Village Operator Feasibility Framework

A recommended method for assessing the viability of Village Operator sites

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Ungana Afrika

Executive Summary

The Meraka Institute, together with its partners, have undertaken an ambitious task to provide broadband connectivity to under-served areas of South Africa through a community centric model, as opposed to a typical national telco-driven model. The goal is to build an alternative ecosystem where the value chain emphasises local economic development and growth by encouraging the development of the ICT sector in non urban areas. In addition to achieving affordable broadband connectivity, the planned model will serve to enhance local industry and government services, and contribute directly to the local economy through job creation. The proposed model empowers local ICT service providers, known as Village Operators, to implement broadband infrastructure using wireless mesh network technology to connect local public and private sector institutions and individuals, with an emphasis on schools as beneficiaries. The South African Department of Science and Technology in partnership with the European Commission (EC) is providing the initial funding to research, develop and demonstrate the proposed models.

Ungana-Afrika has been asked to develop a Feasibility Framework, against which potential Village Operator implementation sites can be evaluated to test their viability. This framework proposes that feasibility is assessed according to six dimensions – Operational, Market, Technical, Social, Management and Financial Feasibility. A theoretical overview is provided for each dimension, along with some practical guidelines for investigation.

To provide a basis for decision-making and comparison, a Feasibility Scorecard is included. The scorecard compares the Village Operator against a standard set of statements that are considered universal characteristics of viable organisations, and allows the assessor to include their own evaluations through SWOT analyses. Each dimension is scored independently, and an overall feasibility score is generated for the enterprise as a whole.

Finally, a business model outline for Village Operators is provided as a basis for understanding the functioning of a Village Operator enterprise. Though it is not part of the framework, it provides context for understanding the application of the framework.

Table of Contents

1. Introduction

The Meraka Institute of the CSIR, together with its partners, have undertaken an ambitious task to provide broadband connectivity to under-served areas of South Africa through a community centric model, as opposed to a typical national telecommunication provider driven model. The goal is to design and build an alternative ecosystem where the value chain emphasises local economic development and growth by encouraging the development of the ICT sector in non urban areas. In addition to achieving affordable broadband connectivity, the planned model will serve to enhance local industry and government services, and contribute directly to the local economy through job creation. The proposed model empowers local ICT service providers to implement broadband infrastructure using wireless mesh network technology to connect local public and private sector institutions and individuals, with an emphasis on schools as beneficiaries. The South African Department of Science and Technology in partnership with the European Commission (EC) is providing the initial funding to research, develop and demonstrate the proposed models.

The reality is that many of the under-served areas do not have existing ICT service providers, or the skills levels of local businesses are quite limited. Therefore it is believed, that a coordinated effort would accelerate the evolution and adoption of the community centric model, and eventually become a successful network of locally run ICT SMMEs, called Village Operators. Institutions like Meraka are able to facilitate research and development work, and eventually provide the Village Operators access to low cost technologies, well defined processes, and efficient capacity building and support models.

Ungana-Afrika has been asked to develop a feasibility framework, against which potential Village Operator (VO) implementation sites can be evaluated to test their viability. For each of the six dimensions of feasibility (introduced below), a theoretical overview is provided, before some practical guidelines for assessing the feasibility of a site prior to implementation. A feasibility scorecard is provided as Appendix A. Most aspects of feasibility are not deterministic in the sense that their presence or absence guarantees failure. Instead, they contribute towards the risk profile for a site. The feasibility scorecard provides a mechanism for evaluating the risk by scoring the viability of each dimension of feasibility.

While the suggested methods for verification are grouped according to the dimension of feasibility for the sake of clarity, there is no reason for each dimension to be assessed separately. Practicality may require that the methods are grouped together. For example, a survey questionnaire can include questions that probe elements of market, technical as well as social feasibility. Furthermore, some aspects would be appropriate for the Village Operator to investigate, others would be appropriate for a Master Village Operator and yet others should be done by qualified researchers. These decisions may depend on the realities of the site being evaluated, and are thus left to the researchers in consultation with the BB4ALL project committee.

It should be noted that at the time of developing this framework, no Village Operator sites were in operation, the business model had not been agreed, and the services that could be provided by the Village Operator Network were still being defined. As a result it makes many assumptions which may not be valid. The methods should thus be adjusted and augmented to fit the realities of implementation.

2. Feasibility Framework

The success of a Village Operator site relies on the successful integration of many different layers, including the channel support (from the Village Operator Network), local partnerships in the targeted community, a successful business platform (including the necessary technologies, business model, tools and processes), the skills and aptitudes of the Village Operators themselves, and the environment in which the Village Operator is doing business (such as the market size, the wireless dynamics of the area and whether they are accepted by the community).

While not everything can be known beforehand, many of the fundamental requirements for success can be evaluated before implementation, thereby giving an indication of the feasibility of a Village Operator enterprise in a given area. If the necessary requirements are in place, there is great confidence that the enterprise will succeed, and the evaluation process provides useful insight into how the Village Operator should respond to the local conditions. If not, then much time and expense can be saved by not proceeding further.

Ungana-Afrika has identified six dimensions along which the feasibility of a Village
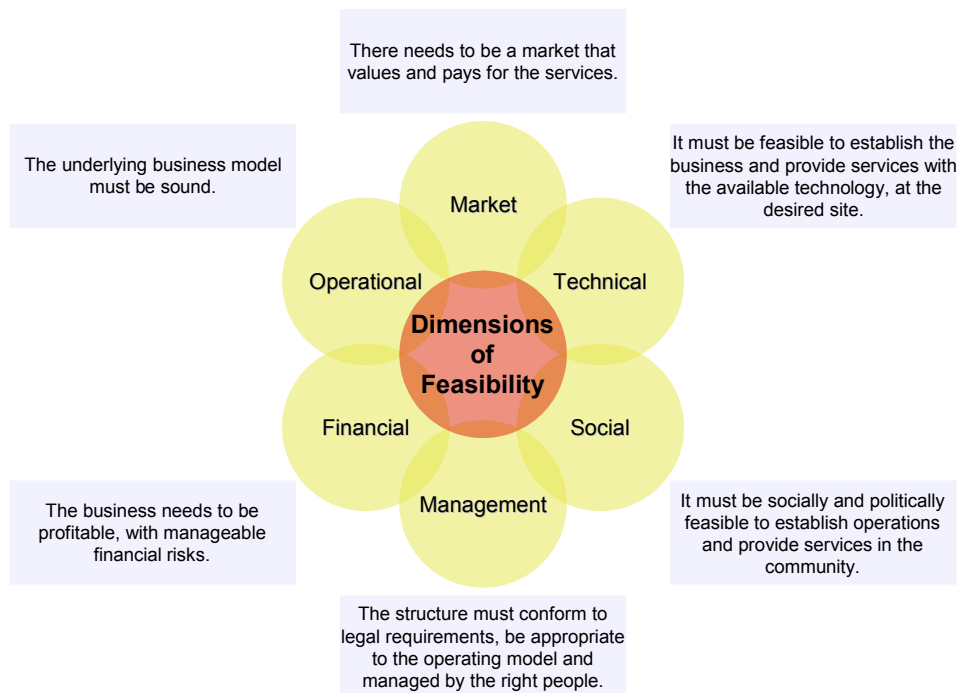
Figure 1: The six dimensions of feasibility

Operator should be assessed (Figure 1). The enterprise must be feasible along each of these dimensions for there to be confidence that it will succeed. The following sections examine each dimension in greater detail.

2.1. Operational Feasibility

2.1.1. Overview
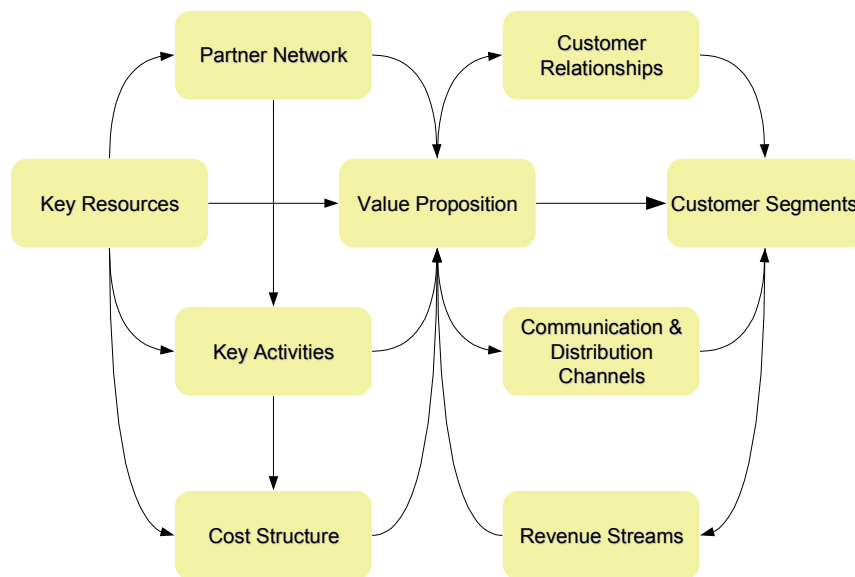
Figure 2: Business model elements

The operational feasibility refers to the viability of the underlying mechanisms of the business. These are encapsulated in the business model, which needs to clearly identify what services the enterprise will be providing (the value proposition), who the clients are (customer segments), what relationships there will be with the customers, and how the enterprise will generate revenue. Associated with this, the business model should identify what key activities need to be performed in the running of the business, what partnerships will be needed, and what costs will be incurred in the establishment and running of the business. The business model defines the operational aspects that must be in place for the Village Operator to provide services and generate revenue. The different elements of the business model are given below.

Customer Segments

The business model needs to identify the different categories of clients that the enterprise will target. These should be grouped because they are targeted in different ways (require a different marketing strategy), demand a different relationship, require different services or have differing profitability. Each customer segment will view the services of the Village Operator through the lens of the characteristics of their organisation, and their own perceived needs. It is important for the Village Operator to have a thorough understanding of their customers so that their communication and service delivery can be appropriately structured.

Value Proposition

The different bundles of products and services must be identified and defined for each of the customer segments. Some customers will require essentially the same service, but require it to be packaged in a slightly different way. For example, one customer segment may require a prepaid ad-hoc broadband service, while another requires reliable connectivity, for which they are willing to sign a contract. Similarly, different customer segments may pay different rates for essentially the same service. Schools may be given free connectivity, while local businesses must pay for it. The way services are configured and bundled has a bearing on the activities, costs and revenue streams, and thus the profitability of the Village Operator. They should therefore be defined as clearly as possible.

Communication and Distribution Channels

The different customer segments need to hear about the services that the Village Operator will be providing, and they need to be communicated in a way that understands and addresses specific needs that are felt by each customer. Similarly, different services may require different channels of delivery. These requirements should be understood.

Customer Relationships

It is much harder to get a new customer than it is to maintain an existing one. The Village Operator needs to have a plan for ensuring that existing customers are satisfied with the service they receive so that they continue to use the services of the VO.

