VOIce-based Community-cEntric mobile Services for social development

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Business Modelling, Adoption Criteria and ICT services for the BoP

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# PROJECT DELIVERABLE REPORT

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2. Executive Summary

Today over 500 million Africans have access to mobile telephony, with only a fraction having access to internet connectivity. Market penetration and rural community adoption of basic mobile telephony and services have been extremely rapid in recent years. As these mobile ICT services are developing in the context of the BoP, one may be tempted to think that Mobile Internet would be the most likely and convenient means to information. The BoP context can however also be characterized by high illiteracy or literacy in marginal languages, lack of broadband infrastructure, and low technical capabilities. The development of VOICE based services with relatively robust, available, easy to use, native language technology therefore offers more potential on the short term.

However, given the characteristics of the BoP, BoP entrepreneurs with the ambition to structurally cater to this market face different challenges. The design-actuality gap was used to stress the need for local activity and ownership. BoP markets have to be understood at the ground level— from the bottom up—if a venture is to succeed in those marketplaces. More recently, the attention for local ownership has been accompanied by a call for more attention to scalability. Many enterprises achieved viability by adopting an expanded view of low-income consumers or business associates, engaging those both at the base of the pyramid, but also those in adjacent income groups. To structurally cater the BoP market BoP entrepreneurs are faced with two challenges. On the one hand, they need to ‘go local’ to ensure that their product fits the very locally orientated heterogeneous contexts that form the BoP, build social relationships and trust, thereby ensuring local ownership. On the other hand, working towards economic sustainability calls for strategies of scaling, or at least a scalable business model. Tools and methodological guidelines to guide the process of innovation would be highly beneficial to learn from previous experiences and allow for a structured process that reduces the risks of failure.

From an extensive literature review of State of the Art knowledge in the development discourse, social entrepreneurship, BOP innovation processes and technology adoption, a framework for strategic focus in innovation projects was derived. This framework is applicable to any innovation project for the BoP and does not limit itself to Voice based services. Neither does it focus specifically on any part that determines adoption, hence technical specifications and design guidelines for VOICE based BoP services should be derived from findings from the pilots. This framework collected findings on three different levels:
1. The adoption methodology described in the phases of the innovation process as well as six methodological guidelines important in each of these phases (Figure 1)
2. Viable business model: Critical Success Factors for an economic and social viable business model (Table 1)
3. The strategic focus between social viability for local adoption and economic viability for scalability (Figure 2)
When developing innovations for the BoP, an entrepreneur can face specific challenges that are less common in ‘regular’ innovation projects. There are six guidelines that need to be considered in each of the phases of an innovation project that are specific for BoP projects:

1. **Collaboration building and cooperation**
   BoP projects need multiple stakeholders on different levels, with different backgrounds to work together. Therefore it is needs to strategically choose partners and manage the partnership professionally.
   Tool: Strategic Alliance Management

2. **Business modelling and financing**
   Sustainable ICT business models for the BoP are scarce and it is challenging to find initial investment when outcomes are uncertain. Creative ways to acquire funding (microfinancing, crowdfunding) and innovative business model creation is needed for the adoption of the service.
   Tool: 3 types of ICT business models for the BoP

3. **Scaling up Innovation**
   Many projects fail after initial pilot phase. For sustainable solutions scaling up is crucial, and developing a scaling strategy early in the project is needed to ensure sustainability of the project after the pilot phase.
   Tool: Diffusion through social networks

4. **Co-creation participation and social embeddedness**
   There is a lack of knowledge of market demand and target group characteristics in the BoP. Participatory approaches should be used to ensure ownership by end-users and appropriateness of technology.
   Tool: co-design weeks

5. **Institutes, policies and strategic alignment**
   Policies and policy makers of governmental and global institutions will have
influence on the adoption of the service. Lobbying with these institution should therefore be incorporated in the development process.

Tool: comprehensive approach

6. **Capabilities and evaluation**

Reaching social goals can’t be done without increasing people’s capabilities. Incorporate proper evaluation mechanisms to ensure the project has the impact it was supposed to have.

Tool: the Choice framework

Taking these guidelines into account throughout the project contributes to the local adoption of the innovation as well as the scaling strategy throughout the design and pilot phase. Each of the six elements described need to be considered in each phase, however some guidelines need more attention than the others, depending on the phase.

We set out to describe the Critical Success Factors (CSFs) for economic and social viability of VOICE based services in the BoP. This is based on the idea that for economic viability it is crucial that VOICE based services are scalable and for social viability it is crucial that the VOICE based service will be locally adopted. We especially focus on the CSFs that differ from the western market. By means of desk research, relevant theories and case study we found 15 relevant CSFs for economic viability and 7 for social viability (grey).

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<td>Single revenue model</td>
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|                      | Cost pooling            | Cost pooling             |
|                      | Economies of scale/scope| Scale                    |
|                      |                         | Scope                    |

**Table 1** Complete overview of CSFs and the choices, CSFs marked grey are for social viability.
By mapping the critical success factors on the relevant methodological guidelines our framework arises. This framework can be used to strategically choose the next step in an innovation process.

![Figure 2 methodological guidelines for economic and social viability of a BoP business model](image)

The aforementioned approach will serve as the basis for developing *a VOICE service toolkit* to support decision making as the starting point for further research into business models for ICT services targeting the BoP. Furthermore, it also serves as the basis for supporting Work Package 4 (m-Health service in Senegal) and Work Package 5 (m-Agro service in Mali) of the VOICES project in developing sustainable ICT services. The Business Modelling and Adoption Methodology approach will consequently be contextualized for both work packages.
3. Introduction

This document is a deliverable of the VOICES project, which is partially funded by the European Commission under the 7th Framework Programme. The goal of the VOICES project is to facilitate diffusion and exploitation of European ICT research results by helping to unleash the potential of mobile ICT services for developing economies and resolving existing content and access barriers for such services, through its VOICE service development toolbox. Furthermore, VOICES will demonstrate how mobile ICT services are adaptable to local Base of the Pyramid (BoP) contexts. It does this by both providing knowledge and tools for local adaptation (for integrating Web content into rural community radio, and novel speech technology suited for African languages) as well as by on-the-ground demonstration of the adequacy of its solutions.

This deliverable is part of Work Package 1 (WP1), Task 2 which deals with identifying, analysing and transferring knowledge on viable business models and adoption methodology for VOICE based services in a BoP context. It was decided to take a generic approach in the development of the adoption methodology and business models, which makes the developed framework applicable in more areas than just the voice based services. The specific challenges of developing VOICE services in a BoP context, is gathered through the pilots in this VOICES projects.

3.1 Problem definition

Today over 500 million Africans have access to mobile telephony, with only a fraction having access to internet connectivity. Thus the specific VOICE network offers an important means of serving information needs of people in the BoP. There is a widespread agreement that ICT services, especially mobile ones, have the potential to play a major role in furthering social and rural development in developing economies such as Africa. Market penetration and rural community adoption of basic mobile telephony and services have been extremely rapid in recent years. As these mobile ICT services are developing in the context of the BoP, one may be tempted to think that Mobile Internet would be the most likely and convenient means to information. The BoP context can however also be characterized by high illiteracy or literacy in marginal languages, lack of broadband infrastructure, and low technical capabilities. The development of VOICE based services with relatively robust, available, easy to use, native language technology therefore offers more potential on the short term.

However, given the characteristics of the BoP, BoP entrepreneurs with the ambition to structurally cater to this market face different challenges. Several authors have noted that there is often a gap between the design of a service and the ‘actuality’ in which it is used (Heeks, 2002). This “design-actuality gap” model seeks to explain the high rates of failure of information systems in developing countries. It describes the match or mismatch between information system designs and local user actuality.

Up until recently, this gap was used to stress the need for local activity and ownership. BoP markets have to be understood at the ground level— from the bottom up—if a
venture is to succeed in those marketplaces. An article by Lyer (Lyer, LaPlace, & Sharma, 2006) quotes several others that point to a similar focus on local ownership: “firms will do better and learn more if they tailor their operations to the unique conditions of developing markets” and “firms will be better off if they exploit the differences between countries rather than utilizing a more homogenous strategy.” (Prahalad & Liebethal, The End of Corporate Imperialism, 2003). In fact, many authors stress it is more than a focal point; given the unstructured character of this market place, it is the absolute basis.

More recently, the attention for local ownership has been accompanied by a call for more attention to scalability. To serve the poor sustainably, it is often necessary to target a broader segment (London & Hart, 2010). Many enterprises achieved viability by adopting an expanded view of low-income consumers or business associates, engaging those both at the base of the pyramid, but also those in adjacent income groups. By doing so, the organizations providing the service can buffer the volatility and risks inherent in dealing with the very poor.

It becomes clear that BoP entrepreneurs with the ambition to structurally cater the BoP market face two challenges. On the one hand, they need to ‘go local’ to ensure that their product fits the very locally orientated heterogeneous contexts that form the BoP, build social relationships and trust, thereby ensuring local ownership. On the other hand, working towards economic sustainability calls for strategies of scaling, or at least a scalable business model.

3.2 Goal and research question

The success of VOICES depends on economic and social viability of the VOICE based services developed for the BoP, to create community ownership of the services and to ensure a long lasting impact. The goal in this deliverable is to propose an approach that enables BoP entrepreneurs to develop viable VOICE based services for the BoP that are able to outlive the project trajectories in which they are initially developed. The overall research question therefore is:

> How to create a viable business model to successfully develop and implement sustainable VOICE based services for the Base of the Pyramid?

This central question can be broken down into a number of sub questions:

- What specific characteristics of the BoP are relevant?
- What specific characteristics of BoP entrepreneurs are relevant?
- What specific characteristics of the VOICE based services are relevant?
- What are the critical success factors for a viable (e.g. scalable and locally adopted) business model for VOICE based services for the BoP?
- What are the critical success factors for a methodology that leads to a viable business model of a VOICE based service for the BoP?
3.3 Approach

By means of desk research the relevant knowledge on business modelling and adoption criteria are determined and transferred to the BoP context. We use a framework to structure and group the critical success factors for a viable business model and will formulate critical success factors for an adoption methodology. This set of business model and adoption methodology criteria is then confronted with the different phases of innovation that can be recognised in design process for VOICE based services: we aim to identify what choices stand out and are specific for each particular phase. This will lead to an approach for BoP entrepreneurs dealing with developing, piloting and commercializing VOICE based services for the BoP, but can also be applied for other BoP services. More explanation about the research approach can be found in Chapter 6.

3.4 Target readers

The theory and results described in this document are meant for entrepreneurs that want to create VOICE based services for the BoP. In this document we will refer to this group as BoP entrepreneurs, social entrepreneurs or just entrepreneurs, although we are aware there is a slight distinction between the three. As the Danish BoP Learning describes: “The core of a BOP strategy does not necessarily include a social mission. BOP strategies simply imply doing business with low-income consumers.” (Madsen, 2011). However, as the goals for BoP entrepreneurs are often related to improving livelihoods of the BoP (making their lives better), it resonates with social goals, and therefore with social entrepreneurs. To stress the market based aspect we would like to follow, and find that the BoP should be the specific target, BoP entrepreneur is felt to be a better term.

This document allows BoP entrepreneurs to choose which critical success factors of their business model to focus on in the different phases of the development process (e.g. design, pilot and commercialize). The body of literature in this field offers a vast range of useful insights for decision makers, and is used as the basis for this document. The framework enables the translation of these insights into a way to organize the decision making process along Critical success factors. This is helpful in understanding when the different methodologies, strategies and advice mentioned in literature are relevant in making design and business decisions.

3.5 Outline of the report

First we describe what we see as the BoP (Chapter 4) and VOICE interface technology (Chapter 5). Chapter 5 gives a short outline of the research method. In Chapter 7 the adoption methodology and methodological guidelines are explained. Chapter 8, 9 and 10 describe in detail the economic and social viability of a business model. Chapter 10 describes the framework, in which the adoption methodology, methodological guidelines and critical success factors for an economic and social viable business model are combined into one framework. Chapter 12 and 13 illustrate how the framework can work in practice, first by illustrating two example routes, and then by describing the m-Agro and m-Health pilots. In Chapter 14 we draw up the conclusions and define next steps.
4. The Base of the Pyramid

As described in the introduction, the goals of this the VOICES project is to help unleashing the potential of mobile ICT services for the Base of the Pyramid (BoP) by enabling BoP entrepreneurs to develop and implement viable business models for Voice based services for the BoP. In this chapter the BoP market and BoP entrepreneurs will be described as well as the challenges this market place contains.

4.1 What is the Base of the Pyramid?

The Base of the Pyramid (BoP) refers to ‘the poor’, or those people who form the economical ‘underclass’ of society and are prone to marginalisation (Klein, 2008) (Prahalad, 2005). A lack of sufficient income is one of the most important characteristics used to define this group, although the full range of socio-economic conditions that affects a person’s quality of life are relevant (e.g., living in informal economy) (Hart, 2005).

The number of people that make up the BoP is generally calculated based on purchasing power parity (PPP). 2.6 billion people have less than $2 (2002 PPP) a day to spend (Klein, 2008). The phrase BoP is often used in conjunction with the notion that the poorest people should not (only) be seen as beneficiaries, but as price-conscious consumers (Prahalad, 2005), business partners (Simanis & Hart, 2008) or sources of innovation (Immelt, Govindarajan, & Trimble, 2009). The philosophy of this approach is best summarized by the often heard phrase of: “Doing well by doing good”. The view of using business as a tool for poverty alleviation in developing countries coincides with a recent focus on sustainability and shared value creation in Western economies. Although some businesses are viewed as a major cause of social, environmental and economic problems, capitalism also represents an “unparalleled vehicle for meeting human needs, improving efficiency, creating jobs and building wealth” as long as its focus is on solving societal needs rather than individual profit maximization (Porter & Kramer, 2011).

Developing ICT services that meet the needs of the BoP comes with specific challenges that are uncommon in developing ICT services for a Western market. (Boer & Chevrollier, 2010) state the following for mobile services in emerging regions:

- **(ICT) illiteracy:** Both illiteracy and ICT illiteracy are common in emerging regions which restricts the potential numbers of customers for the mobile services that imposing reading and writing (e.g. SMS) and the knowledge of using a mobile phone. Workarounds include proximal literacy (whereby a literate third party is acting on behalf of the customer), using voice modality or graphical representation. In the VOICES project, voice is used to overcome the issue of illiteracy.

- **Cultural Identity:** Mobile services are impacted by cultural values, so particularities from developing regions need to be taken into account. For example, the context of mobile phone use in emerging regions means that mobile phones are sometimes shared. This leads to a number of shared identity and privacy issues. By
creating critical success factors for local adoption, we aim to include aspects related to the cultural identity.

- **Cultural Diversity**: The number of local languages is also a key factor for the acceptance of a given mobile service. There are for instance 240 spoken languages in Democratic Republic of Congo. The voice based services will be based on a limited number of languages which also limits the scale that can be reached.

- **Low-end technology**: As high-end technology is not widespread and too expensive for most people in developing regions, it is necessary to focus on low-end technology. Developing services for low-end phones and low-bandwidth means that there are only a few degrees of freedom in designing the user interface. The goal of the designer is to do more with less as the customer still expects a satisfactory user experience.

- **Affordability**: The financial burden of mobile phones on already stretched family budgets and the lack of saving capabilities imply to rethink business models and value chains. In that respect, pre-paid cards of low value have for example been a way to provide affordable mobile services. As we are working towards a viable business model we are constantly focused on the affordability of the service for end-users.

Finally, one has to consider that the BoP is not concentrated in one country or a continent but spread around the world. Consequently there are regional differences within the BoP; in other words there is no BoP market place that can be characterised with one set of generic characteristics and covers the entire BoP. The BoP is not referring to a specific demographic region, neither makes a distinction between fragile, developing and emerging states, though for this report we take the BoP in the two VOICES pilot countries (Senegal and Mali) as the point of reference.

### 4.2 Who are the BoP entrepreneurs?

The profile of a BoP entrepreneur is not uniform. Roughly three different types of BoP entrepreneurs can be described, following personas developed by the WWW foundation (to be published)

1. **Software technologist** with vast experience in an industrial environment outside the BoP. This can be returning diaspora or expats that decide to live in a developing country and set-up a BoP venture. They are highly educated, have experience in and good knowledge of technology. They are quite good in developing a product that serves a need, but find specific challenges in marketing the product.

2. **Problem solvers** for local challenges that have experienced this problem first hand. They typically don’t have a lot of education and find a rather naive, but locally adopted solution. They encounter challenges in scaling this service and developing a product for a larger audience.

3. **Computer science and software development students**. This is a bigger group than the former two, but has a lower success rate. They lack the knowledge and experience on how to set-up an enterprise and market their product.
Each of the above groups comes across specific challenges in their innovation process and setting up an enterprise. This group of entrepreneurs is quite new, as opposed to for example project managers at NGOs that implement and develop products and programmes to serve the poor, or R&D department at a multinational corporation. BoP entrepreneurs are felt to bring something new to the development discourse, but their approach and challenges they face in that process, are not yet described. We therefore feel that it is best to address their challenges in this document.

4.3 What are the challenges in the BoP market?

The difference between BoP context and traditional western markets, is nicely captured by (London & Hart, 2010) in the phrase: “Needs, needs, needs, but no market”. In both contexts there are consumer needs but whereas these needs are served in the Western context through a functional ‘market’, such a market is non-existing in the BoP; the poor’s unmet needs can be regarded as untapped market opportunities. Research indicates that innovation strategies that are effective in serving or entering existing consumer markets are ineffective in creating new consumer markets (London & Hart, 2010). Both the characteristics of the poor as well as the challenging environments in which to operate pose business challenges that are specific to the BoP-context (Hammond, Kramer, Katz, Tran, & Walker, 2007). Success in a BoP-context requires innovation on multiple aspects of the ways in which firms do business, such as price-performance, value chains, workflows, payment schemes, customer education, human resource management etc. (Klein, 2008).

At this point, non-consumption of products and services is the defining condition of the BoP. As a result, entrepreneurs in the BoP context have to think in terms of market creation. Market creation, it turns out, poses an entirely different kind of innovation challenge than market entry.

BoP markets differ from Western markets in important ways and thus require unique solutions. The five key factors according to (London & Hart, 2010):

- There are many unaddressed needs at the BoP. These range from services where the government does not meet its mandate (clean water, sanitation and so on) to needs that are neglected because people are perceived as being too poor to buy goods and services (health care, housing).
- BoP markets are beset by poor infrastructure (roads, water, power) and inadequate distribution networks. As a result, firms cannot count on the basics – connectivity, roads, water, power – when setting up a factory, warehouse, bank, branch, or sales office. Poor infrastructure also means that the low-income customer generally has poor access to education and information – which makes marketing and service delivery different from a company’s approach to ToP customers.
- Corruption is common, sapping economic value from the system and adversely affecting those who follow the rules.
- Low purchasing power which makes it difficult for new products and service to enter the market. A 2007 study indicates that there are more than 4 billion people living in conditions where they are subject to a ‘poverty penalty’ whereby the poor
pay significantly more for products and services than their middle income counterparts (in some cases, up to 40 times more)

- A lack of equity capital. Traditional capital providers typically bypass BoP entrepreneurs, including those who are trying to solve tough problems in healthcare, water, sanitation and alternative energy because they are perceived as highly risky.

Summarized, the BoP is a challenging market that asks for well thought-out market creation strategies because of the business challenges posed by both the characteristics of the poor as well as the challenging environments in which to operate.
5. Voice User Interface technology

Voice based services are services that use voice User Interface technology. This chapter first describes what is meant with voice user interface technology needed to create voice based services. Then different roles of that technology in services are grouped. After that, existing examples of voice based services are explained by means of the voice user interface technology they are using. However, as examples of services that incorporate Voice User Interface Technology in the African context are scarce, we explore voice based services that are or have been in use for ICT services in Western markets and have proven to have a viable business model. Eight case studies of the business rationale behind those services are described, and lessons learned from those examples are formulated. As we are mostly interested in the social and economic viability of the services, and these examples are not in an African context, we mostly focus on the lessons learned regarding the economic sustainability i.e. that directly affect either revenue generating or cost saving potential. Social viability of voice based services is related to the context of use of the service and as these services are only introduced in a Western context, we feel that those lessons learned would not be applicable for a BoP context. However the different stakeholders or organisational roles that need to be in place for viable technical development of voice based services are addressed based on the examples.

5.1 What is Voice User Interface Technology

Voice User Interface technology, also referred to as (Automated) Speech technology or Human Language Processing technology, can be broken down into two distinct technologies that can be used separately or combined: the synthesis of human (sounding) speech by a machine or the recognition of human speech by a machine.

Synthesis of human (sounding) speech is used to allow information from a computer to be communicated to a user by using audio. Recognition of human speech can serve three basic goals: to determine what is being said, who is saying it, and how is it said.

- **WHAT**: Words and sentences are recognized from patterns in the human voice. These words or sentences are used as text input for a computer system.
- **WHO**: The identity of the speaker is recognized from patterns in the human voice. This is used for identification and verification purposes.
- **HOW**: The status of the speaker is recognized from patterns in the human voice. This is used to determine if a user is under stress, is angry, is happy, and take that as input for a computer system.

The WHAT-category is often referred to as Speech-To-Text (STT) or Automated Speech Recognition technology (ASR). Text-to-Speech (TTS) is synonymous for speech synthesis technology. In this chapter we focus on systems that either use VOICE synthesis technology (TTS) or Automated Speech Recognition technology (ASR/STT), or both, because these are used to act as an interface between the user and services. The technologies that are related to the WHO and HOW questions are used to fulfil secondary functions in the interaction between the user and the service (is the user allowed to use
the service, what way of interaction is preferred given the users status) and are out of scope.

5.2 What are services based on Voice User Interface Technology

In a Western context, voice based services and associated business models are only a fraction of the overall market for information services. Of this fraction, most services have an internal focus, where businesses implement voice services in for example their customer call centre to save on labour costs, putting added usability or customer experience second. Externally focused voice services are -and have been- primarily used to provide tailored information on demand for example providing travel information, telephone numbers, the weather forecast etc. This market is however fairly small in a media dominated environment such as Europe is; the on-going developments of the internet and devices connected to it (smartphones, tablets) provide for an easy to use and low cost \(^1\) information access that, in addition, offers much more user options than most voice services do. Voice services remain to exist where characteristics of the ‘context of use’ dictate that voice operation is most suiting. Examples include call centres where the primary means of interaction was already voice contact, and operating devices in stimuli rich and potentially dangerous environments e.g. in traffic.

Based on conversations with industry experts, we have chosen several services that can serve as relevant examples.

**Information services**: Services where a user, by means of speech requests, receives context-specific information from a (web) server. We have chosen three case studies for travel information that all slightly differ in setup. Other related information services that are common are weather information, stock market information or telephone number information. We chose travel information services because a common use context is for users to be behind the steering wheel of a vehicle, making a Voice User Interface a logical and crucial design choice.

**Navigation services**: Services where a user interacts by means of speech with a helpdesk menu, to either get answers to his/her basic or frequently asked questions or be directed to the correct department, where a human call centre agent will answer his/her questions.

**Assistance services**: Services where a user by means of speech is able to perform a certain task, such as finding and being connected to another telephone number. Often, assistance services include some form of information services or navigation services.

**Process optimisation**: Services with voice user interfaces that are used to optimise (internal) processes. These services are often observed in environments where operators get many stimuli at the same time, and/or do not have their hand free to operate a manual input device.

