

Service design as an approach for envisioning e-health solutions: Mapping the context of development in Grabouw, Western Cape

Izak van Zyl^a, Terhi Pennanen^b

^a Cape Peninsula University of Technology, South Africa

^b Laurea University of Applied Sciences, Finland

Abstract

This paper depicts the utilisation of a service design approach for envisioning health-related ICT solutions in Grabouw, in the Western Cape of South Africa. Grabouw, located in the vast Elgin Valley, is the largest fruit-producing region in the country. As the commercial centre for the district, Grabouw attracts seasonal and informal labour. Together with the geographic isolation of the town, these aspects contribute to challenges in the regional health sector, especially in service provision. This is exacerbated by unemployment, poverty, and crime, which hamper quality living conditions. In this context, civil society institutions aim to appropriate information and communication technologies (ICTs) for health development and service provision. The authors discuss the opportunities and challenges of this enterprise, and reflect on a service design methodology to drive health services development in the region. A service design approach builds towards a nuanced framework of collective development. With reference to the Grabouw case, the authors study those design principles that enhance the utilisation of technology for development outcomes. This endeavour builds toward an evidence-based ICT-for-development programme in health.

Keywords: context mapping; ICT for development; e-health; service design

Introduction

This paper depicts the health services development landscape in Grabouw – an agri-commercial centre in the heart of the Elgin Valley, 100 km from Cape Town. This Valley is home to 76 farms, and is the largest fruit production and export region in South Africa. The town of Grabouw, along with neighbouring towns in the Overberg District, attract seasonal and informal labour from across the province and country. Some migrant labourers travel from as far North as Mozambique, Zimbabwe, and the Limpopo Province. The seasonal quality of labour presents a number of socio-economic and political implications, including unemployment, industrial action, poverty, and ill health. These challenges hamper the development prospects of the region.

A number of civil society institutions seek to address development priorities in Grabouw and the Overberg by appropriating information and communication technology (ICT), especially in healthcare. However, these approaches are perceived as fractured and uncoordinated. This is marred by the relative geographic isolation of

Grabouw, deeming most development opportunities as unattainable.

In brief, the Grabouw community is deeply stratified and in search of new ways and solutions to tackle local development challenges. In light of these dynamics, this paper endeavours to map the context of development in Grabouw, especially in its socio-political, economic and environmental dimensions. The authors discuss, particularly, the use of service design as an approach for the development process, involving multiple stakeholders.

The authors discuss the initial findings from the first, 'exploration and insight phase of a broader e-health intervention. The actual development project will be a process of various interrelated steps. Ultimately, this project will build toward a co-designed intervention framework, which will later be reflected in relation to a Community Capability Assessment model. In addition, the goal of the overarching research project is to create empowered community facilitators, able to utilise service design methods and tools for development, not dependent on external facilitation or intervention [1]. Finally, this paper aims to provide information and recommendations for a larger community interested in ICT for health development.

Literature review

Challenges and expectations facing the local health sector

In the South African context, the process of free (or even cost-effective) and easily accessible treatment is yet to become a full-fledged reality. The effects of infirmity and growing death tolls associated with the HIV virus are seething. In addition to HIV/AIDS and tuberculosis, other non-communicable diseases are also perceived as urgent health priorities in the country (cancers, hypertension, heart disease, diabetes, and the like). These and other public health concerns further exacerbate the national state of ill health: injury death, infant mortality, homicide and violence, and sparsely distributed medical personnel [2]. This context is informing the meanings that individuals attribute to life and concurrently shapes their vision of the future – a future that often seems unreachable [3].

South African healthcare has seen the consistent introduction, use, and adoption of information and communication technologies. There are a considerable number of ICT-for-health initiatives currently deployed throughout the country. These indicate various levels of success and failure. More importantly, current initiatives have shown the propensity for electronic facilities in making

the process of health care delivery more efficient. Public health service in the country has effectively latched on to the globalisation of care – a movement that will see local and national facilities ‘scaled to hyperconnectivity’. That said, the South African health sector is still challenged with high disease burdens, lack of resources – both social and economic – and the repercussions of a discriminatory past.

