

# Towards a Needs-ICTD Strategy Alignment Framework

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## **Abstract**

Access to ICTD projects has increased over the years; however, it has not significantly changed the lives of the communities they are involved in. The cause of this discrepancy is the gap that exists between the reality of the community and its needs, and the ICTD strategy of the project. Through understanding and relaying the needs and reality of the community, projects can effectively develop their strategy to suit the needs of the community. However, the solutions that are provided are often commonly developed without the needs of these communities being sufficiently investigated beforehand. Some of the reasons why ICTD centres or projects have failed include: an inappropriate technological approach that is not developed in accordance with the available resources, mismatches of Information Systems (IS) and local realities, incomplete/abandoned projects; projects failing to meet objectives or which fail to satisfy key stakeholders; and projects which cannot be sustained. As a result, the ICTD strategy of the project is not aligned well with the needs and development objectives of the community. Consequently, when an impact assessment is conducted it is often found that the intended effects are not directly linked to the needs of the community or what the community had hoped to gain from the ICTD initiative. This research paper proposes a framework to support the alignment of ICTD strategy, with needs of rural communities, hence providing a foundation that supports the identification and formulation of relevant impact assessment indicators. The Needs-ICTD Strategy Alignment framework is composed of eight main components that describe the alignment process. These components include: collaboration between internal and external stakeholders, understanding the development of the community, conducting baseline studies, the needs assessment, the ICTD strategy, linking of the needs-ICTD strategy, and lastly the identification of impact indicators.

## **Keywords**

Community Needs, ICTD Strategy, Business-IT Alignment, Needs-ICTD Alignment

# 1. Introduction

Rural areas in South Africa are characterized by high levels of poverty. This poverty is a result of interlinked challenges such as low agricultural productivity, poor rural infrastructure, lack of access to markets and market information, and low levels of investment in people (European Commission, 2013). The focus of this paper is based on rural areas as the majority of poor are in rural areas with a lack of access to basic services and needs. Therefore, every society needs to acquire, store, and exchange this basic stock of information to allow it to survive and thrive, which can be supported through Information and Communication Technology (ICT). McNamara (2003) stipulates that ICT does not create change in itself, but rather enables it. This means that although communities might be faced with different challenges and needs, ICT is not necessarily there to solve these problems directly. Rather, ICTs are a supportive tool that attempts to enable people to find solutions to these problems. According to Pade, Mallinson and Sewry (2008:2), the main uses of ICT in rural areas include entrepreneurial support and market access, access to education and knowledge, addressing health challenges, rural empowerment and participation, and establishing community networks. Despite this, there are still a number of challenges that are faced by rural communities when it comes to implementing, using or adopting ICTs. These include, but are not limited to, problems associated with limited access to infrastructure, limited formal education, insufficient ICT training and capacity building, and financial, political, social and cultural constraints (Pade et al., 2008; Wakelin and Shadrach, 2001). These challenges contribute to what Heeks (2009) calls the "Design-Reality gap". This refers to a large gap that exists between ICTD design expectations and the actual realities of the project and its context on the ground. The Design-Reality gap is based on the following dimensions: information, technology, processes, objectives and values, staffing and skills, management systems and structures, and other resources (Heeks, 2009). In the discipline of Information Systems, the design-reality gap model can be compared to the concept of Business-IT alignment, which is defined as the 'cohesive and concurrent achievement of mutual goals between business and IT' (Garlan and Shanks, 2007). This means that an approach that supports the alignment of ICTD strategies with the needs of the community is essential. Literature on the concept of 'Business-IT' alignment indicates that the following factors promote alignment between business and IT: company/firm wide active involvement, long term focus, open communication, the meeting of the minds, clarity of ideas and consistency (Luftman *et al.*, 1999; Garlan and Shanks, 2007; Henderson and Venkatraman, 1996). A case can then be made to learn from such alignment practice, to establish an alignment between what the community needs and what the ICT project intends to achieve within the chosen community. Many ICTD projects are established with the aim of progressively developing a community, but without the needs of these communities being thoroughly investigated, and aligning ICTD strategy with these needs. As a result, an adequate programme theory and relevant impact indicators fail to be developed. This means that most of the time when an impact assessment is conducted, the effects are often not directly linked to the needs of the community or what the community had hoped to gain from the ICTD initiative because of the disjuncture between community needs and those of implementers. The paper aims to discuss bridging this disjuncture by developing a needs-ICTD focused strategy alignment foundation that supports the identification and formulation of impact indicators. The paper firstly presents a literature review on community needs and ICTD strategy. The case of business-IT alignment in ICTD is

discussed, the needs-ICTD alignment framework is then presented and each component is discussed, with a summary of the results presented. Lastly, the paper concludes that the application of the framework could greatly enhance the alignment of community needs and ICTD strategy.

## 2. Community Needs and ICTD Strategy

According to Remenyi et al., (2004), there are two primary principles for rural community development. The first principle indicates that rural development is about development of and for the community, while the second principle emphasises development through community decision-making processes. Development is fundamental for the human race to be able to survive, and one of the approaches is to provide effective rural development programmes that will be assisted by information and knowledge that can be provided by ICTs as supportive tools. However, ICT interventions are faced with challenges which also stem from under-developed areas. Unless effective development takes place, ICTs will always inherit problems that could have been solved had proper development initiatives taken place. However, more appropriate technology development is taking place, which addresses some of the challenges that ICT4D is faced with and incorporates the community into the development process. An alignment should exist between rural development needs and how ICT can support these needs. Obviously the challenge is to understand the appropriate community needs and to align appropriate ICTD strategy to these needs.

