Challenges and Success Factors for Knowledge Sharing Using Information and Communication Technologies (ICTs) in Development Projects

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The Asian Conference on the Social Sciences 2019
Official Conference Proceedings

Abstract
'Wicked nature' of major social, economic, health, and education, and environmental problems has posed significant challenges that needs to be tackled with focused dialogue and knowledge sharing from wide range of settings and actors whose goal is the same. Unfortunately, these perspectives are scattered in disparate locations: in the mind of marginalized people, government staffs, development practitioners, and academics. Knowledge sharing across this wide range of space and stakeholders can be fostered by ICTs that have been deployed by many development projects. However, although these projects invest heavily in ICTs, they neglect management of context-dependent knowledge, creating barriers in the process of knowledge sharing. Knowledge withholding because of political gain, territorials behaviours, and norms of secrecy is one of the main challenges in knowledge transfer among a community of practice. A member of community fears to share their knowledge since knowledge is regarded as a power bringing extrinsic reward to its owner, since they have particular attachment to the knowledge, and since norms do not embrace mistake, thus, they conceal the full story of lessons learned. This fear is based on a contestation of interest between 'I' and 'Us'. Therefore, in order to maximize the utilization of ICT for knowledge sharing in development projects, this paper aims to identify challenges faced by community of practice in knowledge sharing using ICTs in independence and interdependence lens and to determine success factors to tackle these challenges. This paper uses meta-ethnography approach with a total of 16 concepts from 65 articles identified.

Keywords: communication technology, knowledge sharing, development project

Introduction

'Wicked nature' of major social, justice, economic, health, education, and environment problems has increased (Hulsebosch et al., 2006) and posed significant challenges that needs to be tackled with focused dialogue and knowledge sharing from wide range of settings and actors with mutual objectives (Clappison et al., 2013; Harvey et al., 2013). Unfortunately, these perspectives are scattered in different corners: in the minds of marginalized people, government staffs, development practitioners, and academics (Harvey et al., 2013).

Capturing and facilitating knowledge sharing across this wide range of space and diverse sets of people can be fostered by communities of practice (Sethi, 2017) or a learning network (Gumann & Mullinax, 2015) and their utilization of ICTs (Clappison et al., 2013; Howland et al., 2015). The concept of "communities of practice" is referred to a group of people who implement joint activities, exchange knowledge, deepen their expertise, share common objective and practice through a routine interaction with one another (Sethi, 2017).

ICTs enable these communities to share knowledge and access information in the non-physical space (Howland et al., 2015). However, although development interventions invest heavily in ICTs, they neglect management of context-dependent knowledge, creating barriers in the process of knowledge sharing. Knowledge sharing cannot automatically happen with ICTs alone. The platforms developed should be appropriate with context and knowledge sharing process where they were deployed (Janus, 2016).

Therefore, in order to maximize the utilization of ICTs for knowledge sharing in development projects, this paper aims to identify challenges faced by community of practice in knowledge sharing using ICTs in independence and interdependence lens and to determine success factors to tackle these challenges.

Methodology

The paper used a meta-ethnography approach developed by Noblit and Hare (1988). During meta-ethnography process, studies were analyzed while building new interpretations over multiple studies (Atkins et al., 2008). Meta-ethnography is interpretative rather than aggregative and consists of seven stages, i.e., (Noblit and Hare, 1988):

1. Getting started. This paper aims to answer the following questions:

a) What are the challenges of knowledge sharing using ICTs influenced by independence and interdependence relationship in a community of practice or a learning network?
b) What are success factors for these challenges?

2. Deciding what is relevant with initial interest of study. Studies which are relevant to this study are retrieved from ScienceDirect electronic database and Knowledge Management for Development Journal using keywords such as: "knowledge sharing", "ICTs" and "development project". Articles were restricted to

papers written in English published from 1998 to 2017. There are 168 articles discovered. After screening through abstracts and conclusions, a total of 35 articles are found which are then used in the next stage.

3. Reading the studies. Throughout this process, 35 articles have been read repeatedly. The key concepts ("challenge" and "success factors") are noted. There are 14 concepts which become the raw data for the synthesis (Campbell et al., 2003) obtained from those 35 articles. This paper also explains the concept of each other.

4. Determine how the studies are related. This stages involves creating a table that contains the concepts from 35 articles which can be seen in Table 1, Table 2, and Table 3. In this stage, relationship between studies must be understood and initial assumption should be made. It can be concluded that a lot of the concepts are comparatively similar, but some concepts are not directly comparable and some concepts are in opposition, so it can be assumed that the studies are related in reciprocal translation, refutational translation and line of argument with second-order construction.