Several expectations have fuelled the need for more efficient, digitised health delivery locally. These are common among the developing world. Yet given South Africa’s makeup as a profoundly unequal country [4], constraints in the local health sector have reached new depths. Many of the predominant challenges and expectations that ‘preface’ e-health in the country are described below: [adapted from 5]

- the increasing demand for health and social services, due to an ageing population, the burden of chronic disease, and urbanisation;
- the rise in expectations of citizens who demand improved service delivery and reduced inequalities in access to good healthcare;
- the simultaneous increase and decrease in the mobility of patients and health professionals within a better functioning internal market;
- the need to reduce the local disease burden, and to respond to emerging disease risks like tuberculosis, typhoid fever, and hepatitis;
- the difficulties public authorities encounter in matching investment in technology with investment in the complex organisational changes needed to exploit its potential;
- the need to limit occupational accidents and diseases, to reinforce wellbeing at work and to address new forms of work-related diseases;
- the management of massive amounts of health information, which must be accessible, securely stored, available in a timely manner when needed, and processed efficiently for administrative and clinical purposes; and
- the need to provide the best possible healthcare under limited budgetary conditions

Rural communities in particular are compromised by the lack of infrastructure, services and expertise, limited resources, low literacy levels and professional isolation [5]. The combined complexities offered by these challenges, driven by the global advance toward hyperconnectivity, have set the tone for electronic health integration. The role of e-health has been determined early on by the national government and other actors as an enabler of transformation [5,6]. Yet, despite the nationwide impetus for a uniformed approach in healthcare delivery, the viability of comprehensive e-health is uncertain.

The role of e-health and the problem of adoption

The development of health priorities via digitised resources, offering increased efficiency and rapid mobility, are seen as the key supporting arguments in modern health and well-being. eHealth can play a fundamental role in the transition to a knowledge economy, and in improving the quality of life for South African citizens and communities. The many transformative capacities of an electronic health environment, in South Africa no less other nations, can include [5]:

- accelerating the advancement of medical knowledge and improving the understanding of disease-related processes;
- enabling citizens in actively managing their personal health, shifting the responsibility and power of health information (management);
- improving the prevention and early diagnosis of many diseases, thus reducing overall healthcare costs and improving quality of life;
- enhancing patient safety through accessible, free, and flexible decision-support;
- enabling cost-effective management of chronic diseases; and
- facilitating active ageing and independent living for the ageing population

These possibilities notwithstanding, the recognition of ICT in healthcare is not merely an end unto itself but a means to a complex end. The integration and adoption process of e-health interventions is often subject to a range of micro and macro dynamics. The successful support of digital technologies in this domain requires, therefore, the examination of multifarious political, organisational and infrastructural factors, including a readiness factor [7]. In their recent e-health readiness assessment of rural and urban hospitals in the North West Province, [7] confirm the many integration challenges inherent to most of the country. In this sense, South Africa does not indicate an extensive readiness toward e-health adoption, and has not performed well on the maturity curve (which indicates the level of service integration).

In line with the call for a holistic understanding of e-health integration, certain underlying dynamics compound the ability to leverage technologies for healthcare. [5] emphasise the lack of uniformity in building towards a national ‘template for health reform’ by means of technology. The healthcare sector, it would seem, does not benefit from the fundamentals of e-health solutions due to delays in reaching agreement on best practice and processes (ibid.). These claims are in line with the directive of the Presidential National Commission on Information Society and Development [8], calling for a comprehensive and integrated health information system (HIS). Nationally, this was to be supported by an enabling e-health policy environment, promoting efficient health information standards. The 2007 draft White Paper on e-Health, and the eHealth Strategy South Africa 2012-2014 are recent attempts at road mapping the achievement of a functional national HIS, with the patient “located at the centre” [9].

The adoption of e-health is further limited by the lack of standardisation between health information systems. This typically results in duplication of client records, in particular concerning diagnosis and patient history. These are often viewed as “medical errors” with serious implications for both patient administration and patient wellbeing [5,10]. Other adoption challenges, as earlier mentioned, include the geographic ill distribution of medical professionals. This indicates a highly differential allocation of ‘patients to physician’ in rural and urban settings [11]. Solutions in this vein have relied mostly on the creative application of telehealth or rural deployment of medical facilities. However, these have been largely hampered by the lack of ICT infrastructure and resources, notably in rural hospitals. This for the most part

is not a novel adoption challenge, but continues to inhibit the leveraging of electronic support systems.

