Contextualisation: An exercise in Knowledge Management and Transfer

Adele Botha *

Meraka, CSIR
P.O. Box 395, Pretoria, 0001, South Africa
and
School of Computing
University of South Africa
Florida Campus, South Africa
E-mail: abotha@csir.co.za

Marlien Herselman

Meraka, CSIR
P.O. Box 395, Pretoria, 0001, South Africa
and
School of Computing
University of South Africa
Florida Campus, South Africa
E-mail: mherselman@csir.co.za

Derrick Kotze

MLab South Africa
P.O. Box 395, Pretoria, 0001, South Africa
E-mail: derrick@mlab.co.za

* Corresponding author

Structured Abstract

   Purpose –The purpose of this paper is to describe the adaption of the DEMOLA Innovation Model, developed in Finland, to the South African and African context, supported by an interrogation of tacit knowledge through an adaption of Holsapple and Joshi's (2002) Threefold Knowledge Management Framework's Knowledge Resource component.
   Design/methodology/approach – The mHealth and Wellness Innovation Ecosystem building (Botha, Herselman, & Kotz, 2016) is an initiative embarked on in 2015 and entails the exploration, mapping, description and stimulation of mHealth and Wellness Innovations in the South African National Innovation System. The outcome was envisioned as a stimulus in the South African mHealth and Wellness Domain and as supporting the National Innovation System of South Africa. The DEMOLA Model was the chosen innovation mechanism that would be used to stimulate and catalyse the mHealth and Innovation Ecosystem as it facilitates youth involvement, industry co-creation, and network formation and has a reported high percentage of global licencing. The execution in South Africa would be the initial

implementation envisaged to guide further implementations into the rest of the African continent. Transferring models from Europe to Africa would necessitate a significant amount of contextualisation. Much of the DEMOLA model has been lived by their facilitators and the resulting complex multifaceted knowledge have become entrenched in the Model. Site visits were supplemented with semi structured interviews in two sites, DEMOLA Tampere and Oulu. The interviews and visits were used towards explicitly describing the tacit knowledge resources that would need to be evaluated for contextualisation and how the South African environment can absorb this learning.

Originality/value –The identified knowledge resources would position the local African implementers to effectively adapt the Innovation model and provide a common language and understanding between the stakeholders. Towards further adoption into Africa the same procedure can be followed.

Practical implications – The clear presentation of knowledge resources entangled as explicit and well as tacit components would enable stakeholders to manage knowledge resources more effectively and provide the potential for full deliberate, systematic knowledge management and transfer.

Keywords – Innovation, Contextualisation, Knowledge Transfer, Knowledge Management Framework

Paper type – Academic Research Paper

1   Introduction

Digitalisation of healthcare processes is one of the key phenomena in global health, and as such an obvious central issue for every government concerned with the health and well-being of its citizens. Digital health can be summarised as an umbrella concept for the over-reaching digitalisation of healthcare services and information, and often it involves the addition of artificial intelligence and automation solutions for improved effectiveness, coverage and accuracy of service provision (GBC Health, 2013; Sonnier, 2016). It is very much about moving away from the artisanal and analogue mode of organising and providing healthcare, where economies of scale, access to and availability of care are constrained by the physical proximity and availability of skilled health personnel and sophisticated equipment. It is a ubiquitous phenomenon, impacting potentially every aspect of healthcare and opening up new avenues of cross-sectoral collaboration, especially between social security and healthcare sectors.

Digital health should incorporate the concept of 'innovation ecosystems'. Successful digital health systems present as adaptive, learning, and capable of improvising as new problems, challenges, and objectives emerge (Herselman et al., 2016). The mHealth and Wellness Innovation Ecosystem building (Botha et al., 2016) was an initiative embarked on in 2015 and entailed the exploration, mapping, description and stimulation of mHealth and Wellness Innovations in the South African National Innovation System. The outcome was envisioned as a stimulus in the South African mHealth and Wellness Domain and as supporting the National Innovation System of South Africa (Botha et al., 2016).

An innovation mechanism would be used to catalyse and stimulate an ecosystem and facilitate youth involvement, industry co-creation, and network formation leading to global licencing. The initial implementation in South Africa would serve to guide further enactments within the country and the rest of the African continent.