5. Translate one study with another. In this stage, the explanations of each study on challenges and success factors are considered. Concept from one study is translated to another study.

6. Synthesis the translation. During this stage, concepts found were compared, refined, and collapsed, turning into something more meaningful than the others. For example, Clappison et al. (2013) said that one of the success factors for sharing knowledge is having "facilitator". They said that this concept is about having a particular person who facilitates communicate and translates information. This particular person has also been implied by Howland et al. (2013) by stating the use of "facilitator" would bring tacit and explicit knowledge from community members.

7. Express the synthesis result. This paper is an expression of the synthesis.

Discussion

Based on the synthesis, the results showed 14 concepts for challenges and success factors for knowledge sharing using ICTs in development projects. The synthesis findings are written in four parts: (1) organizational and networking (2) human (3) technology (4) process.

Organizational and networking

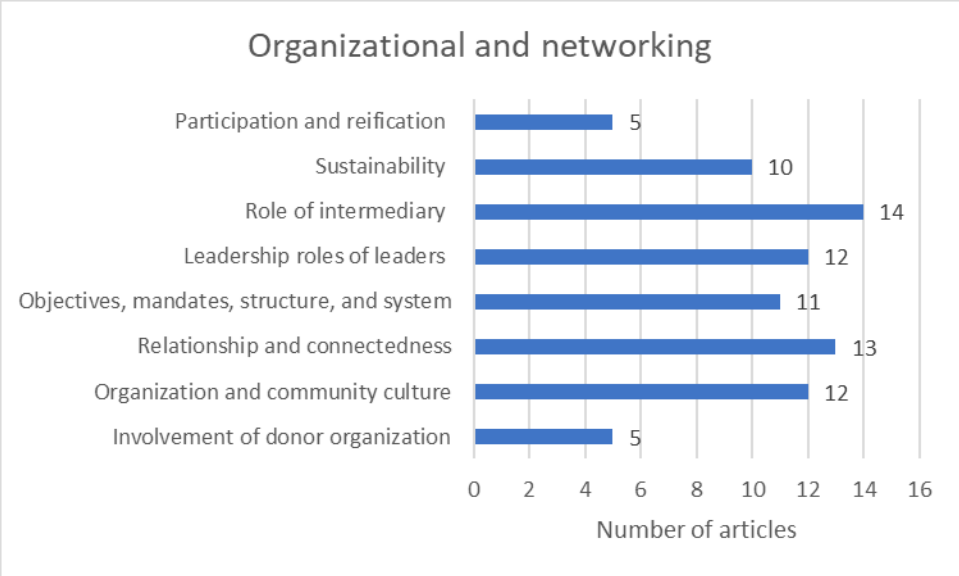
Involvement of donor organization

A concept in 5 out of 35 articles relates to how involvement of donor organization influences communities in various ways. It could complicate the objectives of the communities because donor organizations expect them to deliver specific pre-determined outcomes which can be a challenge to ensure learning process within the community (Fullan et al., 2006; Gumann & Mullinax, 2015; Hulsebosch et al., 2016). Community members might be reluctant to share their experiences to other members

or donors, particularly if these include failures or 'proprietary' information (Coninck, 2009; Gumann & Mullinax, 2015).

Donors organizations which take multiple roles (sponsor, participant, and advisor) would create inherent contradiction and a confusion of their roles (Hulsebosch et al., 2016). Donors' advice can be mistakenly considered as an instruction by CoP members (Hulsebosch et al., 2016). This situation leads the 'advised' or 'directed' network CoP miss the inherent purposes of knowledge sharing, which are collaboration, learning process (Clappison et al., 2013), and creating a horizontal relationship (Hulsebosch et al., 2006).

Table 1. Concepts for organizational and networking



Involvement of donor organization also influences power relationship over CoP (Hulsebosch et al., 2006) and how knowledge is shared within CoP members. Member of CoP which is more skilled or expert in creating innovation and finding best practice may hide their experience to reinforce their status (Webster et al., 2008) as leading organization and main funding recipient within the CoP. Competition for fund, indeed, is the reality of development projects (Hulsebosch et al., 2006), especially when multiple organizations involved in a community working on the same issue to achieve mutual goal. It is an attempt to garner what leverage they can because knowledge is considered an asset for them to attract funding (Webster et al., 2008). In addition, a member possessing knowledge can increase other members' dependency on them (Webster et al., 2008).

Community members needs to set clear roles and expectations under the presence of donors (Gumann & Mullinax, 2015) and donor organization should be flexible and not interfere with CoP's management (Sethi, 2017). Baseline study should be held at the beginning of initiation and evaluation to monitor any changes should be separated from learning process (Yadav et al., 2015; Sethi, 2017).