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\(^1\) Although internet bundles are not cheap per se, the total costs can be divided over all the internet based services used, keeping the costs for the use of one service relatively low.
This categorisation is by no means exhaustive, many other ICT services exist that use Voice User Interface technology in some way or the other, but these categories represent broad groups of services that make up a large fraction of the market. For each of these services, one or more case studies have been worked out and are presented in the appendix.

The use of Voice User Interface technology is either externally or internally focused. Externally focused means that the reasoning to install the voice based service is mostly driven by a desire to offer added value to end users e.g. easy way to look up public transport routes, like 9292OV. Internally focused systems aim to increase efficiency within the organization offering the service; e.g. the helpdesk routing system that allows for less helpdesk employees to be present and saves time questioning the caller, like American Airlines. This directly influences the way organisations judge the economic sustainability.

In Table 1 below an overview is given of the different case studies, and indicates the type of service, as well as focus and the major driver for economic sustainability.

<table>
<thead>
<tr>
<th>Name</th>
<th>Service type</th>
<th>Service</th>
<th>Focus</th>
<th>Economic sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>OV9292</td>
<td>Information</td>
<td>Public transport information</td>
<td>External</td>
<td>Revenue share</td>
</tr>
<tr>
<td>TFL</td>
<td>Information</td>
<td>Public transport information</td>
<td>External</td>
<td>Subsidy</td>
</tr>
<tr>
<td>1.800. Flights</td>
<td>Information</td>
<td>Flight information</td>
<td>External</td>
<td>Advertisements</td>
</tr>
<tr>
<td>American Airlines</td>
<td>Navigation</td>
<td>Helpdesk menu routing</td>
<td>Internal</td>
<td>Cost savings</td>
</tr>
<tr>
<td>Wixi</td>
<td>Assistance</td>
<td>Telephone connect</td>
<td>External</td>
<td>Revenue share/advertisement</td>
</tr>
<tr>
<td>TNO Connect</td>
<td>Assistance</td>
<td>Telephone connect</td>
<td>Internal</td>
<td>Cost savings</td>
</tr>
<tr>
<td>Apple Siri</td>
<td>Assistance</td>
<td>Automated personal assistant</td>
<td>External</td>
<td>Personal information/advertisement</td>
</tr>
<tr>
<td>Flora Holland</td>
<td>Process optimisation</td>
<td>Order picking</td>
<td>Internal</td>
<td>Cost savings</td>
</tr>
</tbody>
</table>

Table 2: Overview of case studies

5.3 **Economic sustainability of Voice based services**

Externally focused services are considered economically sustainable if they provide sufficient income to cover their costs. The revenue models for externally focused systems show several general directions:

- **Airtime revenue sharing**: For commercial services, airtime revenue sharing with telephone operators (0,70 EURO a minute phone call in the OV9292 case) provides enough revenues to support the cost of running the system. In these cases, contact with a human operator is often completely removed from the service.

- **Subsidisation**: Some services use a toll-free number to stimulate use, but require subsidies to cover expenses. One way of subsidisation can be government funds, another category of subsidisation is a multi-channel business model, where the voice service is seen as an add-on to the regular (web)services. Income from the main service (in most cases: advertisement) is used to subsidize the niche system, to increase the attractiveness of the overall system.

- **Advertisement**: Advertisement is used in two forms: commercial messages that are played before, during or after interaction with the service, or companies paying to have their information given higher priority. Keeping a fair balance
between the most relevant information and the sponsored information is crucial for information services.

- **Personal information**: Some business models also revolve around gathering and selling (or using for another service) personal information based on individual usage of the service. This model is still in its infancy when voice-services are concerned, because of the huge critical mass of users and the extremely low marginal cost of the service that are required to make this model work.

Internally focused systems are deemed sustainable if they provide a cost saving. In most cases this means limiting the use of personnel, and having as much of the service delivered automatically. This means that less personnel can be used, or personnel can focus their effort on the most relevant issues (external calls rather than internal calls in the TNO Connect case). In terms of lowering costs, several general models can be identified:

- **Scale**: Most externally oriented services focus on mass markets. Running a service requires investment in programming, hardware and scaling license fees, meaning that the more users the service can attract, the lower the cost per user.

- **Automation**: Most externally oriented services offer no or little interaction with its personnel, but rather have all interaction automated.

- **Data/content aggregation**: The content that is offered through services is in general not gathered by the organisation offering the service itself, but rather collected from several sources, saving the cost to build a proprietary database.

- **Open Source Software**: Especially smaller organisations tend to apply open source software as a way to cut the cost of purchasing software. Open source software does not mean that no Service Level Agreements are or can be purchased, as this is one of the models that open source software companies use to attract revenues.

- **Centralisation/mutualisation of software/hardware**: Although not clearly apparent from the case studies, using ASR technology allows a single infrastructure (VOICE services connected via IP) which reduces the cost for both hardware and software that would otherwise be associated with a multi-channel service offering.

The above mentioned revenue models and cost models offer an overview of possible business models that companies operate to be able to offer sustainable VOICE based services in a Western context. In developing VOICE based services for a BoP context these can be used as possible direction for economic sustainability of VOICE based services in a BoP context.

**5.4 What are the organisational roles involved**

There are three types of organisational roles involved in delivering the technical part of services that use VOICE User Interface technology: technology providers, integrators and service providers. Technology providers create and deliver the components (both
software and hardware) that are necessary to construct a service, integrators design and implement services using these technologies, while service providers provide the actual services to the end-users. For some services, external content is sourced from a content provider. The diagram in Figure 3 depicts these general roles.

![Figure 3 General organisational roles of service delivery](image)

Companies can combine multiple of these roles within their organisation. The most obvious example is a company that develops its own hardware and software, builds its own services based on its own content and provides these services to its customers. In this document we aim to create an approach to design viable voice based services for the BoP. Therefore, we focus on economic and social sustainability for voice based services for BoP entrepreneurs. The BoP entrepreneurs typically act as the service providers (who actually serve the BoP) rather than the suppliers to a service provider.

### 5.5 Conclusion

Voice based services, especially externally focused ones, are or have become a niche product in Western markets due to the fact that most users are knowledgeable to operate a web browser user interface and high availability of internet access, either fixed or mobile. This strongly differs from the (potential of) VOICE Based Services for the BoP market.

The fairly fundamental differences between the ‘Western’ and the BoP context, dictate that knowledge on business and service development that has primarily originated in an industrialised context, cannot be applied directly in the BoP context. Even if the relatively generic lessons from business models from a Western context could provide a starting point and inspiration for designing BoP specific business models, the market still provides business challenges posed by both the characteristics of the poor as well as the challenging environments in which to operate.
6. Research method

The success of VOICES depends on economic and social viability of the services developed. To achieve economic and social viability local ownership and scalability are crucial to ensure a long lasting impact. Due to the specific characteristics of the BoP and BoP market it is not possible to simply apply the knowledge about developing VOICE based services for a Western context to a BoP context. This chapter explains the research method to specify critical success factors (CSFs) for a viable business model (economic viability) and local adoption (social viability) that are used as input for an adoption methodology that describes a phased approach to reach the economic and social viability of VOICE based services in the BoP.

6.1 The adoption methodology

A well-known overarching methodology for cyclical development in BoP is described in “The Base of the Pyramid Protocol: Toward Next Generation BoP Strategy” (Simanis & Hart, 2008). This protocol seeks to close gaps between design and actuality (in the words of (Heeks, 2002)) by promoting a “Business Co-Venturing” strategy, as opposed to the currently dominant “Selling to the Poor” approach (Simanis & Hart, 2008). Central principles in the Protocol are “mutual value” and “co-creation.” Mutual value entails that each stage of the process creates value for all partners. The “co-” in “co-creation” describes the need for companies to work in equal partnership with base of the pyramid communities to create a sustainable business.

The protocol identifies a number of phases that are not limited to conceptualization, design and experimental projects, but also include business expansion. The following are identified:

- **Pre-field-phase:** 1) the selection of appropriate BoP project site(s); 2) the formation and training of a multidisciplinary corporate “field” team; and 3) the selection of local community partners; 4) the creation of an enabling environment or “R&D White Space”.
- **In-field-phase:** 1) opening up – build rapport and a base of trust with local communities; 2) building the ecosystem – forming project team of company representatives and committed and motivated community members; 3) enterprise creation - creates the full business model using small-scale tests and continued action learning.
- **Scaling-out phase:** 1) reach out to new communities using business ambassadors to localize the core concept; 2) formalize linkages between the parent business and the new Project Team; 3) re-embed the original business model within the unique context of the new community (Simanis & Hart, 2008).

This protocol thus has a focus on the successful set up of a field trial as part of a successful development cycle, leaving the characteristics of ‘the field’ in which this trial is embedded out of scope. In other development cycles the focus is more on these field characteristics, for example on the need to create ‘a level playing field’ with ‘western’
partners as well as local partners. In the innovation cycle of the BoP innovation centre for example (BoPinc.org, Figure 4), ‘Preparing the ground’ and ‘learning from each other’ precede steps like co-creation and market introduction.

We have chosen to adapt our methodology to the three phases of business/service creation as proposed by (London & Hart, 2010) (Figure 4), which together form an iterative process. The different phases we have identified are design, pilot and commercialize. However, each of these phases could be split into several sub-phases that describe specific activities. Going into such detail about the right steps to take in the process, would create a more artificial representation of reality, as in reality a development process will never go according to this strict path. We therefore propose three broad phases that need to be followed iteratively and, depending on the context, specific activities can be taken into account and describe six guidelines that need to be taken into account in each of these phases.

6.2 Critical Success Factors for a viable business model

Despite the widespread interest in the concept of business models, there is no commonly held definition of the term. The definition used in this report is:

A description of how a company or a set of companies intend to create and deliver value to the customer with a product or a service, and how a company is able to capture value back in return. A business model defines the architecture of the product or service, the roles and relations of the company, its customers, partners and suppliers, and the physical, virtual and financial flows between them.

A common used business model tool is the Business model canvas as proposed by (Osterwalder & Pigneur, 2002) (Osterwalder, Pigneur, Smith, & 470 practitioners from 45 countries, 2009). It is an open source business model generation tool, that is freely accessible to anyone with an internet connection, which means it is accessible to BoP entrepreneurs anywhere in the world that are planning to develop VOICE based services. It is the de-facto standard for Business Model Generation and widely adopted with over 500.000 books sold in 26 different languages (Osterwalder, 2013) and is rated 4.3 out of 5 (Good Reads, 2010). It provides sufficient flexibility and extension possibilities to
incorporate elements for a networked business eco-system that is not uncommon in a BoP context. Lastly it has been used in many instances before and shown its flexibility in application in multiple contexts. A critical note might be that it does not include competition explicitly, for example, but one can argue that when there is fierce competition the value proposition will be influenced by that. This document does not aim to question the appropriateness of the Business Model Canvas, but is used to generate Critical Success Factors for a viable business model, as it being one of the most use business model generation tools.

In Table 3, the business model building blocks of the business model canvas are presented.

<table>
<thead>
<tr>
<th>Building block</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offer/Value Proposition</td>
<td>an overall view of a company's bundle of products and services that are of value to the customer</td>
</tr>
<tr>
<td>Customer Segment</td>
<td>a segment of customers a company wants to offer value to.</td>
</tr>
<tr>
<td>Distribution Channel</td>
<td>a means of getting in touch with the customer, describes marketing and distribution plan</td>
</tr>
<tr>
<td>Customer relationship</td>
<td>the manner in which the relationship with the customer or customer segment is managed</td>
</tr>
<tr>
<td>Key Resources</td>
<td>Most critical resources required to perform activities and deliver the value proposition. For our purposes, this category is reduced to technological components or systems.</td>
</tr>
<tr>
<td>Key activities</td>
<td>Most critical activities required to be able to the value proposition</td>
</tr>
<tr>
<td>Partner network:</td>
<td>Partnerships that influence the success of the business model. This category is extended here into a description of the business ecosystem relevant to the consortium to scope the work in the FFE</td>
</tr>
<tr>
<td>Cost structure</td>
<td>The monetary consequences of the means employed in the business model.</td>
</tr>
<tr>
<td>Revenue model</td>
<td>The manner in which the creation of value is leveraged into financial revenue.</td>
</tr>
</tbody>
</table>

**Table 3** The building blocks in the business model canvas, adapted from Osterwalder (2009)

In view of our task we chose to set up our approach along the lines of Critical Success Factors (CSFs) for (1) economic viability (chapter 9) and (2) social viability (chapter 10). The CSFs highlight the important elements to take into account while developing a viable business model for voice based service for the BoP. CSFs can be identified as a limited set of crucial elements that need to be addressed when developing a viable business model for new or improved ICT products or services. Or: as Wikipedia states about Critical Success Factors (Wikipedia, Critical Success Factor, 2011):

*Critical success factors are elements that are vital for a strategy to be successful. A critical success factor drives the strategy forward; it makes or breaks the success of the strategy, (hence “critical”). Strategists should ask themselves ‘Why would customers choose us?’ The answer is typically a critical success factor.*

Our selection of most relevant criteria is based on the following preconditions:

- Problematic and uncertain: The impact of the choice needs to be uncertain but potentially high. For instance, a criterion related to the functional architecture such as efficiency, while crucial for the viability of any service or product, is not included, because the choice to make a system, service or product operate as efficiently as
possible can be expected to be common to all business model designs. In contrast, design choices in the field of scalability are highly problematic as both the option to design dedicated systems as well as the option to design SOAs may be part of a valid business strategy.

- Generic within the purpose of the research aim: the choices need to be generically applicable to all voice base services for the BoP, and needs to be structurally related to the value creation and capturing processes for these kinds of services. For instance, a choice for a certain level of security, while very important in many cases, cannot be deemed generic or structurally important enough. In contrast, a criterion such as the organisation of the supply chain is included, because it is generic to practically all ICT services and products and because it is directly related to the issue of control over the business model.

It is important to acknowledge that one cannot devise one simple checklist to develop viable services that will be applicable and useful throughout the BoP. When addressing the different choices, trade-offs will appear and therefore every final design is inherently suboptimal. In addition, contextual specifics that differ throughout the BoP are likely to have an important influence on the success of services. We especially focus on the CSFs that differ from the western market. It is certainly not to say that the CSFs listed are the only development choices to be made. Other choices can also be critical, depending upon the particular market context, background of supplier and other characteristics of a specific business model. Here, only the generic choices are identified that appear to be critical throughout all business models for VOICE services specifically in the BoP. They leave room for elaboration and adjustment to specific cases, something that should be part of any business modelling process.

To ensure a comprehensive overview of the CSFs they will be presented by means of the business model canvas from Osterwalder (2009).
7.  The Adoption Methodology

In this chapter we develop the adoption methodology to organize BoP projects. We will first describe the different phases (design, pilot, commercialize) of an innovation project to create an understanding of the specific challenges of each phase. This will be followed by six elements that need to be considered in each of the phases. This chapter is concluded with an overview of how the guidelines can be incorporated in the phases, as well as an overview of tools available to put the theory into practice.

7.1  Design, pilot and commercialize

7.1.1  The design phase

The design phase is generally considered as the phase in which ideas are created, elaborated, and evaluated by means of early user testing. These activities result in identification of requirements and prototypes. The results of this phase form a stepping stone towards scaling or pilots.

To get a grasp on the specifics of the design phase for the BoP, we turn to literature. In Next Generation Business Strategies for the Base of the Pyramid (London and Hart, 2010) the authors state that this phase involves creating market opportunities and crafting solutions with the Base of Pyramid. Exploration of potential partnerships, a dialogue grounded in mutual respect, and an appropriate mind-set: be patient, stay longer, come back. Also a number of key “innovations” are mentioned of which one or more have been adopted by most successful Base of the Pyramid ventures;

- Introducing radical cost reductions in some value activity (in the context of this report: cost driven value proposition)
- Building a BoP-centric management team, that constantly rebalances the social impulse (that is, the will to serve the poor) with the more traditional business skills needed to build a successful business (in the context of this report: mobilise key human resources and explore how to balance key activities)
- Implementing human-centric design thinking to products and services (In the context of this report: specify the value proposition, channels and especially customer relationship by applying a holistic approach to the customer). Further, applying co-creation and co-design methods (Boer, Kuiper, 2008).

In the Base of the Pyramid Protocol described in (Simanis & Hart, 2008), a “pre-field-phase” is described as one of three major phases in an innovation cycle for the Base of the Pyramid. The ‘pre-field phase’ is conceptually similar to the ‘design phase’ as described here. Key activities in this pre-field-phase are the selection of appropriate project sites within the Base of the Pyramid context, the formation and training of a multidisciplinary “field” team and the selection of local community partners. In Business Linkages: Enabling Access to Markets at the Base of the Pyramid, the authors list a number of operational challenges in doing business with those at the Base of the Pyramid: securing internal commitment, obtaining reliable, actionable market information, and measuring impact (Jenkins & Ishikawa, Business Linkages: Enabling

7.1.2 The pilot phase

In the pilot phase a base of trust with the targeted Base of the Pyramid community is established, a project team including community members is formed, and a full business model is created through small-scale tests and continuous learning. This phase takes local demand and needs, and the local context as the starting point. It should yield indications of size, integration and feasibility of the final project. The results of this phase can be a stepping stone towards (re)design or commercialisation. The activities performed in this phase should generate lessons to be used for the scale or design phases. The pilot phase may guide choices on what activities, resources and partners are needed.

One important type of input are the results of the design phase. These decisions are put to the test, and might be perceived as working hypothesis. Decisions made in the pilot phase should be geared towards learning and iteration of design choices made: testing, refining and optimising the design decision made earlier. On the other hand, information on how revenues could be generated should steer the design and management of a pilot: how are we learning to commercialize in this pilot?

This is in line with the conclusions stated in Next Generation Business Strategies for the Base of the Pyramid (London & Hart, 2010). Here, some key activities for this phase are identified: orchestrating effective experiments, utilizing metrics that support a process of trial and error, explicitly identifying and testing specific hypotheses. Also required is the ability to manage failures, and to avoid turning learning-oriented pilots into philanthropic projects. Finally, ensuring a soft landing for the Base of the Pyramid users when the pilot ends, is important.

In the Base of the Pyramid Protocol described in (Simanis & Hart, 2008), the “pilot phase” is called the “in-field-phase”. The “in-field-phase” consists of opening up (build a base of trust with local communities), building the ecosystem (forming a project team of company representatives and committed, motivated community members), and enterprise creation (creating the full business model using small-scale tests and continued action learning).

A lot of activities in this phase are centred around gathering information, learning about the local context, and establishing local “ownership”. In the Participatory Entrepreneurship Development Project Training Manual (Gendt-Langeveld & Makuru, 2011) some methods and instruments for this are described. They state that “in the context of community work it is mostly about valuing people for what they know and giving them a real role to play. By having such interaction you will find out what they really think.”

In piloting a concept usually not all aspects of the concept can be tested in one pilot. A phased approach might be necessary to test the different elements. One such division can be as followed:

- Technical user pilot: a pilot in which with a small group of participants the technical feasibility of the service is tested. This means that power problems,
usability issues, bugs, connectivity problems, are all tested in a real-life environment (not a lab environment).

- **Friendly user pilot**: a pilot in which a group of friendly users, or early adopters, are selected to test the product. As they are already familiar with technology, or are in favour of new technology being used, it helps in adjusting the usability and biggest added value of the service among this group of people.

- **Commercial user pilot**: Once the value proposition is made more clear, the commercial introduction can be prepared and marketing campaigns can be tested in a commercial user pilot. Also distribution networks and training programs need to be tested in this pilot.

Often BoP projects only have included a commercial user pilot, which usually results in having to solve technical issues at the start of the pilot. This is a shame, as it will influence people’s opinion about the service.

### 7.1.3 The commercialisation phase

In the commercialisation phase the knowledge gained from the often small-scale and context-specific test settings and pilots, and the (improved) design resulting from the design phase are used to make revenues, mostly by reaching a larger audience. In Roger’s technology adoption curve, this means getting the innovation from the “innovators” and some “early adopters” to the “early majority”, and hence to a much larger scale.

In this phase the cost and revenues of exploiting are taken as a starting point to make choices. Results from this phase can be used to either guide (re)design of the business model or service concept to ensuring local ownership.

In *Next Generation Business Strategies for the Base of the Pyramid* (London and Hart, 2010), key activities described for this phase are generating a “co-mingled competitive advantage” by gaining access to, and investing in, existing platforms. By ensuring partners’ value creation goals are achieved. Also, to leverage and transfer social embeddedness (also described as ‘scaling deep and wide’) by gaining access to rich and diverse sources of information and performing frame analysis based on identifying and enhancing ‘what is right’ (London & Hart, 2010).

In the *Base of the Pyramid Protocol* described in (Simanis & Hart, 2008) this phase is called the “scaling-out-phase” and involves reaching out to new communities using business ambassadors to localize the core concept, formalizing linkages between the parent business and the new project team, and re-embedding the original business model within the unique context of the new community.

### 7.2 The methodological guidelines

When developing innovations for the BoP, an entrepreneur can face specific challenges that are less common in ‘regular’ innovation projects. In this paragraph we describe six guidelines that need to be considered in each of the phases of an innovation project that are specific for BoP projects:

1. Collaboration Building and Cooperation (Chapter 7.2.1)
2. Business models and Financing (Chapter 7.2.2)
3. Scaling-Up innovation (Chapter 7.2.3)
4. Co-creation, active participation and Social Embeddedness (Chapter 7.2.4)
5. Institutes, Policies and Strategic Alignment (Chapter 7.2.5)
6. Capabilities and Evaluation (Chapter 7.2.6)

Taking these guidelines into account throughout the project contributes to the local adoption of the innovation.

Each of the six elements described need to be considered in each phase, however some guidelines need more attention than the others, depending on the phase.

The guidelines are partly based on familiar discourses in development cooperation. Although BoP entrepreneurs aim for a market based approach, they are working in an environment that has a history of aid and development cooperation. Crewe & Harrison (Crewe & Harrison, 1998, p. 137) make clear that “the development effect is widespread. It is influential in decisions about the adoption of new technologies and subsequent behaviour”. We have therefore looked into literature that showed us the most important lessons learned in success and failure of development project for elements that should be taken into account in any innovation project and structured them in six categories.

After explaining the theoretical relevance of the guideline, suggestions for existing tools are given, to put the theory into practice.

7.2.1 Collaboration building and cooperation

Prahalad stated that “the opportunities at the BoP cannot be unlocked if large and small firms, governments, civil society organizations, development agencies and the poor themselves do not work together with a shared agenda” (Prahalad, 2005, p. 3). As can be seen from Figure 5 inclusive innovation project involve different stakeholders, form diverse (cultural, educational, ethnic) backgrounds, often from different demographic regions. For a BoP entrepreneur this means that collaboration between these stakeholders is needed to ensure everyone is on board. Ignoring this network of organizations and assuming all knowledge and skills can be found in one’s own organization, or “when times come”can be problematic in further development. “MNCs working at the BoP learn rapidly that they have to learn to live with a wide variety of relationships with a large number of institutions” (Prahalad, 2005, p. 61).