A challenge perhaps not immediately apparent to the modern application of e-health, is that of establishing unique patient identifiers [5]. In a country marked by a 'diversity of poverty', many rural and peri-urban citizens do not possess any form of physical and official identification. Date of birth can also be problematic, as many of the rural aged population have imprecise knowledge of their birth dates. They know instead that they were born, for example, 'on the day of rain' [5]. Patient identification, undoubtedly, is a crucial consideration in obtaining histories of medical status and progress, and for administering treatment. In addition to these and other inherent problems, shortcomings in the knowledge and the skills of patients and health professionals to use ICT solutions represent other challenges [5].

User participation in e-health development

In rural healthcare centres, findings by [5] go on to highlight the limited user participation in and knowledge about e-health solutions. This, in some cases, is despite these solutions being implemented in full force. This reflects a limited interaction with said interventions among health workers and medical staff. There is typically only a single person at the health centre knowledgeable in the respective digital solution. This enforces a knowledge divide between novice or disinterested users, and involved or expert stakeholders. And as is characteristic of such a divide, knowledge is dispersed or ill distributed across the continuum of care. Resultantly, when the purported benefits of technology can really enhance the process of care, contributing to the wellbeing of a patient, the majority of health workers remain technically illiterate.

Along with [11], [5] propose a participative, bottom-up framework whereby users are included in the implementation of the e-health solution. Users can participate at three distinct yet interrelated levels. The first of these, *consultative*, entails the identification of and planning for user needs. Another level, *representative*, involves single persons from each user base in the development and eventual deployment of the solution. Representatives are tasked to ensure that their base is properly established or catered for by the proposed technology. Finally, some e-health solutions require the involvement of all affected users. This is known as the *consensus* level, and is typically only feasible on a smaller scale [5]. A type of 'representative participation' model can then be advanced within the lifecycle of e-health interventions.

Materials and Methods

Service design: an approach for community, health service, and ICT-based solution development

Given the socio-economic complexity of the Grabouw region, the authors propose a localised service design approach as a framework for regional development. This involves the ideation of ICT-based solutions / interventions that will aim to address the myriad health challenges in Grabouw.

Service design can be characterised as an interdisciplinary and process based approach that aims to develop new or innovate existing services. The service design framework focuses especially on users' needs, goals and aspirations and on collaborative creation, with the

help of design methods, tools and thinking [12,13]. In the context of ICT-based service development, a service design approach builds on the methodological and research foundations related to user experience, user-centred design and contextual design [14,15].

As an interdisciplinary approach and 'toolbox' for development, service design can be utilised in various fields and contexts. In recent years, service design, and design thinking principles in general, have increasingly been used to tackle the challenges of social and community development [16,17]. Service design has also been successfully utilised in the development of several public and health related services [13,18,19].

The various models that describe service design as an approach share some defining characteristics. These especially include the principles of Human Centred Design (HCD), closely involving actual users in a co-design process. Service design is an iterative, holistic approach, and emphasises multi-stakeholder collaboration in development [13,16].

Service design as a process (of planning and shaping solutions), is the application of different methods and tools to support the different stages of development. The iterative cycle of service design includes phases of 1) Exploration and insight gathering; 2) Design and creation; 3) Testing and reflecting; and 4) Implementation and iteration [1,13,20]. The utilisation of shared design principles allows for greater interaction, feedback and reflection between different (community) stakeholders, service users and designers. This helps to facilitate a 'collaboratively designed' intervention. During the iterative, co-designed process, stakeholders become active participants in creating locally sensitive development interventions, ensuring a focus on local voice and local action [21].

The research that is reported in this paper is structured around the four-phased service design process introduced above. However, this paper focuses only on the methods, experiences and results from the first, *Exploration and Insight* phase, with respect to the Grabouw case. This is due to the continuous nature and state of the development project itself.

Service design activities in the Exploration and Insight phase in Grabouw included a number of preparatory meetings, and a multi-stakeholder workshop for context mapping. This paper will describe those engagements that helped the research team to map the context for development, identify important stakeholders, establish relationships with community partners, and to set important first goals and parameters for the development process. During the next phase(s) of the project, further service design methods and tools – such as user need analysis, co-design sessions, service concepting, prototyping and iteration – will be explored, tested and utilised for the ideation, design and implementation of new solutions for ICT-based health services.