Organizational and community culture

A recurring theme in 12 articles was organizational culture and level of interdependence which defined community of practice (Henderson, 2005; Clappison et al., 2013). Culture, community's interaction style (open or closed) and existing disposition of power can enable knowledge sharing process or slowing the process down (Coninck, 2009; Yadav et al., 2015; Sethi, 2017; Cranston & Pels, 2017). Some communities have the tendency to be hierarchical, closed, and formal in nature which is different from what is expected for a knowledge sharing community using ICTs that is egalitarian, open, and informal (Doodewaard, 2006). Some of impeding factors which hinder the flow of knowledge are the following:

1. Strong hierarchical environment and top-down approach (Henderson, 2005; Carter et al., 2009; Yadev et al., 2015) in which community members consider knowledge is placed at the top hierarchy, creating barrier to effective coordination and knowledge across CoP (Barrett et al., 2005).

2. Bureaucracy and organizational discouragement (Yadev et al., 2015; Sethi, 2017). Members representing their organizations to join CoP might be expected to be open with their fellow within the same organization during discussion, but are expected to be quite during deliberation outside of the organization, hindering knowledge exchange within CoP (Webster et al., 2008).

To openly share information within an organization can be a challenge as well. In some contexts, stored data and information cannot be shared automatically due to bureaucracy process. Lack of access to data and information leads to a 'knowledge fortress mentality' in which people keep their knowledge asset from outsiders, although these data and information are not used by their organization (Karetji, 2005).

3. Conflict of avoidance (Yadev et al., 2015). Members of CoP may choose to engage in knowledge sharing process to maintain interpersonal relationship, protect other members' feeling, minimize discomfort, and avoid disruptions or conflict. The element of reciprocity also influences the likelihood of members to opt to share their knowledge. Members who have received shared knowledge previously may feel duty-bound to reciprocate by sharing their knowledge whenever possible with those who have provided the knowledge or assistance. Member whose requests for knowledge or assistance are reprimanded may feel entitled to withhold knowledge (Webster et al., 2008).

4. Relationship of power between members of CoP that can be reflected through how power is distributed and exercised (Cranston & Pels, 2017). Recognizing one's error can lead to defensive behavior (Coninck et al., 2009). Engrained culture of practice in which people do not embrace culture of freely sharing knowledge with peers and public (Yadev et al., 2015; Hulsebosch et al., 2015)

A CoP with enabling environment would provide a safe space for genuine discussion to build their knowledge and capacity (Mwakalinga, 2005; Handerson, 2005; Cranston & Pels, 2017; Ortiz-Echevarria et al., 2017). Decision-making within a CoP should be decentralized regarding priorities of the network by forging a horizontal, nonhierarchical, open, unregulated and informal network with bottom-up approach,

little organizational structure, and vertical lines communication, giving equal right to members to express their opinions and share experiences regardless of authority levels they have in organization they represent with their own devices (Mwakalinga, 2005; Handerson, 2005; Guzman, 2007; Cranston & Pels (2017); Ortiz-Echevarria et al., 2017)

Relationship and connectedness between community members

A CoP can become an effective network when members have a sociability linked with medium solidarity in which communication is regularly performed (Junne & Verkoren, 2005; Fullan et al., 2006; Carter et al., 2009; Clappison et al., 2013; Sethi, 2017). How members of CoP interact and the kind of relationship already existing between members influences how knowledge is shared and the efficiency of the resulting knowledge exchanged (Adam & Urquhart, 2009). A community with a strong existing relationship can be an important element in which members have known each other before starting knowledge network (Kapma, 2007; Clappison et al., 2013). Although community members are friendly and act like family (Doodewaard, 2006), domineering friendly nuance often leads to difficulties in agreeing on priorities and doing tasks or divisions to cooperate with each other (Carter et al., 2009)

Platforms providing relative anonymity in regard to voice, gender, and social status might be able to break down traditional group norms (Sethi, 2017). However, anonymity could be a challenge for building trust because contributors do not know their audience (Sethi, 2017) and contributors should show their credibility (Doodewaard, 2006). Building trust by encouraging an open knowledge sharing platform is an important element to the success of community collaboration and active participation with healthy relationship (Henderson, 2005; Hulsebosch et al., 2006; Doodewaard, 2006; Guznam, 2007; Gumann & Mullinax, 2015). It is important to stay connected to the community members to understand their responses to the ICTs deployed (Yadev et al., 2015).