A needs assessment is a diagnostic process that relies on data collection, collaboration, and negotiation to identify and understand gaps in the current condition in a community compared to the desired condition. A needs assessment also frames the problems or opportunities of interest and builds relationships among the people and groups who have a stake in the issue (Gupta *et al.*, 2007; Dagenais, 2010). Bridges (2011) notes that in relation to ICT initiatives, a needs assessment should also fully investigate current technology use in the area to be served. Some of the factors that have to be taken into account include the local capacity to use the technology; the availability of technical support; the kind of services that people and organizations would be willing to pay for and what may need to be provided for free. Furthermore, the training needed to integrate technology use into daily routines of the target groups, the availability and reliability of electricity and phone lines; secure storage for technology; and many other factors also have to be accounted for. According to Dhingra and Misra (2004) rural ICTD professionals tend to develop ICT solutions based on their own perception of the end-users' requirements, rather than developing ICT through an exploration of the rural poor's information needs. Dhingra and Misra (2004) state that it is advisable to develop information *categories* representing the information needs of rural communities. There are three main types of needs for community development, and these include information needs, community and target needs, and demand driven needs.

Information needs are defined as a "gap between the information and knowledge available to solve a problem and the actual solution of the problem" (Miranda and Tarapanoff, 2007: 1). Information needs are for example communities needing information relating to government information and services that are offered which can help them with solving

their problems. The information categories in this instance would be for example; forms, land records, employment opportunities, voter lists, government departments and offices and more (Dhingra and Misra, 2004; Ndiwalana, Scott, Batchelor, and Sumner, 2010). It is therefore imperative that these information needs are known so that the ICT project can be properly used and applied (Heeks and Molla, 2009; Harris, 2004). Community needs are those needs that are identified through a participatory process involving the community (Alkire, 2002). These needs are needs that are relevant, contextualized and accepted by the majority of the people in the community to be reflective of their desires for development needs (Bailur, 2007). In the community, people have different ages, genders, occupations and roles, and thus when people are then grouped into these groups we are able to start establishing target groups. These groups can be the youth, the elderly, schoolchildren, business groups, teachers and the wider community at large. ICT projects should assess whether such projects are consistent with the preferences of target groups essential for contributing to the development process. This includes making sure that the projects are better designed and constructed, and are more sustainable in improving the delivery of services (Mansuri, 2004). It is vital that needs relating to these specific groups are identified to provide information that is appropriate to their needs. Demand driven needs occur when the users formulate the demands of the services and information that they require and thereby shape solutions as to how they can solve their own problems (Mulder, Bohle, Boshoman, Morris, Tempelman and Velthausz, 2008). According to Pade-Khene and Sewry (2011), demand driven needs start to materialize when ICT services have been implemented and are being used in the community and local individuals or ICT service staff are empowered to evaluate demand driven needs that have arisen. Here, ICT services now become a part of the community and thus the users can observe and report on changing usage patterns or community requests especially in the absence of the project team or evaluator. It is also noted that at times projects might have specific goals and objectives to achieve and also at times specified methodologies to carry out the projects. This is the case in most projects and it can be argued that, this might be the reason why the projects fail as they are not suited to the context of the community. It is argued that the precise neglect of the needs of the community therefore increases the design-reality gap and such pilot projects fail. Therefore, the identification of these needs provides external project stakeholders with vital information that should contribute to the development of an appropriate ICTD strategy that is tailored to suit the needs of the community and enhance development.

An ICTD strategy contains an information strategy, development strategy and a technology strategy (Harris, 2004). The different strategies are interrelated and build-up the ICTD strategy. They provide a link to how information, development and the technology strategy link up. The application of ICTs for development should always begin with a development strategy, which includes development decisions, objectives and directions, change orientation and priorities of the development (Harris, 2004). An information strategy can then be developed from this development strategy, as it informed of the existing gaps in information and communication related to development challenges. A technology strategy then indicates the various platforms that are available to access the information to support development of the community. Overall, the ICTD strategy should contain an aim, vision, objectives and goals that are envisioned by the community. An ICTD strategy is used to effectively plan over the long term aspects such as how the ICT supports development initiatives, and how ICT resources will be used to implement this strategy in the rural

environment to meet the information needs for development in the community. The ICTD strategy objectives should be tied to the community's overall development objectives which include topics such as education, health, government, business, and industry (World Bank, 2006; Geldof, 2005; Rossi *et al.*, 2004). Linking the development-information-technology strategy with the aims and goal of the project contributes to a sound ICTD strategy. If the ICTD strategy is not sound, the actual human development needs focused on for a project (e.g. health, education, etc) do not relate to ICTD strategy to support addressing these needs, hence a gaps in strategy emerges. Approaches on how the alignment between human development needs and ICTD strategy can be achieved could be learned from business-IT alignment.

### 3. The Case for Business-IT Alignment in ICT4D

Business-IT alignment is defined as the degree to which the Information Technology (IT) function of the business supports and is supported by the business strategy through the alignment of the mission, objectives, structure, technology, personnel, processes and plans of both functions working towards the same goal (Chan, 2002; Gartlan and Shanks, 2007; Luftman, 2003a; Reich and Benbasat, 2000). There are numerous approaches and methodologies that are used to achieve business-IT alignment. These methodologies and approaches provide direction on how the alignment can be achieved effectively. However, focus is primarily on the Social Dimension business-IT alignment model, which is more closely related to the context of ICTD interventions. A Social Dimension of alignment refers to the state in which business and IT executives understand and are committed to the business and IT mission, plans and activities (Reich and Benbasat, 2000). Relevance, understanding and commitment by stakeholders are all key requirements for supporting human development initiatives, such as, ICTD.