Revenue Streams

The business model should specify where revenues will be coming from, and what nature they will take, for each value proposition and customer segment. The revenue streams should consider the payment terms and sources, whether the service is subsidised and anything else that would affect the amount of revenue, or the frequency of payments.

Key Resources

The Village Operator will require a number of key resources in order to deliver services. These could include physical resources, such as the technologies that enable the mesh platform, as well as intangible resources, like knowledge and processes.

Key Activities

The business model should identify what the key activities are that need to be performed for the Village Operator to function.

Partner Network

Many of the key activities will be performed by the Village Operators directly, but others will need to be performed by outside parties. This would include activities which require specialised skills, or where outsourcing is logistically preferable.

Cost Structure

Based on all the other elements of the business model, the costs of the Village Operator can be identified. This should include the costs required to establish the enterprise, as well as the operating costs.

2.1.2. Verification

Operational feasibility can be verified by producing a viable business model for the enterprise. There may be components of the business model which are common to all Village Operators, but each business case will be slightly different, and the model should thus be modified to respond to the specific circumstances of the cluster. There needs to be a high confidence in the validity of the business model, and it is particularly important to understand the customers, and to package the services in a way that makes them accessible and relevant. Some methods that can be used to verify operational feasibility are given below.

Recommended Methods

- *Business Model*. A sample business model outline for Village Operators has been attached as Appendix B. The method proposed to produce the business model is based on the work of Dr. Alexander Osterwalder[1].

- *Focus Groups*. A focus group discussion can be used to collect data on the needs, preferences and attitudes of a group of four to eight like-minded individuals. It is important that there is a commonality of experience in the group, so typically it would not be advisable to mix individuals from different customer segments. Although the facilitator guides the discussion, much of the useful information comes from the interaction between the participants, through their agreement, dissent and body language. The information that is gathered is qualitative rather than quantitative, but can provide critical information on

  - the needs of the segment
  - their current experience of technology
  - the purchasing process (for example, whether purchasing decisions must be a selection between different quotes)
  - the decision-making authority (whether purchasing decisions can be made by an individual, or must be authorised by a committee or outside body)
  - service configurations that would either resonate or clash with the strategic objectives or culture of the segment
  - whether the assumptions about the segment used in product development are valid

  While focus-groups provide the greatest depth of information, particularly information that can't be anticipated beforehand, they are often impractical to implement. To yield relevant data, there should be at least three focus groups with each customer segment. The opinions of one group may be dominated by an individual, so it is important to be able to verify the conclusions independently. Also, the first focus group may not be effective because of invalid assumptions. Subsequent focus groups should correct for this and yield more useful results.

- *Semi-Structured Interviews*. Where focus groups are not viable, semi-structured interviews can be used to gather the required information. They take the form of a loosely defined set of questions related to the researcher's area of interest. The interviewer is free to add additional questions to further probe specific areas based on the respondent's responses. Questions should be open-ended rather than leading, but there is still the danger that the respondent gives answers that he or she thinks the interviewer wants to hear, rather than their honest opinion.

Note that the business model is a theoretical definition of the business functions. The other dimensions of feasibility must verify that the business model will be effective at the proposed site.

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1   http://alexosterwalder.com/

2.2. Market Feasibility

2.2.1. Overview

The operational feasibility defines what the services of the enterprise will be, and to whom those services will be provided. Market feasibility considers how the market in the cluster will respond to the services being offered, both immediately and in the future. This will depend on the state of the industry (locally and generally), as well as the state of the market. Both will need to be evaluated.

Industry Assessment

The industry assessment should define the industry in which the enterprise will be operating, and assess the size, growth rate and prospects of the industry generally. At a macro level, the industrial assessment should include

- A scan of national and international developments that can be expected to affect the industry in the medium term.
- How quickly innovation is happening in the sector, and what effect this could have on the enterprise.

Locally, the assessment should consider

- How supply chains are likely to change in time.
- What competition there is for the services the Village Operator will be providing, how they are priced, and what it would cost a customer to switch providers. The competition may be locally based or centrally located, but the services must be available in the target site.
- The strengths and weaknesses of the competition, and their market share.
- What competitive advantage (if any) exists for the Village Operator, relative to the needs of the customer segments.
- How the local customers view the services of the competition.
- How the competition is likely to respond to the services of the Village Operator.

Market Assessment

It is vital that there is a large enough market that values the services of the Village Operator and is able to provide sufficient revenue to ensure the sustainability of the Village Operator. This would depend on the range of services provided by the Village Operator, how the services are priced, the intrinsic demand that the customer segments have for those services, and how effectively they are marketed.

Pricing can be approached in a variety of ways.

- Cost-based pricing simply takes the view that the revenue from the service needs to cover the costs of providing the service. Costs can be calculated, and then the price is set at a certain percentage above that. Although this approach is relatively straightforward, there are some challenges, not least because some of the costs are variable based on the volumes sold (for example, the cost of rent must be covered by the customers, and the relative contribution of each will be a lot more if there are ten customers than if there are fifty). Also, demand will depend on the pricing, so cost-based pricing may be inefficient if the objective is either to maximise profits, or to maximise the number of customers.

- Competition-based pricing pegs pricing to the prices already established by the competition. Pricing may be set a little cheaper to gain a greater market share, or a little more expensive if the service is positioned to be more exclusive and of greater quality.

- Market-based pricing sets pricing based on surveys of the customer segments, and an analysis of their willingness and ability to pay for the service at different prices.

However the pricing is set, it is then necessary to know how many potential customers there are in the target area for each value proposition. Furthermore, the Village Operator should know with a reasonable level of confidence what percentage of the possible customers are likely to make use of the services.

Finally, the market assessment should consider the marketing strategy, to ensure that it is appropriate for persuading potential customers of the value of the Village Operator services, and that it will reach as many as possible.

2.2.2. Verification

As mentioned previously, there are many potential methods that can be employed to assess the market. Some suggested methods are discussed below, but others may be more appropriate depending on the circumstances.

- *Desktop Research*. The state and prospects of the industry can best be assessed by a review of journals and other industry-focused literature, and by speaking to industry experts. Desktop research can also be used to evaluate the services and pricing of centrally located competition.

- *Community Scan*. A community scan can be used to identify potential local competition. This can include direct observation, an assessment of local business advertising, as well as discussions with the local chamber of business, local economic development unit or information service if such organisations exist. The community scan can also be used to identify potential customers, and to estimate their numbers.

- *Semi-Structured Interviews*. Semi-structured interviews can be used to estimate the current market share and perception of the competition, and can also be used as a vehicle for price testing.

- *Price Testing*. The price that customers would be willing to pay for the Village Operator services can be tested in a variety of ways. Some of the more applicable options are discussed here.

  - *Monadic Price Testing*. The simplest way to test the response to prices is simply to decide on a price and ask customers whether they would pay for the service at that price, using a scaled response from definitely would not purchase to definitely would purchase (known as monadic price testing). The responses can then be weighted to estimate the uptake. If a potential customer said they would definitely make use of the service, the likelihood can be set to 65% for example, while very likely might be weighted at 40%. From this, it's possible to estimate uptake relative to the size of the market, and this can feed into revenue projections.

    Monadic testing can also be tested at different price points (to generate a demand curve), but the sample size would need to be substantial for this to generate useful information. It is useful where the product configuration is

defined, there is a fairly fixed idea of what the price of the service should be, and the researchers would only like to estimate what the uptake is likely to be at that price. This method also depends on a reasonable price awareness among the potential customers. It can be accomplished through a customer survey, but would need to have a good explanation of the product concept.

- *Van Westendorp's Price Sensitivity Meter*. In 1973 Dutch economist Peter van Westendorp developed a new method for testing prices, which can create a rich picture of the market with relatively few questions. It is based on the assumption that for each product or service, there is a viable range of prices – at the top end, customers consider the price too expensive for the value they are receiving. At the lower end, customers feel that the price is so low that they can't be getting much value and would look elsewhere. Essentially, it asks each respondent four questions, namely:

  At what price is this service too expensive for you to consider purchasing?
  At what price is it too cheap and you would think it's quality can't be good?
  At what price would you think it's starting to get expensive and you would have to think carefully about purchasing it?
  At what price is it a bargain – a great buy for that money?

  The data from these questions can be used to create graphs of the response frequency from the different questions. These graphs can then be interpreted to estimate a range of prices that the market would find acceptable.

  The method can also be extended by adding behaviour questions to estimate the likelihood of purchase (similar to monadic testing) at the "too expensive" and "bargain" price points. These can then be used to generate a demand curve and estimate revenue streams.

  The Price Sensitivity Meter has been criticized for its limited application in situations where there is a poor price awareness in the market. In these situations it would tend to underestimate the price that people would be willing to pay. Nevertheless, it is still a useful way to gauge price awareness even in these situations. If the service must be priced very differently from what the market would expect, then the marketing strategy would need to incorporate market education.

  The questions used in the Price Sensitivity Meter may need some explanation so that respondents understand what is being asked. Because of this, it is best used in a semi-structured interview rather than in a survey.

- *Customer Survey*. A survey form with predefined questions can be used to gather demographic information about the customer segments, such as size of organisation, purchasing processes, decision-making body, market share and perceptions of the competition, current use of technology and whether they have the necessary skills and infrastructure to use the services, perceptions of the products and whether they would be likely to use the Village Operator services.

- *GIS Analysis*. If enough data can be obtained for an area in electronic format, it may be possible to estimate the size of the market for a new area without having to do expensive and time-consuming surveys. The data would need to be able to quantify the size of each customer segment in an area of interest. This can use

either direct data (clinic locations obtained from Dept. of Health) or surrogate information where necessary (for example, television ownership is probably strongly correlated with income levels).

2.3. Technical Feasibility

2.3.1. Overview

The technical feasibility is closely linked with the operational feasibility, since it is largely a verification that the technical requirements of the business plan can be met in the target site.

Facilities

The necessary facilities should be defined in the "Key Resources" section of the business plan. In the case of a Village Operator, an office will probably be needed, but other facilities may have been identified as well. These need to be available and affordable within the community, and they should meet the specifications based on how they will be used. For example, if the enterprise will rely on passing traffic, a central office will be important, while a service enterprise that does most of its business at the client's office could probably use an office that's a bit out of the way.

Labour Pool

If the Village Operators will be hiring additional staff members with specialised skills to perform certain duties, these skills must also be available (note that Village Operator skills are considered under Management Feasibility).

Services and Utilities

Many of the essential activities of the Village Operator will need to be performed by entities outside of the Village Operator. These outside entities, identified under "Partner Network" in the business model, will need to be found. They may need to be located in or close to the area of interest (e.g. accountants), or they may be further afield (e.g. a stationery supplier).

The technical feasibility should also consider what necessary utilities are available in the target area (especially electricity), and if they are absent, whether this will cause problems for the Village Operator.

Infrastructure

Whatever infrastructure is needed according to the business model (should be identified under "Key Resources") should be available at the target site. For example, if a link to the Internet backbone is needed, it must be available at the site.