2   DEMOLA Innovation Model

A generally accepted definition for innovation is given by the Organisation for Economic Co-operation and Development (OECD, 2005) as "the creation of better or more effective products, processes, services, technologies, or ideas that are accepted by markets, governments, and society. Innovation differs from invention in that innovation refers to the use of a new idea or method, whereas invention refers more directly to the creation of the idea or method itself." Various innovation models and techniques exist which have been reported to

support the creation of innovation towards stimulating socio-economic development through ecosystems where academia, industry, students and other stakeholders can co-create new ideas and concepts. The DEMOLA Innovation Model (DIM) was identified and selected for its global network ("Demola Network," 2016) and established validated mechanisms to stimulate and catalyse an Innovation Ecosystem. This model process facilitates youth involvement, industry co-creation, network formation, and has a track record of a high percentage of global licencing.

The model evolved from a localised innovation space located in Tampere, Finland (Pippola, Poranen, Vuori, Kairamo, & Tuominiemi, 2012) acting as an Open innovation environments or platform that provide a governance framework needed to "bring innovation partners together and to ensure ongoing innovation work (Kilamo, Hammouda, Kairamo, Räsänen, & Saarinen, 2012, p. 3)" Kilamo, Hammouda, Kairamo, et al. (2012) describe DEMOLA as a modern learning environment that aims to facilitate students from different universities, in multidisciplinary and agile development of innovative products. The product ideas emanating from industry and public organisations, ensure practical relevance. Students are supported by both industry and academic partners that provide guidance throughout the innovation process. As such DEMOLA can be seen as (i) a space (DEMOLA Centres ("Demola Network," 2016)) that facilitates team work and co-creation (Kilamo, Hammouda, & Chatti, 2012); (ii) a governance framework that includes the process and contracts, intellectual property rights, licencing models and other legal requirements to meet international standards and practices ("Demola Network," 2016). These facilitates the interaction of innovation partners to ensure innovation work and provides guidelines for managing Intellectual Property Rights (IPR) that support start-ups (Kilamo, Hammouda, Kairamo, et al., 2012); and as (iii) a network (Demola, 2015; "Demola Network," 2016).
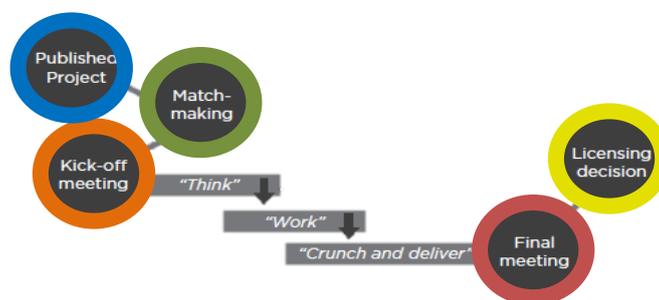

Figure 2-1: Demola Innovation Framework process. Adapted from Pippola, Poranen,Vuori, Kairamo, & Tuominiemi, 2012)

The DIM process can be seen as an intentionally structured innovation methodology consisting of a number of guided interventions, the space where the activities take place and the management of the co-created IP and stakeholder interactions. The structured innovation processes illustrated in Figure 2-1 are briefly outlined below (DEMOLA, 2015; DEMOLA Network, 2016; Einarson & Lundblad, 2014; Huhtamäki et al., 2013; Pippola et al., 2012; Silven, 2016):

- *Publish Project:* Local and international organisations are identified and sourced to submit specific industry challenges or opportunities. These challenges are guided to optimise innovation opportunities
- *Match Making:* Students apply to a specific challenge that they are interested in.
- *Kick-off meeting:* Participating organisations agree upfront, as a condition of participation, to mentor and collaborate with students in their specific challenge. The interaction agreement is negotiated by the students and the industry partner, and it forms the basis of their future co-creation endeavours. The ideation and co-creation activities that follow are part of a structured innovation process that is facilitated by the innovation model
- *Final Meeting*: After about three months, students are expected to present and demonstrate the solutions to their challenge.
- *Licensing Decision:* If the participating industry collaborators consider the outcome meaningful and decide that it possibly warrants further development, they have the option to compensate the student team to secure either a shared licence or full licence to the intellectual created property. Should the industry partner decide that they are not interested in taking the concept outcome further; the students retain full IPR to their innovation.