For an inclusive innovation project partners should be strategically chosen, keeping in mind the (political and strategic) agenda of the collaboration and the partners involved. Especially with local partners, that have seen agencies come and go in that past years, “trust might be difficult to build after 50 years of suspicion and prejudice based on little evidence and strong stereotyping” (Prahalad, 2005, p. 21). Strategically selecting partners, setting up partnerships and manage the partnerships, is the main focus of this guideline.

Organizing and promoting a productive and creative cooperation between organizations and between people is therefore especially critical for BoP innovation projects. Typically different ‘knowledge bases’ are combined: they involve commercial businesses and not-for-profit organizations and combine commercial and social logic. Despite the fact that “technical expertise in development is still associated with expatriate advisers and with men” (Crewe & Harrison, 1998, p. 92), more transfer of knowledge from South to North taking place. BoP projects have the potential to combine the transfer of knowledge and
technology in ‘both directions’, e.g. technology goes from North to South, while market intelligence goes from South to North. The last couple of years, examples of ‘reverse innovation’ have been identified: cases in which an innovation ‘from the South’ is exported ‘to the North’ (Immelt, Govindarajan, & Trimble, 2009). For a BoP entrepreneur this is relevant, as in scaling the innovation, also the North is a potential market, which might make a more viable business model.

As NGOs, civil society organizations and donors dominate the development agenda and are important stakeholders to collaborate with in BoP projects, specific attention needs to be paid to the different connotations that can be given to the term partnership in the development sector. The term partnership is rather vague and how this partnership is shaped and working out in practice depends on the power relations between partners. Although the term partnership might sound like all partners are equal, in reality this is not the case (Crewe & Harrison, 1998). In this respect it is important to keep in mind that the different partners involved in a collaboration are not equal, although the term partnership does imply equality. “Categories such as ‘targets’ and ‘recipients’ have been replaced by notions of “partnership” for capacity building.” (Crewe & Harrison, 1998, p. 155). Knowing that the target group and local partners that are involved in the innovation project have the background in development projects, might mistake certain terminology and expectations that come with it.

**Tool: Strategic Alliance Management**

The Strategic Alliance Management model (Tjemkes, Vos, & Burgers, 2012) gives a step-by-step description on what to consider when forming, managing and evaluating a partnership, which can help in structuring the collaboration between partners in a project. Figure 6 describes these steps.
7.2.2 Business models and financing

During the development process there is ample time needed to develop a viable business model in several iterative stages. In developing a business model, one should take into account that the principles on which the market in a BoP context is currently functioning, might differ from the Western market place. Neoclassical economics assumes that it is always the market that allocates resources most efficiently (Staveren, 2001, p. 166), however for social goals in for example health and education (that are typical in BoP projects), this is very likely not the most effective and efficient model. Decisions for purchasing goods is not a full rational process and is done entirely on the basis on self-fulfilment, rather people make decisions by the commitment, emotional attachment, deliberation and human interaction (Staveren, 2001, p. 166), (Stam, 2012). Table 4 give an illustration of how the different markets are based on different principles. Sen describes this as an exchange economy which depends on mutual trust and the use of norms – explicit and implicit (Sen, 2000, p. 163). In Chapter 8 of this document we will give a detailed description on creation of a social and economic viable business model, having in mind the different way in which the market in a BoP context might be operating.

Especially in initial stages of the innovation project it is challenging to find sufficient financial resources, due to the (possible) uncertain outcomes of innovation projects. Many current initiative in BoP ICT projects are becoming dead pilots, partially because they are fully grant-based (Figure 7, (Carvalho, Klarsfeld, & Lepicard, 2011, p. 9). In ‘regular’ development projects, financing usually comes through donors. Donors often require certain outcomes and impact of the project, as well as proper monitoring of the project. But donors find it difficult to finance open-ended needs assessment as “these are difficult to assess according to sector-based criteria” (Crewe & Harrison, 1998, p. 191). Also the way donor’s spend their money has found much critique; Dambisa Moyo summarized it in the title of her book “Dead aid”, saying that the aid money has done very little for Africa (Moyo, 2009). Therefore BoP innovation projects often require innovative financial approaches (Prahalad, 2005). Many projects, though possibly market-based
today, often have used grants in their initial phases to grow (Carvalho, Klarsfeld, & Lepicard, 2011, p. 6).

Micro financing is typically available for individuals and for micro-businesses, and regular banking services are typically available for larger companies. Small and medium businesses, however, often lack access to appropriate financing options (‘missing middle’), which can limit their potential growth (BoP Inc, 2012). “Investor interest in BoP markets is based on expectations of a large-volume, low-risk and high return on capital employed business opportunity” (Prahalad, 2005, p. 30), but they state that they are still missing adequate models to measure the social impact of the entrepreneurs they want to invest in. Current developments in crowd funding platforms, incubator labs and venture capitalist for African entrepreneurs can contribute to the development of BoP projects.

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Table 4 Value domains according a meaningful efficient economy (Staveren, 2001, p. 57)
Tool: Three types of ICT business models
The French organisation Hystra has done a case study analysis on “leveraging ICT for the BoP” that concluded with three different types of successful business models (Carvalho, Klarsfeld, & Lepicard, 2011).

- 1 way directly from technology platform
- 1 way via intermediaries
- 2 way on 2 sides of technology platform

Each of these business models require a different way of organizing the final service delivery and it depends on the service that is being developed, and by whom it is used, what is most effective.
Scaling-up the results of an innovation project into full deployment and, e.g., bringing new business initiatives to new regions or new sectors, is always a challenge, and especially so for BoP project. Even the most popular ICT4D initiatives, have too high expectations over too short time. In 2005 Nicholas Negroponte announced an initiative called One Laptop Per Child (OLPC) at the World Economic Forum in Davos, Switzerland. The vision was that with this relatively cheap laptop children in underdeveloped regions could help teach themselves and others. It was envisioned that within 2 years 20 million OLPCs were introduced. This appeared to be a rather ambitious goal as is explained in an evaluation of this project in the Communications of the ACM in June 2009 (Kraemer, 2009). It is stated that “expecting a laptop to cause such a revolutionary change showed a degree of naivété, even for an organization with the best intention and the smartest people”.

In the study by Hystra it is stated that many ICT4D projects can be regarded as “dead pilots” (Carvalho, Klarsfeld, & Lepicard, 2011)(see also Figure 7). Projects that have reached the million customer landmark, remain the exception (Carvalho, Klarsfeld, & Lepicard, 2011, p. 6). Dambisa Moyo in her critique on aid also points out that there is a “Micro-macro paradox; a short term efficacious intervention may have few discernible, sustainable long-term benefits. Worse still, it can unintentionally undermine whatever fragile chance for sustainable development may already be in play” (Moyo, 2009, p. 44).
problems. Reaching scale in this sector therefore is a big challenge and could possibly partly be attributed to the fact that donors mainly finance projects that have a well stated goal. In (London & Hart, 2010) some often occurring structural flaws resulting in a failure to achieve scale are listed:

- A purely top-down approach to Base of the Pyramid enterprises. Successful Base of the Pyramid enterprises are mostly built bottom-up.
- Lack of knowledge of the basic tools of business.
- Lack of textbook solutions for local, micro level challenges: creating markets where there are none, engaging a community already fractured along caste or tribal lines, non-traditional approaches to marketing, building bridges to governments and other stakeholders that often seem distant and unreachable, managing distribution chains in the face of unreliable transport and power, etcetera.

Special effort is typically needed to ensure the sustainability of the innovation and effective scaling-up. If money streams are secured to continue the project, a proper scaling strategy has to be put in place. In Chapter 9 the CSFs for economic viability of a business model, that can reach scale are formulated which will describe in more detail what can be done in the business model for economic viability. The cost and revenue model and willingness to pay on the user side being one condition to reach scale, on the other hand also the diffusion in the market requires certain strategies in order to fulfil the scale.

![Figure 9 MHealth pilotitis in Uganda (Unicef, 2009)]
**Tool: Use social networks in diffusion of service**

Posthumus et al. describe three aspects of the social network that determine how a service can be diffused in the market (Posthumus, Aarnoudse, & Stroek, 2013). Firstly there is the homogeneity of the group: When people within a community are alike this can facilitate diffusion of innovation as communication is ‘relatively easy and requires little effort’ (Rogers, 2003). In raising awareness about a mobile agricultural information service homogeneity is an important factor. Secondly there is certain opinion leaders of the network; the local champions. They often have a higher status and are more exposed to external sources of information. They can be used to actively promote an innovation. Thirdly the ties between community members can differ in strength, which can influence the diffusion of an innovation. Weak ties, characterized by few interactions, no emotional bond and little reciprocation facilitate the entrance of new ideas. Strong ties characterized by frequent interactions, a strong emotional bond and reciprocation can be used in the implementation of new innovation when support and cooperation are needed.

### 7.2.4 Co-creation, active participation and social embeddedness

A significant part of the BoP population is not integrated into the global market economy, which makes it difficult to understand market demand (BoP Inc, 2012) and to relate these to people’s needs (Prahalad, 2005). In development projects that lack of knowledge about market demand, can be the lack of knowledge about a culture: “Cultural barriers and gaps in local knowledge are often seen to impede the progress of development interventions.” (Crewe & Harrison, 1998, p. 134). Culture is often used for categorizing what cannot be identified or explained” (Crewe & Harrison, 1998, p. 154) and is therefore given as the reason for failure of the project. In development cooperation they have therefore applied participatory approaches and involve the local people to understand the culture and create ownership. “Many development projects had floundered because people had been left out, where they were allowed in, much more was achieved with less” (Black, 2003, p. 127). Embedding BoP projects in local communities can help to understand culture and history, and to integrate them into the community in order to co-create innovative and systemic solutions for mutual value (Simanis & Hart, 2008) (BoP Inc, 2012).

But now the question arises: who are the local people? “A distinction between donors ‘partners’ and the ultimate beneficiaries – the real locals – is impossible to sustain” (Crewe & Harrison, 1998, p. 171). Therefore in co-creating with “local people” and “local organizations” is similar, but one just has to wonder who is the BoP?

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<th>Ubuntu Tradition</th>
<th>Western Tradition</th>
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<td>History</td>
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The BoP entrepreneur also brings his or her own culture in the development of the service. Van Stam (2012) has made a comparison between different aspects of a Western culture and the Ubuntu culture in Zambia (Table 5, (Stam, 2012)). The way ‘local people’ look at the BoP entrepreneur is influencing the way they respond. “Whether colonial or government, donor supported development projects, has a profound influence on the way in which local people respond to the latest one” (Crewe & Harrison, 1998, p. 135). In tandem with various interventions, people have learned to adapt their behaviour in anticipation of where they see potential benefit” (Crewe & Harrison, 1998, p. 157). In co-creating with them, involving them in the development process this should be kept in mind as it can influence the response and also the own view of what is good.

Co-creation can be done on multiple levels. It is related to user involvement in product and service development. An user can be involved in multiple ways, and co-creation is the most advanced and intensive one. It is therefore also a more time-consuming method and should be used strategically and not as a rigid model for developing new services. The idea of co-creation is that instead of one organization gathering a lot of information and transforming that into a product, this is a process in which both sides contribute and create the product together. What should be kept in mind is that in co-creation processes it is important there is a stakeholder that has a stake in the final product to succeed, meaning wanting to create a business with it. Only then the right decisions can be made. It requires an open mind-set from people that are used to thinking “what is best for them”, as the them in this case are often people that are difficult to relate to. Furthermore, what is aimed for with the service, often a social goal, might not be what the users want, which means that it needs to be “repackaged” in order to reach its potential. Only through co-creation and active participation of the target group, such structures can be discovered.

**Tool: Co-design weeks**

Organizing co-creation sessions can be quite tedious. It often involves people from several organizations with each their own schedule. De Boer and Chevrollier (2010) have articulated three co-design weeks with each their own outcome that feeds into the service development (Figure 10). They have specified one week for “strategy and conceptualisation”, one week for “design and implementation”, and one week for “impact and evaluation”. The focus is on creating ownership through a user centred design approach, using existing building blocks, a multi-stakeholder approach and taking into account the whole system that contributes to the service. All of these aspects are also addressed in other paragraphs in this chapter, hence the most interesting aspect that
in each of these elements one can choose to have a co-creation approach. Co-creation can be with end-users, but also between organizations and institutions.

Figure 10 Co-design weeks (Boer & Chevrollier, 2010)

7.2.5 Institutes, policies and strategic alignment

The scaling-up of BoP innovation projects typically requires well-functioning institutions and institutional structures to support the scaling-up of the innovation. Unless somebody knows how to interact with a particular bureaucracy, gain access to resources and negotiate obstructions, the best policy documents achieve nothing (Black, 2003, p. 128). In the development sector the well-functioning of institutes and institutional structures is related to activities in ‘good governance’. Alongside the opening up of markets, deregulation and privatisation ran an agenda for political reform: calls for democracy and ‘good governance” (Black, 2003, p. 125).

In the development discourse there is a strong donor’s assumption that they have better understanding of a country’s needs than its’ own government (Crewe & Harrison, 1998, p. 69). Most of the time certain preconditions are set for overseas development aid, and agendas of multilateral donors is mostly based on the UN millennium development goals. This means that what happens in a local context, is mostly depending on agendas of national and international institutions. Strategic alignment either for future buy-in of the idea, or to influence a future agenda, is necessary from the early stages of the development process.

Despite BoP projects not having an explicit ambition to change policy agendas, governance agendas and policies will have influence for e.g. the uptake and
implementation of the service on a local and international level. For example it is critical to understand national or local policies and to use them constructively and strategically in further developing and deploying the innovation. Sometimes, it may be necessary to work at influencing or modifying policies, e.g. if they directly affect success or failure of the innovation. Overall, sufficient institutional capacity and sufficient infrastructure are critical for scaling-up innovations.

**Tool: Comprehensive approach**

The ‘Comprehensive Approach’, involves the organization of effective cooperation between diverse stakeholders and institutional capacity building in rebuilding a failed state (Coning & Friis, 2011). The comprehensive approach is used in peace and development missions in which civil society and military forces are working towards the same goal. It addresses how to cooperate with local institutions to reach similar goals. Figure 11 describes the different levels of cooperation with local institutions. These levels can be adopted in BoP projects as well in e.g. cooperating with governmental bodies or local technical institutions, depending on the goals of the project.

![Figure 11 Comprehensive approach](image)

**Integration**: Integrated planning and action.

**Coherence**: Common goals and trust lead to comprehensive actions – concerted planning and action.

**Cooperation**: Shared view and economy of activities encourages common purposes and common goals.

**De-confliction**: Shared view avoids interference and encourages economy of activities – self-synchronize.

**Awareness**: Transparency and information sharing enhance shared view of the engagement space.

**Coexistence**: The state of being together in the same place at the same time.

### 7.2.6 Focus on capabilities and evaluation

At the start of the development agenda, just after the Second World War, development was measured in terms of GDP per capita. Later a focus was shifted to more social goals, ultimately resulting in the millennium development goals. This resulted in projects and programs that were set-up around reaching the targets as set by the United Nations. Furthermore there was a shift in providing money, to providing goods and later providing knowledge and people. Still outcomes of projects needed to be measured in terms of e.g. how many people were reached, benefited from it, and how it contributed to the millennium development goals. Notwithstanding that the MDGs are indeed good pillars to alleviate poverty, a new discourse was introduced by Amartya Sen (2000) that said to focus on increase of people’s capabilities to live the life they want to lead (Sen, 2000). Focusing on capabilities instead of e.g. numbers of beneficiaries or providing goods, is an innovative approach that is felt to relate more to sustainable development.

However, to be able to measure the increase of capabilities, and which works better than the other, proper evaluation mechanisms need to be put in place. Common methods are counter factual analysis (what would have happened if we would not have done the intervention) or follow the money (how much (people) are reached, with the money that
is spent). Esther Duflo has introduced a method that is new to the development sector and provides proper insight in what works and what doesn’t on her evidence based approach with randomized control trials (Duflo, 2010) (Banerjee & Duflo, 2007a).

The last methodological guideline therefore describes the importance of the focus on capabilities and evaluation to ensure that the initial goals of the BoP project will in the end achieve it, one way or the other. It is critical for BoP innovation projects to focus on increasing people’s capabilities, while organizing and managing the project. This Capability Approach (Sen, 2000) (Nussbaum, 2011) involves a focus on people’s development and freedom—instead of a focus on ‘merely’ supplying hardware or equipment (‘too little’), or ‘overdoing’ it by prescribing specific behaviour (‘too much’). This focus on people’s capabilities, development and freedom can be integrated into the project plan, and needs to be evaluated in iterative cycles of the project, in order to ensure a productive combination of commercial and social goals. The ways to evaluate the improvement of people’s capabilities is currently discussed, both practically and theoretically (Oosterlaken & Hoven, 2012).

Figure 12 Capability approach (Sen 2000)

**Tool: The choice framework**

Dorothea Kleine (2009) has developed the choice framework based on the capability approach. The choice framework can be used to analyse the role of technologies in development processes. To what extend does the technology indeed stimulate development? As she takes freedom of choice as the enabler for development she focuses on the existence, sense, use and achievement of choice to bridge between the local structure, individual agency and the development outcomes. An elaborate description is available in the book “Technologies of choice?” published in 2013.
7.3 Conclusion

This chapter has described the three stages of an innovation project: design, pilot and commercialisation phase. It has also given six methodological guidelines that should be taken into account throughout the innovation process. The six elements are:

1. **Collaboration building and cooperation**
   BoP projects need multiple stakeholders on different levels, with different backgrounds to work together. Therefore it is needs to strategically choose partners and manage the partnership professionally.
   Tool: Strategic Alliance Management

2. **Business modelling and financing**
   Sustainable ICT business models for the BoP are scarce and it is challenging to find initial investment when outcomes are uncertain. Creative ways to acquire funding (microfinancing, crowdfunding) and innovative business model creation is needed for the adoption of the service.
   Tool: 3 types of ICT business models for the BoP

3. **Scaling up Innovation**
   Many projects fail after initial pilot phase. For sustainable solutions scaling up is crucial, and developing a scaling strategy early in the project is needed to ensure sustainability of the project after the pilot phase.
   Tool: Diffusion through social networks

4. **Co-creation participation and social embeddedness**
   There is a lack of knowledge of market demand and target group characteristics in the BoP. Participatory approaches should be used to ensure ownership by end-users and appropriateness of technology.
   Tool: co-design weeks

5. **Institutes, policies and strategic alignment**
   Policies and policy makers of governmental and global institutions will have
influence on the adoption of the service. Lobbying with these institutions should therefore be incorporated in the development process.

Tool: comprehensive approach

6. **Capabilities and evaluation**

Reaching social goals can’t be done without increasing people’s capabilities.

Incorporate proper evaluation mechanisms to ensure the project has the impact it was supposed to have.

Tool: the Choice framework

As said in the introduction, each of these elements need to be taken into account in all phases of the development process, however some need more attention in some parts. Figure 14 illustrates the relevance of each element in each design phase. This is an indication only and needs to be validated in practice.

![Figure 14 Adoption methodology for BoP innovation projects](image)

**Figure 14** Adoption methodology for BoP innovation projects
8. **A viable business model**

One of the elements of the adoption methodology if the create a viable business model. This chapter will explain in more detail what a viable business model is. The next two chapters go in even more detail into what the critical success factors for a viable business model are, which makes it a tangible and concrete tool to use during the innovation process. To create a viable business model it is important that (1) it is financially sustainable (economic viability) and (2) the value proposition will be adopted by the target group (social viability). Although these two aspects are related, they will be described separately, as they need different strategies in developing the business model.

8.1 **Economic viability**

To serve the BoP sustainably, it is often necessary to target a broader segment (London & Hart, 2010), or in other words to focus on scalability. The scalability of a company implies that ‘the underlying business model offers the potential for economic growth within the company’. A prerequisite for scaling is that the business model can handle additional sales (volume), without the need to invest in additional resources.

Many enterprises achieved viability by adopting an expanded view of low-income consumers or business associates, engaging those both at the base of the pyramid, but also those in adjacent income groups. By doing so, the organizations providing the service can buffer the volatility and risk inherent in dealing with the very poor. The already seminal report by the Monitor Group (Karamchandrai, Kuzisansky, & Lalwani, 2011) reveals that the majority of successful enterprises are able to survive by selling “push” products and services. Yet to do so, companies must engage in large-scale demand stimulation to educate their target customers about the benefits of their offerings. While this may be expensive, companies in sectors as diverse as mobile-enabled services and agriculture inputs successfully incorporate this cost into an economically viable business model, although it often requires higher gross margin to afford the “push”.

8.2 **Social viability**

When people are presented with a new technology, it is not self-evident that they are willing to and going to use this technology. The process in which people come to accept a technology is often referred to as the process of ‘technology adoption’. A significant amount of scientific research has been dedicated to the study of technology adoption processes and a lot of influential factors have been identified. A good understanding of these factors is a precondition for realizing successful adoption.

Over the last two decades ICT -as a class of technology- has entered private and professional spheres to the extent it is hard to imagine life without basic ICTs such as mobile phones or internet. Together with the fast spread of ICT applications, research on the topic of ICT has also seen its growth. An important topic relates to adoption and acceptance of ICT products and services. As the ICT sector is subject to on-going developments, the question as to what influences adoption and acceptance of ICT
remains relevant. ICT for development exemplifies this relevance. For this reason ICT adoption models are explored in the chapter to see how they can be applied in the context of developing countries.

8.2.1 Models and main constructs of ICT adoption

In the late 1980s and early 1990s various models were introduced which defined factors influencing the adoption of ICT (Venkatesh, Morris, Davis, & Davis, 2003). One of the most prominent models among these is Davis’ Technology Acceptance Model (TAM). Davis built this model around the constructs of ‘perceived usefulness’ and ‘perceived ease of use’. Perceived usefulness is ‘the degree to which a person believes that using a particular system would enhance his or her job performance’ and perceived ease of use is ‘the degree to which a person believes that using a particular system would be free of effort’ (Davis, 1989). These two constructs mainly relate to the ‘design of system characteristics’ (Malhotra & Galetta, 1999) and it was soon pointed out that TAM does not include ‘subjective norms’ (Davis, 1989). It was not only the original author who realized that social influence was absent in TAM. A wide variety of authors have fine-tuned and added on to TAM to develop models incorporating the construct of social influence. Malhotra and Galletta for example included social influence based on the Theory of Reasoned Action (TRA) (Malhotra & Galetta, 1999). Their elaborated version of TAM incorporates the three psychological attachment processes of compliance, identification and internalization. Freely translated compliance means that an individual adopts certain behaviour, because he expects to gain a reward or avoid punishment. During identification behaviour is accepted because the individual wants to maintain or build a good relationship with a certain group or person. Finally, internalization arises when an individual accepts behaviour because they match his own (internal) values (Malhotra & Galetta, 1999). Hossain and de Silva (2009) explored the TAM model in relation to virtual networks and looked at the influence of strong and weak social ties on acceptance of technology. These two examples underline the relevance of the inclusion of social influences as a factor in adoption models.

A more general approach to adoption models has been taken by Venkatesh et al. (2003), eight different adoption models were reviewed and examined. The resulting ‘Unified Theory of Acceptance and Use of Technology’ (UTAUT) is built on four main constructs of performance expectancy, effort expectancy, social influence and facilitating conditions. These four constructs have a direct influence on behavioural intention which in turn directly influences use behaviour (as based on the TRA). Links can be found between the UTAUT constructs and the earlier discussed three TAM factors, namely between: performance expectancy and perceived usefulness; effort expectancy (and to a lesser extent facilitating conditions) and perceived ease of use; and between social influence and subjective norms.