Supply Chain

The supply chain logistics will need to be worked out for both hard products (such as stationery) as well as the softer elements (such as Internet access). The technical feasibility assessment should also look at the reliability of the supply chains, since their failure can have a significant impact on the Village Operator.

Technologies

The wireless mesh on which the Village Operator will depend will have to be functional at the target site. The technical assessment should include a network plan and an assessment of whether it is viable at the site considering the location and facilities of the customers, and the terrain of the area. It should also evaluate whether the robustness and reliability of the technologies are acceptable.

2.3.2. Verification

The technical feasibility verification should start with an analysis of the business plan to identify the technical aspects which must be in place. Each of these aspects must then be verified within the target site. Much of this could be done in conjunction with other parts of the feasibility assessment, such as the community scan.

The methods for verification of the labour pool and technologies have been developed by other groups within the BB4ALL team, so they should be consulted about these aspects.

2.4. Social Feasibility

2.4.1. Overview

Market feasibility assessment takes a very homogenous and rational view of the community, and can produce results which look great in theory, but may not work in practice because of the socio-economic, cultural and political context of the community. Social aspects which should be evaluated are as follows.

Customer Capacity

Potential customers may say that they are in desperate need of the Village Operator's services, only to find out later that they don't have the necessary skills or confidence to take advantage of the services. The customer capacity should be assessed to identify potential barriers to using the services.

Community Acceptance

Even if there is a large enough market for the VO services, if the community or elements of the community are hostile to them, they can make it so difficult to operate that sustainability will not be possible. The social feasibility assessment should explore the willingness of the community to accept the Village Operator, and try to identify what challenges may be encountered. These could include prejudices (against race, age, gender or culture), language barriers, cultural barriers (which may take a conservative stance on new technologies), whether leadership structures are properly consulted, and whether there are any parties that would feel disenfranchised and may try to sabotage the Village Operator.

Security

The mesh network relies on expensive equipment to operate, and often this equipment will be out in the open. Customers also require computer equipment to make use of VO services, so the social feasibility assessment will also need to estimate the security risk in the target area. This should also include an assessment of the personal safety risk that would be carried by the Village Operators because of the equipment they will be carrying with them. If security is seen as a significant risk in the area, there should be a mitigation strategy in place.

2.4.2. Verification

Questions related to customer capacity can be included in focus groups, semi-structured interviews and customer surveys. The issue of community acceptance should be evaluated together with a trusted party in the community. This would probably be a local NGO. Security can be assessed during a community scan, through customer surveys and through discussions with other parties and authorities (such as the police) in the community.

2.5. Management Feasibility

2.5.1. Overview

Legal Form

The Village Operators will need to agree on a legal form for their enterprise (or this will need to be mandated for the Network). Possible legal forms are a Sole Trader, Partnership, Co-Operative, Private Company, Non-Profit Company and State-Owned Company. Since each legal form has its own advantages, costs, and risks, it should be evaluated what these are for the Village Operators, and what the implications would be. It is especially important to consider what risks the VO will be exposed to, and whether these risks would be acceptable.

Management

The management feasibility assessment will need to consider not just the technical and business skills of the Village Operators, but also the drive of the individuals involved, their character, motivations and their commitment to making a success of the enterprise. If they will be working in partnership, then the team dynamic should also be assessed.

Governance and Stakeholders

The decision-making process and lines of authority should be clear for the VO. The relationship with the Village Operator Network should be especially clear, and mutual commitments must be well understood. The role of any investors in the governance of the enterprise should be agreed. Relationships with other external bodies that could affect decision-making should be defined.

Legal Requirements

The management feasibility assessment should also verify that the legal requirements for the enterprise are met. This includes licences that the Village Operator needs to operate (such as the Electronic Communications Network Services (ECNS) and Electronic Communications Services (ECS) licences). It also includes statutory requirements which may vary based on the legal form of the enterprise, and whether staff are employed or not. Workmen's safety should be considered if technical installations are to be done under challenging conditions.

2.5.2. Verification

Some desktop research and probably the assistance of a companies lawyer will be required to assess the feasibility of the legal form of the business. The management style of the Village Operators can be assessed through the process of finding Village Operators, with character references, situational simulations and interviews. Governance questions will need to be evaluated on a case-by-case basis. Legal requirements can be assessed with desktop research, but may also require legal advice.

2.6. Financial Feasibility

2.6.1. Overview

The financial feasibility verification draws on much of the work done in other dimensions to generate a financial model of the enterprise and evaluate whether it is viable. It also requires that there is a source of capital that can cover the costs of establishment until the enterprise can run sustainably.

Profitability

The establishment and ongoing costs must be quantified. These can be obtained by analysing the business model, but the costs should be determined as accurately as possible in the target area. Revenues can be estimated based on the market research, and these can be combined into a financial model which shows the anticipated profitability of the enterprise. A financial projection can be used to estimate the operating capital that will be needed, and the anticipated pay-back period of the business. A break-even analysis can be used to work out what would be the minimum service output in order to be sustainable.

Capital

The establishment costs of the Village Operator, until it becomes sustainable, will need to be covered from somewhere. This source will need to be identified, and the payback terms agreed. A contingency plan will need to be agreed to cover the possibility that the enterprise never becomes sustainable, and the capital can't be paid back.

2.6.2. Verification
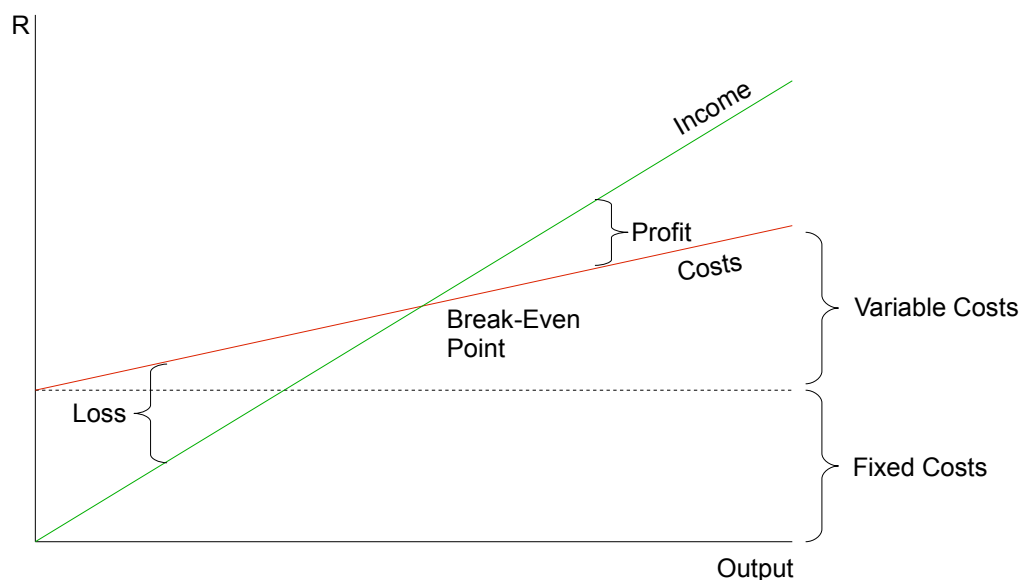
Figure 3: Break-Even Analysis

Verification of the capital availability will need to be done on a case by case basis, but there are some methods that can be used for verification of the profitability:

- *Financial Model*. A financial model for Village Operators has been developed (available separately), but this will need to be modified to match the business model of the VO, and the costs must be researched in the area. These costs can be determined for the most part during the community scan. Usage levels can be estimated based on the market research.

- *Financial Projection*. The financial projection estimates the service uptake over time and includes the establishment and ongoing costs of the enterprise to evaluate when the starting capital will be paid back, and the enterprise becomes sustainable.

- *Break-Even Analysis*. A break-even analysis (Figure 3) evaluates the fixed costs of the business (such as rent), and the variable costs that depend on the number of customers (such as wireless routers), and compare these with the revenue projections to work out what the minimum level of output is for the business to be operating profitably. This can be very useful in evaluating business performance. It works best where there is a single service or product, but it can also be used in a multiple-service environment by estimating the ratio of uptake between the services (for example, there might be three video customers for every broadband customer).

3. Conclusion

Each dimension of feasibility needs to be examined in detail. This may require in-depth investigation by the assessor, or it could be based on work done by other parties in establishing the enterprise. In either case, the assessor must be able to complete the attached Feasibility Scorecard with a high degree of confidence, starting with each dimension, and concluding with the Feasibility Summary.

The six dimensions each have a set of five statements which the assessor must evaluate for accuracy. If the statement is completely accurate in the case of the cluster in question, then it is given all five points. If the statement is completely inaccurate, then no points are awarded. Some statements are viewed as critical requirements for feasibility, and these are given a red number. The point allocation for these questions should be transposed to the summary section on the first page (in the red block if the allocation is 0-3, or the green block if it's 4-5).

Once all statements have been evaluated, the sum of points awarded is totalled as the Base Score for that dimension. The assessor must then perform a SWOT analysis of each dimension as a whole to identify any Strengths, Weaknesses, Opportunities or Threats that may not be encapsulated in the evaluation statements. A summary of the dimension is then provided, followed by an an objective allocation of between zero and ten points based on the assessor's evaluation of the risks. These points must be justified by the SWOT analysis and additional assessor comments. A total score is then calculated by adding the Base Score to the Assessor Score. This is then transposed to the appropriate block on the summary page. For example, if the score for Market Feasibility is 10, it would be placed in the orange block on the second row. If the score for Financial Feasibility is 25, it would be placed in the lime green block on the "Financial Feasibility" row. The points from all the dimensions are then totalled for an overall score (between 0 and 210), which is placed on the last row of the summary.

In order to pass the feasibility test, three checks must be made.

- Firstly, all critical statements must pass with a score of 4 or 5 (in other words, be transposed in the green block). These are considered non-negotiable elements of a sustainable enterprise, and must be in place.

- Secondly, each dimension must be scored at least in the yellow block. Each dimension must be feasible to ensure overall feasibility, and it's no good being strong in five dimensions, but failing in one.

- Finally, the total score gives an overall picture of the risk. If the score is in the red or orange blocks, then implementation is not feasible. A score in the yellow block would still indicate a high risk, and it would be important to take steps to mitigate this risk. A score in either of the two green blocks would indicate a high confidence in the feasibility of the cluster.

As a final step, the assessor gives their conclusions about the feasibility of the cluster and whether to proceed or not. He or she will also give management recommendations where necessary, so that risks may be mitigated.

It should be noted that the Framework as it stands has not been practically tested, and any conclusions that are drawn from it should be critically assessed before being acted upon. It may be that it over-represents the importance of some factors and under-represents others. It would undoubtedly benefit from further development and refinement based on the practical experience of implementation.

Appendix A. Feasibility Scorecard

Cluster	
Date	
Assessor	

Feasibility Summary

Critical Questions

	0-3	4-5			0-3	4-5			0-3	4-5
1.1.				5.1.				6.3.		
2.4.				5.2.				6.4.		
3.5.				5.3.				6.5.		