The Social Dimension model (Figure 1) proposes that the alignment of business and IT should be viewed from the social dimension side (Reich and Benbasat, 2000).

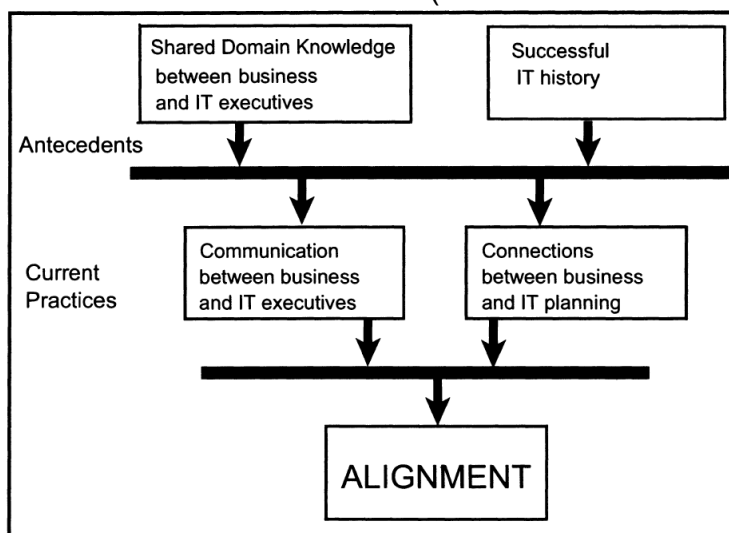


Figure 1: Social Dimension Business-IT Alignment Model (Reich and Benbasat, 2000)

Figure 1 illustrates how the social dimension of the alignment process should occur using the current practices and antecedents to achieve alignment. The first antecedent is the shared domain knowledge between business and IT executives. This means that there needs to be a deep level of understanding between business and IT executives that will enable them to contribute to each other's processes and respect their contribution and challenges (Reich and Benbasat, 2000). The second antecedent is the successful IT history. The IT department needs to share their successes with the entire company. This entails the IT department sharing their implementation success and how it has impacted the business. This will also positively influence the level of communication and connections between the business and IT executives (Reich and Benbasat, 2000). The current practices firstly include the communication between business and IT executives. This practice entails them sharing information with each other in order to reach mutual understanding. However, over time this can also contribute to them disagreeing, but also can lead to them agreeing on topics of mutual understanding (Reich and Benbasat, 2000). This can positively affect the level of communication between business and IT executives, as it will greatly influence the level of alignment. The last current practice to achieve the alignment is connections between business and IT planning. This entails a better understanding of what business envisions for IT and what IT envisions for business (Reich and Benbasat, 2000). It can then be stated that the level of connection amongst business and IT planning processes will positively impact the level of alignment (Reich and Benbasat, 2000).

The application of the social dimension alignment model can be applied to the concept of aligning ICTD strategy to local needs. The community and the external ICTD stakeholders can apply practices from this model to enhance the connections and communication in their relationship. For example, this means that the ICTD external stakeholders can share with the community how ICT may play a role in supporting activities that address their needs and also sharing how ICT has supported other communities. The community should also communicate their needs to the ICTD external stakeholders effectively, so that they also have a clear understanding of what the community needs. However, this will require sensitised approaches to truly understanding what the community needs, because it is a challenge to actually determine when the community is not really sure what they need (especially in relation to addressing their development challenges).

The business-IT relationship cannot be possible without business and IT departments collaborating with each other on how they can improve the capability and stand of the business in the environment and the market they are faced with. Therefore, IT starts by knowing the what, how, why, and when of the business environment and market before they can align their strategy to business. In ICTD practice, this means that the external stakeholders need to know the developmental, informational and technological needs, the strategies and the environment, and the context of the community. As much as there are enablers and inhibitors of the alignment relationship, there are also enablers for the community needs-ICTD relationship. The top enabler of a business-IT relationship is top management support of the endeavours of IT. In the community there needs to be support from the community leaders, whether it is the municipal leader, church leader, the chief or an elected community leader. Another enabler of the relationship is IT understanding the needs and requirements of the business. This is also similar in ICTD as the strategy develops need to clearly understand the needs of the community fully. Another enabler is

the involvement of IT in the development of strategy, in the community they have to have a development plan. In the strategy that will be used to achieve the plan, the community needs to involve the external stakeholders fully so that they understand what the community wants to achieve and how they can aid them. The inhibitors of business-IT alignment process also need to be avoided. An example of an inhibitor would be the lack of a close working relationship between IT and business. In the ICTD area communities need to be close to the external stakeholders so that they know their end vision and how they can assist the internal stakeholders to address community challenges. Another inhibitor would be IT not understanding and prioritizing the needs of business. External stakeholders need to serve the community as well as they can and they if cannot they need to communicate this to the community. This will allow for the appropriate needs to be fully understood and prioritized.

The use of the lessons learned from the business-IT alignment can contribute greatly to understanding how the alignment of community needs and ICTD strategy may occur. As Gomez and Pather (2012: 4), state the challenges that are currently experienced in ICTD are not new, as the business and IT have been experiencing similar challenges for more years and lesson can be learned from it. The occurrence of such alignment can provide a base from which the appropriate impact assessment and indicators can be identified. The evaluation of an ICTD project should therefore, be based on the needs of the community, of which the project goals are linked to (depending on the human development intervention focus). An impact assessment aims to implement a monitoring and evaluation system to identify whether the project fulfils its development purpose for its clients and beneficiaries (Batchelor and Norrish, 2006; Rothenberg-Aalami and Pal, 2005). Impact indicators are pieces of information that communicate a certain state, trend, warning or progress to the audience and contribute to the impact assessment (Khosa, 1996).