In the study “technology adoption in developing country contexts” (Cabral, Lucas, & Gordon, 2009) a literature review of technology adoption models is given, and eventually a slightly extended technology acceptance model is presented. This model is shown in Figure 15.
This technology acceptance model from Cabral (Cabral, Lucas, & Gordon, 2009) is an extended version of the one described in Venkatesh et al (Venkatesh, Morris, Davis, & Davis, 2003) and lists four “key influences” on technology adoption:

- Perceived Usefulness (or Performance Expectancy): how useful a technology is perceived to be in supporting and/or improving job performance and/or professional goals
- Ease of Use (or Effort Expectancy): how easy or difficult it is (or is perceived to be) to use the system effectively
- Social Influence: including perceived degree to which others approve the use of the technology, internalization of cultural acceptance and perception of how use affects professional image
- Facilitating Conditions: including actual control, resource, organizational and technological conditions, and internal conditions such as perceived control, perceptions of efficacy and compatibility with work style (Cabral, 2009)

In addition, three “moderating influences” are listed, that can reduce or increase the relative effect of the key influences:

- ‘Voluntariness’ of Use: the degree to which the adoption of the technology is voluntary or mandatory
- Experience: how the new technology is experienced by the user
- Gender & Age: key demographic factors which are grouped here because of the evidence to suggest they do not have independent influence but interact.

Note that in addition to factors that influence the intention of individuals to use a technology, the factor “facilitating conditions” is listed as a precondition to actual use.
It should be noted as well, that the TAM model or any other model aiming to understand adoption of technology, will never be able to predict the adoption and acceptance of the technology. It will however give clues on what to pay attention to in order to maximize the probability of adoption and can therefore be used as a tool to formulated criteria for social viability.

8.3 Conclusion

This chapter has briefly introduced the economic and social viability of the business model in BoP projects. Economic viability is related to the scaling-up of innovation and the social viability is mostly related to the local adoption of the ICT innovation. Economic and social viability is described in terms of generating a business model, however the process of innovation (which is also described in the section on adoption methodologies) as well as the actual look and feel of the product are other factors that need specific attention to ensure the viable business model will work.

The models introduced in this chapter are meant as illustrations of the given construct. We will not pay further attention to the validity of those construct, but merely use them as a means to generate context specific critical success factors for a viable business model.

The next two chapters describe the critical success factors for an economic and viable business model for the BoP.
9. Critical Success factors for economic viability

In this chapter, the most important CSFs for the economic viability of a business model are described. The CSFs are based on the idea that in order to reach economic viability it is important the VOICE based service is scalable, meaning it can reach enough scale to gain enough revenue streams. We structure our CSFs alongside the four basic elements from the Business Model Canvas. These elements are: the product or service, the customer (management), the infrastructure and the financial aspects. Summarized as: What? Who? How? and How Much? The chapter is concluded with mapping the CSFs on the business model canvas.

9.1 What? The product or service

In the BoP there is often a limited installed base and experience with products and services. There are many unaddressed needs. This makes market product positioning an interesting factor to address, as there is usually nothing to copy.

9.1.1 Positioning
The design challenge regarding positioning usually is to identify the relevant attributes of the product or service that set the product apart from competing products by means of identifying market segments, establishing consumer trust and identifying competing products or services.

Complementary goods can be defined as goods that only have value when they are being used together. Substitutes can be defined as goods that have an autonomous value, in the presence of alternative products that carry more or less the same value. Usually, literature takes the complementarity and substitutability between products and services as a given. For the BoP the situation might be quite different. In terms of complementarity, the BoP is different as in many cases there is a limited installed base of technology as well as skill level of users to build upon. In terms of substitutability, several sources (e.g. (Karamchandani, Kubzamnsky, & Frandano, 2009) (London & Hart, 2010); (WBCSD, 2005)) argue that it is hard to determine the value of a substitute as there is only a limited set of (low tech) market alternatives, especially in remote areas (WBCSD, 2005) (Klein, 2008). In the case of VOICE based services, the substitute could be a process (the old way of doing things), e.g. acquiring information by word-of-mouth.

Therefore the most critical choice in the BoP is how to create or enrich a market place for ICT products and services given the local context. The main challenge for service and business model design therefore is to find the right mix between building on the expectations, skills and installed base of technology in the local market and providing surplus value to the existing offer, thereby creating competitive edge.

→ Does the product or service build on expectations, skills and installed base of technology in the local market or is it a new substitute for an old service or product?
It costs usually less to market a complimentary product or service. However, in terms of scalability, a good substitute has more promise in sales for a mass audience. A complementary product usually is adopted only by a partial segment of the mass market.

### 9.2 Who? The customer (management)

With earnings of approximately $2 a day, people living at the BoP are not only very critical consumers; their purchasing options are also limited. This makes it difficult for new products and service to enter the market.

#### 9.2.1 Heterogeneity of demand

Generally an organisation focuses on a particular part of a market to sell its products and services. Such a part is often called a market segment. ‘A market segment is a sub-set of a market made up of people or organizations with one or more characteristics that cause them to demand similar product and/or services based on qualities of those products such as price or function’ (Wikipedia, Market Segmentation). The BoP can be analysed as if it were a market (segment) with its own unique characteristics. The BoP ‘market’ is generally defined to be formed by the people who have less than $2 a day to spend, meaning we focus on the 4.0 billion poorest people worldwide (Hammond, Kramer, Katz, Tran, & Walker, 2007). This makes a low purchasing power an important characteristic of the target group (London & Hart, 2010). However, though the lack of sufficient income is one of the most important characteristics of this group, the full range of socio-economic conditions that affects a person’s quality of life should be considered (Hart, 2005). For example, the BoP generally has poor access to education, leading to high rates of (ICT) illiteracy in low income countries. Low literacy has been associated with difficulties in making abstractions, leading to thinking styles that tend to be counterproductive (London & Hart, 2010). Another important socio-economic characteristic of the BoP is that the occupation of BoP customers is, in rural areas, over 80% related to the agricultural sector (IFAD, 2011).

A true market segment meets all of the following criteria: ‘it is distinct from other segments (different segments have different needs), it is homogenous within the segment (exhibits common needs); it responds similarly to a market stimulus, and it can be reached by a market intervention’ (Wikipedia, Market Segmentation). This definition fully changes the idea of taking the BoP as a market segment. Though some of characteristics of the BoP are similar, the BoP is not at all a homogeneous group. Firstly, there are a large number of local languages and dialects in BoP countries. Furthermore, social structures may vary by state, region, district, and even neighbourhood (Hellström, 2010) (London & Hart, 2010). Further also within regions, differentiation between occupation, age groups and gender should be made. This makes the BoP market heterogeneous across multiple dimensions.

⇒ Do you address a mass market or a niche?

Addressing a niche is often a good cost reducing strategy with less competition and an easier to reach target group. However with mass you can benefit of scales, which in the BoP might be necessary to achieve viability. An organisation that tackled this problem is
Esoko (see textbox below). Esoko focuses on a mass market, but does take the needs of different end users into consideration.

**CASE STUDY: Esoko**

Esoko, set up in 2008, is a mobile-enabled web trade platform for agro products. Esoko is the first organization to offer parties across the African agricultural value chain the ability to push or pull sector-specific data in a simple way via mobile phones or computers. Esoko improves small African farmers bargaining power by bringing them relevant market data on their mobile phone.

The real differentiating aspect of Esoko is that they offer agricultural information demanded by the homogeneous needs of the customer. Content, for example is specifically adapted to measurements utilized by the end-user (e.g. bags, kg, cups, etc). Though Esoko focuses on a mass market, the needs of different end users are taken into consideration. Customer-needs research and product design have been the focus of Esoko from inception.

www.esoko.com
(Carvalho, Klarsfeld, & Lepicard, 2011)

**9.2.2 Market entry strategy**

An important choice to be made in terms of market approach as well as segmentation is the extent to which a market needs cultivation, i.e. needs to be created. A western example of a company creating markets is Apple. With the introduction of the iPad a whole new market was created for what is now known as the market for tablets. The other option would be to join a market for existing products. Joining a market would mean that a company introduces substitute versions of ‘proven’ technology, products or services.

In the saturated marketplaces of developed countries, it is pretty clear in what situation it is viable to either enter an existing market or create a new market. Creation of a market requires superior competencies in terms of product development, branding, whereas market entry requires business intelligence, positioning vis-à-vis the competition and more focus on customer acquisition and retention. However, at the unsaturated BoP market it is all unclear.

⇒ Do you create a new market or join a market and adapt a product or service?

Actually in most cases an organised market is non-existing in the BoP. This leaves little choice, but more reason to think about the market strategy before trying to create a new market. Companies that pioneer new products and services for low-income customers typically take a decade or more to attain scale. However, companies that pursue proven business models and do not try to attempt market creation may scale in just three or four years. Hence, market creation is more costly than market entry. However, while creating a market you do not have to share your revenues with owners of the proven product or service, whereas with market entry you might be forced to do that. Another way of formulating the trade-off is the level of risk a company is willing to take: high risk, high gain, or low risk, low gain?
9.3 How? The (technical) infrastructure

In the BoP, firms often cannot count on existing high quality real estate when setting up a branch or sales offices (London & Hart, 2010). Furthermore, customers may not always have direct access to conventional distribution networks, as remote rural areas and conventional selling points are usually not within close distance. A poor physical infrastructure (roads, water, power, connectivity) is a main barrier in terms of logistics towards selling points or the end customer (London and Hart, 2010). Specifically in ICT, a limited network coverage or actual network quality is an important barrier (Hellström, 2010).

9.3.1 Local service delivery

Local service delivery is an important factor in reaching customers. Improving local service delivery can be addressed at two levels: delivery of the core service itself and delivery of services related to the core service.

Many organisations offering (mobile) ICT services consider users without connectivity to lie beyond their addressable market. Some organisations however have set up internet kiosks that have network connectivity, thus expanding their reach to customers who do not have access to a personal internet connection. Often, these kiosks are shared between several organisations offering ICT services.

Next to this offering of the core service, several related services are often provided, such as customer support or purchasing points. A good example of local service delivery of related services is the sale of scratch cards on virtually every street corner in Africa. Mobile operators have very little control over this organic network of informal sales agents, but by organizing the sale of scratch cards in this way operators can reach customers at very low costs.

An important choice for companies in this aspect lies in either building a local infrastructure themself or in partnering in local service delivery. Partnership can help companies to get access to channels that were previously not within reach (London and Hart, 2010). On the other hand, offering services through partnerships (and sometimes bundled with other services) allows less control over the way the service is delivered and consequently can influence the customers perception of the service.

⇒ Are you going to build your own distribution network, or ally with other companies?

Building your own network might be expensive, but will give you control and therefore minimises unnecessary loss of sales (wrong perception, other competitive offers or unreliable delivery).

9.3.2 Develop an end-to-end organisation

At the BoP one of the main challenges is related to the undeveloped innovation ecosystem that exists in many industries in developing countries (Karamchandani,
Kubzamnsky, & Frandano, 2009) (Porter & Kramer, 2011) (Jenkins & Ishikawa, Business Linkages: Enabling Access to Markets at the Base of the Pyramid. Report of a Roundtable Dialogue March 3-5 2009 in Jaipur (India), 2009). In the previous sections, several challenges were noted that in fact are a consequence of the ecosystem being relatively underdeveloped. Therefore, as Jenkins (2009) writes; ‘companies have to think proactively about the systems in which their BoP suppliers, distributors, and customers are embedded’.

By analysing the ecosystem, entrepreneurs will get a better understanding of the local situation and system gaps can be identified. In order to optimize the ecosystem, firms can either fill in the pieces of the system themselves, called insourcing, or reach out to partnerships, outsourcing (Karamchandani, Kubzamnsky, & Frandano, 2009) (Porter & Kramer, 2011) (Jenkins & Ishikawa, Business Linkages: Enabling Access to Markets at the Base of the Pyramid. Report of a Roundtable Dialogue March 3-5 2009 in Jaipur (India), 2009) (IFAD, 2011). In effect, this strategy is more than just focussing on the business itself, but on developing a so called ‘end-to-end organisation’ (London & Hart, 2010).

**How will you develop your end-to-end organisation?**

Designing a clever insourced and outsourced value chain can be done based upon a good value chain analysis. When done well, this may save a lot of money later. An interesting case in this respect is Drishtee (see textbox below), which found a way to reach about 10-15 million villagers by insourcing retail points and partnering with suppliers and local e-services providers.

### CASE STUDY: Drishtee

Started in 2001, Drishtee is a for profit organization founded by Shailesh Thakur, Nitin Gachhayat and Satyan Mishra to enable the emergence of a rural network of franchises and partnerships capable of providing access to basic services and goods to the rural population of India. Drishtee provides access to web-based services through a network of 2,000 village kiosks. In addition, Drishtee distributes Fast Moving Consumer Goods (FMCGs) to 13,000 rural shops, the Drishtee Rural Retail Points (DRRPs).

The uniqueness lies in the original use of ICT to foster development in remote communities by combining access to ICT-based services and the physical availability of essential goods. In each District, Drishtee identifies “milkman routes” that connect 20 to 25 villages. It then establishes “rural routes” with kiosks at the nodes that support the development of an ecosystem of micro-enterprises in the route villages, for both services and products. By means of insourcing retail points and partnering with suppliers of goods and services (e.g. Nestle/Danone for FMCG products) and local e-services providers, Drishtee has reached about 10-15m villagers in 2011 and demonstrated economic sustainability by breaking even in 2006.

www.drishtee.com

(Carvalho, Klarsfeld, & Lepicard, 2011)

### 9.3.3 Manufacturing (value creation)

Value creation relates to designing, making, and delivering a product of the desired quality and quantity. The production activity dominates the business models of
manufacturing firms. In manufacturing, a trade-off can be made between lean manufacturing and demand driven manufacturing. This can also be extrapolated to ICT services.

Lean manufacturing is based on optimizing flow; it focuses on increasing efficiency and decreasing waste. Demand-driven manufacturing, on the other hand, is an approach to manufacturing where production is based on actual orders and producing customised products. Lean manufacturing especially focuses on cost reduction and economies of scale, while demand-driven ‘manufacturing’ focuses on customer value and economies of choice.

In terms of voice-based services, a company could choose to produce a particular mobile service in a limited number of languages and focus on the lowest costs of production. On the other hand, a company could also customize the product to the language requested by the customer and focus on creating a flexible production organisation.

→ Do you choose for lean manufacturing or demand driven manufacturing?

Lean manufacturing usually leads to less costs, but demand driven manufacturing translates itself in customisable products making up for higher price and thus more revenue. The design choice depends heavily on the target segment of choice: can they afford higher prices? In the BoP this might not be the case. Therefore lean manufacturing usually seems more logic in the BoP. A case study supporting this statement is the Narayana Hrudayalaya Group (see textbox below). This organisation made it possible to serve more patients at lower costs than other cardiac institutes by focusing on lean manufacturing.

**CASE STUDY: Narayana Hrudayalaya Hospitals**

The Narayana Hrudayalaya Group (NH) is a private group of hospitals with 25 hospitals and two main campuses in India. NH was founded in 2001 by Dr. Devi Shetty with the objective of providing cardiac care to a diverse patient base at affordable prices.

In the case of NH, value creation is especially delivered by providing low costs services. In order to do so, NH has a strong focus on lean ‘manufacturing’ (or in this case service delivery). Thanks to the use of ICT at all levels and an innovative focus on minimizing administrative roles for operational staff, it serves more patients at lower costs than other cardiac institutes while high volume also allows bargaining for low prices of suppliers.

www.narayanahospitals.com (Carvalho, Klarsfeld, & Lepicard, 2011)

**9.3.4 Organisational learning and problem solving**

The organisational learning and problem solving capacity usually includes: research and development activities, training facilities and feedback processing mechanisms. There are two relevant value strategies in this respect in the BoP: 1) operational excellence and 2) customer intimacy.
Do you want to create value by operational excellence or do you aim for customer intimacy?

The first strategy focuses on optimization of value creation, focusing on optimization and standardization of managing and operating the service platform. Activities could include working towards a robust and scalable technical architecture and efficient day-to-day operation, but also towards standardizing training modules and developing best practice guidelines. The second strategy is optimization of value delivery, focusing on social learning together with the local population and local organizations. Activities could include optimizing local service delivery by adapting to the local context, setting up enterprise centres or more intangible learning by embedding the organisational operation in the local context by on-going coaching and peer networking (London & Hart, 2010).

Optimizing value creation will lead to less costs in terms of manufacturing, optimizing value delivery however translates in more revenue in terms of sales.

9.3.5 Network governance

The main rationale to ‘govern’ a network of partners is to mitigate risks. Two types of risks can be identified: relational and performance risk. The relational risk can be described as the chance that a partner will behave opportunistic and will damage the collaboration or even the company. Performance risk on the other hand can be described as the risk that the outcome of the collaboration will not be successful, regardless of whether there is a ‘sound’ collaboration. Organisations have a choice in what governance mechanisms to choose, with total control and blind trust as the extreme opposites.

The key element in the control approach is ensuring that the interest of the organisation is guarded and that opportunistic behaviour of partners is minimized. This can be done by enforcing strict rules and detailed contracts. The trust approach on the other hand is based on the idea that when partners have an intrinsic motivation to turn the cooperation into a success, control is less needed, because partners will automatically act in the interest of the network (Man & Roijakkers, 2009). In practice, the two approaches will always be combined but one has to choose the amount of control that one wants to exercise and the control mechanisms that one wants to use to this end.

Do you govern your operation with control or with trust?

Trust or control based governance mechanism can take various shapes. The large body of literature on this subject identifies three fundamentally different governance modes. To organize the activities within a firm there is hierarchy governance: coordination that takes place via authority and employment contacts. If executed well, this bureaucratic mode can be very efficient, but it requires specific internal coordination. Secondly, there is market governance (Reuver & Bouwman, 2012) which has clear advantages in terms of coordination, as the ‘invisible hand’ of the market takes a large part of coordination out of the hands of companies. On the other hand, this involves considerable extra transaction costs as it involves extra legal, financial and physical activities to complete a transaction to mitigate the risks involved. Critics of transactional cost economics claim that limiting oneself to these two modes underestimates the fact that transitions are embedded in
social networks (Granovetter, 1985) and that the embeddedness leads to social mechanisms that govern the exchange process (Jones & Lichtenstein, 2010). Therefore there is a third governance type; network governance (Powell, 1990), here social contracts and reputation are dominant.

One can be tempted to think that in a BoP context, the network governance is more dominant. However, we have found evidence of all three types of governance models being operated within the same organisation. Western companies often choose a single governance style, while we believe in a BoP setting, it is important for an organisation to be flexible in the type of governance for each relation. Dealing with government can be sometimes classified as hierarchical governance, while relations with local sales offices can be more of the network governance type. Also, the type of governance required in the design or pilot stage can be quite different than that required for the commercialisation phase.

In practice, in the BoP the two approaches will always be combined but one has to choose the amount of control that one wants to exercise and the control mechanisms that one wants to use to this end. Thereby it is crucial to think about the scalability of such a mechanism.

9.3.6 Human resources skill mix

Every enterprise requires human resources, but in certain business models people are more prominent than in others. For example, human resources are crucial in knowledge-intensive and creative industries. When operating at the BoP, human resources play a crucial role as human resources are not scarce in a quantitative sense, but human resources tend to be quite homogenous which can make it hard to find personnel with the right combination of skills.

On the one hand, innovative and technical solutions have to be found to overcome infrastructural ICT barriers. On the other hand, the BoP market consists of an informal economy in which relationships are key. Therefore deep knowledge of local conditions and trust from local communities are precious assets, especially when working with local agents to sell your products or services. As London and Hart (2010) note, building a BoP-centric management team is key, and should constantly rebalance the social impulse (that is, the will to serve the poor) with the more traditional business skills needed to build a successful business. The right balance between technical skilled personnel and personnel with networking skills is therefore important.

Do you need more techno/economic oriented skills or local networking/delivery skills?

Finding people with both the right mind set and with techno/economic oriented skills might be costly, as the case study of RML shows (see textbox below).
9.4 How much? Financial aspects

The basic idea is, that all choices in the business model can be translated in costs and revenues; in short: the business case. The people living at the BoP are very critical customers and on top of that uncertainty on the conditions under which an investment will flourish as well as uncertainty on anticipated risks and revenues leads to underinvestment in the BoP. This creates business challenges for companies that wish to enter the market (both at the costs and the revenues side of the business case).

9.4.1 Revenue model

Choices will have to be made on a revenue model that at least covers the costs of operating in the market. In this decision making process, a choice can be made between direct revenues and indirect revenues.

Direct revenues are revenues generated directly from the targeted customer segments. In this case, a company should ask itself, for what value is each customer segment truly willing to pay? Successfully answering that question allows a firm to generate one or more revenue streams from each customer segment. Streams may consist of one-time customer payments (e.g. fixed price or volume or time dependent; a telecom operator may charge customers for the number of minutes spent on the phone) or on-going payments (e.g. mobile phone subscription). Also differential pricing based on ability to pay can be a form of direct revenue model (Jenkins, Ishikawa, Geanotes, & Paul, 2010).

Indirect revenues are revenue streams that do not come directly from the targeted customer segments. Some common examples are listed below:

- Advertisements: allowing other organisations (public or commercial) to communicate their message to a user of the service
- Data collection: selling information that is provided by users to other (commercial or public) organisations

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CASE STUDY: RML

Started in 2006, Reuters Market Light (RML) provides individual farmers with customized, localized and personalized weather forecasts, local crop prices, agricultural news and relevant information (e.g. information influencing market prices) – in the form of SMS messages sent to their mobile phones in their local language.

The main strength of RML lays its flexible and comprehensive system enabling the company to deliver high quality information services to several hundred thousand farmers in India. Setting up such a system, meeting exact customer demand requires a strong technical team. At the same time, the right team focusing on marketing and sales is important to scale up the system. Currently, the marketing and sales team of RML focuses on developing new relationships with distributors throughout the country and deepening existing relationships with partners to sell its services. According to RML it is very important, but challenging to recruit the right people to develop an innovative marketing and sales model.

www.reutersmarketlight.com

(Carvalho, Klarsfeld, & Lepicard, 2011)
monitoring usage) or by active participation (e.g. by asking users to answer specific question)

- Subsidies: development communities or government agencies willing to subsidize part of the service because its mission is aligned with the success of the service.

### 9.4.2 Revenue mix

Instead of choosing for direct or indirect revenues, there is also the possibility for choosing a revenue mix. Businesses should always think about whether their business model is able to generate sufficient revenues from a single source or if it should focus on generating multiple sources of revenues. These multiple sources can be both direct as indirect.

The choice between the two types of revenue generation boils down to the stability of revenue streams and the complexity of generating the revenue streams. For example, in case government subsidies are the only source of revenue for an organisation, this holds a risks for that company because policies can change and subsidies may be cut. In this case it is advisable to look for additional revenue streams. On the other hand, managing multiple sources of revenue streams may be complex and time consuming. An optimal decision should thus be made with regard to the revenue mix.

=> Do you rely on one single revenue model or do you opt for multiple revenue sources?

Whereas multiple sources of revenue will make your business more robust in bad market conditions, multiple revenue streams also introduce complexity and therefore costs. The previous discussed Narayana Hrudayalaya Group (see textbox below) again offers a good example. The NH Group uses a revenue mix to deliver a sustainable service for the BoP.