Dimension Scores

	0-7	8-14	15-21	22-28	29-35
Operational Feasibility					
Market Feasibility					
Technical Feasibility					
Social Feasibility					
Management Feasibility					
Financial Feasibility					

	0-42	43-84	85-126	127-168	169-210
Total					
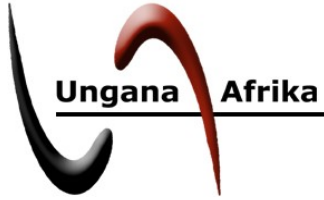
Assessor Conclusions

1. **Operational Feasibility**

0 1 2 3 4 5	

1.1. The Village Operator cluster has a clearly articulated business model, which is appropriate to the local context.

1.2. The Village Operators have a good understanding of their customers, and how to structure their services to serve them best.

1.3. The Village Operators have clearly defined services, and know which services they will be providing to which customers.

1.4. The VOs know what processes will need to happen in order to operate the enterprise effectively and efficiently.

1.5. The VOs have a clear plan for developing the partnerships they will need in order to provide their services.
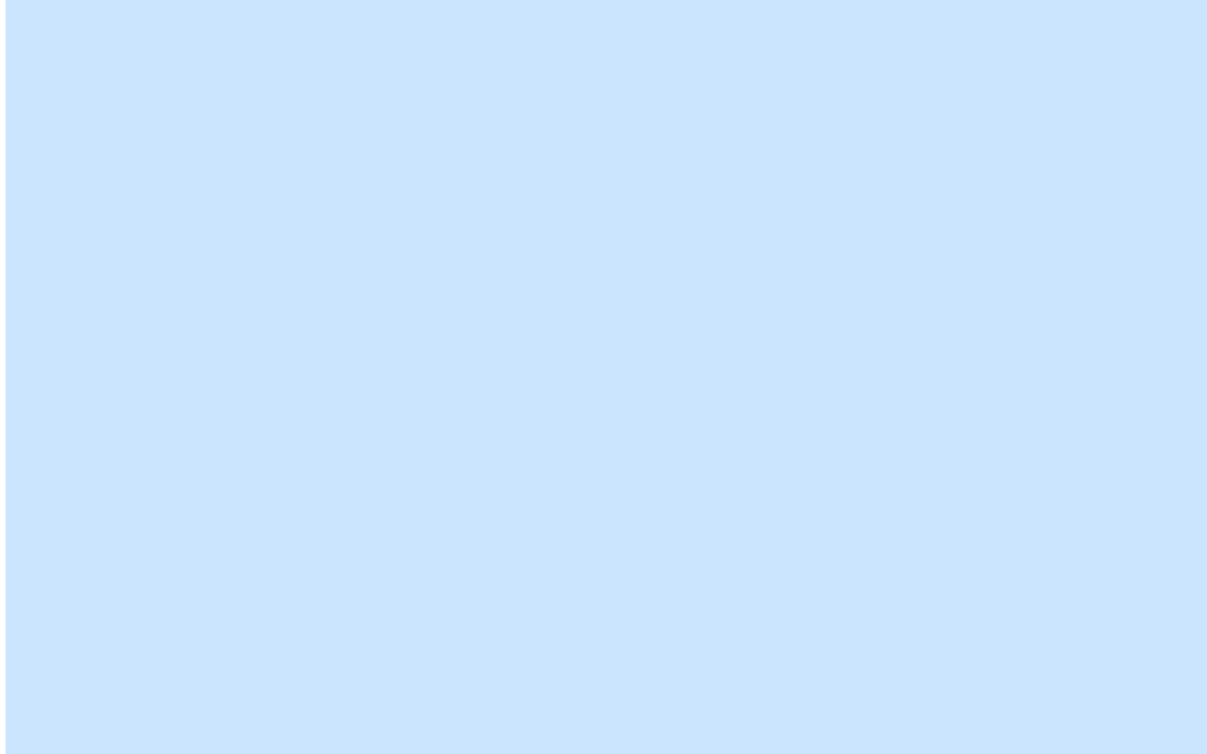
Base Score /25

SWOT Analysis

S W

O T

Assessor Comments

Assessor Score   /10

Total (Base + Assessor Score)   /35

Ungana Afrika

2. Market Feasibility
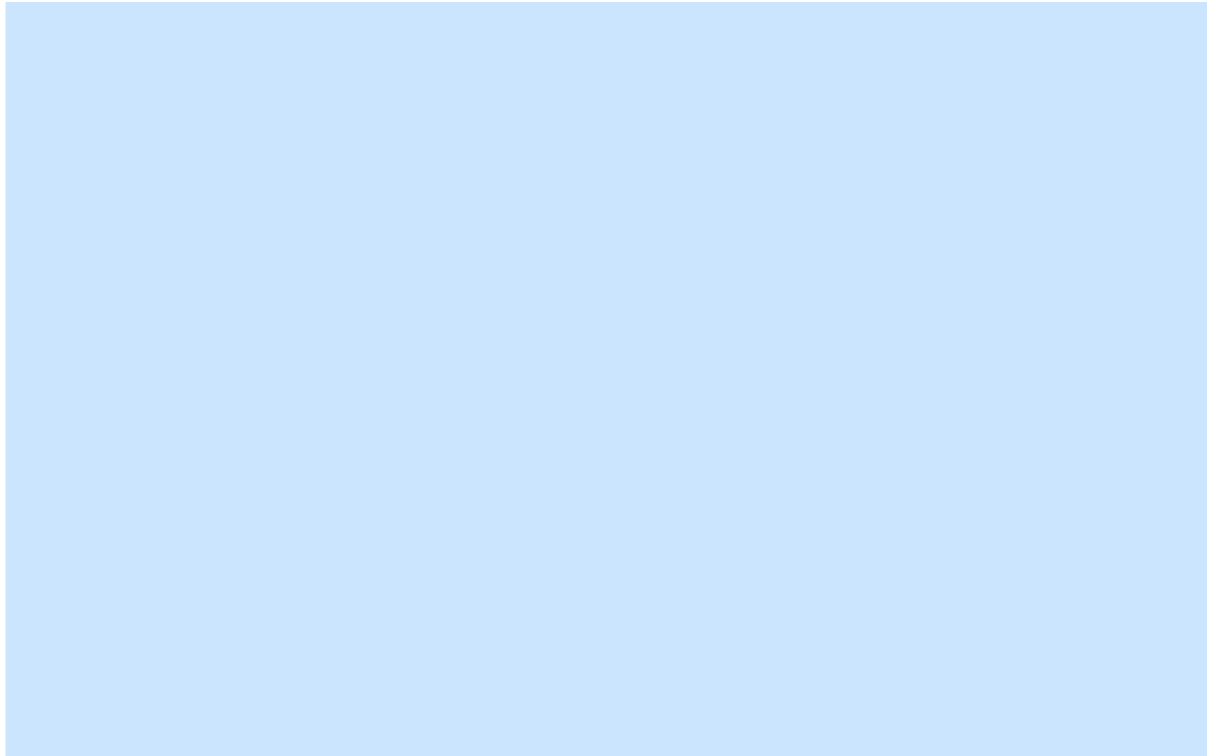
		0	1	2	3	4	5

2.1. There is a good understanding of what developments can be expected in the industry in the next 18 months, and the cluster is well set to deal with these developments, as well as general innovation in the industry.

2.2. The Village Operators have a good knowledge of who is currently providing similar services to customers within the cluster, and who might move into the market in the next 18 months. There is a clear understanding of their market share, strengths and weaknesses, how their services compare, and how they might respond to the Village Operator.

2.3. The service pricing is set to a level that the customers find affordable, but that provides sufficient margin on costs to be profitable.

2.4. The Village Operators have a good picture of how many potential customers there are that would pay for and be able to use each service, and what percentage are likely to make use of their services.

2.5. The Village Operators have a marketing strategy that speaks to the needs of the customers, and is likely to reach them.

Base Score   /25

SWOT Analysis

S | W

O | T
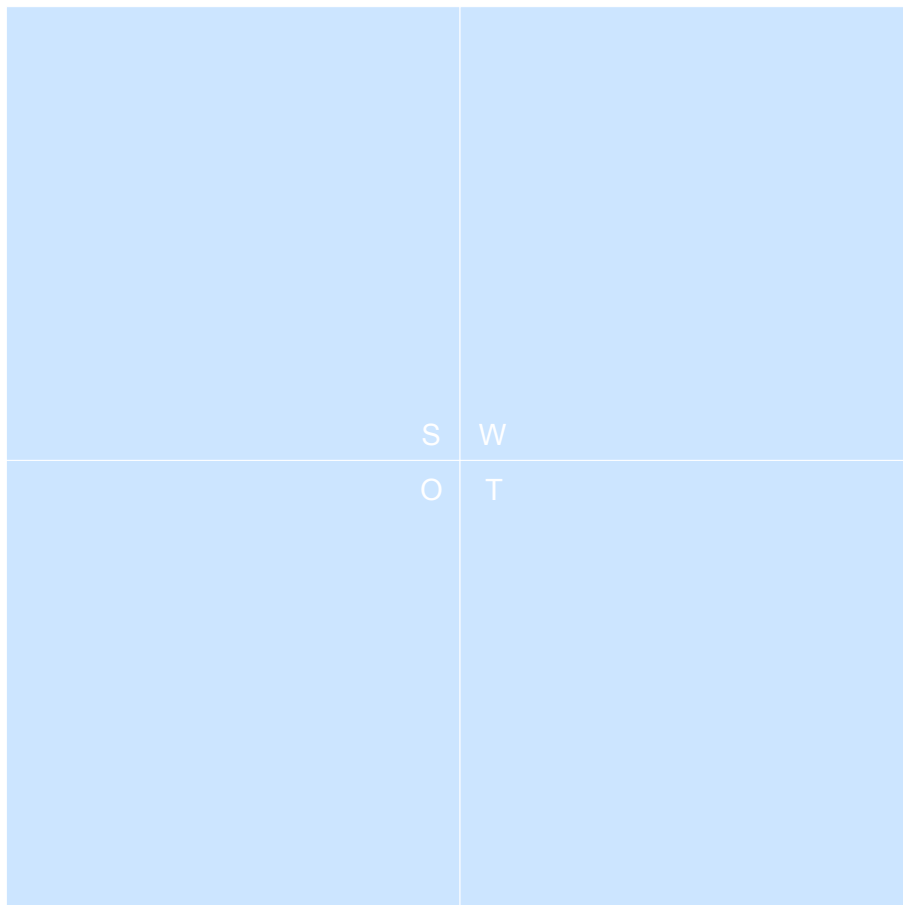
Assessor Comments

Assessor Score	/10
Total (Base + Assessor Score)	/35

3. Technical Feasibility

		0	1	2	3	4	5

3.1. The necessary facilities and infrastructure are available, and are accessible at affordable rates.

3.2. There are locally available service providers, utilities and a sufficiently skilled labour pool to provide the services required by the Village Operator.

3.3. The Village Operators have secure and reliable supply chains for both hard (eg. stationery) and soft (eg. Internet bandwidth) stock items.