Exploration and Insight: defining the goals for development and the framework for collaboration

Service design processes typically commence with an attempt to gain a thorough understanding of the problem or development area to be addressed. Additionally, an understanding needs to be obtained in terms of how the organisation(s) in question – e.g. that aims to develop new solutions – mobilises around a local development agenda. In the first phase, it becomes important to gath-

er information around the broader context, as well as seek to understand the different viewpoints and goals of the primary stakeholders. Subsequent to this, the respective designers and developers should focus on identifying the “real problem” situation and issue from the point of view of the actual users. The third step in the Exploration and Insight phase is to visualise the findings into a clear, communicative structure for further discussions. Following this, the team will design steps among the different participants of the development team. The Exploration and Insight phase should lead to a better, shared understanding of the starting point, goals, possibilities and requirements for the development. This phase should also inspire and guide the actual design and implementation [13].

Different methods can be used in this phase. In the Grabouw case, the process started with informal discussions between project partners and proceeded into more formalised meetings, where preliminary goals and project steps were defined and agreed. This is detailed in the preparatory meetings section on the following pages.

Context and stakeholder mapping as a tool to build shared understanding

Stakeholder and context maps are useful tools in the early phases of the service design process. Stakeholder maps can be used to build shared understanding and to analyse the current situation, different actors and their connections. The visual modelling or mapping of the larger service context – e.g. organisations, the environment, and other services – builds toward joint understanding and communication between different actors. Visual modelling allows participants to concretise those missing elements, challenges, assets, and opportunity areas within the service context. This also helps to elicit tacit knowledge and assumptions [22].

Stakeholder- and context maps are visual or physical representations of various groups connected to the service or design challenge in question. Maps can have various formats, but should identify the primary stakeholders and their roles and relationships in terms of one another. Other services, artefacts, tools and technologies can also be included in the map. Different “visual make-tools” (pictures, notes, cards.) can help to map and gather information that is not easy to verbalise [12,13].

Within the context of the Grabouw case, a special template and tools for a group exercise were developed and used in a multi-stakeholder workshop. This workshop was titled, “*Painting a picture of Grabouw as a community*”. The project team designed an A1 sized map of the Grabouw-Elgin area as a template for the exercise (see Figure 1). The goal was to map the important places (formal and informal), organisations and people, and current services available in the area, from local stakeholders’ points of view. The design team employed a Human Centred Design toolkit, developed by [16] and used its illustrative picture cards to map the abovementioned themes. Different stakeholders and focus areas – health, youth, farmers and farm workers, education and training, information and communication, and local economy and business – were also indicated via picture cards. Specific, named illustration cards with free space for further clarifications were developed for the workshop. In addition, it was decided that the exercise should also include probes to incorporate views of current community strengths, problem areas, hidden assets and

descriptions of community spirit. These probes would help to gather a comprehensive picture of the current situation and context of development. Coloured *Post-it* notes were employed for this purpose. The exercise concluded by asking participants to complete the following (partial) sentences: *Grabouw is...*, *Grabouw needs...*, and *Grabouw could be...*



Figure 1 – Template and visual tools developed for the context mapping exercise

Results

Research context and participants

The research that is presented henceforth was conducted in the community of Grabouw, located in the vast Elgin Valley, in the Western Cape of South Africa. As a first step, by means of archival and desktop research, the research team identified some of the key stakeholders in the region. These were approached in the planning of a research and design intervention in Grabouw. The Elgin Learning Foundation (ELF) was identified as the primary non-profit institution that would assist in the structuring of the intervention. ELF was initiated in 1996 and was foreseen as a vehicle to support and empower agriculture communities in the Elgin Valley through skills training programmes [1]. Basic training programmes later expanded to include the farm worker family as an integrated unit. ELF thus aimed to provide holistic development interventions. Apart from being active in various development projects and services, ELF’s core activity is accredited skills training through a Section 21 private FET college – the Elgin Community College [1]. The college offers accredited training in health and social care, small business development and entrepreneurship, early childhood development, ABET, agriculture and technical trades such as bricklaying, masonry and carpentry [1]. More recently, ELF has formed a partnership with the Development Bank of South Africa and the Theewaterskloof Municipality with regard to being part of the Grabouw Sustainable Development Initiative (ibid.).