There are many approaches that can be used to derive such impact indicators that are linked to the alignment of community needs and ICTD strategy. One approach in identifying the impact indicators is through the CARTRA approach where indicators identified based on ICT4D impact can be measured according to the extent to which it improves information delivery (Heeks and Molla, 2009). In the CARTA approach the development of impact indicators is based on the Completeness, Accuracy, Relevance, Timeliness and Appropriateness (CARTA). This means the CARTA can be appropriately applied when there is a clear alignment between the needs of the community and ICTD strategy. Another approach is through identifying the indicators based on the goals that are meant to be achieved (Prennushi *et al.*, 2002). This approach focuses on identifying the input, output, outcome and then impact based on the specific goal that was meant to be achieved. For example, literacy may be considered one of the dimensions of well-being and so an indicator measuring it would be the proportion of people of a certain age who can read a simple text and write their name (Prennushi *et al.*, 2002). The project goals therefore also need to be based on the actual community needs as to be able to link them to the outputs of the project.

All the topics and factors discussed in the literature review have informed the development of the needs-ICTD strategy alignment framework (Table 1).

*Table 1: Contribution of literature to framework*

<b>Topic</b>	<b>Contribution to the framework</b>	<b>Frameworks/Models used to inform topics</b>
Information and knowledge for Rural development	Appropriate and relevant information to communities will enhance the development of a well-informed baseline study and a development plan of the community which will assist in gathering the most appropriate community needs.	Millennium Development Goals (World Bank, 2003); Design-Reality Gaps in ICTD Projects. (Heeks 2009);
Community Needs Assessments and ICTD Strategy	Gathering the appropriate needs of the community will allow for the relevant needs to be addresses and the ICTD strategy aligned to the community needs. The development of the ICTD strategy should take into account the needs of the community and be developed in accordance to their needs.	The Relationship between Development, Information and ICTs (Harris 2004); The need Identification (Gupta et al, 2000
The case of business-IT Alignment in ICTD	Business-IT alignment has factors which can contribute positively to how the needs-ICTD linkage will take place. Whilst drawing all the components of the framework to contribute to the alignment.	Social Dimension Business-IT Alignment Model (Reich and Benbasat, 2000); A Topology of IT Strategies and their Impacts (Silvius et al., 2009)
Impact Assessments and Indicators in ICTD Projects	Impact indicators allow the appropriate indicators to be developed based on the alignment of the community needs and ICTD strategy. They allow for the linkage to be properly assessed by the development of intended and unintended impact indicators as based on the development plan of the community.	CARTRA approach (Heeks and Molla, 2009); The RICT-CEF Framework (Pade-Khene and Sewry, 2012); Relation between the baseline indicators, output, result and impact indicators. (InfoDev, 2010)

## 4. The Needs-ICTD Strategy Alignment Framework

The Needs-ICTD strategy alignment framework supports the process of linking the ICTD strategy to community needs and in providing a foundation for the identification of impact indicators. A theoretical analysis across the concepts of ICTD, business-IT alignment, and impact assessments/indicators contributed to the preliminary development of the framework. The framework is important as it firstly guides interaction between external and internal stakeholders (which would guide how the development of the community should be investigated), which subsequently supports needs elicitation and alignment. Secondly, based on the baseline study and the needs assessment the framework explains how the ICTD strategy could be aligned to the needs of the community.

The framework is divided into nine components, which facilitate the alignment of needs and ICTD strategy in order to measure impact as demonstrated in Figure 2. The framework is dependent on rigorous interaction with external stakeholders and internal stakeholders. The consultation of these stakeholders influences the success rate of applying this framework in the community. Each component also affects the success of the application of the framework. Since each component affects the execution of the following component, each component cannot be executed without the results of the previous component. Mutual understanding of how the framework works from the external and



internal stakeholders is vital as it affects the understanding and execution of the framework to benefit the community and ICTD project.