#### CASE STUDY: Narayana Hrudayalaya Hospitals

The Narayana Hrudayalaya Group (NH) is a private group of hospitals with 25 hospitals and two main campuses in India. NH was founded in 2001 by Dr. Devi Shetty with the objective of providing cardiac care to a diverse patient base at affordable prices.

In order to be able to provide cardiac care to the Base of the Pyramid, NH initiated a flexible insurance scheme: low-income farmers pay low premiums and are given access to same high-quality facilities (such as those of NH) as average or high income patients paying full-price. By managing various levels of income streams, the service becomes sustainable for the poorest to receive world class treatment and for NH to enjoy a 7.7% profit after taxes, higher than the average of US hospitals.

[www.narayanahospitals.com](http://www.narayanahospitals.com) (Carvalho, Klarsfeld, & Lepicard, 2011)

### 9.4.3 Cost pooling

Cost pooling refers to the extent to which partners share the Capital as well as operational Expenditures (CAPEX/OPEX) and thereby share risks. Two related concepts of costs that are relevant here are sunk costs, i.e. up-front costs that cannot be recovered and marginal costs, i.e. costs that are incurred when producing additional increments to
the existing production level. The most important choice is whether investments are concentrated at one actor, or (actively) distributed over various actors.

How do you pool your costs?

It is commonly argued that 1) uncertainty on the conditions under which an investment will flourish as well as 2) uncertainty on anticipated risks and revenues leads to underinvestment in new ICT products, services and systems. An example of the first argument is the ‘chicken-and-egg’ problem as studied in the two-sided market theory. A typical example is the fact that mobile application providers have no direct incentive to develop mobile applications as long as there are no mobile phones capable of running these applications, while mobile vendors have no direct incentive to develop a new generation of mobile phones if there are no applications written for it. The second argument of coordination problems appears when stakeholders have different expectations of the risks involved and/or anticipated revenues. Due to a lack of consensus, the negotiations on how to divide revenues cannot be closed before the actual investment, which makes participating altogether too risky. This should be avoided, or tackled by single party cost pooling.

9.4.4 Economies of scale/scope

Economies of scale and scope both refer to the phenomenon that as the production and/or selling of (a) product(s) or service(s) increases, the average cost per unit decreases. Whereas ‘economies of scale’ primarily refers to reductions in average cost (cost per unit) that are associated with increasing the scale of production for a single product type, ‘economies of scope’ refers to lowering average cost for a firm in creating and delivering two or more products. For our purposes, we interpret economies of scale to refer to synergies on the production, value creation side (left part of canvas), whereas economies of scope are used to cover synergies on the value delivery side (right part of canvas). We see this distinction as the main trade-off.

How do you reach cost synergies?

Due to advancements in technology, mass customization is also considered to enhance economies of scale as product differentiation leads to no or only a minimal increase in average costs per unit.

Examples of economies of scope focus on distribution channels, marketing and sales. For example as the number of products promoted is increased, more people can be reached per dollar spent. At some point, additional advertising expenditure on new products may start to be less effective (an example of diseconomies of scope). Economies of scope can also operate through achieving distribution efficiencies.

mPedigree (see textbox below) especially focuses on reaching economies of scale to serve the BoP.
9.5 Conclusion

In this section, we set out to describe the most important CSFs for economic viability of the business model for VOICE based services in the BoP. The CSFs are based on the idea that in order to reach economic viability it is important the VOICE based service is scalable. We especially focus on the CSFs that differ from the Western market. By means of desk research, relevant theories and case study we found fifteen relevant CSFs for Business Modelling (for VOICE based services in the BoP). Figure 16 gives an overview of this CSFs structured in the proposed Framework: the Business Model Canvas.

CASE STUDY: mPedigree

Launched in 2007, mPedigree is an African-based for-profit company spun out of a non-profit organization, which was founded by a Ghanaian social entrepreneur. They work with mobile operators and pharmaceutical manufacturers to provide a mobile phone-based real-time drug verification system for addressing the issue of the prevalence of counterfeit drugs in pharmacies at the point-of-sale, currently offered in Ghana, Kenya, and Nigeria.

The mPedigree system is simple to roll-out to new customers and easy to access for end-users and therefore a perfect system to scale. mPedigree especially focuses on reaching economies of scale, by working on increasing the sales volume of verification codes to pharmaceutical companies. The company is said to be on target to reach over 2m consumers and over 6m products successfully protected by December 2011.

www.mpedigree.net
(Carvalho, Klarsfeld, & Lepicard, 2011)

<table>
<thead>
<tr>
<th>Key Partnerships</th>
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<th>Value Proposition</th>
<th>Customer Relationships</th>
<th>Customers Segments</th>
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Figure 16 Framework with CSFs for Business Modelling in the BoP
10. Critical success factors for social viability

In this chapter, the most important CSFs for the social viability of a business model are described. The CSFs are based on the idea that for social viability it is crucial that the VOICE based service will be locally adopted. The CSFs are therefore related to local adoption and structures alongside the four factors important for technology acceptance and local ICT adoption as described in Chapter 8.2.1. These four elements are: Perceived Usefulness, Ease of Use and Social Influences. The chapter is concluded with mapping the CSFs on the business model canvas.

10.1 Perceived usefulness

As described in the preceding paragraph, the construct perceived usefulness describes the degree to which new products or services are perceived to be useful for an individual’s personal goals, or in Sen’s (2000) terms; for an individual’s freedom and capabilities. This perception may be influenced by wrongful assumptions, lack of interest etc. and thus may not correlate with for example a designers (perhaps more neutral) judgment of how useful a product will be.

For ICT services in general some factors that may influence the perceived usability are lack of transparency (people may have a hard time to imagine what a new product can do for them), and the availability of many alternatives. One way to address the issue of perceived usefulness is to involve future end-users in the development process. In the VOICES project the (perceived) usefulness of the voice-based system is also tested in the two pilots in Senegal and Mali.

10.1.1 Nature of demand

When reviewing the literature on the needs of the BoP one can easily conclude that a lot has been written on the differences of BoP needs (see e.g. (London & Hart, 2010)). One general conclusion is that the problems or needs of these target groups are significantly different than those of the western market. For poor households, the main needs they have are related to mitigating risks, which can move them out of poverty (IFAD, 2011). London and Hart (2010) also indicate that there are many unaddressed needs at the BoP. According to them ‘these unaddressed needs range from services where the government does not meet its mandate (clean water, sanitation and so on) to needs that are neglected because people are perceived as being too poor to buy (health care, housing)’. Some of the risks mentioned by the IFAD (2011) and London and Hart (2010) can be difficult to manage by products or services, as they are out of the direct control of the customer/businesses. Nevertheless, it is important to realise that (trying) to manage risks is central to the livelihood strategies of customers at the BoP. A VOICE service that focuses on reducing these types of risks could help to solve customer problems at the BoP. However, in determining the value of the service it is important to consider the difference between customer needs and customer wants, or as Karamchandani et al (2009) indicates, “just because they need it, doesn’t mean they want it”. This means that ‘people living at the base of the economic pyramid should be seen as customers and not
beneficiaries; they will spend money, or switch livelihoods, or invest valuable time, only if they calculate the transaction will be worth their while’ (Karamchandani, Kubzamnsky, & Frandano, 2009) or is, as stated before, perceived as useful to them.

Does the product or service address a need or a want?

A choice should be made on products or services meeting a need a right or a want of the BoP customer. Needs can be seen as more universal; they especially concern basic living requirements, such as food, water and shelter. Rights can be seen as universal rights that concern humanitarian living conditions, freedom of speech and gender equality. Wants can be seen less universal as they address a specific need of a certain target group. Wants are therefore more personal. With needs, the value is much clearer to the customer and therefore perhaps perceived as more useful. Wants however, are not to be ignored in the BoP.

10.1.2 Open ended value proposition

Many of the unaddressed needs in the BoP are related to basic needs or the physiological needs of people, such as food, shelter etc. In other words: ‘non-consumption of products and services is the defining condition of the BoP’ (London and Hart, 2010). Further, the economic activity concerning the trade of these basic needs is often informal and the practice of paying money for a value proposition may not always be the trading standard (ibid). As both the needs of the BoP as the organisation of the market for these needs are very different than for the western market, a very different approach is required for defining the value proposition (and convincing the customer of its use). Conventional marketing wisdom usually results in product marketing in which the products value is explicitly defined. This is also known as ‘value closed messaging’. Value closed messaging removes customers’ uncertainty, thereby enabling them to make informed choices. But until a product is embedded in the community base, precise messaging of a product’s value can create a “take-it-or-leave-it” decision framework that limits a user’s freedom of use and therefore perceived usefulness. According to London and Hart (2010), entrepreneurs in the BoP context should think in terms of market creation. This requires an initial value proposition should be what London and Hart call “value open”. ‘Value open means that the product’s value is not specifically defined’. By encouraging a consumer to personally define the value proposition, personal commitment can be created leading to behavioural change and a broader potential product uptake.

Do you offer a customizable or modifiable product or service?

In developing and marketing products and services open ended, entrepreneurs have a choice in how open the value proposition is. ‘Openness’ can range from offering customizable till modifiable products or services. Customizable products or services provide customers with the opportunity to adapt these products to their own personal needs in terms of e.g. colour, language, style or financial situation. Modifiable products are more extreme in terms of openness and can actually be changed in form or character and thereby applied in different contexts. A good example of using an open ended value proposition to create usefulness is given by Reuters Market Light (see textbox below).
Another point to address in this respect is **Added Value**: what value are we offering our customers? As was explained in the previous paragraphs, the BoP has its own needs and wants, which differ from western markets. The products and services meeting these needs and wants are however not always available (London & Hart, 2010), which offers great ‘untapped market’ opportunities. At one side of the spectrum, we identify unmet needs at the BoP that concern reducing risks or costs. The IFAD (2011) has identified a number of the key risks for poor rural people today:

1) Personal and household-level risks: ill-health and ceremonial costs,
2) Natural resource-related risks,
3) Market-related risks: food price volatility, and
4) The state as a source of risk.

Risk reducing value propositions or cost reducing value propositions can therefore offer added value for the BoP. At the other side of the spectrum, we identify needs at the BoP that concern a need for an increase in revenue or benefits (WBCSD, 2005). These revenue enhancing or benefit increasing value propositions can range from an increase in personal benefits (e.g. TV) to product or service enhancing value propositions (e.g. crop advice increasing crop quality). Some of these value propositions may meet an entirely new set of needs that customers previously didn’t perceive because there was no similar offering. Other value propositions are new in that they are made available to customers who previously lacked access to them. In developing a value proposition a trade-off should be made on products or services reducing risks of increasing benefits.

### 10.2 Ease of use

The construct ‘perceived ease of use’ refers to an individual’s perception of how easy it will be to use the technology for his personal goals. An important factor influencing the perceived ease of use in the context of developing countries is illiteracy. This problem is principally addressed by using voice-based technology developed in the VOICES project.
However, although using VOICE does cope with the problem of illiteracy it does not deal with the problem of low language mastery. The BoP context can be characterized by a relative high number people who only master one often marginal language. Experience with ICT may also affect the perceived ease of use (Venkatesh, Morris, Davis, & Davis, 2003). This is partly accounted for as the VOICES project mainly uses radio and mobile phones, two broadly used media in developing countries.

10.2.1 Capacity building

Chaskin et al (2001) define local capacity at the community level as the ‘interaction of human capital, organizational resources, and social capital existing within a given community that can be leveraged to solve collective problems and improve and maintain the well-being of that community’. Local capacity building can help to improve the economic environment of the BoP and augments people’s capacity to engage in economic activities.

Klein (2008) distinguishes three dimensions of local capacity: the human resources, the enabling environment and the market-based ecosystem. The first one, human resources focuses on skill development and is especially relevant in customer relationship. According to Silvius (Silvius, Sheombar, & Smit, 2009), organisations tend to have unrealistic (under- or overestimated) expectations about local skills and knowledge. Therefore, developing appropriate training is an important element in capacity building. The main trade-off we identify in developing training programs for employees and future customers is between more general skills development and specific ICT skills training.

Do you need to build up general skills or specific skills for customer relationship management?

Organisations tend to have unrealistic (under- or overestimated) expectations about local skills and knowledge in the BoP. Developing appropriate training, campaigning and marketing to raise awareness is an important element in capacity building, and consequently perceived ease of use. This choice must be decided based on the needs in a certain business scenario. A general rule of thumb is that if building of general skills are mostly done on a greater scale and hence costs whereas only a specific group will have to be trained for specific skills. The latter trainings are usually more expensive, and an alternative can be to facilitate peer-training, the group is much smaller leading to fewer costs.

10.3 Social influence

In the one-on-one marketplaces of the BoP, the boundaries between “human” and “economic” issues tend to get blurred, long-term relationships tend to trump short-term ones, “rich networks” make up for resource constraints, and consumption and entrepreneurship can be two sides of the same coin. BoP entrepreneurs, therefore, have to concretize, localize, and “socialize” their products and services. (London and Hart, 2010).
Little research has been done on the influence of social issues on the adoption of ICT in the context of developing countries. For this reason the theoretical framework on social influence and ICT4D has to be built on literature from two realms of study. Literature which discusses adoption models in the context of developing countries as well as literature which discusses social influence and ICT adoption can be used.

**Adoption models in the context of developing countries:** Van Rijn et al. (Rijn, Bulte, & Adekunle, 2012) have identified three mechanisms through which social capital may influence the adoption of agricultural innovation in Sub-Saharan Africa. These are: reduced transaction costs, facilitated exchange of information and enhanced trust and cooperation. Different types of social influence may have a different effect on these factors. ‘Structural social capital’ is formed by the formal and informal networks people may have and ‘cognitive social capital’ are shared norms and values among people.

**Social influence and ICT adoption:** The earlier mentioned work of Hossain and De Silva (Hossain & Silva, 2009) also refers to the importance of social influence and looks at the role of social capital in the adoption of ICT. According to them the strong social ties (intensive contact, high trust) have a different effect on the adoption of ICT than weak social ties (infrequent contact, lower trust). While the first is useful for the support needed to invest in innovation the latter is useful to access new information and learn about innovations.

### 10.3.1 Local awareness creation

A low-income customer generally has poor access to conventional information sources. Though the use of mobile phones is increasing rapidly, the penetration of mobile phones and Internet subscriptions in the BoP is still significantly lower than in the western world (ITU, 2011). The BoP can be characterised by a largely informal economy, where information provision and marketing activities are mainly below the line; meaning that these activities do not rely on mass media (word-to-mouth, demonstrations) and trade is highly based on relationships. Furthermore, cultural differences, high rates of illiteracy and other socioeconomic differences cause the decision making processes in the BoP to be very different than those in the western world. This makes it difficult to transmit market signals down the chain. As a result, marketing and information provision should be very different from a company’s approach to western customers (Jenkins & Ishikawa, 2009) (London & Hart, 2010) (Klein, 2008). Local awareness creation is key in developing marketing activities for the BoP.

> Will you do your advertising above the line (radio, TV) or below the line (word of mouth)?

Thus a choice can be made between above the line and below the line marketing. Above the line channels could involve using existing local media and marketing channels, such as TV, local radio or mobile phones. Below the line marketing involves local social networking, such as local sales presence and word of mouth marketing. Above the line marketing in the BoP context is much less of an obvious means than it is in the western market.
Below the line marketing can be very cost effective, provided that it is done well and supported by cues (the message to be told by word of mouth) for below the line marketing and incentives such as demonstrations or free product use. These cues can be very well supported by above the line such as local radio messages.

10.3.2 Embeddedness

To attract and win customers the product or service must become firmly embedded in the local communities (Klein, 2008). Klein (2008) defines the embeddedness of a firm as ‘the extent to which the business is an integrated part of the lives of those at the BoP’. In order to embed a product or service at a target group, the underlying model should be built upon local customs and conditions. Only then will people accept the business and see the product or service as an option for them (Klein, 2008). In order to actually integrate a product or service within the life of people as sort of customer relationship management is important. In the western market, there are numerous applications that enhance Customer Relationship Management (CRM), such as the use of databases for managing customer related information or the offering of toll-free numbers connected to call centres (Ballon & Arbanowski, 2004). At the BoP, these types of CRM tools can hardly be applied and in BoP literature, little information can be found on the topic of CRM.

In the awareness phase, the company tries to reach its target customer segments by means of advertising, promotions, public relations and partnerships. Once a customer has identified a specific firm as a potential solution provider to his problem or his needs he will want to learn more about the organization and the bundle of products and services it offers (Ballon & Arbanowski, 2004). Attracting customers at the BoP in this sense has a lot to do with aspirational marketing to attract customers by framing the value proposition around prevailing social and cultural ideals. Activities, such as value demonstration, that visualise the application of products and services, can also help to create awareness among customers and provide customers the opportunity to learn about the specific product or service. Furthermore, being active in community network can trigger word-of-mouth endorsement through relationships of trust (London & Hart, 2010). These types of activities enhance the embeddedness of a firm in the customers’ life (London & Hart, 2010). In this, we distinguish between Aspirational marketing (presenting the product as a premium) or Authentic marketing (presenting the product ‘as it is’).

Do you want to position your product as a premium (Aspirational market) or do you want to present the product ‘as it is’?

Marketing at the BoP has a lot to do with aspirational marketing when framing the value proposition around prevailing social and cultural ideals. Being active in a community network can trigger word-of-mouth advertising through relationships of trust. Activities such as product or service demonstration, authentic marketing, can help to create awareness among customers. Aspirational marketing tends to be more costly, but will reward itself in more revenues and sales when done well. Value demonstration should never be neglected even when doing aspirational marketing, so the choice is more between doing authentic only or authentic plus aspirational.
10.3.3 User interaction

In the after sales phase of the buying cycle lies the potential to create loyal customers by focusing on nurturing and retaining customers. After-sales services can enormously contribute to a customer’s satisfaction by helping him/her to maximize profit from the value proposition and by assisting him/her in case of problems. It can embrace implementation, use, training, maintenance, monitoring, troubleshooting and reverse logistics (i.e. disposal).

Do you choose for automated after sales or for personalized after sales?

In managing customer relationship management, we distinguish a trade-off between personal versus automated. Personal CRM could be done through community networks or local agents. When considering automated CRM activities, automated help desk VOICE response systems or a self-help manual come to mind as examples. Due to the informal character and low labour cost of BoP markets in general, personalized after sales may have more potential but the final choice largely depends of the specifics of the business case.

**CASE STUDY: eKutir**

eKutir is a Rural Social Enterprise and has been operating since 2008. In 2009, eKutir launched franchised, local e-kiosks (“hubs”), supporting local farmers with expert and individualized agro advice and trade information by means of different technologies (internet-connected computer, camera, etc.).

The business model of eKutir is focused around local entrepreneurs who act as the interface between technologies and end-users.

eKutir entrepreneurs provide, amongst other services, advice on agro-practices via internet searches, direct conference calls or broadcasting. This more personalized approach, compared to automated customer relationship management, has the advantage of personalizing and offer more depth to the services delivered.

www.eKutir.net
(Carvalho, Klarsfeld, & Lepicard, 2011)

10.4 Summary

In this section, we set out to describe the CSFs for social viability of VOICE based services in the BoP. This is based on the idea that for social viability it is crucial that the VOICE based service will be locally adopted. The CSFs are therefore related to local adoption. We especially focus on the CSFs that differ from the western market. By means of desk research, relevant theories and case study we found seven relevant CSFs for social viability (of VOICE based services in the BoP). Figure 17 gives an overview of this CSFs structured in the proposed Framework. As expected the CSFs for social viability cluster around the customer side of the framework.
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<tr>
<th>Key Partnerships</th>
<th>Key Activities</th>
<th>Value Proposition</th>
<th>Customer Relationships</th>
<th>Customers Segments</th>
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<td>Added value</td>
<td>Capacity building</td>
<td>Nature of demand</td>
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<td>Open value proposition</td>
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**Cost Structure**

**Revenue Streams**

*Figure 17* Framework with CSFs for Local Adoption of VOICE based services in the BoP
11. The framework

The previous sections have described the critical success factors for the economic and social viability of a business model for voice based services. Prior to that we have described the adoption methodology with six methodological guidelines. This chapter merges the theory described in the chapters into one framework in 3 steps: (1) Introducing the framework (2) an overview of all the CSFs for an economic and socially viable business model and how they fit into the adoption methodology and (3) the relevancy of economic and social viability in the six methodological guidelines and how this fits into the framework of step 1.

London and Hart (London & Hart, 2010) set as a requirement that in every development phase, there is a need to deal with business as well as adoption issues. In our model the business issues are related to the economic viability of the business model and the adoption issues in the social viability. We therefore propose to set-up the framework by focussing on the specific elements in the different phases of the process that need to be taken into account for economic and social viability of the voice based service.

The framework proposed here can be captured and illustrated with a matrix that is formed by the binominal variable ‘local ownership/scaleability’ and the trinomial variable ‘phase’ (based on the theory in Chapter 7.1). Figure 18 illustrates this.

The difference with the frameworks discussed in Chapter 7.1 is that we make an explicit distinction between the strategic focus and the phases: the strategic focus is either achieving social viability (local ownership) or economic viability (achieving scale); the phase refers to the level of maturity of the service: in the design or redesign phase (infancy), in the piloting phase (adolescence; market adaptation) or a fully commercial
service (mature, growth and consolidation). In each phase, an organisation should make a decision on which strategic focus to aim.

By making use of the proposed approach, the methodology becomes suitable for both mature products entering new markets as well as for new products. A multinational, for example, might have a proven ICT service which has reached large scale in the Western world and which the company would like to introduce in a BoP context. In Figure 19, an example route is drawn of the situation. In the case of the proven ICT service, the starting point would be a 100% scaled product (#1). The challenge for this company would be to find solutions to create local ownership in the BoP in this phase (#2) and how to design a pilot in this context (#3). Consequently, the company might want to implement the pilot in various regions to test a certain scaling strategy that works locally (#4).

In the case of a BoP entrepreneur, the route may look different (Figure 20). The BoP entrepreneur may for example have developed a successful pilot of a mobile based VOICE service in a local context (#1). Consequently the BoP entrepreneur may wish to develop a scalable service. Therefore he or she will have to go back to the original design of the service and adapt it to make it suitable (e.g. in speed, infrastructure) for expansion, while keeping in mind local ownership (#2). Consequently he or she will have to test the service on the scalability (#3). Lastly, the entrepreneur will have to work on the commercialization phase (#4).
As may be concluded from the examples, throughout the development phases, strategic focus should be taken into consideration. For instance, although the piloting is usually geared towards achieving local ownership, it is critical that in the design and especially in the commercialization phase, local ownership is an integral part of the design and decision making process. The other way round, it is equally critical to include (learning what to) scale as a requirement in the piloting phase. Further, it is important to note that the phases are not linear but iterative; fundamentally it is a process of continuous improvement that has no starting point or end point. In the next paragraph we elaborate on the specific methodological guidelines that need to be taken account in each of the steps, by mapping the critical success factors on the design process.

### 11.1 Critical success factors for a viable business model

Chapter 8 and 9 gave an overview of the critical success factors. We especially focus on the CSFs that differ from the western market. The table below gives an overview of the choices the different CSFs represent.