3.4. The technologies on which the Village Operators will base their services are reliable, and there is a plan for dealing with technical failures.

3.5. There is a viable network plan for the cluster, which will provide robust performance to each customer.

Base Score ☐ /25

SWOT Analysis

S | W

O | T
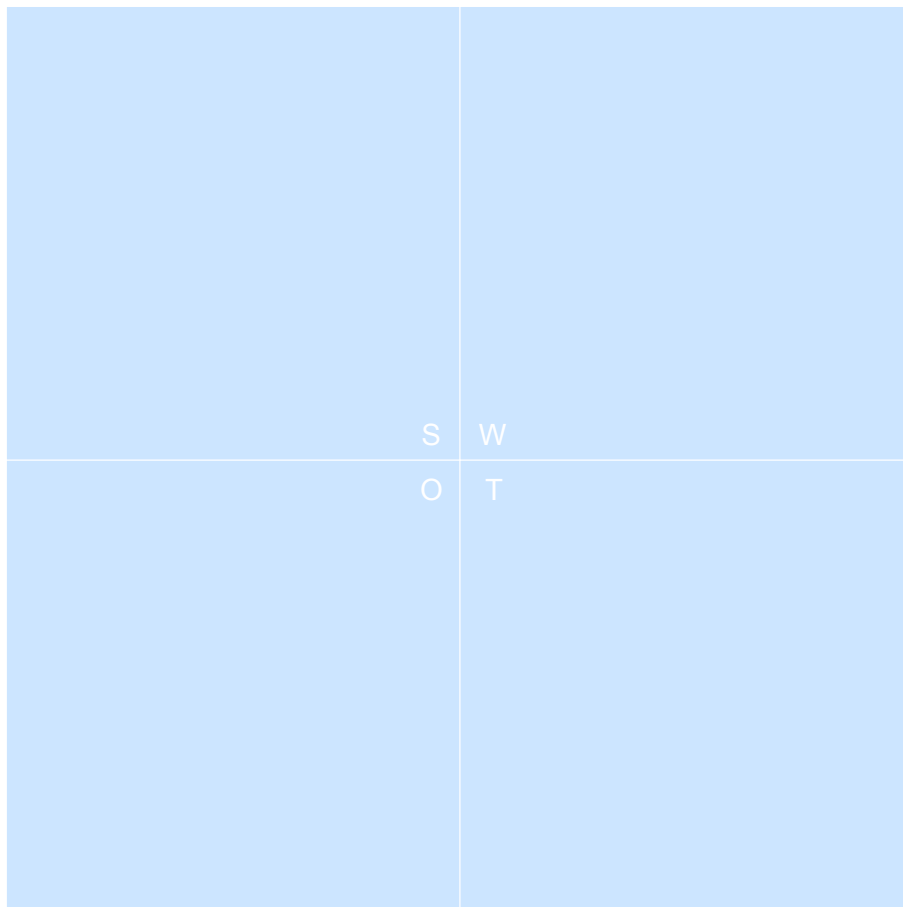
Assessor Comments

| Assessor Score | | /10 |
| Total (Base + Assessor Score) | | /35 |

4. **Social Feasibility**
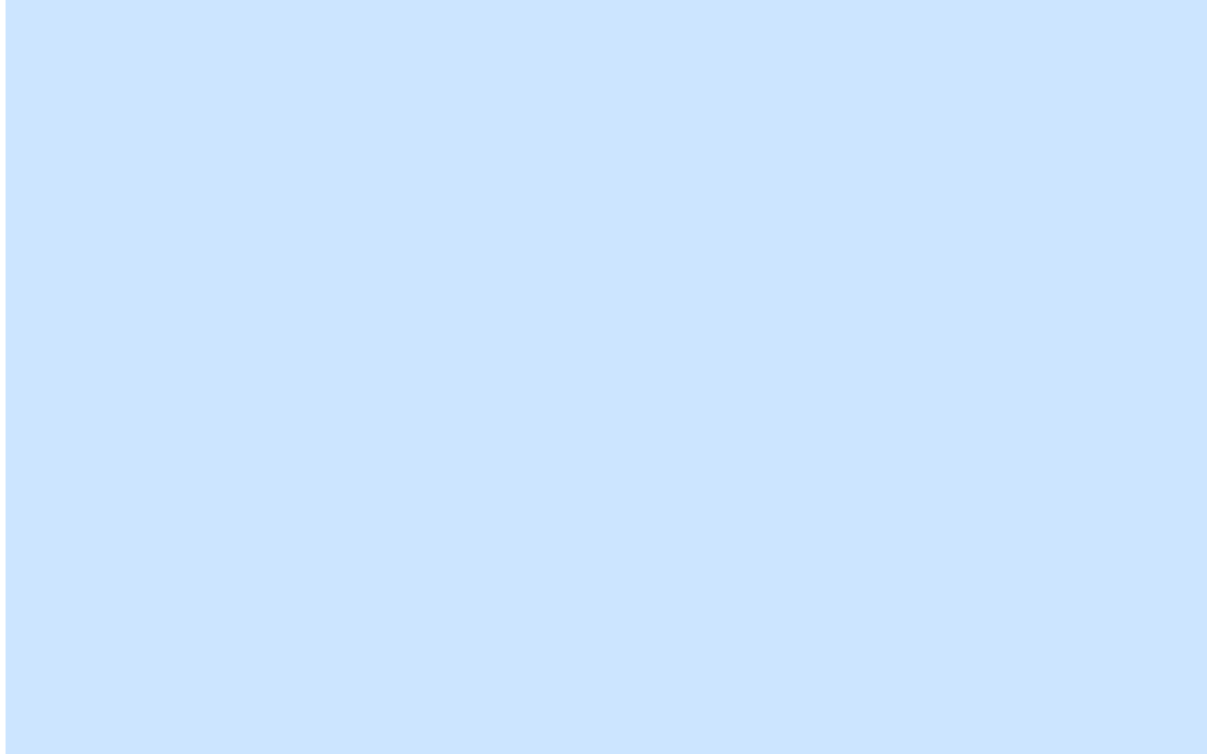
		0	1	2	3	4	5

4.1. All customers have the facilities, skills and confidence necessary to make use of the Village Operator's services.

4.2. There are no prejudices, language or cultural barriers that will prevent customers from using the services of the Village Operator.

4.3. The community leadership structures have been shown the necessary respect, and there are no prominent community members who may have cause for resentment to the extent that they subvert the work of the Village Operators.

4.4. The Village Operators have strategies to ensure the safety of their equipment, which are appropriate to the level of risk in the community.

4.5. The Village Operators are not facing undue personal security risk because of being seen to operate in a high-tech industry, or because of the equipment they carry.

Base Score /25

SWOT Analysis

S | W

O | T
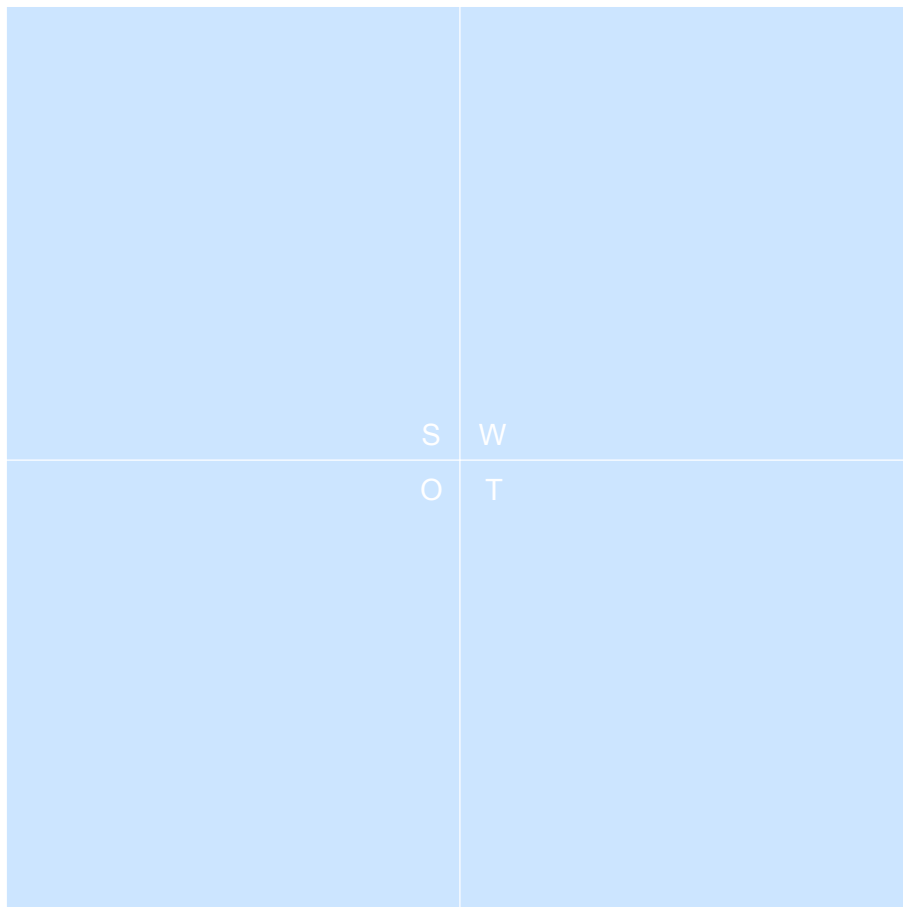
Assessor Comments

Assessor Score	/10
Total (Base + Assessor Score)	/35

5. Management Feasibility

0   1   2   3   4   5

5.1. The Village Operators have the necessary technical and business skills to perform the necessary activities of the enterprise.

5.2. The Village Operators are fully motivated to make a success of their enterprise, are prepared and capable of dealing with unexpected developments, and work effectively as a partnership.

5.3. The Village Operator is a formally established entity, and the legal form provides the right balance of structure, flexibility and risk management.

5.4. The ownership, governance and decision-making processes and responsibilities are clearly understood by all stakeholders, as are the relationships and authorities of the Master Village Operator and Network.

5.5. The Village Operator holds the necessary operating licences, and meets the necessary statutory requirements for operating legally.