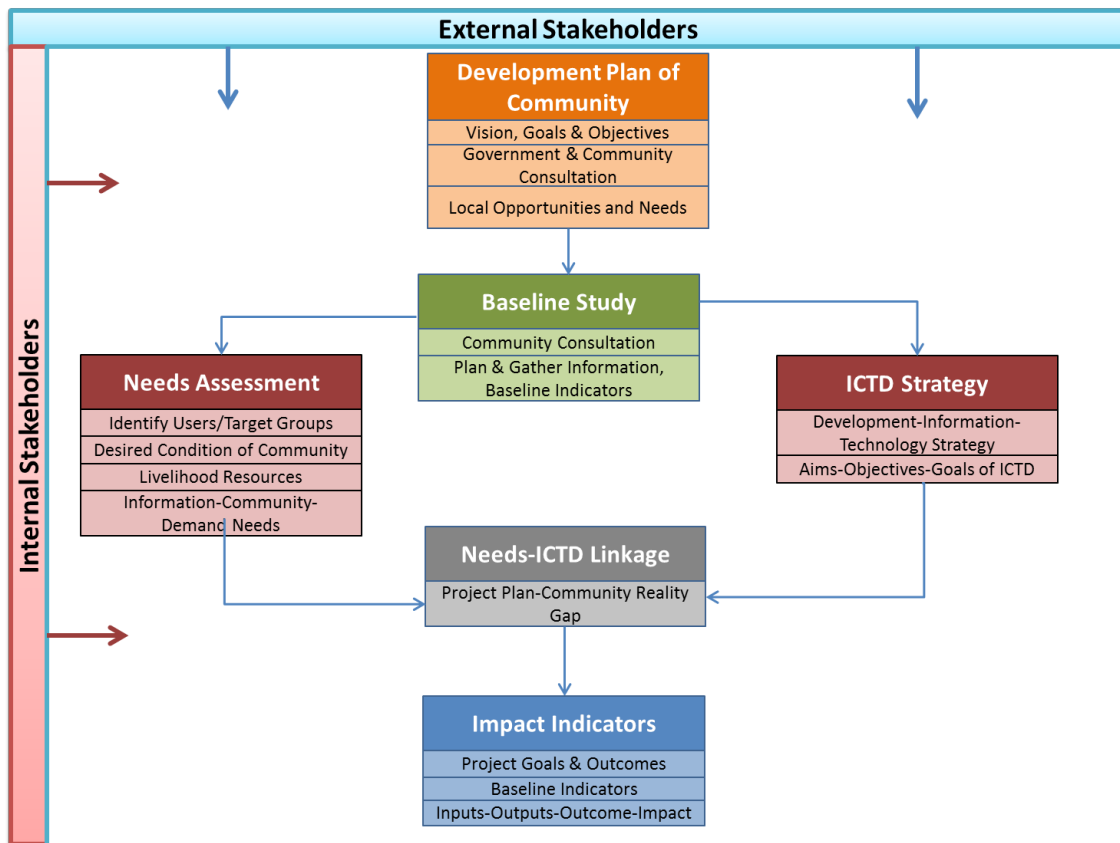


Figure 2: Needs-ICTD Strategy Alignment Framework

#### 4.1 External and Internal Stakeholders

Internal stakeholders are the community at large and are made up of groups within the community; for example, the youth, elderly people, business groups, teachers, health officers, and school children (Pade et al., 2009). The community also includes community leaders, project champions and other representatives in the community. Internal stakeholders at times know their development needs when asked in a manner in which they understand; however at times they need to be guided on the possibilities and also their challenges. Therefore, it is important that any development should occur through a consultative process with the people involved. If this is not the case, communities often reject and are not enthusiastic of any development that occurs in their community without their involvement (Reid, 2000). The decisions that are taken by external stakeholders should be clearly communicated to community leaders and members. When these members are not involved in this process, the validity of the project and its intention to bring about real change to the community is questioned. Therefore, the process of making decisions needs to be participatory and people-centred.

External stakeholders are at times, the people that initiate development in the various communities and are placed at the top of the diagram for this purpose but in consultation with the internal stakeholders at all times. They provide most of the resources for ICTD

interventions and they aim to create impact and involved in solving societal problems and also to facilitate the development of the community (Gumbo, Thinyane, Thinyane, Terizoli and Hansen, 2012). Examples of external stakeholders would be the researchers, project partners and funders, project leads, trainers and technicians (Gumbo *et al.*, 2012). It is important that external stakeholders provide avenues to assist the development transition. The internal stakeholders should also assist in driving the projects to channel development through the appropriate direction, which would include how they would like the project to work for them. The external stakeholders direct and assist in driving the technology to support development initiatives. External stakeholders should provide clear direction in terms of providing some guidance for development strategies, valuable information, and technology to internal stakeholders. More so, internal stakeholders should be consulted at all times throughout the life of the project. The first step in consulting the community should be in constructing the development plan of the community. A development plan of the community may focus on one particular aspect at a time in the community for example, education or health.

## 4.2 The Development Plan of the Community

A development strategy provides enabling environments through support for policy and regulatory framework advice, and the development and promotion of local capacity development (Canadian International Development Agency, 2005). The development strategy provides a plan for creating employment, eradicating poverty and improving the socio-economic status in the community (Inter-American Development Bank, 2004). The development plan of the community is aimed at (based on the community's needs) developing the community into a more self-sufficient society. It should be driven by the community members and through consultation with all internal stakeholders of the community. It should also be driven by the leaders of the community. The component as seen in Figure 3 is divided into three parts, which encompass the vision, goals and objectives; government and community consultation; and local opportunities and needs.



Figure 3: Development Plan of Community Component

The vision, goals and objectives clearly state the direction in which the community will develop and what the aim of development is. The process of creating the vision, goals and objectives of the community should be a bottom-up approach so as to include all the stakeholders of the community. When the community stakeholders set what they would like to achieve they are more likely to be cooperative and interested in the development of the community than when this has been dictated in a top-down fashion. The local needs of the community should also drive the initiative of creating the selected goals and objectives of the community. The external organisations (such as government, academia, NGO's, and

other private organisations) and community should consult each other on what is best for the community. The government should always be in contact with the community and its leaders to know the needs and development aspirations of the community. The government itself should have a development plan for the community, which is commonly referred to as the DP (Development Plan) that indicates the plan that government will follow to address the development needs of the community (McEwan, 2003). The DP is commonly developed with the assistance of community leaders and not government officials alone. This means that the vision, goals and objectives of the community should be visible in the DP. Frequent consultation with the community will assist the government in knowing which development needs and services should be provided urgently to the community. When government wants to implement its plans for the community, the plans should also be linked to the local needs of the community.