Transferring the model from Finland to the South African and African context necessitates contextualisation. As this specific innovation model's localisation is framed within an initiative to facilitate co-creation between South African and international industry and academia, it becomes important to manage the knowledge transfer rather than leaving it to providence (Amidon, 1996; Lee, 2016).

3   Knowledge transfer

An organisation's knowledge can be viewed as complex and multifaceted. Nonaka (2008) describes it in terms of implicit as well as explicit components that include descriptive

knowledge, procedural knowledge and reasoning knowledge (Alguezaui & Filieri, 2014; Holsapple & Whinston, 1987). The explicit learning and knowledge transfer would be easier to adapt to local contexts but the implicit learning and knowledge, which conceivably contributes to the greater success of the model, needed to be understood and become part of the narrative of the contextualisation process, to be adapted. The Threefold Knowledge Management Framework of Holsapple and Joshi (2002) was considered convenient to adapt for a conceptual framework to interrogate the different implementation sites in Finland through a multiple case study. Two sites were visited. The first was DEMOLA Tampere (in existence since 2008) located at the New Factory innovation centre in the historic cotton factory. An interview was held with a local Facilitator specialising in the User Experience Design. The second was DEMOLA Oulu, as part of The *Business Kitchen* which is a university entrepreneurship hub. It is a joint effort between the *University of Oulu* and *Oulu University of Applied Sciences*. The hub describes itself as an open space and a community. It is located in the city centre of Oulu that serves individuals with business ideas; start-ups and entrepreneurs; small and medium sized companies; and students and staff of the universities.

Holsapple and Joshi (2002) argue that a descriptive framework such as theirs identifies and characterises the main elements of the Knowledge Management (KM) phenomena, describing it in the form of key factors, constructs, or variables and their relationships. As their framework is general, and not aimed at any particular organisation, it lends itself to adaption for considering the tacit knowledge imbedded in the innovation model.

The Threefold Knowledge Management Framework of Holsapple and Joshi (2002) consists of three dimensions:

- Knowledge resource component, that identifies the generic types of knowledge resources and organisational processes;
- Knowledge manipulation activities component; and
- Knowledge management influences.

Only the Knowledge resource component was considered of relevance to the aim of this study. Holsapple and Joshi (2002) argue that knowledge can be stored, embedded or represented in any of six kinds of resources: Participant's knowledge, culture, infrastructure, knowledge artefacts, purpose and strategy.

Each of the six knowledge resource components (Holsapple & Joshi, 2002) were explored through site visits to two DEMOLA spaces. Semi structured interviews were conducted with key representatives, which informed the quest for tacit knowledge embedded in the innovation

model. The description of the case study is beyond the scope of this paper. The following section does, however, outline the findings.

4   Knowledge resource components and the implications for contextualisation

Working from Holsapple and Josi's (2002) view that knowledge can be stored, embedded or represented in six kinds of resources, the following section provides an outline of the findings on the Participant's knowledge, the culture, the infrastructure, their knowledge artefacts, the purpose and the DIM strategy.

4.1   Participant knowledge:

Holsapple and Josi (2002) argue that participants can be human resources (employees) and/or material resources. The knowledge that an employee needs and gains in the performance of their role within an organisation is considered a knowledge resource of that organisation (Holsapple & Joshi, 2002; Nonaka, 2008). Much of the implementation of the innovation model has been lived by the facilitators. Most of the staff involved first students that attended an innovation event at the spaces and later joined the staff there. Many of the shared and changing activities, attitudes and actions have developed with the evolution of the governance framework from single innovation space to a network and have, as such, become entrenched in the Innovation Model.

Each local coordinator has a postgraduate technical background, good links with local Higher Education Institutions and is responsible for qualifying and establishing student teams. Facilitators encourage students to make a significant investment in time and effort on the initial ideation of their innovation. The ideation outcome is often referred back to the students to reiterate. It was found that students are sometimes very set in their own beliefs and these needs to be challenged and changed to accommodate new ideas. The reflective ideation is often repeated until someone (partners, family or users/industry) indicate the value of the innovative idea; then only can the students work further on refining the product and process.