<table>
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<tr>
<th>Business Model element</th>
<th>Critical Success Factor</th>
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<td>Value Proposition</td>
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<tr>
<td>Customer</td>
<td>Capacity building</td>
<td>General skills</td>
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</tbody>
</table>

Figure 20 Example route 2

As may be concluded from the examples, throughout the development phases, strategic focus should be taken into consideration. For instance, although the piloting is usually geared towards achieving local ownership, it is critical that in the design and especially in the commercialization phase, local ownership is an integral part of the design and decision making process. The other way round, it is equally critical to include (learning what to) scale as a requirement in the piloting phase. Further, it is important to note that the phases are not linear but iterative; fundamentally it is a process of continuous improvement that has no starting point or end point. In the next paragraph we elaborate on the specific methodological guidelines that need to be taken account in each of the steps, by mapping the critical success factors on the design process.

### 11.1 Critical success factors for a viable business model

Chapter 8 and 9 gave an overview of the critical success factors. We especially focus on the CSFs that differ from the western market. The table below gives an overview of the choices the different CSFs represent.
Table 6 Complete overview of CSFs and the choices, CSFs marked grey are for social viability.

By mapping the critical success factors in the relevant methodological guidelines, Figure 21 emerges. This is used to derive how the methodological guidelines are relevant in each of the parts of the framework. This is illustrated in the next paragraph.
11.2 **Social and economic viability in the adoption methodology**

Social viability is mainly associated with local adoption, economic viability with scalability. When mapping the critical success factors on the methodological guidelines one can draw an image that shows the relevancy of each of the guidelines in the framework.

![Diagram](image)

**Figure 22** methodological guidelines for economic and social viability of a BoP business model

- Collaboration building and cooperation
- Business models and financing
- Scaling-up innovation
- Co-creation, active participation and social embeddedness
- Institutes, policies and strategic alignment
- Focus on capabilities and evaluation

What is interesting to notice is that the social viability needs a lot of attention in the pilot phase. This is probably mainly because the viability and willingness to use and purchase the new service, will only become evident if people can actually use the service. As can also be seen from Figure 22 is that for meeting the critical success factors in economic viability, the design phase is mostly crucial. The next paragraphs will briefly describe the relevancy of each of the elements for social and economic viability.
11.2.1 Methodological guidelines for economic viability

- **Collaboration building and cooperation**
  Partners are needed that can contribute to distribution and large scale implementation, as well as manufacturing or development. High tech expertise might be needed to continue development on the innovation.

- **Business models and financing**
  Once more scale is aimed for, larger investment is needed. This can be partly through revenue streams from participating users, but these streams are very low at start. Options like crowd funding or asking for a loan are available and need to be considered.

- **Scaling-up innovation**
  Prevent dead pilots by planning ahead and thinking of alternative scenarios for scaling and replication.

- **Co-creation, participation and social embeddedness**
  Once insights are gathered on differing elements per community, a generic model for replication can be formulated. The product needs to be generic, as well as customizable for it to be scalable.

- **Institutes, policies and strategic alignment**
  For large scale implementation government policies, import and export taxes and awareness about power structures on a national and international scale is needed. It can for example be beneficial to align your service with targets set by national and international institutes in order to apply for (financial) commitment from those institutions.

- **Capabilities and evaluation**
  Expanding people’s freedom is a need acknowledge by many people across the world. However, the means to the end might be different depending on the target group. This means that for scaling the technological service, might mean that customized after care and training schedules are needed to fit into another context. Also it is necessary to keep in mind that part of the service can be tested on a small scale and other effects on the daily lives of people will only become evident over time or when it is adopted by a larger group of people.

11.2.2 Methodological guidelines for social viability

- **Collaboration building and cooperation**
  Partners are needed to gain access to or have insight in local needs and wishes. Also intense cooperation with local stakeholders and local champions helps in adoption of the technology in the larger community.

- **Business models and financing**
  Financing in the initial stages of service development often happens in an open project. Especially when the targeted value proposition aims to reach social goals, donors, angel investors or crowd funding platforms can be useful to finance start-up costs. When you
typically aim for a certain region, with a certain social goal, there might be specific donors available.

- **Scaling-up innovation**
  Diffusion of service within and between communities. A need that is widespread, and can be served with the same product.

- **Co-creation, participation and social embeddedness**
  Co-creation can help to create local ownership with a specific target group. Allowing users to actively participate in the innovation process (especially in the design phase) increases adoption. The right insights for social embeddedness are needed to ensure a fit in the local context.

- **Institutes, policies and strategic alignment**
  On a local level it is common to work through local chiefs and local governments. The informal power structure might not be clear from the start, but is crucial to identify in order to ensure you are talking to the right people.

- **Capabilities and evaluation**
  The social goal that is aimed for with the service, might not be the same as the potential it has for the users of the service. The impact of the service might therefore be different and going in other directions that initially planned for. Also unforeseen negative effects, like limiting other people’s freedom by introducing a technological service because their jobs become redundant, should be kept in mind and monitored along the process.

### 11.3 Conclusion

This chapter described the framework for adoption methodology and critical success factors. It is the core of the document, where all theory is combined together in one framework. The critical success factors for social and economic viability of a business model and the elements to be taken into account to ensure adoption of the service. In the next chapters the framework will be applied in several situations. First hypothetically, and then practically for the VOICES pilots.
12. Business models and adoption methodology for a BoP entrepreneur and a MNC

The previous chapters described the theoretical framework for social and economic viability of the business model and the adoption methodology framework. In making the framework and CSFs applicable in practice, we illustrate two possible routes through the framework, how the methodological guidelines can be used to guide the process and how this leads to finding solutions on how to deal with the CSFs. We explicitly want to stress that we do not aim to provide a rigid process with steps that need to be followed consequently, as it is impossible to take into account all different scenarios and contexts possible in practice. It is up to the entrepreneur to take the guidelines, CSFs and the framework and use it in the way he or she feels it fits best with the project he or she is working on.

As a side note we propose the two example routes also to be the example routes for two of the three critical stakeholders for the Emerginov platform. Deliverable 1.7 describes these roles in more detail and we will not address them separately in this deliverable.

12.1 Example route 1: BoP entrepreneur

In example route 2, a BoP entrepreneur has a product that he has piloted successfully and now needs to wonder how he can scale this to other regions (Figure 23).

![Figure 23 Example route 1 (entrepreneur) in framework with methodological guidelines](image)
Step 1 → 2: How to make our localized pilot suitable for large scale?
A design that works in one context, one village, for a few people, might not be suitable for a larger audience. It should be determined how this service can be delivered on a larger scale, as well as what resources are needed to do so. The critical success factors of this step are detailed in Table 7.

<table>
<thead>
<tr>
<th>Business Model element</th>
<th>Critical Success Factor</th>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Resources</td>
<td>Human resources: skill mix</td>
<td>Techno/economic oriented skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Local networking/delivery skills</td>
</tr>
<tr>
<td>Key activities</td>
<td>Manufacturing</td>
<td>Lean manufacturing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Demand driven manufacturing</td>
</tr>
<tr>
<td>Organisational learning</td>
<td></td>
<td>Operational Excellence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customer Intimacy</td>
</tr>
<tr>
<td>Network governance</td>
<td></td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trust</td>
</tr>
<tr>
<td>Partner network</td>
<td>Develop an end-to-end organisation</td>
<td>Insourcing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outsourcing</td>
</tr>
</tbody>
</table>

Table 7 CSFs for economic viability in the design phase

- Collaboration building and cooperation: Partners are needed to determine how technical services can be scaled. Knowledge about the regional, national and global market is needed that might be available at other organizations.

- Business models and financing: once added value of the service is clear, it is still not sure how the business model can work exactly. The economic viability of the business model will only be achieved with a certain amount of scale. Therefore it is now a good time how the scaled business model looks like and what further investment is needed to reach that.

- Scaling up innovation: the social networks that determine the possible diffusion in the market needs to be analysed and a scaling strategy can be formulated based on that.

- Co-creation, active participation and social embeddedness: mainly with technical experts that know how the service needs to be designed in order to serve a larger group of people. Together with local organisations needs to be determined what parts of the product or local and culturally sensitive and hence need to change if going to another region. To what extend is the problem solved in one community also present in other communities?

- Institutes, policies and strategic alignment: institutions relevant in the area that is included in the scaling strategy need to be involved. Reversely one could choose the area strategically depending on the institutions that could positively influence the introduction of the service in the region.

- Capabilities and evaluation: The scaled area for market introduction needs to be well prepared. Strategies for marketing, training and evaluation need to be adjusted according to local standards. Other evaluation criteria apply than in initial stages, as you would like to test a scaling strategy, rather than functionalities of a product. It should be kept in mind that it will still benefit to the capabilities of the people that are targeted.
Step 2 → 3: How can we test our scalable design?
The scaling strategy should be further determined by deciding on what the position in the market is and how an entrepreneur wants to position himself in the market. The critical success factors of this step are detailed in Table 8.

<table>
<thead>
<tr>
<th>Business Model element</th>
<th>Critical Success Factor</th>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Proposition</td>
<td>Positioning</td>
<td>Substitutes</td>
</tr>
<tr>
<td>Customer Segment</td>
<td>Market entry strategy</td>
<td>Market creation</td>
</tr>
<tr>
<td></td>
<td>Heterogeneity of demand</td>
<td>Mass</td>
</tr>
<tr>
<td>Distribution Channel</td>
<td>Local service delivery</td>
<td>Build</td>
</tr>
</tbody>
</table>

Table 8 CSFs for economic viability in the pilot phase

- Collaboration building and cooperation: For a larger scale implementation, other distribution mechanisms apply. Partners are needed to reach out to the many people that are targeted. One can consider testing different possible distribution networks to eventually choose the one that suits best.

- Business models and financing: The uptake of the scaled design will determine the viability of the designed business model. By providing the service to a certain group of people, letting them use it for some time, can help in finding the right revenue mix for a scaled product.

- Scaling up innovation: predefined scaling strategies can be tested during a pilot. Several options for a scaling strategy should be determined in order to be flexible and respond to unforeseen other incidences. Scale can mean just a few extra villages, or an entire region, and one can wonder what works best as a first step.

- Co-creation, active participation and social embeddedness: Introduction of the service in different target groups can give insight in how different groups, from different regions respond to the design. It helps to create insight in what is a generic benefit of the product, and what needs to be explained on a regional or local level. Focus groups with a few of the lead users can help in creating more qualitative and in-depth insight in how to improve in local distribution and marketing.

- Institutes, policies and strategic alignment: Usually it is wise to provide local authorities with ample time to get acquainted with the innovation, and decide with them on the strategy. They could be beneficial in linking you with the right people across the region and provide with the relevant permits for selling and distributing the services.

- Capabilities and evaluation: It is interesting to see how a scaled service works differently than a locally developed service. If the benefits for the end-users will decrease due to the different scaling strategy, it should be wondered if that is the right strategy. It could also work reversely; because more people are using the service, it will create a snowball effect which eventually reaches out to relatively more people.
Step 3 → 4: How to commercialize our pilots that have proven scalable, while keeping local ownership?

In commercializing the service, the cost structure and revenue model need to be determined. The critical success factors of this step are detailed in Table 9.

<table>
<thead>
<tr>
<th>Business Model element</th>
<th>Critical Success Factor</th>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost structure</td>
<td>Cost pooling</td>
<td>Single party</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cost pooling</td>
</tr>
<tr>
<td></td>
<td>Economies of scale/scope</td>
<td>Scale</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scope</td>
</tr>
<tr>
<td>Revenue model</td>
<td>Revenue model</td>
<td>Direct</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indirect revenue</td>
</tr>
<tr>
<td></td>
<td>Revenue mix</td>
<td>Single revenue model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multiple sources of revenue</td>
</tr>
</tbody>
</table>

Table 9 CSFs for economic viability in the commercialization phase

- Collaboration building and cooperation: Relations with local distributors should be intensified and strengthened. The previous step will have gained insight in what distribution works best. Furthermore local marketing campaigns are needed, or awareness raising about the possible benefits. Training might be needed for some groups, which should be provided for by local organizations preferably.

- Business models and financing: your business model should be finalised and income should be generated from your service delivery.

- Scaling up innovation: As this is the step when the scalable model is proven, scaling to other regions can be considered as well. This might mean that service needs to be slightly adjusted. Diffusion of the service can happen through social networks.

- Co-creation, active participation and social embeddedness: in creating marketing campaigns local involvement might be needed to make it socially embedded. It is quite important that awareness raising, visualisations are related to the local context.

- Institutes, policies and strategic alignment: awareness creation and further promotion and relevant institutions can help to further spread the service.

- Capabilities and evaluation: regular measurements about the achievements of the service, and the capabilities that people are catered with can be compared between different regions. Also longer term effect should be measured to ensure the service achieves what it was designed for, as well as keep on creating a competitive advantage.

12.2 Example route 2: MNC

In example route 1, a MNC starts with 100% scaled product that should be adapted to a local context (Figure 24).
Step 1 → 2: how to adapt our generic design to local contexts?
A product is already designed for a large group of people, but not yet specifically targeted to the BoP. First it is needed to design the service or product for the local market together with local people to define the added value and to see to how the product should be customizable or modifiable for it to serve the BoP. The critical success factors of this step are detailed in Table 10

<table>
<thead>
<tr>
<th>Business Model element</th>
<th>Critical Success Factor</th>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Proposition</td>
<td>Added value</td>
<td>Cost/risk reduction</td>
</tr>
<tr>
<td></td>
<td>Open ended value proposition</td>
<td>Customizable</td>
</tr>
</tbody>
</table>

Table 10 CSFs for social viability in the design phase

- Collaboration building and cooperation: Partners that are relevant for the social viability are partners with a lot of knowledge and access to the local market. Conversations with several organisations would be necessary to see which one could best be hired or partnered with for the access to local target population.

- Business models and financing: It depends on the context what kind of business model will work best in this context. Looking at similar services in the same context, how households spend their money etc., are therefore crucial information to be able to design your business model and service offering. Furthermore a cost calculation needs to be made for the introduction on a local level and money acquired for implementation of the service.

- Scaling up innovation: The way communities organize themselves can be very influential in the scaling strategy, and this should therefore also be found out. The scaling
strategy can be co-created together with local organisations, or several local organisations.

- **Co-creation, active participation and social embeddedness:** the service needs to be redesigned based on the local context. For a first encounter with the service it would be good to have it in the local language and ensure there are no culturally sensitive parts in it anymore. Together with the local organisation this needs to be determined. Then with a group of friendly users or local champions a redesign of the service can be co-created.

- **Institutes, policies and strategic alignment:** local import taxes and policies should be investigated in. Also aligned with important institutions and people of power in the region is important for local adoption of the service.

- **Capabilities and evaluation:** It should be found out how the service can benefit the livelihoods of people. How does it contribute to what people need, and what is it that people want to expand their freedoms and capabilities? An evaluation plan needs to be put in place to ensure that the service will offer the added value it is envisioned to add.

**Step 2 → 3: how to pilot our design?**

Once there is more idea on the value proposition for this market, the next step is to define how this message can or should be brought across to the target group. By pilotting the design locally the marketing mechanisms can be defined in more detail and also direction for training needed should be given. The critical success factors of this step are detailed in Table 11.

<table>
<thead>
<tr>
<th>Business Model element</th>
<th>Critical Success Factor</th>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Segment</td>
<td>Nature of demand</td>
<td>Needs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wants</td>
</tr>
<tr>
<td>Distribution Channel</td>
<td>Local awareness creation</td>
<td>Above the line</td>
</tr>
<tr>
<td>Customer relationship</td>
<td>Capacity building</td>
<td>General skills</td>
</tr>
<tr>
<td></td>
<td>Building customer relationship</td>
<td>Aspirational</td>
</tr>
<tr>
<td></td>
<td>User interaction</td>
<td>Automated</td>
</tr>
</tbody>
</table>

**Table 11** CSFs for social viability in the pilot phase

- **Collaboration building and cooperation:** Same partners as in the first step are needed to organize a good pilot. Furthermore the evaluation and outcome of the pilot could be done by another organisation, as for objectivity purposes. Also other people might be needed to organize the pilot, as this goes from a design and strategic focus to an operational focus in type of work.

- **Business models and financing:** depending on the level of maturity of the product, a fee for using the product can be asked to test to what extend people are willing to pay for the service. If your business model does not include charging to end-users, but gets revenue streams in another way, it should be tested if the service indeed gets the right data or exposure that makes third parties willing to pay for it.
Scaling up innovation: although scaling is not yet the focus of this pilot, it would be good to find out in the pilot how the service spreads by itself, without any intervention done yet. Also in testing the value proposition it can be figured out what scale is possible in each community and how distribution has to work in this local community.

Co-creation, active participation and social embeddedness: As potential users now will have a longer time to use the product in a realistic environment, it becomes easier to co-create (part of) the product with them. Adjustments in interface and usability, and perhaps the way trainings and workshops are organized can be suggested by the users. It also gives input for manuals and training materials.

Institutes, policies and strategic alignment: Contacts in local governments mainly need to be involved to keep them informed. If possible they could be present in a kick-off to stress the relevance of the project for the local community. This can help in adoption and a successful pilot.

Capabilities and evaluation: The first pilot in a new local community reflects how the service can benefit a community, household or individual. It gives a first indication how it contributes to the social goals initially intended, although preliminary. Different evaluation mechanisms to test the successfulness of the pilot and the effectiveness of the product is needed to create an evidence base which can help for future accountability.

Step 3 \(\rightarrow\) 4: How can we test a scaling strategy for a service that works locally?
Once the product is successful enough in one local context, the next step is to look at how this can work in other similar contexts as well. The critical success factors of this step are detailed in Table 12.

<table>
<thead>
<tr>
<th>Business Model element</th>
<th>Critical Success Factor</th>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Proposition</td>
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</tr>
<tr>
<td></td>
<td>Heterogeneity of demand</td>
<td>Mass</td>
</tr>
<tr>
<td>Distribution Channel</td>
<td>Local service delivery</td>
<td>Build</td>
</tr>
</tbody>
</table>

Table 12 CSFs for economic viability in the pilot phase

Collaboration building and cooperation: Probably other partners need to be found in other regions to enable access to the market and the knowledge of local structures and networks. Also partnering with local entrepreneurs, distributors and manufacturers might be needed to produce and manufacture on a larger scale.

Business models and financing: If implementing on a larger scale, it is needed to have bigger prior investments to get the right amount of services and distribution mechanisms. Also the business model needs to be adjusted according to the different possible scenarios for scaling. Alternative routes can be thought of, in order not to bet on one horse.
Scaling up innovation: Looking for to what extent things just flow by itself and what buttons need to be pressed in order to get things going. It needs to be tested how well people would like to adopt the service and in what pace this is likely to go, this to set expectations right.

Co-creation, active participation and social embeddedness: to find out what part of the product is very localized, and what part is generic for other communities as well, groups of other users need to be involved. This can for example be done through local champions of other regions, or through other local organisations. Together with technical experts a model for customization and technical scalability should be figured out.

Institutes, policies and strategic alignment: possibly other governmental institutions need to get involved, which can also help for scaling. If the product is related to multiple sectors, it is good to have both involved by now.

Capabilities and evaluation: Other aspects of the service offering need to be evaluated in this step. Also if the service is piloted on a larger scale differences in capabilities and the impact on a larger scale can be envisioned. Possibly patterns on who benefits most and also groups of people that are not benefiting at all from the product can be identified.

12.3 Conclusion

This chapter described two examples routes to apply the framework proposed in Chapter 11. It illustrates how an entrepreneur and an MNC can practically apply the framework to shape their innovation process and make strategic decisions. This was meant illustrative and not exhaustive, as many more routes through the framework are possible. Furthermore in practice it is usually an iterative process in which you can also be in between two ends, instead of explicitly in one of the six squares. The next chapter will take a closer look at how the framework can be applied in practice for the VOICES pilots.
13. Applying the framework

In this chapter, the proposed framework is applied to the m-Health and m-Agro pilot of VOICES (resp. work package 4 and work package 5). We based our work on the deliverables from these work packages (WP), on visits to the pilots on the ground in both Mali and Senegal in October and November 2011 as well as from interviews with stakeholders throughout the project period. In the deliverable D4.4 and D5.4 of work package 4 and 5, additional analysis of the business models of the pilots is provided.

13.1 Brief description of the pilots

Two pilots are carried out in the VOICES project, an m-Health pilot in Senegal (WP4, Table 13), and an m-Agro pilot in Mali (WP5, Table 14).

<table>
<thead>
<tr>
<th>Pilot</th>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>m-Agro</td>
<td>Radio Marché</td>
<td>Radio Bulletins with Speech to Text and Text to Speech technology</td>
</tr>
<tr>
<td></td>
<td>M-Event Organizer</td>
<td>Organization of events for farmers through mobile phone, initiated by Sahel Eco</td>
</tr>
<tr>
<td></td>
<td>Citizen Journalism Application</td>
<td>Service for reporters to send digital interview recordings directly to local radio stations</td>
</tr>
</tbody>
</table>

Table 13 Overview of m-Agro Pilot (Radio Marche)

In the m-Agro pilot, three services are developed, namely the Radio Marché, the M-Event Organizer and the Citizen Journalism Application. This last application is not included in this chapter, as it was developed after this review. In the Radio Marché service producers of local non-timber forest products use SMS to provide information about the availability and price of local non-timber forest products. This is aggregated by voice technology into a spoken communiqué that is broadcasted on local radio. The goal of this service is to automate the creation of those communiques, so that local supply and demand can be connected. In the future, the service will be expanded so that local producers can use the service to directly create a communiqué (without the NGO actively acting as aggregator). The M-Event Organizer service was developed within VOICES for the convocation of farmers for a regreening event. With the help of the m-Event Organizer messages NGO Sahel Eco is able to send messages to their user-list of farmers. Users can consequently phone back later to hear the message again.

<table>
<thead>
<tr>
<th>Pilot</th>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>m-Health</td>
<td>Epidemiological Surveillance</td>
<td>Input of Health data to track (outbreak of) epidemics</td>
</tr>
<tr>
<td></td>
<td>Quiz</td>
<td>Improve knowledge of lab technicians through SMS quizzes</td>
</tr>
<tr>
<td></td>
<td>Information of the Month</td>
<td>SMS based information service for lab technicians</td>
</tr>
</tbody>
</table>

Table 14 Overview of m-Health Pilot
In the m-Health pilot, lab technicians of the National Network of National Laboratories (RNL) use an Epidemiological Surveillance application to input epidemiological data. This allows for more efficient registration of disease outbreaks. The system is also used to provide lab technicians with up-to-date information about diseases and has a quiz function as well, aimed to improve knowledge of lab technicians.

For a more detailed description of the pilots we kindly refer you to the appropriate deliverables from WP4 and WP5. In Appendix C a description of the impact assessment methodology for the pilots can be found. This chapter will focus on the evaluation of the pilots based on the framework that is developed in this work package.

13.1 Economic and Social Viability

The goal of this chapter is to have a high-level understanding of the economic and social viability of the pilots. We evaluate the pilots on the four different aspects of Economic Viability of the Business model which are introduced in Chapter 9 (what?, who?, how? and how much?) and the three aspects of social viability introduced in Chapter 10 (Perceives usefulness, Ease of use and Social influence). These are the most basic fields of the Business Model Canvas to describe a service. This is concluded with an overview of the Critical Success Factors.