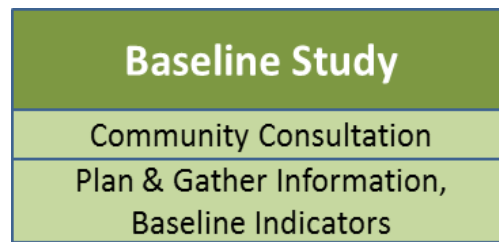
Formalising the development plan of the community should be a process that involves all members of the community, and therefore, should reflect the community holistically. When the development plan has been drawn up, the direction in which development progresses will become more evident based on goals and objectives to drive the development. When external stakeholders initiates the ICTD project in the community they arrive knowing fully what the community aims to achieve and how they can assist in driving development.

### **4.3 Baseline Study**

The baseline study is aimed at investigating and assessing the current status of the community and its readiness to uptake innovative development activities through the use of ICT (Pade et al., 2009; Rossi, Lipsey and Freeman, 2004). The baseline study also reflects the socio-economic status of the community. The baseline study can be directed and guided by research questions such as (Pade et al., 2009):

- 1) What is the status of the local economy and what directions can it take?
- 2) What is the quality of life in the communities?
- 3) How ready are the communities to form part or become partners in the initiative?

The baseline study does not focus on issues associated with the new ICT project's technology, but aims to understand the existing status of the community (Rossi, Lipsey and Freeman, 2004). The following are some examples of the aspects that should be assessed, and these include: socio-economic conditions, demographics, cultural context, political context, existing ICT diffusion (both modern and traditional ICT), the way of life in the community and traditional information and communication channels, existing politics of information and information flows, and the extent to which an enabling environment exists for ICTs to empower poor communities (Pade-Khene and Sewry, 2011). The baseline study is the second component of the framework and should be conducted when the community has a clear development plan in place. As shown in Figure 4, the baseline study is made up of community consultation and the identification of baseline indicators to plan and elicit the status of the community.



*Figure 4: Baseline Study Component*

Community consultation should go hand in hand with the participatory process and should include all stakeholders. Through community consultation it can be discovered whether the community is actually ready to be involved in the project and be involved in the change that will occur. Suggested means of consulting the community include firstly meeting the heads of the community as they drive the participation of the internal stakeholders. Secondly, a community meeting can be called to provide overall clarity of the project, while thirdly, meeting with the community members informally in their natural environments (such as when people are fetching water from the river) can also provide invaluable information on the desires for development of the people in the community.

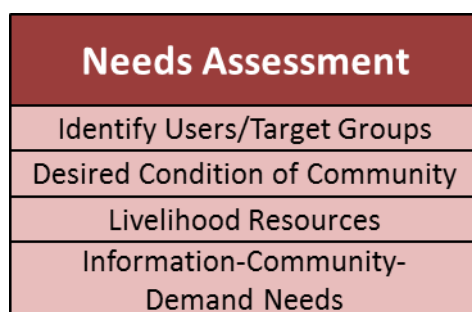
Planning and gathering information is a process of knowing what, how and which information must be gathered for the baseline study and this therefore requires rigorous interaction between the external and internal stakeholders. Examples of how the internal stakeholders can be involved could be through them relaying stories about 'a day in their life' or to be involved in community feedback meetings. From the gathered information appropriate baseline indicators need to be identified so as to measure the involvement of the project in the community and track the development of the community. The baseline study will then contribute to the needs assessment of the community, by providing the current context of the community. It also provides a general view of all needs and priorities of the community, which allows the needs assessment to conduct a more in-depth analysis of the various needs and priorities.

#### **4.4 Needs Assessment**

A need is identified as the difference between a current condition and a desired condition (Gupta *et al.*, 2007). A needs assessment is a process that identifies the needs of the community or target group needs. It also frames the problems or opportunities of interest and builds relationships among the people and groups who have a stake in the issue (Gupta *et al.*, 2007; Dagenais, 2010). As indicated by Bridges (2011) a needs assessment should fully investigate current technology use in the area to be served including the local capacity to use the technology, the availability of technical support, the kind of services that people and organizations would be willing to pay for and what they may need to be provided for free, the training needed to integrate technology use into daily routines of the target groups, the availability and reliability of electricity and phone lines, secure storage for technology, and many other factors. If the needs assessment is not taken from the technology perspective, Gigler (2004) provide us with a different view from Bridges (2011) as they indicate that needs are identified through a needs assessment of livelihood resources essential for rural development such as, economic or financial capital, natural capital, human capital, social capital, and informational capital. A needs assessment should also provide a view from the different stakeholders within the community. This

means that information, community, target and demand driven needs have to be explored. Rural ICTD professionals tend to develop ICT solutions based on their own perception of the end-users' requirements rather than exploring the rural poor's information needs (Dhingra and Misra, 2004).

The needs assessment component can only proceed once the development plan and baseline study results of the community are evident. The needs assessment relies on the holistic needs and priorities of the community. This information is gathered during the baseline study and the development plan of the community. The needs assessment component (Figure 5) is divided into four parts, which are: the Desired condition, Identify user/target groups, Livelihood resources and Information-Community-Demands Needs. The needs assessment is driven by the external stakeholders but through a consultative process with internal stakeholders in the community.



*Figure 5: Needs Assessment Component*

The first part of this component is identifying user/target groups within the community to understand their specific needs. This can be done through reviewing the baseline and development plans of the community in order to get an indication of the groups that exist in the community. These groups can be explored through collaborating and communicating with them. Potential examples of groups include the youth, school learners, entrepreneurs, health workers, and teachers. When the users and target groups are identified, then an in-depth analysis of the desired condition of the community can be explored.