The tacit knowledge is transferred to new facilitators through a training session that involves knowledge transfer as well as enculturation, thus facilitating both explicit and implicit learning. The South African facilitators did not attend the facilitator training at their venue in Sweden but had undergone training in Cape Town and Pretoria South Africa. This localised training was mostly descriptive in nature, outlining the process, procedures, and mechanisms of the governance framework and the IPR model. The South African facilitators did not have

the advantage of experiencing one of the innovation seasons. As such they brought many of their own values and assumptions of the innovation process to the intervention without the benefit of having lived through the process.

4.2   Culture

The Finnish population is largely homogeneous. As one of the DEMOLA tenents is that innovation is born from diversity and the multiple views and ideas that it engenders. "We believe that ground breaking innovation is created only when people with passion and talent are interconnected across nations, cultures, and fields of expertise. It surmises that innovation with true impact cannot be created in isolated and in disconnected units. That is the reason for building towards a stronger ecosystem instead of bigger silos" ("Demola Network," 2016). The multidisciplinary teams are viewed as key innovation drivers. It is argued that people from different background and knowledge domains breaks down silo thinking and leads to creative thinking and innovative co-creations in an open innovation context. Industry has indicated that the multidisciplinary teams, in addition, grant them access to different viewpoints and that some of the ideas that emerge are combined with their other products or even in their everyday activities at work to allow for more creativity and exploration.

South Africa on the other hand has been called the 'Rainbow nation' with an enormous cultural, language and economical diversity. Two core values that highlighted a need for further localization or skills development within the facilitation teams where:

- *The facilitator role:* The DEMOLA Facilitator has a specific role in bringing neutral guidance on the co-creation process but not directly influencing or guiding the innovation outcomes. This requires a special skill that not only includes facilitation knowledge but also crosses over into cultural roles. In the South African context participating students to a large extent relied on Facilitators to provide guidance and support beyond the innovation tasks and tapped into a strong local culture of mentorship. This mentor-mentee dynamic was evident in the general communication and engagement between the student teams and the facilitators. An observation by the Finnish Demola team reflected on the facilitators playing a much stronger role as *mentor* and not neutral facilitators.
- *The removal of power distance:* Viewed as a key enabler to true co-creation the programme and processes involved the elimination of any power distance between the industry partner representative and the student teams. At the start of the process

the partner and teams meet to set key roles, responsibilities and rules through the *playbook* session and reference to the term *student* is replaced by *talent*. There is great emphasis placed on treating the *talent* and the *industry partners* as equals, which apart from co-creation, also develops a level of professionalism with the participating students. In a largely homogeneous population, like Finland or the Nordic countries as a whole, the power distance is generally very small to begin with. In the case of South Africa this is very different due to a number of factors ranging from the legacy of apartheid, cultural hierarchies in age and gender and significantly entrenched power distances in business culture. These contributed to unexpected and complicated processes to manage within the first season.

4.3   DEMOLA Infrastructure

The physical space occupied is separate from any of the Universities that the students that attend the Innovation events are from. This fits the general model of hosting the DEMOLA activities in an *off campus* environment. This fits well with the existing implementation model of other programmes in South Africa due to the local IPR models (most HEI claim rights to the students' IP). This did however come with complexities of its own which included:

At an early stage of implementation, the requirement for sufficient infrastructure, which can be defined as a commodity in South Africa, brings with it the requirement of significant investment. While the model is developed and executed as a very lean model in most markets, it will require a rethink on either its dependence on University infrastructure (where the concept and importance of innovation is already understood or explored) or earlier engagement and development of awareness and interest, to support such innovation models with Public or private sector partners to host the programme.

Providing a central or accessible location between multiple universities in South Africa poses a unique challenge due to the location of the different universities. This can be seen as due to the apartheid legacy, and the continuing wealth gap within the society. Significant local investment was required to ensure a diverse group of students participating from multiple campuses with a requirement to subsidize travel and daily expenses for specific students.

The location also needs to cater for the industry partners, who by definition are largely positioned in the higher income segment of society. This brings some entrenched stereotypes of specific location, mostly centred on security concerns and influences as to where the DEMOLA facilities were located.