Participants from ELF helped to identify other immediate stakeholders in Grabouw (and neighbouring districts). These persons represented, inter alia, the CPUT IT Department, the Elgin United Church, the CENCE institute, the Youthstar Centre, Heideiland farms, and the Grabouw Business Junction (with fringe involvement of representatives from the University of the Western Cape, the CIO Forum, and Margin Mentor). Together with this group, the research team helped institute the

Grabouw Enablement Forum (GEF) initiative, aimed at stimulating locally relevant development interventions.

Preparatory meetings: towards a shared goal and development plan

The group of representatives (from the aforementioned domains) met in person in December 2012 to build towards a shared development agenda for Grabouw. During these preparatory meetings, several key issues/challenges were outlined around which the team were to mobilise: employment/entrepreneurship, access to information and education, and access to support services (especially in health). The goal (or *purpose*) of said development agenda would be to 'enable' such capacities. The team decided on three mechanisms to facilitate regional enablement: service design (and co-design), up/re-skilling, and e-learning.

The next logical steps were also outlined in the establishment of a collaborative network. In later meetings, this network was formalised as the Grabouw Enablement Forum, subsequent to the buy-in of all members. After careful deliberation, GEF identified six focus areas, each dedicated to a domain of research and development: youth at risk, 'techno teenagers', skilling and entrepreneurship, agriculture, healthcare, and incubation. The team recognised these as the more critical priorities of local and regional development. Each domain – or "theme" – had a dedicated team member allocated to it. Team members were concerned, however, at the number of uncoordinated ICT initiatives and projects in Grabouw. There is seemingly a visible overlap across these programmes, giving rise to conflicts of interest. To mitigate such conflict, representatives from these domains would be approached for membership and/or input in the GEF.

During follow-up meetings, the GEF team concretised its development agenda. The health theme gained prominence in these discussions, and many urgent focus areas were outlined. Team members specially outlined the access to relevant health information as an immediate development priority. The GEF decided that there would be scope to work with the group to create "innovative solutions" that would address health information access in Grabouw.

Through these ideations, GEF gradually built towards a community development agenda. Some members proposed a rough guideline of development, structured around increased buy-in and participation. This was indicated as a STEP model of collective development: Structure, Task, Environment, and People. The components of this framework are set against the backdrop of the Community and the Organisation, which together form the Enterprise. STEP is a turnaround model used in business (see Figure 2) adapted to apply to communities. GEF team members are in the process of outlining its use and purpose for the Grabouw context.

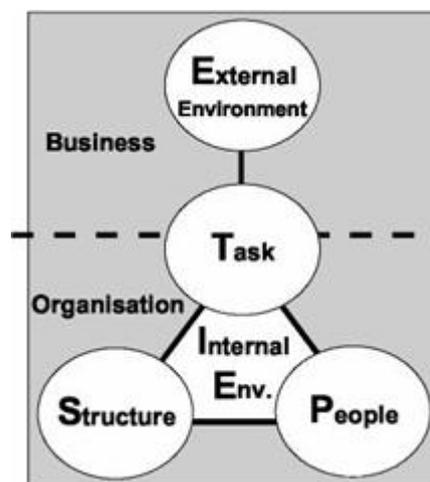


Figure 2 – STEP model

It was decided, ultimately, for each GEF task team to crystallise its respective development work plan. This would be ideated in future discussions and workshops.