The second part of this component is exploring an in-depth desired condition of the community. The current condition of the community can be viewed through the baseline study as it provides the existence of the community as it stands. The development plan of the community identifies the plans that the community would like to achieve in order to progress in human development. Most needs therefore, become evident through the comparison of the baseline study and the development plan of the community. In knowing the in-depth desired condition of the community, this entails assessing each target group and provides a more detailed analysis for each group.

The third part of this component is identifying and exploring the needs of the community through a livelihood resources approach, as one approach. The resources essential for rural development include economic or financial capital, natural capital, human capital, social capital, and informational capital (Gigler, 2004). This process gives a clear understanding of what the community needs to survive and, therefore, contributes to attaining these resources to fulfil the needs. There are three different types of needs which

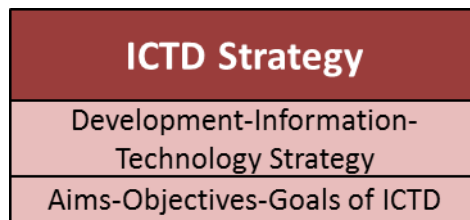
are information needs, community and target group needs and lastly demand driven needs.

The last part of this component is identifying and exploring the Information-Community-Demands Needs of the community which are related to livelihood resources. Information needs address the type of information the community would like to be exposed to in order to aid their own development. This means identifying the type of information needs of the community. If the community is focused more on agriculture or farming, a need that they may have is to know more about how to keep their land fertile through all seasons. Then it would be beneficial to the community to provide information channels that provide this type of information. Community and target group needs are needs of specific groups or the community as a whole. Breaking down community and target group needs assists in clearly understanding what each group needs to develop and how ICTD can assist them. An example would be a target group of entrepreneurs that need access to markets. The ICTD could provide platforms which assist in linking customers to the sellers, for instance, through a website which facilitates the buying and selling process for both sides. Demand driven needs only arise when the users are already exposed to ICT services which have supported their basic needs. An example for instance, would be the sellers wanting access to international chain store buyers to carry their items in the shops. More information, resources and platforms would be needed to facilitate this process through the involvement of external stakeholders.

The needs assessment component contains a number of processes that are needed collectively to produce adequate information to contribute to the next section of the framework. The needs assessment process is a continuous process and therefore, cannot be conducted and completed all at once. Overtime the needs of the community change and, therefore, sustainability needs to be achieved through continuous assessment of the community.

#### **4.5 ICTD Strategy**

Harris (2004) states that an ICTD strategy should always begin with a development strategy, from which an information strategy will be developed and this can be followed by the development of a technology plan. An ICTD strategy like any other strategy contains the aims, vision, objectives and goals for the ICTD project. An ICTD strategy would then be a strategy that would be used to effectively plan over the long term how the ICT will operate in terms of development, and how the ICT resource/s will be used to achieve this strategy in the rural environment to meet the information needs of the community. The ICTD strategy objectives are tied to the communities overall development objectives, which include education, health, government, business, and industry (World Bank, 2006; Geldof, 2005). The development of ICTD strategy is based on the baseline study and development plan of the community that provides the state of the community and the direction development should progressing be progressing toward. The ICTD Strategy component is divided into two themes: the development-information-technology strategy and the aims-objectives-goals of the ICTD.



*Figure 6: ICTD Strategy Component*

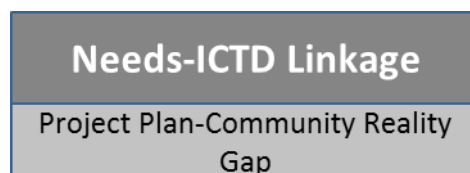
The development-information-technology strategy holistically brings together the different types of strategies that are needed to provide a sound ICTD strategy (Harris, 2004). The development strategy highlights the development needs of the community. The development strategy should indicate why there is a need for development within the community and how it will occur. As indicated earlier, information is needed to aid in any development initiative and, therefore, an information strategy needs to be developed. The information strategy guides how relevant access to information will be incorporated in development initiatives. The technology strategy stipulates how the required information for development can be delivered. This means investigating the possible means possible for delivering the information in convenient and accessible avenues. Linking the development, information, and technology strategy should be driven by the external stakeholders and in consultation with internal stakeholders.

The second sub-component which is the aims-objectives-goals of ICTD can be established when there is a clear indication of the development, information and technology plans. Formulating the aims, objectives and goals of the ICTD should be a collective effort between the external and internal stakeholders. The external stakeholders clearly indicate to the community what technology can do and achieve when used in the correct ways. The external stakeholders could then indicate to the community their strategy and, therefore also share aims for the community, the objectives they wish to aim for and lastly the goals that they would like to achieve.

The combination of the two parts of this component which is the development-information-technology strategy and the aims-objectives-goals of the ICTD all contribute to the development of a sound ICTD strategy. A sound ICTD strategy contributes to developing the alignment between the needs and ICTD strategy more effectively than an ICTD strategy that is fully developed without community participation.

#### **4.6 Needs-ICTD Linkage**

The Needs-ICTD linkage component of the framework aims to align local needs elicited with the ICTD strategy. The Needs-ICTD linkage component contains one section, which is the project plan-community reality gap (Figure 8).