Objective, mandate, structure, and system

A community of practice is a system of relationship and made up of community objectives to shape a collaborative culture rather than competition (Junne & Verkoren, 2005; Greenwood et al., 2017). Although different way of thinking, motivations, priorities, approaches, and knowledge base of community members (Hulsebosch et al., 2006; Nascimbeni, 2007; Sethi, 2017) provides an opportunity to draw on wide range of knowledge base, it can be a challenge to provide appropriate knowledge to each member (Clappison et al., 2013) and effective organization practice (White et al., 2014) due to different values CoP members bring and what knowledge is relevant for their priorities (Nascimbeni, 2007).

Based on a spectrum of formality and informality, members' relationships might be defined in detail, framed by structure and operational procedures, or nothing more than undocumented assumptions and past routines shaping the way the CoPs operate (Cranston & Pels, 2017). There is no specific blue print for the best structure and network dynamic (Hulsebosch et al., 2006; Fallah & Addai, 2017). Structure of the network should not be the focus of an intervention and should be explored based on

the objectives of the community and the nature of members relationship (Hulsebosch, 2006).

Communities should ensure that all members have identified and verbalized their intentions to participate to CoP develop stakeholder alignment and have a full understanding of what the CoP entails (Johnson & Khalidi, 2005; Sethi, 2017). It is important for a CoP to regularly connect activities to the larger learning goals and take responsibilities which they develop themselves in a flexible manner to respond changing environment and evolving needs (Henderson, 2005; Gumann; 2015).

Some CoPs might prefer less degree of formalization (organic, open, and informal) without organizational structure, brand, and office and depend on the internet to make them 'a network' focusing more on the relationship between people (Kapma, 2007). However, these communities might evolve to be more formal and governed with a legal entity because they need legitimation attract more funding and become more influential to achieve their objectives (Hulsebosch et al., 2006; Cranston & Pels., 2017).

Leadership roles of leaders

Commitment for sharing knowledge using a technology requires initiative and full support from the top management (Karetji, 2005; Johnson & Khalidi, 2005; Winslow, 2005; Henderson, 2005; Pels, 2009; Jensen, 2015; Yadav et al., 2015; Fallah & Addai, 2017; Greenwood et al., 2017; Ortiz-Echevarria, 2017). They can emphasize the benefit of knowledge sharing and treat participation as an important element by engaging with CoP's activities and or motivating their staffs to engage with CoP's activities (Winslow, 2005; Jensen, 2015; Fallah & Addai, 2017; Greenwood et al., 2017).

Leadership roles is not about a person with authority. These roles can be served by champions from non-management staff, who have leadership quality, strong technical capacity, passion to share their reference, energy and time to commit and devote to the CoP (Hulsebosch et al., 2006; Johnson & Khalidi, 2005; Fullan et al., 2006; Ortiz-Echevarria et al., 2017). Within a CoP, champions serve as a core group to engage members and or outsiders with different perspectives, balance clear challenge and manageable realistic steps (Hulsebosch et al., 2006; Fullan et al., 2006; Greenwood et al., 2017)

Role of intermediary

Junne & Verkoren (2005), Barrett et al. (2005), Henderson (2005), Johnson & Khalidi (2005), Hulsebosch et al. (2006), Coninck (2009), Clappison et al. (2013), Harvey & Catherine (2013), Gumann & Mullinax, 2015; Howland et al. (2015), Fallah & Addai (2017), Sethi (2017) recognize that intermediaries are one of key success for knowledge sharing activities. Selection of intermediary should be tailored specifically to the community, reflecting the complexity and structure of a network. The following are the types of intermediary found in the studies:

1. A facilitator who facilitates communication, keeps members 'hooked' into the network, use both diplomacy and conflict mitigation skills.

2. A technology steward who is responsible for members technological resources whose function is different from other intermediaries who facilitate and broker knowledge. This can be complemented by another intermediary who possess social and organizational skills since most of CoPs do not only require technical assistance
3. A knowledge broker who translates information, bringing tacit and explicit knowledge from network.

Intermediary should moderate interaction in balanced manner to create a relevant interaction by maintaining quality of contribution while balancing participation (Junne & Verkoren, 2005; Fullan et al., 2006). Moderation should not be used as a censorship mechanism, but rather as means to encourage knowledge sharing process (Henderson, 2005). An over-moderated community would inhibit participation of members by excluding genuine exchange, resulting in a stifled discussion (Junne & Verkoren, 2005; Henderson, 2005).

