal resources to develop themselves and are always looking for any opportunity to get the attention of the producers,

promoters, fans, etc. The Category B people are ready to perform or present their arts at little or no cost just to build their profile. In essence, Category B people are not well off or are not actually earning decent living or are yet to derive appreciable level of satisfaction in the industry compared with their actual expectations.

Yet is another category (Fig 7), the Category C. Category C is the most populous group with about 50% of the total population of participants in the industry. However, due to lack of requisite knowledge, skills, exposure, support, opportunity, etc the Category C people have become nonchalant about any prospect in the industry. They are at most fans of practitioners, or engage in the industry as pastime and merely patronise the products and services the industry has to offer.

Importantly, given the passion and population of these people in Category B and Category C, they are formidable asset and force for any industry. Whether they are armatures, novitiates, hobbyist or fans, their enduring weak ties to the industry and the iota of love and passion for the products and services in any industry make them important asset to the development of that particular industry. As such, G-SPEACAH initiative is targeting Category B and Category C which make up about 80% of the total population of the overall market.

In the G-SPEACAH strategies, category B people are expected to top the early majority adopters of G-SPEACAH initiative. This is because category B people are always eager and ready to take advantage of opportunity to showcase or develop their skills, potentials and career profiles. However, for the category C people, G-SPEACAH strategy will attract them into the program through the use of 'network and informational effect', 'rock bottom entry point', 'versatile and multifarious engagement scheme', and 'sense of ownership. Precisely, experts have noted that, when people are connected by a network, it becomes possible for them to influence each other's behaviour and decisions. Consequently, networks can serve to aggregate individual behavior and thus produce population-wide, collective outcomes [63]. Network effect' is a phenomenon whereby a good or service becomes more valuable when more people use it. Network effects exist when the benefit a consumer gets from owning a product increases as the number of other consumers of the products increase. 'Informational effect' manifest in some ways such a social validation and viral marketing.

In view of these facts, G-SPEACAH strategy will take advantage of peer group influence among youths and especially among the existing offline and online social networks of the early adopters. Also, with all-out promotion of the G-SPEACAH initiative through regular concerts, tournaments, seminars, etc that are rendered free of charge or at rock bottom fees, G-SPEACAH will attract large crowd and also G-SPEACAH will benefit from the social validation created by the fans of such events.

Furthermore, in order to run the G-SPEACAH program as collective enterprise, G-SPEACAH facilitators (the HubNet)

will establish state-wide free for all user innovators corporative society that is partly crowd funded. The collective funding will be complemented by CSR contributions to ensure that regular programs are organised to keep the tempo of engagement of the members at optimal level. It will also be noted that the cost of organising the G-SPEACAH events is expected to be minimal due to user innovation advantage and the facts that the people engaged are the non-professionals. Therefore, the exorbitant charges of professional are avoided. Furthermore, through the user innovation and collective enterprise network, sense of ownership will be built into the program. In that case, whether as an artist, a sports man or woman, or just a fan, there is some level of financial benefits, sense of ownership and sense of community that is prompting the network member to keep the G-SPEACAH vision alive. Equally, diverse flexible participation or engagement schemes will be developed to enable the members of the collective enterprise to get the best they desired from the G-SPEACAH program. For instance, in the case of the music industry, someone may just focus on song writing, another on singing, another on dancing, another on producing the songs, another on managing artists, another on organising concerts, another on marketing the products, etc. Each of these members play different roles that are suitable and convenient to them. Each of them will be paid for the role he/she plays in the overall music enterprise. In essence, the collective entrepreneurs are user innovators and user entrepreneurs. Altogether, they serve;

- as the producers (they write and produce the songs),
- as promoters and marketers (they promote, distribute and market the songs; by their numbers, viral marketing, social validation of the brand they attract more members, more advertisers, more investor, etc)
- as the consumers (they buy G-SPEACAH products and turn up in concerts and other programs)
- as well, they play other roles that are tantamount to user innovators and user entrepreneurs

4.6. TWUINFAICE Regional Economic Development Networks

4.6.1. Regional Entrepreneurship Initiative

In order to address the growing abject poverty in the developing countries of Africa, the TWUINFAICE program will develop robust regional entrepreneurship program in each state of every country where it operates. Specifically, the entrepreneurship program will seek to work with the various geo-community networks in each state to establish series of collective entrepreneurship platforms including cooperatives and social enterprises that will build regional entrepreneurship culture through training, business start-up supports and business incubation services. Furthermore, in order to get buy-in from the government, donors and other development agencies, the entrepreneurship drive of TWUINFAICE will align with regional or local entrepreneurship agenda. At the same time, the entrepreneurship drive of TWUINFAICE will align with

global realities, namely, the triple-win considerations, funding opportunities from across the globe, and the global competition which local businesses are exposed to due to globalisation.