13.1.1 What?

The m-Health pilot focuses on collecting data and increasing technical knowledge with the aim of increasing the efficiency of the internal process of RNL. The m-Agro pilot itself focuses on increasing the efficiency to create and handle communiqués. On the other hand, the goal of the Radio Marché service is to increase the trade facilities for farmers living in remote areas. Therefore, the value of the m-Agro pilot is twofold; firstly it focuses on increasing the efficiency of services that are already offered to the end users. Secondly, the pilot can be considered as an enabler for revenue increase for producers of agricultural products.

13.1.2 Who?

The m-Health pilot focuses on laboratory staff as users. Those users work for the RNL, so they can be seen as internal users. For the m-Agro pilot, the users are more diverse. In the initial VOICES intervention in the existing Radio Marché system the voice service affects only the NGO staff and radio broadcasters. The NGO staff can be seen as internal users, while the radio broadcasters are external users. In a later stage, the voice service will be expanded to also include producers of agricultural products, who can be seen as external end-users. Both laboratory staff, NGO staff and radio broadcasters can be seen as professional users, while the producers of agricultural products are treated more as customers rather than professionals. The producers of agricultural products are the only users of the VOICE services that truly fall in the BoP category (although the m-Health service obviously increases the efficiency of health services that are provided to BoP patients, but those patients will never use the voice services).
13.1.3 How?
When analysing the two pilots with the (Western) value chain approach, it becomes apparent that both services can be seen as services that are delivered to service providers (RNL and Sahel Eco), rather than to end users. In the m-Agro pilot, the pilot service delivers the platform to Sahel Eco. Content is manually inputted by Sahel Eco, while in a later stage, content will be put in by the end-users themselves. In the m-Health pilot, the pilot service delivers the platform. The content of epidemiological information and quiz content is provided by the local laboratories and RNL respectively. In a later stage, additional content providers might be found to supply relevant content (e.g. universities, other knowledge providers). This is indicated by the orange arrows in the value chain depicted below.

![Figure 25: The value chain](image)

For both pilots the main activity during the VOICES project was to get the services operational. In terms of activities that have to be performed in order to run the services locally the pilots somewhat differ. In the m-Agro pilot, the focus of the service provider Sahel Eco is especially on ‘forwarding’ the data they receive from agricultural producers to the radio broadcasters. Therefore, someone within Sahel Eco was appointed to operationalize the system. Furthermore, existing radio stations partners were approached to enquire about their willingness to change their communiqués broadcasting process (from reading out to direct and automatic broadcasting). In addition, training was provided to local users of the services. For the m-Health pilot, someone with technical skills was responsible for managing the services (ESMT). Furthermore training material was developed for the quiz and the information of the month. In addition, RNL employees participated in the pilot to get local laboratories involved and trainers were required to educate the people making use of the system.

13.1.4 How much?
In both cases, the revenue model is currently underdeveloped. In the m-Health pilot, costs of the service are expected to be covered by the government (responsible for RNL). In the m-Agro pilot, no revenues from end-users (producers of local products) are foreseen, so the cost of the service is to be bared by the NGO. The revenue model of both services can be seen as cost-saving, rather than value-creating, which matches with the focus on internal users rather than external customers.
13.1.5 Perceived usefulness

During the VOICES project, different feedback moments were in place where usefulness was evaluated. During the first period focus was on obtaining information about which services would potentially be useful for the target groups. From this information, use cases were developed. In the second period, the actual services were developed and piloted for the first time. A lot of feedback was obtained on the usefulness of the services. For the m-Agro pilot, the Radio Marché an important challenge that was mentioned in terms of usefulness was that several radio stations indicated that the broadcasts of Radio Marché communiqués creates a demand of agricultural products that cannot be met by some of the producers. Therefore, they asked to stop the broadcasts of communiqués. Furthermore, due to the communiqués by radio, demand and supply may virtually come together, but physically the distance is often large. This creates difficulties in meeting demand. This feedback is very useful for the ICT4D sector, as it (again) indicates the importance for a system approach (see CSF Develop an end-to-end organization, paragraph 9.3.2). During the last field trip by the VOICES partners (April 2013), final feedback sessions were organized. Though some of the aforementioned challenges still exist, a number of farmers expressed their positive experiences with regard to the service. One farmer indicated that his income from honey doubled between 2011 and 2012. Further, as a main contact person for the service in the village he indicated that Radio Marché improved confidence and collaboration between honey producers and sellers.

Regarding the epidemiological alert application, all lab participants found the application useful for collecting epidemiological data. Some users indicated to prefer the epidemiological data collection through the VOICES system above the current method. Furthermore, the m-surveillance application allowed labs that were not used to send notifications to RNL to do it, enabling RNL to collect more data. With regard to the learning applications (quiz and information of the month), all participants were very enthusiastic. They found the ability to access educational content at any time in any place very useful for their work, especially for refreshing their memory and obtaining knowledge of medical laboratory procedures. The web interface was reviewed with the RNL staff, who considered it a useful application, with some suggestions for functionality improvement (e.g. different ways of visualizing epidemiological data).

13.1.6 Ease of use

The development of voice technologies was a key research focus of the VOICES project. As a user centric approach was applied during the project, the ease of use was an important focus point. During a number of cycles in the project user requirements were collected from the target users. This information was again used to improve the system. With regard to the voice technology, there were challenges with regard to the broadcasted voice tone and quality of the local language, especially during the first cycles. For the Radio Marché service, for example, the text-to-speech was understandable, but there were still points of improvement. The feedback sessions have led to the enhancement of the system. Challenges still to be overcome are

- People do not recognise the person
- For a lot of languages there are no language packs yet
- The "France" French language pack is hard to understand for "African" French speakers

For the m-Health applications, feedback on the ease of use was generally positive. For the m-surveillance application, preference was given to the graphical version over the voice
version; this interface seems to be more appropriate and effective in this environment. The feedback sessions on usability also revealed that some aspects of the smart phone used by the participants raised some usability problems (e.g. screen size). Regarding the use of the application, that is entering and sending epidemiological data, not all of them used it regularly during the pilot period. Part of this was a consequence of the technical problems in the Emerginov platform. Another reason was of “cognitive” order (having no time or forgetting to send the notification). These findings show that the task of making notifications on a daily basis posed an initial challenge for the participants in terms of integrating it in their work activities. These initial findings also suggest that careful understanding of the consequences of the application and the task associated to it on existing work activities is a key consideration with the introduction of a mobile phone-based system.

For the learning applications, preference was given to the recorded speech over the TTS-generated speech, as they considered the “natural” voice easier to understand. No participants expressed difficulty in understanding how to operate the IVR system through dialled input.

13.1.7 Social influence

Social influence concerns the perceived degree to which others approve the use of the technology, internalization of cultural acceptance and perception of how use affects professional image. No specific social acceptance study has been done with regard to the M-Health and the M-Agro services.
## 13.1.8 Critical Success Factors

<table>
<thead>
<tr>
<th>Business Model element</th>
<th>m-Agro</th>
<th>m-Event Organizer</th>
<th>Radio Marché</th>
<th>m-Health</th>
<th>Epidemiological surveillance</th>
<th>Quiz</th>
<th>Information of the Month</th>
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<tbody>
<tr>
<td><strong>Critical Success Factor</strong></td>
<td><strong>Added value</strong></td>
<td><strong>Cost/risk reduction</strong></td>
<td><strong>Cost/risk reduction</strong></td>
<td><strong>Cost/risk reduction</strong></td>
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<td><strong>Positioning</strong></td>
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<tr>
<td><strong>Customer Segment</strong></td>
<td><strong>Nature of demand</strong></td>
<td><strong>Need</strong></td>
<td><strong>Want</strong></td>
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<td><strong>Market entry strategy</strong></td>
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<tr>
<td><strong>Heterogeneity of demand</strong></td>
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<td><strong>Mass</strong></td>
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<td><strong>Distribution Channel</strong></td>
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<td><strong>Ally</strong></td>
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<td><strong>Customer relationship</strong></td>
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<td><strong>General skills</strong></td>
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<td></td>
<td><strong>Building customer relationship</strong></td>
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<td><strong>Techno, Economic and local networking, delivery skills</strong></td>
<td><strong>Techno, Economic and local networking, delivery skills</strong></td>
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**Table 15** Pilots and CSFs
13.2 Status of the pilots

Both pilots have moved from the design phase into the pilot phase. In the m-Health case, the pilot phase has just started at the moment of writing. In the m-Agro case, the demarcation between design and pilot phase is less obvious, because the VOICES project does an intervention in the already operational Radio Marché service (which in itself can also be seen as a service that has not matured yet to the commercialization stage).

In both pilots the local ownership is the main focus because most stakeholders have indicated that they regard this as the most crucial success factor for this pilot at the moment. The current status is plotted in the figure below.

Many technical difficulties have been overcome to now be able to offer the voice based service to users. However, both pilots are focused on technical and usability testing, while the piloting of business aspects is still underdeveloped.

The m-Health pilot is somewhat different from ‘regular’ start-to-finish service design because the commercialization phase is currently out of scope. This means that the focus of the pilot will not be on the business goal of scale, and this is explicitly left to the commercialization phase. This is partly mitigated by the inclusion of the intended commercial party (Orange Business Services) as an advisor in the pilot. However, because the pilot uses a platform for application development which is specifically intended for small scale, open source applications, the service will have to be redesigned for scale after the pilot. Although some results from development in the pilot may be re-used, the service will need additional work so it can be used on a commercial scale. This is represented in steps in the figure below.
For the m-Agro pilot, plans are to continue developing on the same platform. The roadmap towards either local commercialization or towards achieving scale is not yet crystalized, also because of some delays related to the Mali political situation. Focusing more on scaling might require additional design work. The current status is visualized in the figure below.

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**Figure 27**: Steps to be taken for commercialization of m-Health pilot

**Figure 28**: Steps to be taken for commercialization of m-Agro pilot
The m-Agro en m-Health pilots are both described in steps and how the adoption methodology elements from paragraph 11.2 have had a role in that:

**Collaboration building and cooperation**

Overall, the VOICES project concerns many partners from different countries and backgrounds. Technical partners are involved (e.g. France Telecom), but also partners with a socioeconomic focus (e.g. VU) and local presence (e.g. Sahel Eco) resulting in a multi-level approach towards the m-Health and m-Agro pilots. Throughout the project new partnerships developed. During the first year focus was especially on the development of the use cases and (technical) requirements. Therefore, workshops were organized in partnership with local partners. Through local partner Sahel Eco, contacts were established with radio station Segou and agricultural producers and interviews with Sahel Eco employees were done to get insights in their work processes. As VOICES partner VU had already been working with Sahel Eco in earlier projects there was already a basis for collaboration.

For the m-Health pilot, development of the relationship with ESMT and RNL was especially important in the first phase as they had not been working together before. During the second year, focus was on the execution of the pilots from a technical perspective. Less attention was put on developing new relations. During the last year of the VOICES project, focus was on optimizing the services from a technical perspective and developing the services towards additional radio stations (m-Agro) and laboratories (m-Health). Furthermore, in the case of the m-Health pilot, collaboration with French Telecom Senegal was sought to jointly look at the commercialization of the services.

**Business models and financing**

The business models of the services developed for the VOICES project were especially centred along the local partners. For the m-Agro pilot, this meant that the services were part of the business model of Sahel Eco, namely improving the competitive and knowledge position of their target group, agricultural producers. For the m-Health pilot, this meant improving the efficiency and quality of the internal operations of health center RNL.

The continuation the VOICES services depends on the business case of these services. During the VOICES project, farmers did not have to pay for making use of the m-Agro services and radio stations were compensated by Sahel Eco. For the m-Health services, RNL could make free use of the services during the VOICES project, only the mobile phone contract required to send the epidemiological data from the local health centers to RNL was paid by RNL. The continuation of the m-Agro services after the VOICES projects depends on the subsidies available for the hardware, software and operating expenses (personnel costs and radio cost). For the continuation of the m-Health services, French Telecom is considering the possibilities of selling the services through the local French Telecom subsidiary to RNL. In this case RNL would become a customer and would need to find financing from the ministry of health to buy the services. In addition, French Telecom and FMX are looking for ways with to develop the services for other health centers in other sub-Saharan countries that are part of the RESAOLAB project.
For the continuation of the M-Agro services, new project proposals have been set-up to continue voice based research.

**Scaling-up innovation**

At this moment, the VOICES services are still in the pilot phase. When considering scaling up the VOICES services one needs to focus on the scalability of the individual services, as the service itself and the relation to its context is often too specific to generalise. For the all services one could either scale horizontally (i.e. selling the same product to a new customer base) or vertically (i.e. increasing the number of applications of the product) or a combination of both. For the m-Agro pilot scaling up concerns the Radio Marché service and the M-Organiser. In this respect, one could consider marketing the same services to other villages in the area (horizontal scaling). Another option would be to set up a Radio Marché service for other applications, such as general supply-demand announcements, broadening the customer base. For the m-Health pilot, the epidemiological surveillance and the learning applications should be analysed for scaling up. Horizontal scaling for the m-Health services could be to sell them to other health centres in other cities or even countries, something that France Telecom is currently considering together with FMX. Vertical scaling would be to adapt the service to other contexts which require surveillance, such as research institutes who could use the service for their local data collection.

In order to scale the VOICES services it would probably be required to adapt the services to meet the new context. In this respect, it would be efficient to make this adaption process as generic as possible. For example, for the epidemiological surveillance, each health centre may have different data requirements standards for surveillance. Making this a generic element in the design process would simplify the scaling process. The VU is currently considering de decentralizing the m-Agro systems so that there can be a separate installation per language area/radio station. Furthermore, they had contact with Mali Tel to offer a more sustainable alternative technology to the Emerginov platform.

Nevertheless, in order to actually achieve diffusion of services, it is important to consider how the target group makes adoption decisions. For the m-Agro pilot this means that insights should be generated on how the agricultural producers get their information and how they make their decisions. The same counts for the users of the m-Health services. Consequently, a strategy should be developed on how to influence this decision making process. A good understanding of the local social networks in the area could help in targeting the right people. Also appointing a local champion who is truly accepted as an opinion leader of the network and is committed to the product or service offering, could help in promoting the m-Health and m-Agro innovations.

**Co-creation, active participation and social embeddedness**

During the VOICES project a lot of interaction has been taken place between the local end-users and the service developers. During the first phase interviews were done with various people within the organizations to get insight in their work processes and challenges in relation to this. In a later stage, when the prototype of the services was ready, interactive sessions took place to work on the usability and acceptability of the VOICES services (see paragraph 13.1.6 on ease of use). With this information the
prototype applications could be improved. One aspect that requires further consideration in the follow-up of the project is how the use of the VOICES services can become part of the daily life of the users, or in other words, in how far the services are socially embedded. So far, the use of the services by the end-user was especially for development purposes and technical difficulties sometimes hindered optimal usage.

Institutes, policies and strategic alignment
Policies and policy makers of governmental and global institutions will have influence on the adoption of the service. Lobbying with these institution should therefore be incorporated in the development process.

For RNL this subject very much depends on from which perspective this is seen. Regarding the adoption of the applications by lab technicians, RNL, which is part of the ministry of health, can be seen as a ‘policy maker’ in the sense that it set up a new procedure for collecting epidemiological data (via mobile phones) within the VOICES project. So the challenge for RNL is that lab technicians accept this new procedure and use the application. RNL’s ‘lobbying’ actions consisted in explaining to labs the importance and the usefulness of this procedure.

For the M-Agro pilot, several people from the governmental were invited during the local workshop in Mali to make them aware of the initiatives. Furthermore, there has been contact with the Dutch embassy.

Focus on capabilities and evaluation
In the first year of the VOICES project focus was especially on the development of use cases and the actual applications. From the second year onwards, new services were piloted, starting with the Radio Marché (m-Agro pilot) and Epidemiological Surveillance (m-Health pilot) service and ending with the M-Organiser (m-Agro pilot) and learning applications should (m-Health pilot). When installing and testing the services locally, training sessions were organized to show and teach the local end-users how the systems work. For example, some participants of the Epidemiological Surveillance service had some problems with the graphical user interface at the beginning of the test because they were not familiar with touch screen devices. By training the users the participants learned how to use a touch screen.

13.3 Validation of model

The discussion in the previous paragraph gives rise to some initial observations on the fit between the approach developed in this document and the pilots in the VOICES project. These conclusions are summarized below:

The developed approach primarily focuses on best practices for:
1. Services to be supplied by a service provider directly to its BoP customers.
2. Users that are end-consumers of the service.
3. Users that fit the BoP definition in terms of income, but also in terms of e.g. education or knowledge.
4. Services being offered by commercially driven service providers.
For the m-Health and m-Agro pilot the following applies:

1. The VOICE services developed are aimed at increasing efficiency internally at a service provider that is offering services to the BoP.
2. The users of the VOICE services are professional, intercompany users.
3. The services are designed for service providers operating in a BoP context, but the users of the VOICE services themselves do not per se fit the BoP definition (NGO staff, laboratory technicians).
4. The service providers aimed at are not commercial companies, but either government or NGO organizations.

The potential mismatch that becomes apparent from the bullets above is less dramatic than it might originally appear: When designing the project, the idea was that the approach developed would be used to strengthen the pilots by providing them with the tools to design a viable business model and ensure local adoption, as well as use the pilots to validate the developed methodology.

On providing tools to the pilots: The approach is based on broad management practices that also hold value for the development of the combination of services, with the organizations and users of the m-Health and m-Agro pilot. This means that the methodology is applicable to the pilots, although not all critical success factors will be equally represented, and some new criteria might appear.

On validation of the approach: Because the pilots only reflect a subset of the services the approach is intended for, proper validation of the methodology cannot be done based on interaction with only the two pilots. Therefore, the approach will have to be applied to several other (more commercially and end-consumer oriented) services for the BoP as well as the two VOICES pilots. We will not solely focus on VOICE services, because the presence of those is very limited on the African continent, but will focus on ICT services in general.
14. Towards viable services for the BoP

14.1 The Conclusions

This deliverable aims to empower entrepreneurs in designing, piloting and commercialising ICT services for the BoP based on the perspective that the BoP needs to be addressed as a market instead of a philanthropic expenditure. People in the BoP can take the role of consumer, local agent, and producer, instead of the role of the needy. The central aspect in our approach is that for successful business development one has to face two challenges. On one side, local ownership is a critical strategic focus for commercial success. Local consumer markets as well as the local business ecosystems require a specific BoP approach. In order to achieve a sustainable adoption rate of any service at the BoP, considerable attention and nurturing is needed. On the other side scalability of the service and business model is a requirement: reaching a critical mass of customers or sold products is necessary to ensure viability of the business model behind the service, especially for ICT services. This is the first working hypothesis we derived from the SotA that needs validation in further research.

A literature review led us to believe that the strategic focus may iterate throughout the different phases of innovation. Local ownership is usually linked to the piloting and design phase and to a lesser extent the scalability phase. Scalability on the other hand is almost exclusively linked to one of the last innovation phases in which commercialisation is the ultimate goal. Based on the lessons learned in the developing body of literature on this subject, we advocate the view that both strategic focus need attention in every phase of innovation: people designing and piloting services for the BoP need to take into account that the service needs to be scaled, and in the commercialisation phase, local ownership is not only necessary to take into account but might even turn out to be a driver for scalability. This claim is the second working hypothesis that needs further validation and research.

In drawing up the proposed approach, we used the business model canvas as developed by Osterwalder et al. (2009) to map and group critical success factors (CSFs) i.e. the decisions that need to be made that ‘make or break’ the viability of a business model and ensure local ownership. This is the part where the SotA in business modelling and service adoption literature for the BoP is discussed, but also ‘repackaged’ into CSFs and the accompanying choices within such a factor. These choices are introduced to outline the spectrum of options decision makers have. This is the third working hypothesis that will be tested: to what extent are the CSFs and choices useful for decision makers? “All CSFs are equal, but some are more equal than others”. In the different stages of innovation, not all CSFs are equally important. Literature on adoption models showed that in the different stages of innovation, development choices in certain parts of the business model are key, while other development choices either serve as enablers for these decisions or only gain relevance in later stages of innovation. This led to the formulation of three working hypotheses that can best be summarized by a visualisation as presented in figure 22.
In the design phase, the value creation design (left part of the business model canvas) is critical. A requirement is that this value creation process is enabled by financial and non-financial investment of resources. To be able to do this, one must have a vision on how the organisation intends to deliver this value in the future to the customer is necessary (right part of the business model canvas).

In the pilot phase, the design of the value delivery process is critical (right part of the canvas). A requirement to do this is an implemented design of the value creation process (left part of the canvas). To be able to make these decisions in an informed manner, input on how revenues can be generated (value can be captured, bottom part of canvas) is needed.

In the commercialisation phase, one has to design the processes that will ensure that revenues can outweigh costs. This design takes the design of the value creation as well as the design of the value delivery process as a basis.

Throughout the process there are several aspects that need specific attention in order to develop the viable business model. Collaboration building and cooperation needs to be addressed to be sure to have the right people around the table constantly. Business models and financing is relevant to ensure proper funding of initial stages and a viable business model in operationalization. Scaling up of the innovation is relevant in each phase of the process, also in early stages. Co-creation, active participation and social embeddedness is needed to involve end-users and local stakeholders in the process and ensure ownership over the solution. Institutes, policies and strategic alignment is crucial for legal purposes and increasing chances of larger scale adoption at a later stage. Lastly also a focus on capabilities and evaluation is needed to ensure the service that is being developed is meeting the (social) goals it was envisioned to achieve.

The aforementioned approach will serve as the basis for developing a VOICE service toolkit to support decision making as the starting point for further research into business models for ICT services targeting the BoP. Furthermore, it also serves as the basis for supporting Work Package 4 (m-Health service in Senegal) and Work Package 5 (m-Agro service in Mali) of the VOICES project in developing sustainable ICT services. The Business Modelling and Adoption Methodology approach will consequently be contextualized for both work packages.

14.2 Future research

In this report, we discussed methodological guidelines, critical success factors for viable business models and an adoption framework and applied them to the BoP context. Although grounded in literature, this approach still lacks validation, both in terms of empirical evidence or practical usefulness and usability. Therefore, the conclusions take the shape of working hypotheses as formulated in the previous paragraph. As a
consequence, a major part of future research needs to be devoted to validating these hypotheses.

One strand of research is empirical validation. We propose that these working hypotheses can be validated with an aggregated set of case studies along different phases of innovation, across different markets/regions target groups and across different types of products/services. This will allow us to evaluate to what extent the challenges, CSFs/choices and prioritization of development choices in different phases of innovation hold ground and to what extent these are generally applicable.

A second strand of research is the usefulness and usability of our approach by the actual entrepreneurs. By applying the provided insights in the design, implementation and piloting process with the entrepreneurs, their business partners and (future) users/consumers, we aim to evaluate to what extent and how this approach supports these decision makers in making viable design decisions.

A third strand of research lies in the shortcomings of the business model framework. One conclusion here is that it is hard to pin down development decisions that are (partly) outside the domain of markets and value networks. This applies especially to organisations that act as enablers in creating, delivering and capturing value without any direct involvement in these processes. For example, decision on what strategy could be applied in dealing with local, regional and national governmental organisations is difficult to pin down using the CSFs. Also, NGOs have a hybrid character in terms of goals and the design decisions, for example, in terms of partnering only partly address the issues that come to the fore in the SotA on this subject.