Sustainability

Community sustainability refers to their ability to continue existing in autonomous manner and flourish beyond their initial funding after donor organization has departed (Mwakalinga, 2005; Hulsebosch et al., 2006; Fullan et al., 2006; Rao, 2008; Cranston and Pels (2017). There are three attributes of sustainability that can be indicators for a successful CoP, which are network sustainability, political sustainability, and financial sustainability.
Network sustainability refers to the ability of CoP to deal with membership issues (Hulsebosch et al., 2006). A CoP with volunteer participation depends on social capital rather than funding (Kapma, 2007; Cranston & Pels, 2017). Political sustainability refers to the ability to build its institutional and political legitimacy by fostering strategic alliance, leveraging the relationship for dealing with development issues, and speaking for wider constituency base through policy impact and policy change (Johnson & Khalidi, 2005; Hulsebosch et al., 2006)

Financial sustainability refers to the ability of CoP in organizing resources for their activities through network resource (e.g. member fees and service fees) and grant (e.g. from donor organization and private corporation (Hulsebosch et al., 2006). Inadequate funding has been one of the greatest challenges for a CoP to continue existing (Junne & Verkoren, 2005; Oronje, 2006; Howland et al., 2015). A CoP has a better chance of continuity by diversifying sources of funds (Johnson & Khalidi, 2005).

Participation and reification

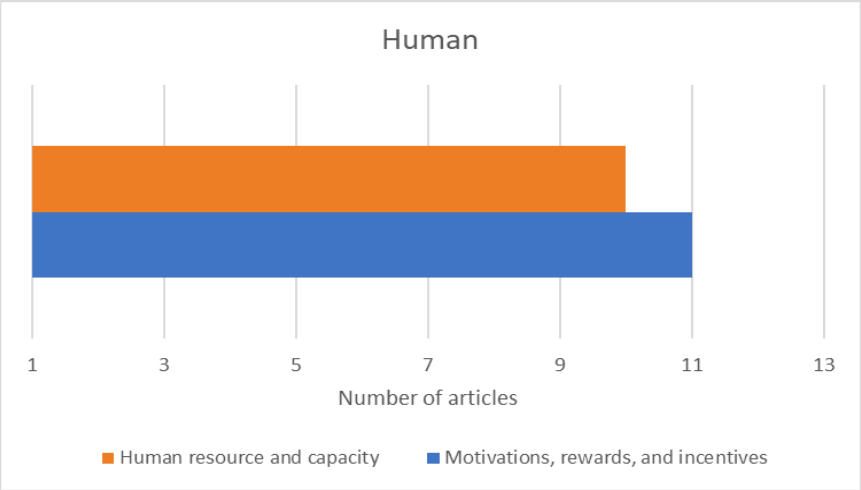
Some CoPs might aim for membership outreach and new linkages by attracting active members and moving the championship roles away from core group of members. The purpose of this effort is to balance between internal exchanges and external view point, to increase sense of belonging and connectedness of members, and to increase opportunities for funding (Junne & Verkoren, 2005; Hulsebosch et al., 2006; Fullan et al., 2006; Fallah & Addai, 2017). Limited networking due to lack of heterogeneity has limited the dissemination of knowledge to the targeted audience (Oronje, 2006).

However, there are numerous concerns related to too broad and diverse community to enable meaningful exchange. Some CoPs might prefer smaller and more confidential

forum where they are able to openly and to have more meaningful exchange. The setbacks of smaller forum are that members are homogenous, limiting innovative capacity because of less varied frames of references and streams of thought (Junne & Verkoren, 2005). Furthermore, they miss the opportunity to share knowledge between a larger numbers of people (Howland et al., 2015).

Human

Table 2. Concepts for human



Motivations, rewards, and incentives

Voluntary participation is highly appreciated when individuals create and join CoPs. Active participation and commitment followed by passion and enthusiasm by community members contributes greatly to the process of knowledge sharing (Ortiz-Echevarria et al., 2017). Howerver, voluntary motivation has its limitation because this kind of participation does not provide direct personal benefit to the members, except for inherent satisfaction in sharing with others (Yadav et al., 2015). Four literatures (Junne & Verokeran, 2005; Doodewaard, 2006; Yadav et al., 2015; Howland et al., 2015) provide examples in which community members contribute to knowledge sharing activities due to external imposition and mandate set by entities with political and financial power.

Voluntary motivation can result in low level of participation and or decreased participation caused by lack of incentive for engagement, lack of motivation to contribute content, barriers to participation, low interactivity, lack of feedback and limited sharing of knowledge (Munthali et al., Winslow, 2005; Junne & Verkoren, 2005; Clappison et al., 2013; Yadav et al., 2015; Devare et al., 2017; Sethi, 2017). Network can dissolve when level of participation decreases and the incentive to join a CoP is removed (Junne & Verkoren., 2005; Clappison et al., 2013; Yadev et al., 2015). Under these circumstances, it is important to provide a sense of gratification to community members for their contribution by applying appropriate incentives (Henderson, 2005; Yadev et al., 2015)