4.6.2. Facilitated User Innovation and Collective Entrepreneurship Network

In order to translate the TWUINFAICE geo-community networks into regional economic development platforms TWUINFAICE hub-firm (the HubNet) will facilitate the formation and coordination of various user innovation and collective entrepreneurship frameworks such as cooperative societies, network marketing platform, crowd funding, e-commerce, warehousing, product and services distribution networks, etc. Specifically, the TWUINFAICE's G-SPEACAH initiative will translate its network into a youth-driven user innovation and collective enterprise network that uses a combination of cooperative society, network marketing, crowd funding, and other social business techniques to operate.

Remarkably, by design, TWUINFAICE's social networks are reusable social structures through close partnership with the state-wide HubNet firm. Consequently, the same TWUINFAICE's G-SPEACAH user innovation and collective enterprise network will be harnessed to run or establish regional enterprise for other areas such as Agropreneurship, Technology Entrepreneurship, etc.

4.6.3. Agropreneurship

There is abundance of rural areas with vast uncultivated green land mass in many African countries. Furthermore, there has also been growing demand by many African governments for job creation and youths' involvement in the Agric sector. Hence, TWUINFAICE program will seek to develop and popularise agro-based enterprises, otherwise called among the youths. The proposed Agropreneurship readily aligns with the development and economic growth agenda of many African countries. Through TWUINFAICE strategic partnership with experts from across the globe, strategic collective investment and corporative society platforms, such Agro-based endeavours will be developed, popularised and made very attractive among the youths and potential investors. In all, TWUINFAICE hub-firm (facilitator organisation) will facilitate the creation and coordination of regional collective agropreneurship enterprise for the various local communities it supports.

4.6.4. Technology Entrepreneurship and Technology Transfer

A survey of existing literatures indicates that Nigerian authors, especially those in universities, have enormous publications each year but these publications do not translate to any significant commercial product or services. In addition, there is also the general complain of growing population of unemployable graduates who do not have the basic industrial skills required in their specific discipline. TWUINFAICE will establish Community Technology Entrepreneurship And Technology Transfer Hub

(C-TEATTH). C-TEATTH will establish strategic partnership that will include among others, students associations, tertiary and research institutions, vocational and skill acquisition centres, professional bodies, industries, government agencies, etc. TWUINFAICE hub-firm (facilitator organisation) will use the collective entrepreneurship approach to institute profitable ventures for most of the service providers in the C-TEATTH scheme.

5. Brief Outline of Other Research Interests in the TWUINFAICE Research Agenda

The statewide layout of the TWUINFAICE network makes it easy for the HubNet to facilitate the reusability of the local community networks for other development concerns other than entrepreneurship. Some of the other TWUINFAICE research interests which will be run on the same TWUINFAICE network are hereby presented. In this section, Nigeria is used in most of the examples cited. In any case, the ultimate target of TWUINFAICE initiative is to cover the whole of African nations. However, by design, the project will start in selected states in Nigeria and then gradually extend to other states in Nigeria and then to the states in the other countries in Africa.

5.1. Community-Based Quality Education Network

In Nigeria for instance, for several years, the quality of education has been declining leading to unacceptable low academic performance, high level of functional illiteracy, growing population of unemployable graduates. The focus here is to enhance the quality of education through community-based approach. The program will use a facilitated community-based social e-learning and education enhancement network to identify and address the issues that pertain to education in each local community. The TWUINFAICE geo-communities will be harnessed to deliver this program to each of the local communities where TWUINFAICE programme is implemented.