Base Score   /25

SWOT Analysis

S | W

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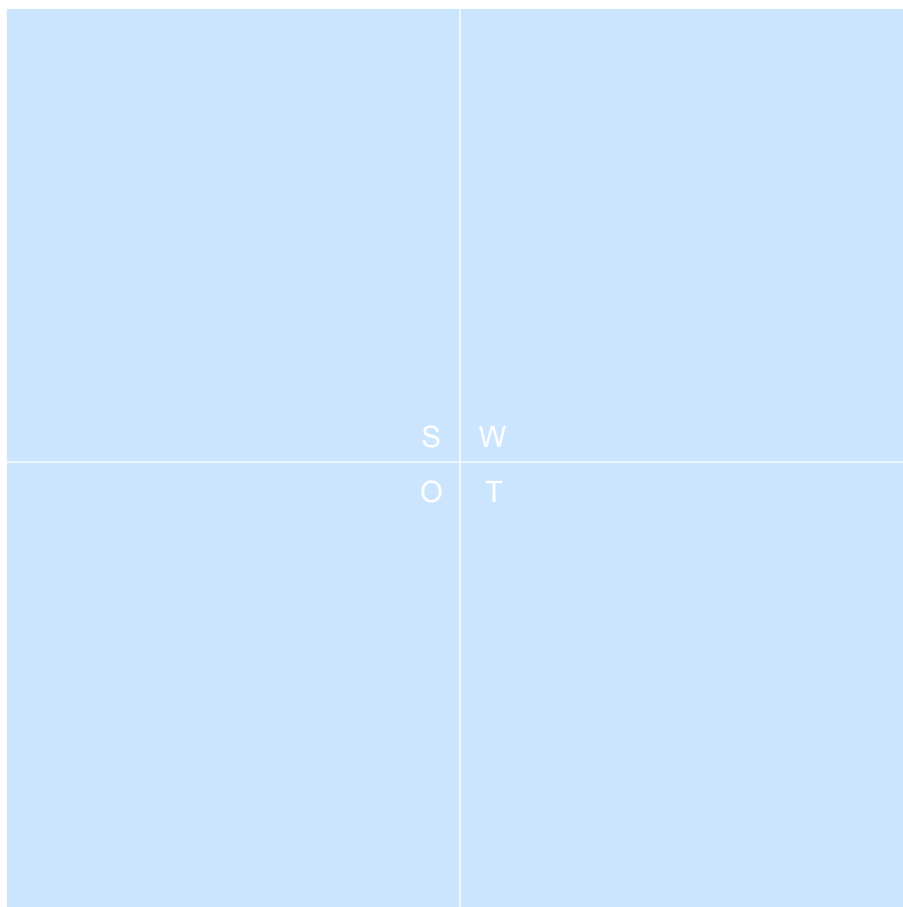
Assessor Comments

Assessor Score	/10
Total (Base + Assessor Score)	/35

6. Financial Feasibility
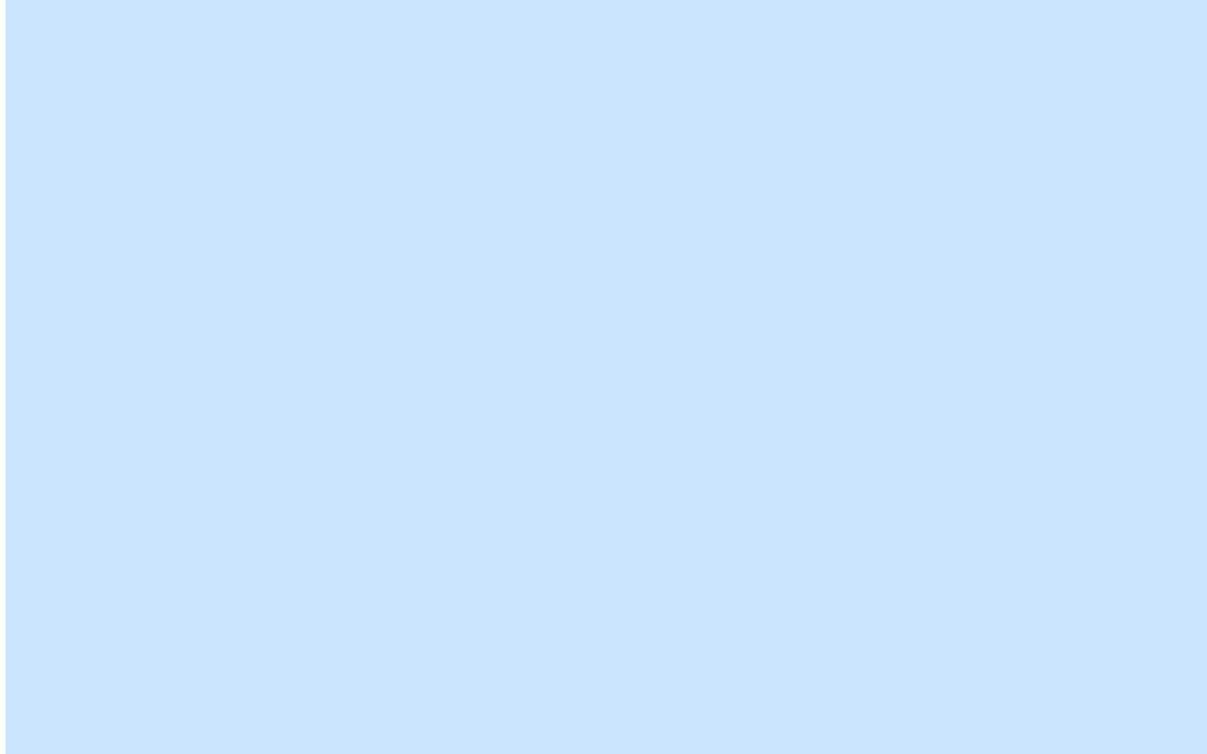
		0	1	2	3	4	5

6.1. The Village Operator has a clear picture of what costs will be incurred in establishing and operating the enterprise, and the figures are a reliable estimate.

6.2. The Village Operator has a good understanding of what revenues can be expected, where they will come from, and how regular they will be.

6.3. The Village Operator can convincingly demonstrate that their enterprise will be profitable within an acceptable period of time, with sufficient margin to cater for uncertainties.

6.4. The establishment capital requirements are known, and a source of capital is available on terms that are acceptable to the Village Operators and reasonable given the financial projections.

6.5. There is a contingency plan that caters for the possibility that the enterprise does not perform as well as predicted, and it is not possible to pay back the establishment capital. The risks are acceptable to all parties.

Base Score ⬜ /25

SWOT Analysis

S | W

O | T
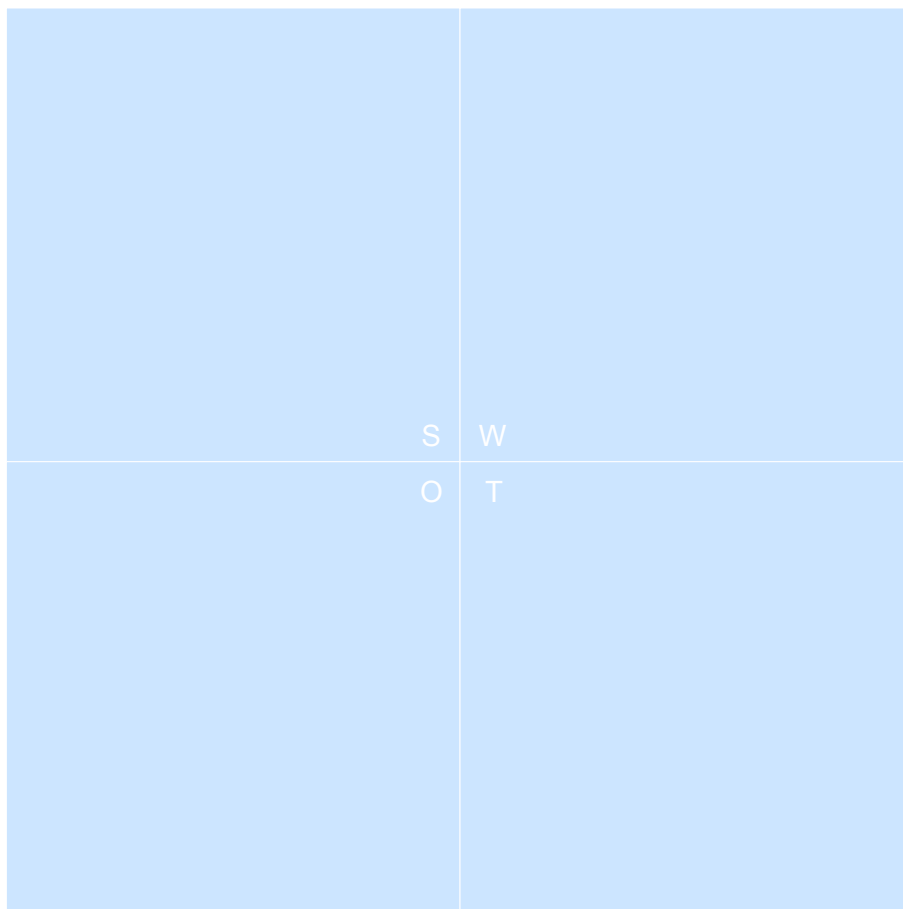
Assessor Comments

Assessor Score   /10

Total (Base + Assessor Score)   /35

Appendix B. Business Model Outline

The business model outline presented here is very much a provisional attempt to define the fundamental elements of a Village Operator enterprise. It was a necessary step in developing the Feasibility Framework, but will need more refinement in consultation with the Village Operators and the project stakeholders before it can be taken as an accurate representation of the Village Operator business logic. An updated version is being developed as a separate project, so this is included as background.

B.1. Logical Elements
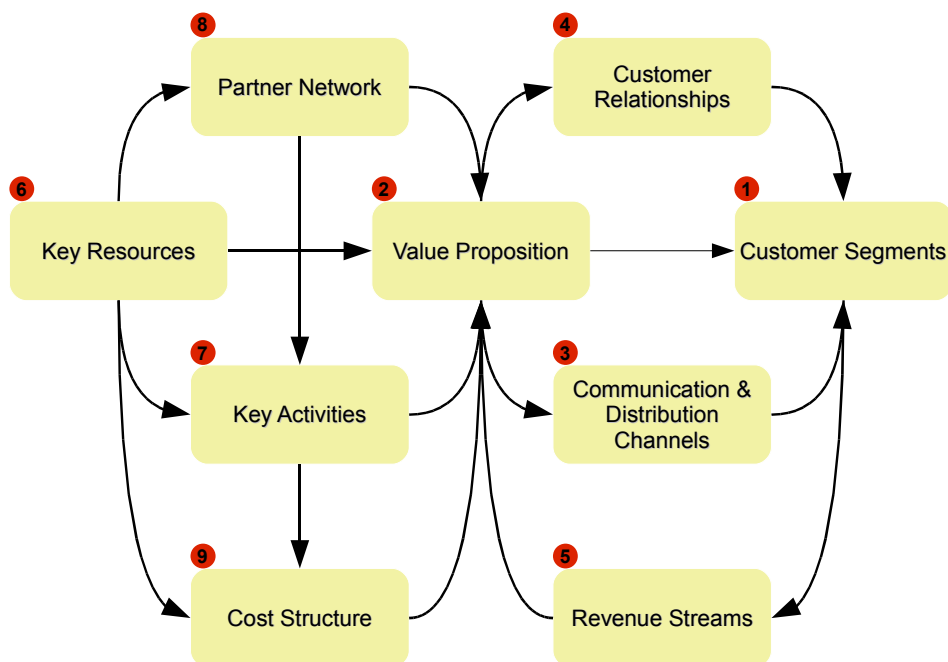
① **Customer Segments** – the different categories of clients, grouped because they are targeted in different ways, demand a different relationship, require different services or have different profitability.

② **Value Proposition** – the value that is being offered to each client segment as a bundle of services and products.