Sethi (2017) emphasizes that it would be helpful to understand diverse individuals' motivations when creating and joining CoPs to shape the network in a way that would

address those intentions. Seven articles mentioned by Sethi (2017) have identified possible motivations to participate and contribute to CoP. Following are various motivations and possible incentives that can be applied:

- Extrinsic motivation, such as personal development, professional identity, capacity development, status and career advancement (Yadev et al., 2015; Sethi, 2017)
- Intrinsic motivation, such as reputation, altruism, and moral obligations to share knowledge (Yadev et al., 2015; Sethi, 2017)
- Interpersonal factors which consist of liking, emotional benefits, feeling of attachment to community, shared values or vision, and networking (Yadev et al., 2015; Sethi, 2017)

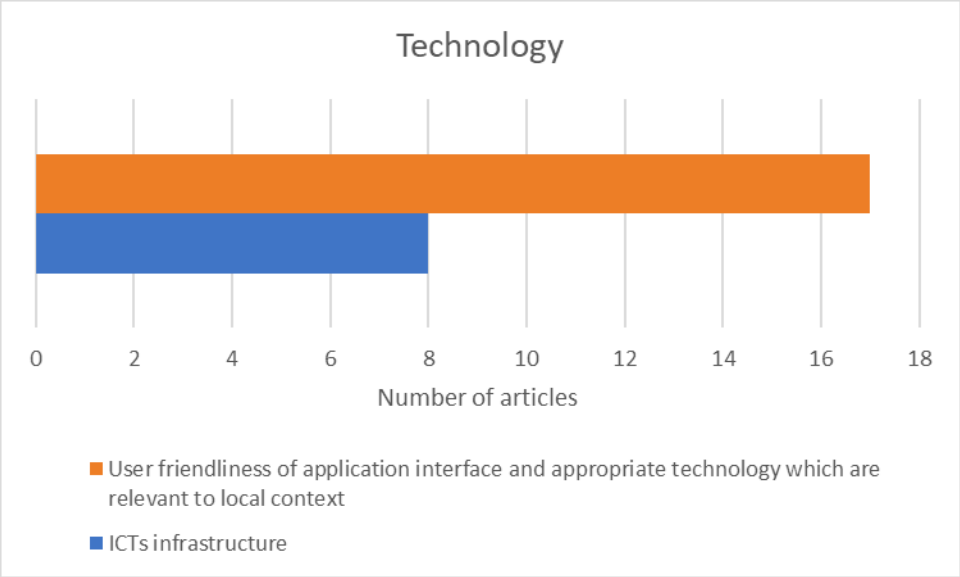
Various rewards can be applied for community members based on their motivation to participate and contribute (Yadev et al., 2015). Extrinsic and intrinsic motivations can be rewarded by a competitive system offering championship or a system which provides monetary gain (Yadev et al., 2015; Devare et al., 2017) while interpersonal motivations can be rewarded by institutionalizing some form of recognition and acknowledgement for contribution (Henderson, 2005; Yadev et al., 2015). For instance, community's recognition on members' good practices boosts them to drive them to develop good practices and share them (Henderson, 2005).

Human resource and capacity

Maximizing utilization of ICTs is not easy to achieve when users lack of knowledge, skills, and self-efficacy to use ICTs (Barrett et al., 2005; Mwakalinga, 2005; Junne & Verkoren, 2005; Oronje, 2006; Doodewaard, 2006; Yadev et al., 2015; and Howland et al., 2015). In addition, community members lack of ability to document their activities and lack of capacity to put knowledge into action because they do not understand how to find, value, absorb, assess critically and interpret knowledge made available through online platform (Karetji, 2005; Oronje, 2006; Doodewaard, 2006; Hammill et al., 2013; Howland et al., 2015). Another sensitive issue that is not easy to confront is a strong generational distinct in aptitude and enthusiasm concerning ICT opportunities in which senior members often feel reluctant to express this inclination or seek assistance (Carter et al., 2009). Building confidence by 'nurturing' network through workshop and training allowing members become familiar with the technologies and knowledge sharing methods is paramount to the success of networking (Hulsebosch et al., 2006; Guzman, 2007; Pels, 2009; Carter et al., 2009; Howland et al., 2015).