A significant part of the innovation process relies on continuous validation from within and from external customer or stakeholders. This process of validation ensures that all the stakeholders are up to date and comfortable with the direction of thought. The physical location of the site and *innovation beneficiary,* as defined by the challenge, both impact these validation tasks. In South Africa, socio-economic challenges are often innovation challenges and present a significant validation challenge; if the innovation season is hosted in a more affluent location, where the industry partner is willing to commute to, the *user* or *beneficiary* is often located elsewhere. This location conundrum is very relevant in the South African and probably African context and it implies travelling significant distances and/or difficulty in accessing the user location. As such the innovation seasons seem to function best in *micro innovation environments* where challenges are matched with the realities of a specific radius around the location. The alternative requires a departure from the lean and scalable model to a highly funded initiative.

4.4   Knowledge Artefacts

The Demola IPR framework as part of the model, "makes it easy for partners to come in and cooperate. Each partner has a clear role, and the work is guided by simple procedures. Contracts, intellectual property rights, licensing models, and other legal requirements are in place and meet international business standards and practices" ("Demola Network," 2016). This IPR framework has evolved from Finnish practice based experiences and has been adapted through experiences in the further DEMOLA network.

These artefacts are not value free and are physical embodiments of the innovation model as enacted by the local staff. All the structures are a requirement but they are very open to allowing the local implementation partner to decide on e.g. the cost of IP for SMME. The preference and requirement for Corporates and especially multinationals are that this is standardized across all locations.

On obstacle faced in South Africa was that, while many multinationals based in Europe understand the value of RDI, their counterparts in South Africa are mostly *Sales and Marketing* focused. The initial discussions almost always indicate from the start that there is no value in the IPR for them or that their internal process would not allow them to pay for it. If the model allowed for *licensing* through acceptable procurement terms like CSR, Marketing, Skills development etc. it would be an easier sell. This said, local intention is to develop a culture of innovation and position SA/Africa as an RDI location. As such the change in the nature and understanding of local industry partners with respect to the IPR will ultimately be the goal.

4.5 Purpose

DEMOLA was born out of the need to enhance creativity and innovativeness in education. The need for academia-industry led to Hermia Ltd. developing the initial Demola model in 2008 "to create an environment for university-business co-creation and innovation education for talented students" (Pippola et al., 2012, p. 3). The gains of this interaction are seen as valuable to both students and industry partners involved in the Demola season. Students do not always value their own knowledge domain until they work together in multidisciplinary teams and brainstorm with each other on ideas to build their product. This allows for a sandbox approach within a safe place, where student get the freedom to explore all options. The student gains are experienced as more than just an innovative product; they also gain experience in working with industry, becoming more effective workers. They learn the value of thinking out of the box and to then apply their own knowledge domains to add value to group thinking.

Industry partners find the learning gained through the process to be valuable as their employees are often immersed in an organisational culture and the identification and innovation around novel products and solutions become a challenge. It has been noted that through participating in the innovation challenges, a mental shift to outside the corporate comfort zone is facilitated.

These learnings from many an academic viewpoint might be one of the greater gains for students, allowing them to upskill through a structured and facilitated industry interaction. This is however implied and hinted at from many student and industry quotes but has not been explicitly outlined. The skills, the gains and the future employability of the students as well as the value of the innovation model as a bridging programme remain open for investigation. In the South African context it highlights the need to focus on the entrenchment of an innovation culture within universities, leading to the possibly seeding and development of more market relevant curriculum.

4.6 DIM strategy

DEMOLA has evolved into an international network that operates through local Centres and affiliate locations around the world. They are endeavouring to connect international industries with local students within the network. The strategy to enable this collaboration across 'silos' has proven successful with a global IPR licencing rate of about 70% ("Demola Network," 2016). Pippola et al. (2012, p. 3) reported that from 2008 to 2012 over 200 Demola projects have been conducted. Some 1100 students have participated and in 93% of the projects the innovative solution or part of the solutions have been claimed for

business. In addition, they report that 15 % of the students have been recruited by the project partners. The students mentioned here most study for free at a university in Finland and are full time students. In South Africa the studies are not free and students, although possibly on bursaries, are under tremendous financial pressure. Often having part time employment to subsidize their living expenses. The investment in an alternative project, although beneficial with possible financial benefit presents a larger opportunity cost than in Finland. It has been suggested that the season should be opened to existing startups and entrepreneurs in addition to students.