5.2. Community Transportation and Tourism Enhancement Network

Geo-community fleet management hub is a form of social web-based community hub, a melting-pot where people, organisations, resources and services pertaining to fleet management in any given geo-community are made visible and accessible. Meanwhile, issues concerning city wide land fleet management system includes among others; fleet booking, fleet maintenance, fleet operators' management, customers and customers' feedback management, fleet hiring, fleet tracking, consignment tracking, fleet purchasing, etc. The focus here is to enhance free movement of people, goods and services in any local community and also to develop and promote the tourism industry in each local community. Equally, community tourism and allied

resource and services are made visible and accessible on the geo-community transportation and tourism hub. Importantly, the program will use facilitated community transport and tourism enhancement network to populate the geo-community transportation and tourism hub and to identify and address the issues that pertain to transportation and tourism in each local community. The TWUINFAICE geo-communities will be harnessed to deliver this program in each of the local communities where TWUINFAICE programme is implemented.

5.3. Build Community Cultural Heritage Sustainability and Enhancement Network

There are several efforts by individuals, groups, public and private institutions to promote and perpetuate local languages, cultural heritage, thoughts and legacies. For instance, in Imo state in Nigeria, there is annual Odenigbo lecture championed by Owerri Catholic Archdiocese. There is also annual Ahiajioku Lecture that is championed by Imo State government. All these lectures are meant to create public awareness and to perpetuate local language, cultural heritage, thoughts and legacies of Igbo people.

Again, Very Rev. Fr. Prof. Emmanuel M.P. Edeh (C.S.Sp, OFR,) is presently creating awareness for his thought provoking work on Igbo metaphysics. Furthermore, Chinua Achebe, the luminary icon passed on in 2013 but his legacies still remain and should be passed on to the generations yet unborn. Consequently, the focus here is to provide facilitated online community hub for local language, culture, arts, technologies and hall of fame (heroes or who is who) in each of the local communities. Again, the emphasis here is to build a one web space (spot) where all the diverse initiatives concerning the promotion of local languages, culture, arts, technologies and hall of fame in each of the local communities are made visible and accessible. Importantly, the TWUINFAICE geo-communities will be harnessed to implement the program in each of the local communities where TWUINFAICE programme is implemented.

5.4. Community-Based Environmental Disaster Prevention and management Network

In 2012, Nigeria witnessed the worst flooding in many states across the nation. More flooding has been forecasted for the nation in 2013. Hence, there is search for institutional structures to effectively handle this environmental disaster. The TWUINFAICE focus here is to establish a community-based facilitated environmental disaster prevention and management scheme. Importantly, the TWUINFAICE geo-communities will be harnessed to implement this program in each of the local communities where TWUINFAICE programme is implemented.

5.5. Community Health Services Enhancement Network

Health service delivery is very poor in many developing countries of Africa, especially, Nigeria. Consequently, mortality rate is quite high when compared to the developed

nations across the globe. Again, in Nigeria, there are several health services and programs that are absolutely free or highly subsidised. However, most of these programs rarely impact meaningfully on the health indices of the various communities in Nigeria. The TWUINFAICE focus here is to provide facilitated community-based health and bioethics informatics network that will help to improve on the health service delivery and ultimately reduce the mortality rate in each local community it supports. The TWUINFAICE geo-communities will be harnessed to implement this program in each of the local communities where TWUINFAICE programme is implemented.

5.6. Community Security Enhancement Network through Facilitated Community Policing Scheme

Nigeria police launched a pilot police-initiated police-driven community policing scheme in 2004. Though the police recorded some success stories but given the growing tension and civil unrest in various communities across the country, it requires a more effective community policing scheme to tackle the insecurity problems. The TWUINFAICE focus here is to establish facilitated community policing scheme for effective community policing across the country. The TWUINFAICE geo-communities will be harnessed to implement this program in each of the local communities where TWUINFAICE programme is implemented.