Participatory context mapping workshop

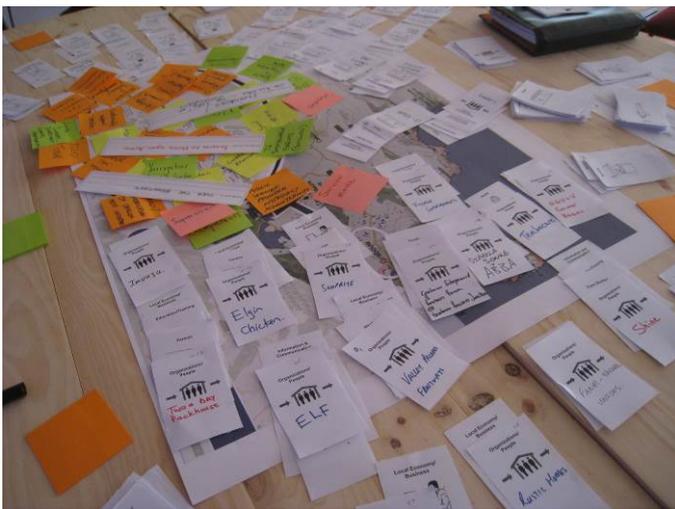
A multi-stakeholder workshop connected to the larger development project in Grabouw – as per the GEF agenda – was held in March 2013 at a local church. Ten representatives – including four from CPUT – attended the session, and represented differing organisation and stakeholder groups in Grabouw. Within this workshop, the CPUT project group facilitated a context mapping exercise. The overall goal was for local stakeholders to discuss the "current situation" in and of Grabouw. Due to the relatively small number of participants, the exercise could proceed without having to divide in smaller groups. However, the exercise can well be run with multiple simultaneous groups, followed by a joint discussion.

Participants were first provided with a very short introduction of the service design approach and its fundamental principles. They were then instructed with the main idea and goal of the exercise. The goal was communicated as the sharing of thoughts and viewpoints to improve the understanding of the current situation in Grabouw. Participants were encouraged to express their views freely, irrespective of "right" or "wrong" answers.

Participants were then asked to map important places, organisations, and services to the provided template of the Grabouw area, using illustrative cards. Participants were instructed to add a name or description to the cards, and were encouraged to add free comments or new stakeholders with blank cards. The exact placement of the cards was emphasised as irrelevant; the focus was rather on the ensuing discussion.

After the first mapping task, participants were asked to consider the results, and to think how different stakeholder or theme areas (such as health, youth, and education) areas are represented. Participants were also encouraged to add new organisations, places, or services to the template if needed. Furthermore, participants were encouraged to discuss the relationships, connections and interactions between different organisations, stakeholders and themes.

After this task, participants were instructed to list the strengths, challenges, hidden assets, and general community spirit to the same template (using *Post-it* notes). As a final task, they were asked to complete the partial sentence cards with mutually agreed sentences.



Figures 3 and 4 – Context mapping exercise in Grabouw

Workshop findings

There is currently no comprehensive information (database) around the socio-economic and health context in Grabouw (and the broader Elgin Valley) [23]. The workshop yielded relevant data in this regard. A number of organisations, stakeholders, places, and services were firstly identified. Organisations and places that are somehow linked to regional health services included the fruit pack houses in the Valley, local non-profit institutions (ABBA; Siphila Sonke; Thembacare; Elgin Learning Foundation) and farms with in-house clinic and education services. Local health services are primarily offered by the Grabouw Community Clinic (also known as the Day Hospital), the Thembacare Hospice, and home- and community-based caregivers (from respective non-profits, ELF, Siphila Sonke, Thembacare, and the like).

Early discussion points included the lack of coordinated services between organisations, especially in addressing youth development in the region. Unemployment was raised as a particular concern, and was felt to impact negatively on issues of health and wellbeing. Participants stressed the need for job creation and youth development, and noted the role of new enterprises in strengthening local entrepreneurship.

The participants listed some of the pertinent strengths visible in Grabouw. These are both directly and indirectly related to health services, and help to map the context of opportunities in the region:

- The local economy is a stable and thriving force, especially in agriculture;
- Non-government organisations are visibly effective, and work at the grassroots to promote and sustain healthy living conditions;
- Local churches play a vitally supportive role in Grabouw;
- The natural environment and sport tourism are lucrative attractions in the region, and help to connect Grabouw with different stakeholders;
- A general willingness to cooperate is present among community institutions.

These opportunities notwithstanding, a number of challenges hamper regional development, and need to be addressed in offering quality health services:

- A lack of communication, interaction and coordination between stakeholders prevents effective development intervention;
- Alluding to the point above, there is a perceivable distance between the many groups that offer social services in the region – this leads to a disparity within Grabouw;
- Service provision is slow, ineffective, and non-sustainable (not limited to health);
- Migrant labour/seasonal employment, although necessary, contributes to variable unemployment and vagrancy in the region;
- There is little accountability on part of the local government;
- Crime, violence, and substance abuse are major challenges in Grabouw;
- Grabouw is “over the mountain” and thus isolated from development activities. Consequently, the mountain represents a symbolic barrier to local community development.