5   Conclusion and recommendations

The following recommendations are made from the study. The transfer of the model as an entity would necessitate a broader tolerance for the diversity of the local site and their needs, expectations and limitations. In addition the tacit knowledge embedded within the model should be acknowledged, understood towards developing a common language around the meaning of the terms, success, failure, innovation and co-creation. It is recommended in this regard that staff should be aware that there is implicit learning and explicit learning that has taken place within the organisation and training process. These are not immediately evident in new environments. Reflecting on practice and articulating organisational learning beyond anecdotal incidents through a structured Monitoring and evaluation process would enable the organisation to reflect on immediate and future impacts beyond craft orientated activities.

Local implementing partners should reflect and validate design and implementation decisions to fit local needs and objectives and not view the DIM as a 'plug and play" solution. Learning through failure and being able to articulate what success and failure is, how it would it be recognised, and what actions need to be modified to change it, will remain crucial.

The DIM is not value free and the tacit knowledge is embedded within the structures and activities of the stakeholders. As this knowledge is not recognised or reflected on, its transfer is often left to the interpretation of case studies. However, the value taken from these examples and testimonies presented by DEMOLA is often lost on the audience that miss the finer nuances that is conveyed.

Contextualising such a framework should in addition allow for contextualisation and in a way form a co-creation between the implementing partners and the stakeholders in establishing a new instance.

6 References

Alguezaui, S., & Filieri, R. (2014). A knowledge-based view of the extending enterprise for enhancing a collaborative innovation advantage. *International Journal of Agile Systems and Management, 7*(2), 116-131.

Amidon, D. M. (1996). The momentum of knowledge management. *Research-Technology Management*.

Botha, A., Herselman, M., & Kotz, D. (2016). mHealtha and Wellness Innovation Ecosystem. In M. Herselman & A. Botha (Eds.), *Strategies, Approaches and Experiences: Towards building a South African Digital Health Innovation Ecosystem*. Pretoria, South Africa: CSIR Meraka.

Demola. (2015). Demola - Open innovation platform for students and companies, http://www.demola.fi Retrieved from http://www.demola.fi

Demola Network. (2016). Retrieved from http://www.demola.net/

GBC Health. (2013). Digital health: A key to global development. Retrieved from http://www.businessfightsaids.org/asset/digital-health-a-key-to-global-development/

Herselman, M., Botha, A., Toivainen, H., Myllyoja, J., Fogwill, T., & Alberts, R. (2016). *A Digital Health Innovation Ecosystem for South Africa*. Paper presented at the IST Africa, Durban, South AFrica.

Holsapple, C. W., & Joshi, K. D. (2002). Knowledge management: A threefold framework. *The Information Society, 18*(1), 47-64.

Holsapple, C. W., & Whinston, A. B. (1987). Knowledge-based organizations. *The Information Society, 5*(2), 77-90.

Kilamo, T., Hammouda, I., & Chatti, M. A. (2012). *Teaching collaborative software development: A case study*. Paper presented at the Proceedings of the 34th International Conference on Software Engineering.

Kilamo, T., Hammouda, I., Kairamo, V., Räsänen, P., & Saarinen, J. P. (2012). *Open source, open innovation and intellectual property rights–a lightning talk*. Paper presented at the IFIP International Conference on Open Source Systems.

Lee, M.-C. (2016). Knowledge management and innovation management: best practices in knowledge sharing and knowledge value chain. *International Journal of Innovation and Learning, 19*(2), 206-226.

Nonaka, I. (2008). *The knowledge-creating company*: Harvard Business Review Press.

OECD. (2005). *Oslo Manual: OECD proposed guidelines for collecting and interpreting technological innovation data* (3rd ed.). Paris, France: OECD/EuroStat.

Pippola, T., Poranen, T., Vuori, M., Kairamo, V., & Tuominiemi, J. (2012). *Teaching Innovation Projects in Universities at Tampere*. Paper presented at the Proceedings of the International Conference on Engineering and Education.

Sonnier, P. (2016). Defining Digital Health. Retrieved from http://storyofdigitalhealth.com/definition/