5.7. Urbanisation Youth Bulge (UYB) and the TWUINFAICE Rural Urbanisation and Transformation Entrepreneurship Initiative (RUTEIN)

Due to lack of employment and basic amenities in the rural communities, there is mass exodus of people, especially the youths to the cities. Meanwhile, most of the cities in the developing countries equally have similar poor or limited facilities to support the influx of people. Eventually, most cities in the developing countries suffer from congestion and urbanisation youth bulge. Urbanisation Youth Bulge (UYB). is a situation whereby a community is over populated with youths due to influx of people searching for better or improved living conditions. In order to address the UYB, TWUINFAICE program proposed Rural Urbanisation and Transformation Entrepreneurship Initiative (RUTEIN). RUTEIN is a rural entrepreneurship scheme that will seek to cite its businesses in the various rural communities in each state of the country where TWUINFAICE program is implemented. First, through the user innovation and collective entrepreneurship networks in the state, each of the geo-community will be assessed to determine the best business it can comfortable support in view of availability of raw materials, access to market, availability of land for large scale farming, mobility of resources, etc. Furthermore, user innovation and collective entrepreneurship networks also runs warehousing and product distribution services. Through these services,

RUTEIN facilitator can improve on the supply of essential products and services to the rural communities thereby reducing the need for people to travel to the cities in search of such products and services. Finally, after citing a major business in a locality, other complementary businesses will be established with time, thereby increasing the ability of the local community to comfortably support more people.

5.8. Community-Diasporas Alliance Network (C-DAN)

African Diasporas are source of innovative and entrepreneurial solutions to poverty and economic development in Africa. Yet, the diplomatic and developmental potentials of African Diasporas remain largely untapped [64]. In line with USAID Diaspora Networks Alliance (DNA) initiative, TWUINFAICE will establish Community-Diasporas Alliance Network (C-DAN) to leverage the vast resources of Diaspora communities, to intensify the flow of knowledge and resources of Diaspora to their communities in their home countries so as to promote economic and social growth. TWUINFAICE will use its C-DAN platform to deploy the six strategic Diaspora engagement mechanisms identified by USAID and its DNA partners, namely, (i) Diaspora Philanthropy, (ii) Diaspora Volunteer Corps, (iii) Diaspora Direct Investment (DDI), (iv) Diaspora Capital Markets, (v) Diaspora Tourism & Nostalgic Trade, (vi) Diaspora Advocacy & Diplomacy [64]. Furthermore, TWUINFAICE's C-DAN initiative will provide a fail-safe and reformation platform for community members in the Diaspora that are deported or who wish to return and settle in their home country.

6. Conclusion and Recommendations

6.1. Conclusion

The work presented in this paper is a postdoctoral research agenda for community informatics social technologies embodied in the acronym TWUINFAICE and designed to facilitate triple-win development in the developing countries of Africa. The general idea of TWUINFAICE strategies as presented in this paper are that TWUINFAICE initiative seeks to

- develop facilitated user innovation and entrepreneurship social technology solutions for African nations to turn their youth bulge into blessing;
- develop and employs network models to setup and run state-wide reusable and scalable social structures in each of the country where the TWUINFAICE initiative is implemented;
- reuse the TUINFAICE social structures in each local community in each state to address different triple-win community development agenda in the state;
- uphold user innovation network and collective entrepreneurship as the bedrock of its strategies for realising the triple-win objectives across Africa;

- target the youths and secure their early majority adoption of the TWUINFAICE user innovation and entrepreneurship network;
- use 'network and informational effect', 'rock bottom entry point', 'versatile and multifarious engagement scheme', and 'sense of ownership techniques to attract buy-in from wide population of their target audience;
- use crowd funding as a fast way of raising start-up fund for the user innovation and collective entrepreneurship.

6.2. Recommendations for Further Works

The success of TWUINFAICE initiative lies on the ability of the facilitating organisation (the HubNet) to develop, deploy, employ, maintain, and enhance, the tools and strategies presented in this paper. Again, by design, the scope of each HubNet is within a state in a country where it operates. Consequently, network of HubNet organisations is needed to cover the various states in each country where TWUINFAICE program is implemented. Again, within each state, different expertise are needed to effectively facilitate the diverse developmental agenda entailed in the TWUINFAICE initiative. Hence, again, cross-functional team along with strategic alliance with requisite partners are required for effective running of the TWUINFAICE program in each state. The formation, composition, organisation and business structures of such cross-functional teams and strategic partnerships are burning issues that require further studies in order to proffer effective solution to them.

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