These are challenges are not immediately visible to the external ICT-for-development practitioner, and represent the critical regional priorities. There are, however, a number of “hidden assets” within Grabouw – these can be further exploited in local development programmes:

- The development of the Youngstar Youth Centre, aiming to harness local youths in tackling regional challenges;
- Leveraging on overseas partnerships, which help bring credibility to local development;
- Local business investment and entrepreneurship – the nucleus of the local economy;
- 76 sustainable farms, which contribute to food security and employment in Grabouw;
- NGOs, providing invaluable services;
- Sport and wine tourism, which helps to fracture the mountain as a symbolic barrier;
- The national highway (N2) functions as a regional gateway or a nexus, and drives interest in Grabouw as a commercial and tourist attraction.

These are some of the hidden assets elicited through the service design workshop. Participants claimed that the harnessing of these opportunities might aid in the strengthening of local social services. In light of this, participants were asked to indicate the “community spirit” in one word. Three descriptions were particularly signifi-

cant: 'stratified', 'survival mode', and 'suppressed'. It can be deduced that Grabouw – at least according to these representatives – is perceived as a deeply divisive community, constrained by socio-economic ills, and isolated from sustainable development intervention.

Finally, workshop participants 'summarised' Grabouw as a community in three expressions:

- Grabouw is... "over the mountain"
- Grabouw could be... "Franschhoek. The 'big apple'. The 'core' of opportunity"
- Grabouw needs... "Passion to thrive again. Action."

Interestingly, participants offered Franschhoek as an ideal community – a utopia of sorts, in which natural beauty, a strong economy, wine tourism, and social services are open and accessible. Ironically, Franschhoek too is a divisive region, subject to much socio-historical and –political strife [24].

Overall, participants identified various important stakeholders and organisations in the area related to health. Many of which were previously unfamiliar to the development team, or which were not perceived as influential.

The exercise and discussion among participants provided a lot of further information about the role and connections to different actors, as well as on the relations between different challenges, opportunities, and assets in the area.

It would appear, ultimately, that any ICT-based intervention needs to be localised within the context of opportunities, challenges, and hidden assets of Grabouw. This will require nuanced knowledge of existing community-based experiences, activities and programmes.

Conclusions and recommendations

Based on the (admittedly preliminary!) experiences from this project case, a service design approach can support the planning and building of the foundation for an ICT-based health intervention. This approach offers concrete tools and techniques that can be used in different phases along the development process.

Preparatory discussions allowed for a mutual development directive, localised to the Grabouw context. During initial meetings, critical issues and challenges were outlined around which the GEF team could mobilise. Team members envisioned a joint development agenda that would enable and strengthen regional health services (inter alia).

The context-mapping tool helped the development team to identify important stakeholders and organisations in the area, as well as gain better understanding of their roles and connections. The exercise also enabled the team to gain deeper understanding of the current situation, both the interrelated challenges as well as the assets for health service development.

The team was also able to gain practical experience around the use of the service design tools. One learning or development area for the future is related to the technical execution or size of the developed context map and visual cards used, so that the participant can more easily map the cards to their actual locations, together with descriptions.

Based on these early experiences, the participatory exercise offers a valuable narrative in mapping the design

of health related ICT initiatives. To triangulate this narrative, the same context mapping exercise and tools (with potential modifications) will also be used with other participants, focusing especially on the health theme. The utilisation of such exercises with different stakeholder groups can help to build a nuanced understanding of the community context. This will also assist in the comparative analysis of potentially different viewpoints, experiences, and meanings.

Based on the activities conducted and the results gained in the exploration and insight phase, the project team has been able to create building blocks for next process steps. This will support the future development of ICT-based health services that could be designed from the local and human centred perspective. The service design approach has ultimately emphasised the inclusion and involvement of various stakeholders to support the collective nature of development. This bespeaks a joint commitment towards addressing the common challenges of sustainability and lack of coordinated collaboration.

Acknowledgments

The authors would like to acknowledge the Cape Peninsula University of technology, and particularly Prof. Retha de la Harpe in the Faculty of Informatics and Design, for enabling this research. Our gratitude is extended to our friends at the Elgin Learning Foundation, CENCE, Heidelberg, Grabouw Entrepreneurship Forum, the Youngstar Youth Centre, and the Elgin United Church. To all those who participated in the preparatory discussions and context-mapping workshop: a sincere 'thank you'!