Technology

Table 3. Concepts for technology



ICTs infrastructure

Eight articles (Mwakalinga, 2005; Winslow, 2005; Oronje, 2006; Doodewaard, 2006; Guzman, 2007; Hammill, 2013; Yadav et al., 2015; Howland et al., 2015) mentioned digital gap and limited basic infrastructure as one of the most tangible challenge for knowledge sharing using ICTs. Adequate ICT infrastructure can be achieved through government and private company support (Yadav et al., 2015 and Howland et al., 2015)

User friendliness of application interface and appropriate technology which are relevant to the local context

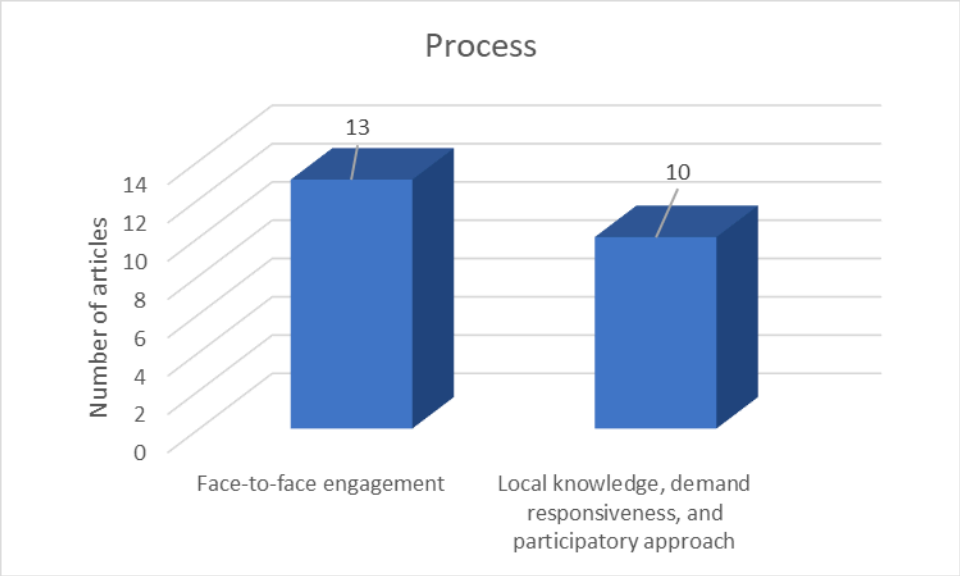
ICTs are able to remove the geographical barrier for people to connect with each other, but this condition can be materialized when these technologies are used, because tools cannot impose community members to share knowledge, interact to each other, and change behavior (Pels, 2009; Sethi, 2017)

User-friendly platforms that both speak to real needs of users and can be utilized without massive investment of time, money, or energy has been recognized as one of the main indicators for success factor for knowledge sharing using ICTs (Hardon, 2005; Doodewaard, 2006; Fullan et al., 2006; Guzman, 2007; Hartwich et al., 2007; Carter et al., 2009; Hammill et al., 2013; White et al., 2014; Yadav et al., 2015; Howland et al., 2015; Fallah & Addai, 2017; Sethi, 2017; Ortiz-Echevarria, 2017). In building a knowledge sharing platform, methodologies and tools should be framed by users' respective, needs, priorities, preferences, context, practices, perceived social and economical barriers (Clappison, et al., 2013 Hammill et al., 2013; Howland et al., 2015; Yadav et al., 2015; Sethi, 2017). Communities do not need latest, most advanced, and tailor-made technologies, but tools that they can use to access knowledge and information (Doodewaard, 2006; Guzman, 2007; Hartwich, 2007). Furthermore, developing and maintaining edge-cutting technologies can be costly for users (Carter et al., 2009), leading for disincentive to use the technologies.

Incorporating relevant, attractive and easy to use technology to build a safe space where community members are able to share conveniently (Guzman, 2007; Carter et al., 2009; Sethi, 2017). There is a growing research highlighting the need to explore technologies beyond web-based communities (Hammill et al., 2013) and promote the creation and communication of tacit knowledge to facilitate culture of oral tradition and literacy problem that remain pervasive in some contexts (Oronje, 2006; Hartwich, 2007). Pattern of ICTs utilization, exploration of previous exposure on technologies and current technologies capabilities should be taken into account when deploying and developing technologies used for knowledge sharing (Mwakalinga, 2005; Hardon, 2005; Guzman, 2007; Yadav et al., 2015; Sethi, 2017).

Process

Table 4. Concept for process



Face-to-face engagement

ICTs can expand the reach and enhance knowledge sharing activities, but human dimension which can be carried through by face-to-face interaction beyond technological exchange remains an crucial element for the success of knowledge sharing activities (Johnson & Khalidi, 2005; Henderson, 2005; Carter et al., 2009; Hulsebosch et al., 2006; Doodewaard, 2006; Nascimbeni, 2007; Clappison et al., 2013; Hammill et al., 2013; Howland et al., 2015; Sethi, 2017).