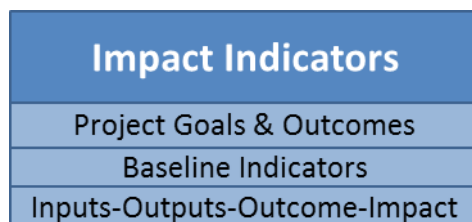
*Figure 7: Needs-ICTD Linkage Component*

The project plan - community reality gap is aimed at reducing the gap between the design of the ICTD strategy and the contextual reality of the community in which the ICTD operates in (Heeks, 2009). The project plan is the strategy in which external stakeholders aim to develop the community. The community plan is that which emanates from the development plan of the community. The business-IT alignment model also provides four key areas as mentioned earlier on which are sharing of domain knowledge, a successful history, communication and connections between business and IT. These domains provide pointers of how the alignment between the community and the project plan planners can take place. Key enablers and inhibitors also play a vital role allowing the alignment to occur. Key enablers such as top management support, the involvement of IT in strategy development, IT understanding the needs of the business, effective and reliable services from IT and lastly, the a successful IT history will greatly enhance and should be followed in order to achieve the alignment. The inhibitors should also be greatly avoided as the hinder the process of aligning the strategy to the needs of the community.

The needs-ICTD linkage component is one of the critical elements of the framework. If the needs and ICTD strategy are not in alignment then a wider gap develops which could ultimately lead to the failure of the project, or a negative effect on sustainability. The impact indicators cannot be clearly articulated to reflect the needs of the community when this component is not applied.

#### 4.7 Impact Indicators

The impact indicators component is dependent on the alignment of ICTD strategy with local needs. The component as seen in Figure 9 is divided into three parts which are the project goals and outcomes, baseline indicators and inputs-outputs-outcome-impact linkage.



*Figure 8: Impact Indicators Component*

The project goals and outcomes should be reiterated throughout the lifecycle of the project and if they change, all stakeholders should be informed. The project goals should have a link to the overall community development goals and the needs of the community. The goals will provide direction as to what the project aims to achieve and how it will go about doing that. They can be used to provide direction on what was achieved and what impact the goals had on the community and on the project itself. The presence of goals and outcomes in a project assists in identifying the intended impact indicators that can be measured. The comparison between the baseline study and the community development plan can clearly bring out the impact which the development plan aims to achieve, and provides the current status of the community. Impact indicators can then emerge from the baseline indicators in order assess and compare the changes.



Inputs, outputs, outcome, and impact should be the line of linking what was done (input) to what was achieved (impact). Therefore, indicators could be identified through linking the needs that were there, the inputs that were used to achieve a positive outcome of the need and what was the outcome linking to impact. The goals of the project can provide a clear connection through linking inputs to impacts. An example would be if the goal of the project was to provide health information to chronic patients, that goal would be based on a need of the community. The input there would be health information accessed through mobile phone for example; whereas the output would be people being more aware of their health, whilst the impact might be people being healthier as a result of this information. Impact indicators are, therefore, a collection of linking the project goals, to baseline indicators, to inputs and ultimately impact; they therefore, create a better way to measure and assess impact indicators. The impact indicators then pave the way in actually conducting an impact assessment which will evaluate the impact the project has had on the community and their development efforts. Unintended impacts may also arise as the changes in the demand driven needs of the community may give rise to unintended impact indicators.

## 5. Summary of Results

The proposed needs-ICTD strategy alignment framework suggests that areas an ICTD project should consider the needs of the community before the ICTD strategy is developed and impact is assessed. The needs-ICTD strategy alignment framework focuses on aligning community needs with ICTD strategy, which in turn affect the effectiveness of the community. In the process of ICTD strategy being aligned to the needs, more context relevant and community relevant solutions and products can be developed to assist the community in their quest for development. When the needs are aligned to ICTD strategy relevant impact indicators can be developed which not only focus on the vision, goals and objectives of the projects, but also on the needs of the community. An interpretive research approach was used to explore and inform the framework through a multi-case study investigation of the Siyakhula Living Lab and two projects in the Systems Application Products (SAP) Living Lab. Two main case study questions drive the exploration of the framework, that being: 1) How were the needs of the community elicited and how is the ICTD strategy aligned to the needs of the community? 2) Why were the selected approaches chosen for aligning the needs of the community and ICTD strategy?

Data for this research was collected qualitatively through interviews, document analysis and participant observation. Key findings indicate that the involvement of internal (local) stakeholders in the development and alignment of ICTD strategy to the needs of the community is still lacking. As a consequence, many community members end up not fully understanding the project objectives and how these objectives are to be achieved. The research also finds that 'solution specific' projects also fail communities as they focus specifically on *one* target group and repeatedly fail to assist the community *holistically* in supporting their information community development, demand-driven needs.

## 6. Conclusion

ICTs do have the potential to change the lives of people in rural areas. However, without an understanding of local needs, and an alignment of ICTD strategy to these needs, ICTD initiatives are not effective in communities. There is a growing frustration by community members, caused by the lack of expected delivery of ICT projects'. The provision of ICT services for development in communities is often not linked to community needs, and therefore, does not provide significant value to the community. A Needs-ICTD strategy alignment framework can be used to provide guidelines in aligning the ICTD strategy to the community needs as a foundation for assessing impact. The components of this framework include the involvement of internal and external stakeholders, the development plan of the community, the baseline study, the needs assessment, the ICTD strategy, the needs-ICTD linkage and lastly, the impact indicators which all contribute to the alignment of the community needs and ICTD strategy. The application of this framework in existing and proposed rural ICT projects can contribute to the alignment of ICTD strategy to the needs of the community and also in the identification of the relevant impact indicators for the measurement of impact. The review of the case studies revealed that most of the components in the framework had been considered in applying projects to the various communities. Various features of the needs-ICTD strategy alignment framework were revised to incorporate the experiences of the case studies.

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