References

- [1] Van Zyl I.J. and Du Preez V. Youth at Risk – Envisioning a Design Response. Proceedings of IFIP WG9.4 – Social Implications of Computers in Developing Countries. Forthcoming July 2013.
- [2] Van Zyl I.J. and De la Harpe R. AT-HOME 2.0 – A collaboration model for informal learning in home-based healthcare. *Journal of Universal Computer Science*, Rethinking Education in the Knowledge Society Special Issue 2012: 18(3): 429–453.
- [3] Leclerc-Madlala S. Transactional Sex and the Pursuit of Modernity. Centre for Social Science Research (CSSR) Working Paper No. 68. Published by CSIR, 2004.
- [4] Ashman S., Fine B. and Newman S. The Crisis in South Africa: Neoliberalism, Financialization and Uneven and Combined Development. *Socialist Register*, 2011: 47: 174–195.
- [5] Ruxwana N.L., Herselman M.E., Pottas D. and Ouma S. Advocating a quality assurance model for the implementation of e-health solutions in rural South Africa. *Health Information Management Journal*, 2010: 39(1): 36–40.
- [6] Khotu S.H. and Cabuko M.E. eHealth. The South African Context. 2006. Retrieved 18 April 2013, <http://www.docstoc.com/docs/70153440/eHEALTH>
- [7] Coleman A., Herselman M.E. and Pottas D. E-health readiness assessment for e-health framework for Africa: a case study of hospitals in South Africa. 4th ICST International Conference on eHealth, Malaga, Spain, 21-23 November 2011, pp 162 – 169.
- [8] Presidential National Commission on Information Society and Development (PNC on ISAD). *The need for e-Health Policy*. 2012. Retrieved 16 April 2013, <http://www.pnc.gov.za>
- [9] Department of Health. eHealth Strategy South Africa 2012. Retrieved 18 April 2013, <http://bit.ly/Ztwcft>
- [10] Mars M. and Seebregts C. Country Case Study for e-Health South Africa. 2008. Retrieved 18 April 2013, <http://archive.k4health.org/system/files>
- [11] Van Zyl I.J. Mutual Isolation and the Fight for Care: An Ethnography of South African Home-based Healthcare Contexts. *Journal of Health Informatics in Developing Countries*, 2011: 5(1): 15-37.
- [12] Miettinen S. and Koivisto M. (Eds.). *Designing Services with Innovative Methods*. Kuopio Academy of Design & University of Art and Design Helsinki, 2009.
- [13] Stickdorn M. and Schneider J. (eds.). *This is Service Design Thinking: basics - tools – cases*. Amsterdam: BIS Publishers, 2010.
- [14] Bayer H. and Holtzblatt K. *Contextual Design: Defining Customer-Centered Systems*. Morgan Kaufmann Publishers, 1998.
- [15] Goodwin K. *Designing for the Digital Age: How to Create Human-Centered Products and Services*. Wiley, 2009.
- [16] IDEO. *Human Centered Design. Toolkit*. 2013. Retrieved 18 April 2013, <http://bit.ly/9QSDqC>
- [17] Brown T. and Wyatt J. *Design Thinking for Social Innovation*. Stanford Social Innovation Review. Winter, 2010.
- [18] Thomas E. *Innovation by design in public services*. Design Council, UK. 2008. Retrieved 18 April 2013, <http://bit.ly/iNyLso>
- [19] UK Design Council. *The role of design in public services*. Design Council briefing. 2008. Retrieved 18 April 2013, <http://bit.ly/Z5puNc>
- [20] Mager B. *Service Design. A Review*. Köln International School of Design, Köln, 2004.
- [21] Babbie E. and Mouton J. *The Practice of Social Research*. Cape Town: Oxford University Press, 2001.
- [22] Miettinen S. *Service Prototyping in Action! Touchpoint – The Journal of Service Design* 2011: 3(2): 64-65.
- [23] Götte-Meyer M. *Development perspective on the Overberg region*. Elgin Learning Foundation, 2010.
- [24] Jennings G. *Franschhoek Memories. Life in the French Valley*. Cape Town: Double Story Books, 2004.

Address for correspondence

Izak van Zyl
PO Box 652
Cape Town
South Africa
8000