A fourth strand of research lies in connecting the phases of innovation. Moving design to pilot or pilot to commercialization implies a change in governance of the value network, strategic focus etc. Research into how this changes and what types of organisation act as either coordinator, govern these networks or act as gatekeeper in moving from one phase to the other holds the promise to be of high value. The challenge is to find ways to break down this abstract challenge into useful insights and tooling.

One of the challenges for example is that Research and Technology Organisations (RTOs) and universities are organised around projects, and therefore show a tendency towards organising pilots as this type of activity fits their project-based operation based on trajectories with a clearly defined beginning and end. (Large) commercial organisations on the other hand organize their operation around an on-going process that is open-ended and evolves in close coordination with internal and external forces. Therefore, they tend to focus on design as well as commercialisation and treat piloting as a second order means to achieve goals in the other phases. From a different perspective, NGOs have a tendency to focus on the strategic focus of local ownership, while commercial organisations tend to focus on scalability. The big question is how to ensure that in moving towards a next phase, partnerships are forged that not only align strategically but also show the appropriate balance in terms of governance and operational fit.
References


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Appendix A: Case studies

1. OV9292 Travel information service
   Website: www.OV9292.nl
   VOICE service reachable via: +31 (0)900 9292

OV9292 is a semi-public organisation offering travel information about all public transport in the Netherlands. It provides departure times, real-time delay information and cost information for train, bus, tram, metro and ferry travels. It also gives additional information on other modes of transport, such as taxis, compares travel times using public transport to using car or bicycle. It offers this information either through a telephone service, via a website or via a mobile app. The telephone service uses VOICE technology for users to input their travel starting point and destination as well as preferred time of arrival or departure, to automatically generate travel advice. For this telephone service customers pay 0,70 EURO per minute, with a maximum of 14 EURO. The website and app are free, but show online adds. OV9292 also sells the aggregated travel information to third parties, such as Google.

OV9292 is the result of a partnership between all Dutch public transport companies, who provide travel data and some subsidies to support the service. The travel data is aggregated by OV9292 from all local transport companies (each with its specific data structure/layout/format), and transposed into a single database. Speech technology is used as a means to automate the customer call center, cutting cost for telephone operators.

The service first originated as a telephone-only service in the 19990’s, (hence the numerical name, where OV is a Dutch abbreviation for Public Transport), and later evolved to also include web and app access. Currently most travel information request come in via the web and app, although the VOICE service is a useful service for people who prefer to use a phone, or who are in situations where the (mobile) internet is not available or practical to use (e.g. when driving in a car to the train station).

2. Transport for London (TFL) Travel information service
   Website: www.tfl.gov.uk
   VOICE service reachable via: +44 (0)843 222 1234

Transport for London is the integrated body of Mayor of London and it manages transport services of London. It is a statutory corporation regulated under local government financial rules. It manages services for buses, underground, railway, river and coach station. Apart from these, maintaining main roads and traffic lights of the city, regulating taxis and promoting walking and cycling initiatives

TFL provides travel information through its website, app and telephone service. The telephone service uses VOICE recognition system. The price for the call is set by the telephone operators. The lowest price is 5 pence per minute. TFL charges telephone
operators a few pence and does not profit from the calls. The website and apps are free but have online adds.

TFL is different than OV9292 in the sense that TFL is the managing body of all the transport services, whereas OV9292 only provides travel information which is aggregated from different transport companies. Therefore TFL provides the travel information which it already owns to its customers.

3. **1.800.Flights – flight departure and arrival information**

Website: http://www.1800flights.com
VOICE service reachable via: +1.800.3544487 (FLIGHTS)

1.800.Flights offers a toll-free number where users can speak airline and flight number of any flight in the US and retrieve departure or arrival information. During the call, users are presented with a audio commercial. Audio commercials are either uploaded into the system by 1.800.Flights or by certain trusted advertisers themselves. A software program manages which commercial to be played to which customer, and in what frequency.

The service gathers its data from the Flightstats database, which offers users an add-supported web site where the same departure and arrival information can be found. 1.800.Flights pays a fee to Flightstats for the use of its database.

4. **Wixi Telephone connect service**

Website: www.wixi.nl (currently not available anymore)
VOICE service reachable via: 1894 (only from NL, not available anymore)

Users wanting to be connected to a person or company could call Wixi (1894 local number), and speak keywords into a VOICE recognition system (they could search for “mr. Smit in Amsterdam” but also use more fuzzy terms to search for “pizza delivery in Amsterdam”). The system than gave a list of hits based on those keywords. Users could select a hit, and the system would connect the user through to that phone number.

Users paid a fee for using such a system, the actual fee is not available anymore, but comparable phone directory services such as 1888 charge 0,80 EURO a minute. The fee for Wixi could be lower because the service uses VOICE technology and therefore needs fewer call center staff.

The ‘catch’ with these type of systems is that when a user is connected to the number of his choice, the call is routed through the call-centre, meaning that the caller keeps paying 0,80 EURO a minute even though he/she is calling to a regular fixed line phone number.

Wixi had one other source of revenues, its users could purchase specific keywords associated with their business, so they would attract more customers. Wixi aimed to have people repeatedly use the keyword calling service rather than using the 10 digit code. Wixi failed because the OPTA (Dutch Telephony Regulator) required number information services to always provide the actual phone number, so the repeated keyword calling scheme could not work. Also, the service experienced heavy competition from other (non-speech recognition) number services. (Source: interview with Octavalent, founder company of Wixi).
5. TNO colleague connect service

Website: www.tno.nl
VOICE service reachable via: +31 (0)88 866 0717

TNO is the Netherlands Applied Research Organisation (also a member of the VOICES consortium, and author of this deliverable). TNO has approximately 4,000 employees, working in 7 research areas, who often work together in ad-hoc multidisciplinary teams. It offers an internal telephone service where TNO employees can easily be connected to other employees’ phones by speaking the name of the colleague they want to be connected to into a VOICE menu on a central phone number. The system is supplied by Dutchear, a TNO VOICE technology spinoff. The system has been supplied to other large corporates as well.

The strategic focus of the system are to: a) make it easier for TNO employees to connect to their colleagues without having to search for phone numbers, b) save cost for staffing of the call centre and c) limit waiting lines at the call centre and allowing the operators to spend more time on handling external calls from clients and suppliers, so a better customer satisfaction can be achieved.

The system is operated from an internal server that is connected to the internal personnel database. In a first implementation TNO paid a licensing fee to Dutchear for the use of the system, based on the number of lines that are being used, and expanded by some consultancy/administrator services. Later, TNO decided to purchase a stand-alone version of the system, and now fulfils the administrator role by itself.

6. Flora Holland order picking system

Website: http://www.floraholland.com/en/
VOICE service reachable: no. Video available via http://youtu.be/c-tDCDiGf0Y

Flora Holland is the world’s leading flower and plant auction, processing 120,000 transactions a day. Batches of flowers come in from suppliers all over the world, are auctioned, repackaged and shipped to the needs of individual buyers, again from all over the world. Its distribution centre in Aalsmeer measures 990,000 m² and is the largest roofed trading structure in the world, and the 4th largest building in the world in terms of floor space.

Understandably, the order picking of the auctioned flowers involves a huge effort. Order pickers drive through the large hall on electric scooters with a series of flower containers in tow. Previously, order pickers worked with a paper ticket indicating what crate to be dropped at what station, then driving back to a central location to get a new paper ticket. Starting in 2011, the paper tickets are replaced by a VOICE system. Order pickers get instructions through a headset connected to a wireless device worn on a belt, and respond by saying “OK” (I have understood the assignment) or by reading a code that is writing on the floor (I am at the right location). This system allows an order picker to process more batches of flowers a day, to make less mistakes (due to the check
mechanism based on the codes on the floor), and to allow for real-time changes in instructions, making the distribution more flexible.

7. American Airlines (AA) – Flight information and reservations

Website: http://www.aa.com
VOICE service reachable via: +1-800-882-8880

American Airlines is the world third largest airline company, which is a subsidiary of the AMR Corporation. It operates in a wide national and international network. Besides the website, AA provides telephone service with speech recognition menu for its customers. With this service customers can reach flight information, information about their reservations, baggage and they can also get some travel tips. The service is provided through a toll free number.

The speech recognition system in part replaces personal assisted telephone service. Customers are prompted to answer questions (are you calling for reservations, baggage, Advantage program or other questions?). The service uses VOICE input to replace interaction with a human call centre agent or a touch-tone system. In this way, the company can give a faster, more intuitive service to its customers and can also decrease the costs by reducing the number of call centre agents.

8. Apple Siri – Personal assistant

Website: http://www.apple.com

Apple introduced Siri to the Iphone 4s which entered the market in 2011. Siri is a VOICE User Interface which allows the phone user to interact with a virtual assistant. The user can speak tasks into the phone, which are then executed by the virtual assistant. These assistant can be asked to call a certain number, write a text (which can be dictated ) or read out incoming e-mails or text messages. The virtual assistant can also retrieve information, such as local weather or other internet searches, appointments from the users calendar etc.

The use of Siri is free of charge, and comes with all Iphone 4S’s. The assistant requires an internet connection to the Apple cloud, which can lead to extra charges by operators. It is argued that by offering Siri, Apple aims at several goals. One is to have its users bypass the use of the search engine of its main competitor Google. Also, by channelling a large fraction of user interaction through Siri, Apple can build personal profiles, and offer targeted services that fit the specific needs of a single customer. When asking Siri for “a good pizza restaurant nearby” Siri can direct a customer to a restaurant that has received high reviews from other users in the users network. A third route is to have advertisers pay to have their results given more priority in Siri’s search.

These routes are all based on highly speculative blog posts and articles from different market and technology reviewers, Apple itself has not given any comments on its future plans or business models regarding Siri.
Appendix B: Checklist for Services

The basic idea is, that all choices in the business model can be translated in costs and revenues (sales); in short: the business case. We therefore added to each choice in the checklist two fields in which you can make an estimation of the costs and revenues of the decision you made. If at the end of the checklist you found out that there are too much costs involved without the necessary benefits you can return to earlier steps and try to make different choices to avoid costs. This will prevent that you make too costly choices in your business model.

If you have trouble indicating costs and benefits in this stadium, just give an indication stating “low”, “middle”, “high” for both costs and benefits (sales). This will give you a rough indication at the end about what the choices are in your business case. Later, if you have more insights, you can indicate them in exact numbers.

Figure 29 is an example of how the choices are made and translated in costs and revenues. As you can see the example below is quite balanced, which is a good. If, for example, the result is predominantly red, you should reconsider your choices.

<table>
<thead>
<tr>
<th>Critical Success Factor</th>
<th>Trade-off</th>
<th>Costs (low/medium/high)</th>
<th>Sales (low/medium/high)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Nature of demand</td>
<td>Needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Heterogeneity of demand</td>
<td>Mass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Market entry strategy</td>
<td>Market creation</td>
<td></td>
<td>Market entry</td>
</tr>
<tr>
<td>4 Added value</td>
<td>Cost/risk reduction</td>
<td></td>
<td>Revenue/benefit increase</td>
</tr>
<tr>
<td>5 Positioning</td>
<td>Substitutes</td>
<td></td>
<td>Complementary</td>
</tr>
<tr>
<td>6 Open ended value proposition</td>
<td>Customizable</td>
<td></td>
<td>Modifiable</td>
</tr>
<tr>
<td>7 Local service delivery</td>
<td>Build</td>
<td></td>
<td>Ally</td>
</tr>
<tr>
<td>8 Local awareness creation</td>
<td>Above the line</td>
<td></td>
<td>Below the line</td>
</tr>
<tr>
<td>9 Service management</td>
<td>Direct access</td>
<td></td>
<td>Local agent</td>
</tr>
<tr>
<td>10 Building customer relationship</td>
<td>Aspirational</td>
<td></td>
<td>Authentic</td>
</tr>
<tr>
<td>11 Capacity building</td>
<td>General skills</td>
<td></td>
<td>Specific skills</td>
</tr>
<tr>
<td>12 User interaction</td>
<td>Automated</td>
<td></td>
<td>Personalized</td>
</tr>
<tr>
<td>13 Customer lock in</td>
<td>Hard lock in</td>
<td></td>
<td>Soft lock</td>
</tr>
<tr>
<td>14 Manufacturing</td>
<td>Lean manufacturing</td>
<td></td>
<td>Demand driven manufacturing</td>
</tr>
<tr>
<td>15 Organisational learning</td>
<td>Building a generic platform</td>
<td></td>
<td>Achieving multi-local ownership</td>
</tr>
<tr>
<td>16 Governance</td>
<td>Control</td>
<td></td>
<td>Trust</td>
</tr>
<tr>
<td>17 Distribution of functionality</td>
<td>Thin</td>
<td></td>
<td>Thick</td>
</tr>
<tr>
<td>18 Interoperability</td>
<td>Proprietary</td>
<td></td>
<td>Open</td>
</tr>
<tr>
<td>19 Human resources: skill mix</td>
<td>Techno/economic oriented skills</td>
<td></td>
<td>Local networking/delivery skills</td>
</tr>
<tr>
<td>20 Develop an end-to-end organisation</td>
<td>Insourcing</td>
<td></td>
<td>Outsourcing</td>
</tr>
<tr>
<td>21 Content / service portfolio development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 Scalability</td>
<td>Scale up</td>
<td></td>
<td>Scale out</td>
</tr>
<tr>
<td>23 Revenue model</td>
<td>Direct</td>
<td></td>
<td>Indirect revenue</td>
</tr>
<tr>
<td>24 Revenue mix</td>
<td>Single revenue model</td>
<td></td>
<td>Multiple sources of revenue</td>
</tr>
<tr>
<td>25 Cost pooling</td>
<td>Single party</td>
<td></td>
<td>Cost pooling</td>
</tr>
<tr>
<td>26 Economies of scale/scope</td>
<td>Scale</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 29: Example of translating the trade-offs in costs and revenues
What for who?
The best starting point is always the market. Usually, one already has a rough idea about the (type of) product or service one wants to deliver. When you have an idea of your customer and market segment, the next step is to return to your product or service and redefine which value you are going to deliver. When you have determined the market and defined the product and value you deliver, the next step is to decide through which channel you will distribute goods, services, customer services, advertise and communicate with your customers. After defining your customer segments, the value you deliver and the channels you will use to reach your customers, you can define how to communicate about your value with your customers. This is done when designing Customer Relationships.

- Does the product or service addresses a need or a want?
- Do you address a mass market or a niche?
- Do you create a new market or join a market and adapt a product or service?
- Does the product or service reduce risk for the BoP or does it increase personal benefits or revenues from daily living?
- Does the product or service build on expectations, skills and installed base of technology in the local market or is it a new substitute for an old service or product?
- Is the product customizable or modifiable?
- Are you going to build your own distribution network, or ally with other companies?
- Will you do your advertising above the line (radio, tv) or below the line (word of mouth)?
- Will you do your customer service direct or via a local agent?
- Do you want to position your product as a premium (Aspirational market) or do you want to present the product ‘as it is’?
- Do you need to build up general skills or specific skills for customer relationship management?
- Do you choose for automated after sales or for personalized after sales?
- Do you want to retain customers by hard lock-in or by soft lock-in?

How?
After you defined your market, service or product and the channels you use to reach your customers, you know which key activities you will be needing. When you defined your Key activities, you can proceed with Key Resources needed to create and offer a proposition, reach markets, maintain relationships with Customer Segments, and earn revenues. After you’ve completed defining your key activities and resources, you can choose your partners and suppliers.

- Do you choose for lean manufacturing or demand driven manufacturing?
- Do you want to create value by operational excellence or do you aim for customer intimacy?
- Do you govern your operation with control or with trust?
- Do you aim for an open infrastructure or opt for more control with a proprietary infrastructure?
Do you need more Techno/economic oriented skills or Local networking/delivery skills?
How will you develop your end-to-end organisation?

How much?
After having all elements in place that provide certain revenues and costs, it is time to look at how you will model your revenues. Having decided how to collect your revenues, you can now model your costs.

What is your revenue model?
Do you rely on one single revenue model or do you opt for multiple revenue sources?
How do you pool your costs?
How do you reach cost synergies?
Appendix C: Impact Assessment

This appendix described the Impact Assessment methods as used in evaluating the pilots. The actual evaluations are part of WP4 and WP5 deliverables.

1. Notes on Evaluation Research and Methodology

According to the branch of social science known as evaluation research [Scriven, 2007; Davidson, 2004], evaluation is the assessment of the merit (or quality), worth (or value) and/or significance (or importance) of something. Evaluation methodology is to be placed among a wide range of social science research methodologies [Bryman, 2008; Trochim, 2008]. What makes it special is that social science research methods historically have a heavy emphasis (bias) on empirical data-based studies where the researcher is typically positioned as an outside (independent, neutral, even supposedly value-free) observer. In contrast, evaluation as a social-science research field inherently and necessarily makes value-based statements about its object of research. So, evaluation research does not and cannot limit itself to "the facts" (in contrast to empirical social science), but endeavours to interpret these facts into a framework of values - which gives rise to the follow-on research question what these values precisely are and why/how they are or can be explicitly justified.

Historically, evaluation research has its roots (already in the 1950's and 1960's) in big (US) government programs especially in public health and education, where the subsequent natural question emerged whether these programs (often seen as "treatments" or "interventions", in very much the same way as a doctor or therapist treats a patient/disease with a medicine) were indeed effective and worth the money spent. Subsequently, the conceptualization and framing concerning how to do evaluations diffused to other sectors, including international development and cooperation (see e.g. [CIDA, 2001; UNESCO, 2009] but also EuropeAid).

There is a vast literature on evaluation methodology and frameworks, but it is well possible to summarize most of it in what may be called the consolidated conventional general framework for evaluation studies, as it has emerged and been published in nowadays standardized evaluation checklists (KEC, see especially [Scriven, 2007]), associated text books (e.g. [Davidson, 2004]), and in scientific journals such as the American Journal of Evaluation.

In brief, the conventional evaluation framework and its checklists can be conveniently summarized in terms of a two-dimensional space. First, it distinguishes a set of important different components of evaluation. Second, it recognizes a set of important typical generic evaluation dimensions or criteria.

First, standard components of evaluation (typically called sub-evaluations) are:

- **Process evaluation:** this sub-evaluation is addressing the evaluation question what happened during the content construction, design, implementation and roll-out of the "intervention" or "program" and what lessons have been learnt from that. In other words, it addresses the direct outputs of the action.
- **Outcome evaluation:** in contrast, this sub-evaluation is not concerned with the direct outputs or deliverables of an action, but focuses instead on the (observable) effects in terms of outcomes or impacts on stakeholders. Note that these effects may be intended
as a goal but also may be unintended, and the latter is also important to include in evaluative studies. In social science research methodology, this is commonly referred to as the issue of "internal validity" of research/knowledge claims or hypotheses.

- **Cost and comparison evaluation**: this sub-evaluation addresses the general question whether the observed effects have been achieved in a cost-effective (resource-economic) way and whether the same effects might have been achieved by alternative means (this also covers the so-called opportunity costs of the action).

- **Beyond-the-current-situation evaluation**: this sub-evaluation addresses the issues of generalizability, transferability, sustainability, exportability, etc. In social science research methodology, this is commonly referred to as the issue of "external validity" of research/knowledge claims or hypotheses.

Second, there is a long checklist of possible evaluative dimensions or criteria that are to be considered. The traditional evaluation research and methodology literature gives the following to consider as important candidates (checklist items):

- Has there been due recognition, analysis and inclusion of the (various) stakeholders needs - especially when they are currently unmet ("stakeholder needs assessment").

- What are the relevant evaluation criteria that follow from the specific professional domain. Namely, in many cases it is pretty clear what is "good" or "not-so-good" once a specific professional domain or focus has been singled out. [Here for example it relates to ICT technology-based innovation.]

- Soundness and consistency of "intervention/program logic": actions taken have a (sometimes implicit) underlying rationale, usually of the reasoning pattern or type: if we undertake this-and-this action, it will address (make a change in) these-and-these needs or shortcomings, and that will help alleviate that-and-that performance problem or issue. This action rationale may itself be in need of evaluation.

- **Fit to (local) context**: the evaluation literature furthermore gives a (pretty unassorted) longlist of relevant criteria-to-be-considered here including:
  
  o legal requirements;
  
  o ethical requirements (e.g. privacy);
  
  o attractiveness to target groups ("marketability")
  
  o organizational, policy, and/or personal development goals;
  
  o historical, traditional and/or cultural norms and values.

  In other words, actions must be properly embedded in the specific surrounding context or environment to be successful, and the various and diverse characteristics of this provide key evaluation elements of what counts as success.

The above are standardized checklist items that represent possible criteria of evaluation. The evaluation research literature points out that in each and every case, it is necessary to select the evaluative items and criteria and limit them to those that are actually most relevant and to specialize them to the case at hand.

As noted above, this summarizes the conventional general framework for evaluation studies as it has emerged and has been consolidated over the years in the evaluation research field. The consolidation of the discussed evaluation framework dates back pretty much to the 1990's. This is not to say that there is universal consensus: it has come under heavy critical fire from several angles. A number of more recent developments have taken place that attempt to correct a number of observed shortcomings and biases in the conventional approach to evaluation. These newer developments in evaluation research (for hot and sometime even heated debates, see for example [Patton, 1997; Fetterman,
1997; Trochim, 1998; Claremont, 2009]) bear moreover a direct relevance to the evaluation of the VOICES field pilots.

**Participatory evaluation (and empowerment evaluation)** [Baker & Bruner, 2010; CIDA, 2001; UNESCO, 2009; U Kansas, 2013; CSIR, 2013]. Traditionally, evaluation is considered to be an independent and outside activity (especially Scriven is an outspoken proponent of this view, see [Claremont, 2009]). More recently, much more emphasis has been placed on the desirability or even necessity that the relevant stakeholders themselves are to be in the driving seat as to the evaluation of the outcomes and perceived benefits of a program, intervention or action. This approach is labelled participatory or collaborative evaluation, and an ultimate consequence of this is the view that evaluation is to contribute to empowerment (especially Fetterman is an outspoken proponent of the latter, see [Claremont, 2009]). As a side remark it may be pointed out that this approach has an unnoted but very strong resemblance to the (much older) social science research methodology known as *action research*.

**Developmental evaluation** [Gamble, 2008]. Traditionally, evaluation is very much seen as a one-shot activity. In the evaluation methodology literature jargon, formative evaluation is basically the same as mid-term review, and summative evaluation is end-of-project review, see [Scriven, 2007; Davidson; 2004]. Another more recent development is that evaluation is to be not just outside criticism, but should be focused on conclusions that can be utilized by stakeholders in a (cyclical) learning or developmental way (especially Patton is an outspoken proponent of this approach, see [Claremont, 2009]).

**Technological innovation** [Rogers, 2003; Tuomi, 2002]. Evaluation research is a social-science field that is quite remote from technological innovation. Thus, experiences and theory concerning the phases and social factors that govern adoption and diffusion of innovations are not taken into account in the conventional frameworks for evaluation. Neither are recent approaches that aim to experiment with the introduction of innovations in a participatory and developmental (co-creation) way such as *Living Labs* (cf. [CSIR, 2013]) that may be viewed as a form of action research specialized to technological innovation.

Evidently, the evaluation framework used for the VOICES field pilots is not properly framed as conventional evaluation, as it is strongly influenced by the stakeholder-based participatory and developmental approach and by the Living-Labs field-experimental approach to (socio-)technological innovation.