③ **Communication & Distribution Channels** – the mechanisms for marketing to the client and through which the services are provided.

④ **Customer Relationships** –the mechanisms through which client relationships are maintained to ensure that customer loyalty is high.

⑤ **Revenue Streams** – the sources and nature of revenue that accrue as a result of the services and products.

⑥ **Key Resources** – the human resources, technologies and other resources that are leveraged to provide value to the customers.

⑦ **Key Activities** –the tasks which need to be performed in order for the business model to function, stemming from the operations in the other building blocks.

⑧ **Partner Network** – the external entities that amplify the service offering and perform some of the key activities.

⑨ **Cost Structure** – the costs that are incurred in executing the business model.

Figure 4: Logical elements of the business model

Figure 4 gives a conceptual overview of the most important aspects of an enterprise. It relates the products and services of the enterprise (Value Proposition) to the beneficiaries (Customer Segments), and defines the nature of that relationship. The Revenue Streams provide the necessary capital to keep the enterprise functioning. The Key Resources provide the essential tools for the enterprise to deliver their products and services, while the Key Activities define the processes that must be carried out in the daily functioning of the business. The Partner Network defines the external entities that are required so that all of the activities can be performed. The Cost Structure then defines the capital outflows that are realised in all of these steps. While there are many ways to frame a business model, this view (developed by Dr. Alexander Osterwalder[1]) is both functional and dynamic, framing the enterprise as an active entity.

B.2. Customer Segments

Dinaledi schools*	Dinaledi schools are an attempt by government to increase access to maths and science at higher-grade level in underprivileged schools. They receive more financial and political support from the government, and are prioritised. They are also the schools with the greatest investment in ICT in rural areas. **Current ICT budget (/m):** Phone R400-R500; Printing R250; Maintenance R50 **Existing technology:** 3-5 administrative computers; 30-50 classmates **Purchasing process:** Either comparison of quotes (preferred), or contract signed by Governing body; according to budget (submitted end 3rd quarter) **Purchasing authority:** Finance committee of school governing body **Strategic value of ICT:** *Administration*: EMIS, LURITS, communication with DoE, Internet Banking, better financial management; *Delivery*: research, access to training materials, video link, learner technology skills development; *Capacity*: computer training for staff; *Political*: Dinaledi requires good performance.
Other schools*	Other schools in the area will probably only receive government support once the Dinaledi schools are connected. However, they may be willing to use their own budgets to access VO services. **Current ICT budget:** Phone R400-R500; Printing R250; Maintenance R50 **Existing technology:** 3-5 administrative computers; 30-50 classmates **Purchasing process:** Non-section 21 schools present a budget to the provincial department, who procures goods and services on their behalf. **Purchasing authority:** finance committee of school governing body **Strategic value of ICT:** *Administration*: Implement EMIS, LURITS, Communication with DoE, Internet Banking, better financial management; *Delivery*: research, access to training materials, video link, learner technology skills development; *Capacity*: computer training for staff.
Other government offices	Other government offices (clinics, police stations, municipal offices, govt. dept. offices) are likely to have greater spending capacity than the majority of private businesses (in underserviced areas), but their centralised purchasing process may complicate contracting. **Current ICT budget:** unknown **Existing technology:** unknown **Purchasing process:** unknown **Purchasing authority:** unknown **Strategic value of ICT:** *Administration*: Improved communication with national & provincial structures, improved data & financial management, Internet Banking; *Service delivery*: Improved access to government, medical information.
Local SMMEs	Local SMMEs are attractive because they have greater decision-making authority and are likely to have less stringent contracting requirements than franchises or government offices. However, their purchasing power is questionable, and they may not be reliable in their payments. Local NGOs can also be included under this category. **Current ICT budget:** unknown **Existing technology:** unknown **Purchasing process:** unknown **Purchasing authority:** unknown **Strategic value of ICT:** *Administration*: Improved communication with suppliers, improved financial management, Internet Banking; *Delivery*: improved CRM, POS; *Capacity*: staff will need guidance

*estimated characteristics based on one visit – not authoritative.

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1   Http://alexosterwalder.com/

Local franchisees	Local franchise outlets (such as PEP, Spar) are attractive because they are likely to require a reasonably substantial ICT infrastructure in order to maintain communication with the head-office, their needs are likely to be uniform and predictable, and they will have well-developed processes. However, their decision-making is likely to be centralised, with stringent contracting requirements. **Current ICT budget:** unknown **Existing technology:** unknown **Purchasing process:** unknown **Purchasing authority:** unknown **Strategic value of ICT:** *Administration*: Improved communication with head office, improved financial management, Internet Banking; *Delivery*: Improved CRM, POS; *Capacity*: Staff will need guidance.
Private individuals	Private citizens could be an attractive market primarily because of its size. They are likely to be extremely price-conscious, and have very limited disposable income. Statistics consistently show that households spend around 3% of their income on communication (including cellphones), which is not a lot in a poor area. The value proposition will need to be carefully constructed to appeal to them. **Current ICT budget:** unknown **Existing technology:** unknown **Purchasing process:** unknown **Purchasing authority:** unknown **Strategic value of ICT:** *Administration*: Internet Banking; *Communication*: Improved communication with family, job prospects; *Capacity*: technology skills enhance opportunities. *Entertainment*: access to news/entertainment is easier.
External research organisations	Because a Village Operator is maintaining a communication infrastructure, they occupy a privileged position because they are highly accessible despite the remoteness of their environment. They have also passed a selection process which guarantees a minimum aptitude. This makes them valuable to research organisations who are interested in studying the rural, underdeveloped context. **Current field research budget:** unknown **Purchasing process:** unknown **Purchasing authority:** unknown **Strategic value of VO:** *Location*: strategically important for research; *Capacity*: have the skills to conduct research; *Accessibility*: VOs are easy to reach; *Affordable*: It's cheaper to work with VOs than to travel.

The customer segments that have been identified are prioritised in the order that they contribute to project objectives, not necessarily in the order that they contribute to profitability. Customer groups that are not being seriously considered at this stage but could be included in the future are coloured in grey.

B.2.1. Schools

Dinaledi schools are the highest priority clients since they have been specifically identified as targeted recipients in the BB4ALL project. Because of this, and also because typical Dinaledi schools may already make greater use of ICT than other schools, they are treated as a separate customer segment. Estimates on current technology, ICT budgets and strategic value assumptions (which relates to the perceived value of VO services) are based on a single visit to a school in Elandsdoorn, and should not be taken as definitive without further verification. The school visited was not a Dinaledi school, though their technology use may be higher than average for non-Dinaledi schools.

EMIS (Education Management Information System) and LURITS (Learner Unit Record Information Tracking System) are high priority projects for the DoE, and could help in convincing them to provide funding assistance to get schools connected. The schools themselves do not seem to be too pressurised to contribute data electronically, however, so this is unlikely to be viewed by them as a motivating factor.

It is assumed that most (if not all) Dinaledi schools are constituted as Section 21 companies, which means that their government funding allocation is paid directly to them, and they are entitled to spend it as they wish, in accordance with an annual budget which must be submitted to the Department of Education (DoE) before the start of the fourth quarter. The funding allocation for non-Section 21 schools is held by the provincial DoE, who procure goods and services on their behalf (also in accordance with their budget). All schools should have a finance committee as part of their governing body, whose responsibility it is to authorise any payment (and sign cheques), and ensure that it is covered in the budget. If schools are going to be paying directly for their own connectivity, it will be important to approach them before the annual budget is prepared at the end of the third quarter.

The e-rate regulations for schools requires that schools are entitled to a 50% discount on the total charge, which includes (but is not limited to):

- Internet connectivity charges
- Equipment charges
- Calls made to an ISP (presumably for dial-up connections)

Although support costs are not mentioned specifically, they would probably be included by association. This makes it tricky to build a sustainable model if the schools are the primary clients, since there is no suggestion that this discount can be claimed back from government – it is simply a cost of doing business. Although the regulatory implications are vague, the result is that the business model needs to take this into account, and most likely increase the charge to other clients to compensate.

B.2.2. Other Government Offices

No other government offices have been visited yet to assess their service requirements and build their profile. Until that is done, we can only work with assumptions. Government offices are not subject to the e-rate.

It may be possible to negotiate with the DoE directly to pay for services to schools, but it will be more difficult to get this agreement from other departments, since there are fewer affected offices.

B.2.3. Local SMMEs

Local SMMEs have also not been approached yet to verify their needs and ability to pay for services.

B.2.4. Local Franchises

Franchises (such as PEP stores) are probably more reliant on ICT services than independent SMMEs, but the service contracts are usually negotiated at a regional level, with a single supplier. It may be difficult to convince the regional franchise holder that the village operators provide reliable service until they have been able to establish a track record.

B.2.5. Private Individuals

It is not yet clear how much of a market there is for individuals to connect to the Internet in the communities in which the project will operate. It is further complicated by the requirement to be within range of an HPN in order to connect.

B.2.6. External Research Organisations

A Village Operator could be a valuable resource for doing community research on behalf of research organisations or the state. However, should this client segment be pursued it could result in dilution of the focus of the Village Operator, so it is only mentioned as a possibility here.

B.3. Value Proposition

The Village Operator services are introduced under the title of Value Proposition, to reinforce the idea that what is being offered to the customer is something that adds value to what they are doing. It is important to convince them of the value that they will receive, not on the technical details of what will be provided.

The services are prioritised first in the order that they contribute to project objectives, then in the extent to which they contribute to the main business (broadband Internet connectivity). Some services are not feasible at this stage because the VOs will probably still not have the skills necessary to perform them once they have undergone their training. Others may be feasible, but have not been formally considered because they may dilute the focus. These services are given in grey.

The services that are considered here are at this stage very different from the services that will be launched. This section should thus be considered only as a guideline for how services can be packaged, and as a possible source of ideas for new services. It should not be taken as authoritative.

Broadband Internet	The client receives a dedicated, uncapped Internet connection with guaranteed throughput of at least 128Kbps. The client does not pay for the hardware necessary to connect to the Internet (but then must sign a contract). Three hours of client training and a user manual are provided to ensure uptake. The client receives free telephonic support and up to two hours of free on-site troubleshooting per week. **Cost to Customer:** R750 per month or R10000 + R350 pm prepaid *[estimated]* **Terms:** Minimum 2 year contract, or month-to-month with up-front payment. **Competition:** ADSL, 3G, VSAT, diginet, other wireless **Competitive Advantage:** The Village Operator is able to directly explain the advantages of the service, and provides guaranteed on-site assistance. The service is uncapped and always on, and cheaper than equivalent VSAT connections. It is available in areas where ADSL can't reach.
SMME/Home Internet Access	SMMEs and home users with limited requirements and within approximately 50m of an HPN can opt to use a low-cost router to access internet in their homes or businesses. Service guarantee is 64Kbps uncapped. The client may choose to purchase the router up front or to sign a one year contract at a slightly higher rate. The VO will connect the device to the client's network. **Cost to Customer:** R250 pm or R600 + R200pm (prepaid) *[estimated]* **Terms:** 2 year contract, or month-to-month **Competition:** EDGE, dial-up **Competitive Advantage:** Always on connection, faster than alternatives.