Offline engagement through ICTs is a mean to share knowledge that should be used strategically as both starting (Clappison et al., 2013) and ending points (Junne & Verkoren, 2005). Tool such website serves as a one-way communication to display information and website which might not be interactive, but the content displayed on website is often the results of intensive interaction (Junne & Verkoren, 2005)

Face-to-face engagement is one of strategies to deploy, especially for a community that is accustomed to oral transmission (Doodewaard, 2006). It is essential for building social capital (Johnson & Khalidi, 2005), community identity (Henderson, 2005), trust (Henderson, 2005; Clappison et al., 2013; Sethi, 2017) and confidence of

CoP members (Hulsebosch et al, 2006; Clappison et al., 2013) . Members are more comfortable to share their opinion and find harmony with each other (Clappison et al., 2013). The existence of offline engagement facilitated by an intermediary has been proven to improve network members' capacity to utilize knowledge for their own good (Howland et al., 2015). Offline engagement is also able to provide opportunities to encourage passive members to be more active for seeking idea exchange and contributing to the community (Howland et al., 2015; Fallah & Addai, 2017).

Local knowledge, demand responsiveness and participatory approach

Some communities depend on tacit knowledge and have a strong oral tradition (Guzman, 2007; Howland et al., 2015). They depend on their experience and expertise stored in their minds as tacit knowledge and generally pass these knowledge around by word of mouth instead of written record (Karetji, 2005; Doodewaard, 2006; Guzman, 2017; Howland et al., 2015). In consequence, when local knowledge and practice are not told and lost, there is no way to obtain the knowledge (Guzman, 2007), limiting knowledge exchange on a broader scale due to distance and time (Karetji, 2005; Coninck, 2009; Howland et al., 2015) because it is more difficult to access tacit knowledge stored in the minds of people. In this sense, documented knowledge is more reliable to be transferred.

Recent trend of knowledge management has been focusing on capturing, codifying, documenting, and sharing knowledge using ICTs to avoid those lost knowledge. However, this trend has led to generally misunderstood rationality that knowledge is an object which is separable from the individual holds it (Berrett et al., 2005). Consequently, those who accustomed to strong oral tradition are required to change their habits in managing knowledge which is difficult to do (Doodewaard, 2006) because it requires energy, time, and motivation. Resistance and refusal to these changes are commonly found in knowledge sharing communities (Nascimbeni, 2007; Carter et al., 2009).

This trend has been exacerbated by little recognition on local knowledge regardless its applicability to the local needs, knowledge generated from previous development interventions and language used by local communities (Karetji, 2005; Oronje, 2006; Clappison et al., 2013; Yadav et al., 2015). Internet is dominated by English language, limiting access for a community who does not speak the language (Mwakalinga, 2005). Establishing platform for knowledge sharing does not only take account of language, but also the kinds of symbols, images, and wording used within a language that are relevant to the community (Barrett, 2005; Guzman, 2007)

Acknowledging local knowledge, profiling existing knowledge resources, a combination of technologies, and cross-cultural communications should be considered to promote knowledge accessible for local and global connection. (Henderson, 2005; Oronje, 2006; Guzman, 2007; Sethi, 2017). Development agencies supporting a CoP's knowledge sharing activities should adapt global knowledge and technology to the local context by localizing global knowledge practice and acknowledging local knowledge and needs (Guzman, 2007; Nascimbeni, 2007). Certain parts of knowledge production and codification should be standardized to help the transfer of local knowledge into other contexts or global perspective (Nascimbeni, 2007).

Conclusion

Multiple development actors join and participate communities of practice for collaboration purpose to tackle development problems by sharing their knowledge and experience. Individuals might represent themselves or their organization that are originally an independent entity before participating CoP. When these individuals become members of CoP, they will develop interdependent relationship. Interdependence among community members can be seen by the interaction between diverse actors with different perspective, motivation, and contribution to negotiate a common and accepted pattern for knowledge sharing using ICTs.

This study has identified challenges and success factors in knowledge sharing activities conducted by CoPs using ICTs based on four parts: (1) organizational and networking, (2) human, (3) technology, and (4) process. Learning for independence and interdependence among members is therefore a necessary factor to identify these challenges and success factors.

The biggest limitation in this study was the a great number of literatures about the topic, but limited access to the resources. A greater number of literatures and diverse databases can increase rigorous of the study. Another limitation is that this study does not distinct ‘community of practice’, ‘learning network’, and individuals who participate in a series of knowledge sharing activities, thus, some challenges and success factors identified in one study can not be translated to another one, thus this study has the potential to sit in the spectrum of aggregative rather than interpretative.

Future work of this study is the development of survey questionnaire and focus group interview questions for CoP members who use knowledge sharing platform within their network based on the concepts developed in this study. The purpose of future study is to find consistency and inconsistency with the findings from this study, then to conduct comparative study.

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