Technical Support	The Village Operator will come to the client's location within 12 hours to troubleshoot technical problems, or within 48 hours if the issue is routine maintenance. If he or she is unable to solve the problem within 2 hours, it will be escalated to second-line support. Client can choose to pay ad-hoc, or sign a support contract which gives up to two hours free support per month. *This has not been considered further at this stage because of doubts that the Village Operators would have the technical capacity to provide this service. This may be a service to be provided by Master VOs.* **Cost to Customer:** R150 p.h. / R150 p.m. **Terms:** Ad-hoc, billed **Competition:** Computer service companies in bigger towns **Competitive Advantage:** Cheaper, faster turnaround, established relationship.
VoIP (Single Line)	For clients of the broadband service, the Village Operator can connect a single telephone line, which uses Voice over Internet Protocol. Cable theft is a systemic problem in the targeted areas, and Telkom often refuses to fix the lines. In many cases, the value of an Internet connection may be greater because of voice than data access. **Cost to Customer:** Installation: R300, Rental: R49 **Terms:** **Competition:** Telkom, Mobile, Skype **Competitive Advantage:** The Village Operator is able to personally explain the advantages of the service, established relationship with clients, cheaper than Telkom.
Ad-hoc Training	The Village Operator can sit with an individual (either private or associated with a government office or SMME) to provide one-on-one assistance with basic computer issues. **Cost to Customer:** R150 per hour **Terms:** post-paid **Competition:** friends, family, school kids, teachers **Competitive Advantage:** VO should have more knowledge and skill.
Ad-hoc Internet Access	Individuals who would like to access the Internet from their homes, or using cellphones or laptops that are WiFi enabled can get best-effort access for a nominal monthly admin fee. Those without WiFi capability (or who are too far from an HPN) must purchase a low-cost router to use the service. **Cost to Customer:** R600 for router (if needed); R20 per month for access **Terms:** R20 prepaid **Competition:** GPRS **Competitive Advantage:** Cheaper than GPRS, VO has the technical skills to set it up
Hardware / Software / Stationery Sales	The Village Operator keeps a stock of popular stationery items (paper, pens, CDs, USB sticks, etc.) for sale to the public. He or she is also able to order more expensive items (cellphones, netbooks, computers, printer cartridges) when needed. **Cost to Customer:** varies **Terms:** 20% markup **Competition:** Local stationery/convenience stores, computer stores in larger towns **Competitive Advantage:** often local providers don't have stock, or are expensive. The network can help to bring down distribution costs.
Domain Hosting	The Village Operator (with VO Network assistance) registers a domain for the customer, and can set up 5 email addresses in that domain (additional costs for more email addresses). **Cost to Customer:** R100 setup, R60 per month **Terms:** contract / prepaid **Competition:** ISPs (MWeb / Intoweb / etc.) **Competitive Advantage:** The VO is local and would be able to give them hands-on training and sort out their problems more easily. Costs are slightly lower than ISP offerings.

B.3.1. Broadband Services

Currently, it is assumed that clients with greater connectivity requirements (and all schools) will need to have an HPN installed at their premises, and will pay the cost of the HPN. Clients with lower requirements and in the vicinity of an existing HPN would only need to purchase a low cost router, and as a result the access cost for them would be much lower. While this approach makes it easier to calculate the costs and work out the profitability of different services, it is in some ways an academic distinction, because both types of device can deliver high speed broadband services. Since the HPNs are needed to extend the reach of the network, the primary clients are being saddled with an extra cost in order to achieve this. This is further complicated by the e-rate for schools, which mandate a 50% discount. This might make it impossible to recover the costs of the hardware.

A different approach would be to make the technical decisions independent of the service offering. With this strategy, there are two levels of service, one faster than the other (and perhaps with more bundled services such as voice and support). The decision over which device to use becomes a technical one, depending on the location of the client in relation to the existing backbone coverage provided by HPNs. If there is no coverage in the area already, or the site is strategically valuable because of its viewshed, then an HPN is installed, otherwise a low cost device is used. This allows for closer pricing of the two services, and balances out the costs of the infrastructure. The downside is that clients would need to be tied to long-term contracts – it becomes more difficult to separate the hardware and service costs.

B.3.2. Voice over IP

Discussions with a headmaster and community partners highlighted the fact that cable theft is a systemic issue in the target areas. In many cases Telkom refuses to replace the cables, and clients are forced to use mobile phones instead. Since wireless services would be unaffected by cable theft, Voice over IP telephony could fill a gap that is already felt, and add to the perceived value of Internet services.

The Village Operator would need to work with one of the established VoIP providers in order to access telephone numbers from the national numbering plan. This would also reduce the technical complexity and support requirement.

B.3.3. Sales of Hardware / Software / Stationery

The Village Operator will need to establish supply channels for the hardware necessary to connect the clients to the Internet. It would be a natural extension to also keep stock of basic hardware, software and stationery that might be needed by clients or individuals. These day-to-day sales will also serve to remind potential clients of the range of services offered by the Village Operator.

B.3.4. Other Services

There are a number of potential value-added services that have been suggested, including banking, prepaid electricity and airtime sales, company registration, printing of government forms, eFiling assistance and others. These may provide useful supplementary revenue streams, but they have not been included yet because they rely on the core set of services being established and working. The focus has thus been on those services which are seen as the main thrust of the Village Operator.

ICT Training (Classroom)	The Village Operator provides accredited ICDL and Office product training to members of the community twice a week in the evenings, making use of the computer facilities at Dinaledi schools, a telecentre or Internet cafe. *It seems that there are many challenges to becoming an accredited training institution and trainer. This should be reserved for a Master VO.*

Cost to Customer: R50 per person per session
Terms: Ad-hoc, payment at the door
Competition: Training centres in bigger towns
Competitive Advantage: Cheaper than alternatives, per-session charge is more manageable, no transport required, possibly lower language and cultural barriers.

Internet Cafe	The Village Operator runs an Internet Cafe which offers computers with Internet access, printing services. *It would make a lot of sense for a VO to co-locate with an Internet Cafe. It may be possible for the VO to also provide this service, but they would generally be competing with established operators, and it may be difficult to maintain focus.*

Cost to Customer: varies – Internet access R5 for 30 min in rural areas
Terms: Internet access is pre-paid; printing is post-paid
Competition: Other local internet cafes, libraries?, telecentres?
Competitive Advantage: Already distributing connectivity, so costs can be lower.

Temporary Internet Access	Individuals who are in the area for a short time but need good Internet connectivity can obtain day-by-day connectivity for a premium fee. This gives them R256Kbps Wi-Fi connectivity (need to be within 50m of HPN). *It's not clear how big the market would be for this sort of service, so it has not been included for now.*

Cost to Customer: R80 per day
Terms: Prepaid, for as many days as client needs
Competition: 3G
Competitive Advantage: Availability, uncapped.

Networking Services	The Village Operator can install a network to link the client's computers. *Similar to technical support, the VOs are unlikely to have the necessary technical skills to do this. This could also be a Master VO service.*

Cost to Customer: R150 per hour + 20% on materials *[first guess]*
Terms: VO to first quote; materials payment up front, balance on completion
Competition: Computer services companies in bigger towns
Competitive Advantage: Lower cost, established relationship.

VoIP (Multiple Extensions)	For larger government offices and businesses, the Village Operator is able to install a VoIP router that will replace a fixed line PABX system, resulting in greater functionality (if no PABX in place) or reduced costs (if replacing an existing system). *This would be more technically complex than simply installing a line. It has thus not been considered at this stage.*

Cost to Customer:
Terms:
Competition: Telkom PABX, regional VoIP consultants
Competitive Advantage: Established relationship, personal marketing advantage

Website Development	The Village Operator can register and construct basic websites for businesses in the community. *This would need some specialised training, and is not part of the core services. It is also not known how much of a market there is for this.*

Cost to Customer: R1,000 once-off, R50 monthly *[first guess]*
Terms:
Competition:
Competitive Advantage:

Video	The Village Operator makes videos of community events (weddings, funerals, etc.) which he or she then sells to family/attendees. *This has been a popular and successful Infopreneur service, and could be a useful value-added service. It has not been included at this stage because it could distract the VO from the core service set.* **Cost to Customer:** **Terms:** **Competition:** **Competitive Advantage:**
Research Services	The Village Operator conducts community research on behalf of external research organisations. *This service is not linked to the core service focus, and has not been considered at this stage.* **Cost to Customer:** **Terms:** **Competition:** **Competitive Advantage:**

Not all of the customer segments would make use of all services, and the following diagram gives a representation of which primary services might be expected to be used by each of the customer segments.
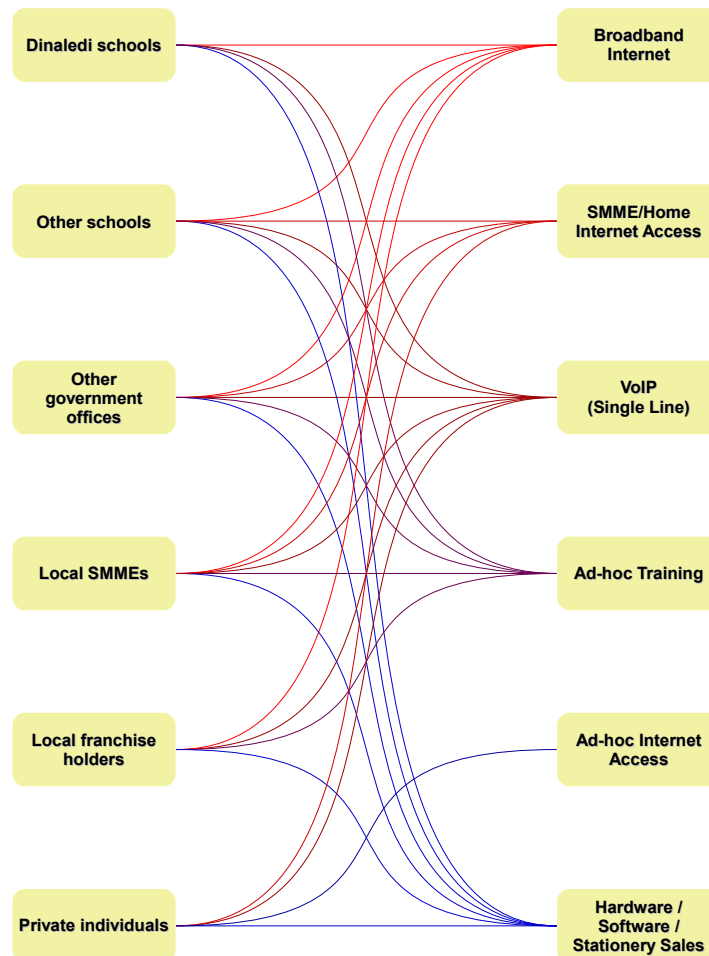
B.4. Marketing, Relationships and Distribution

This section considers how the Village Operator would interact with each customer segment. There are three aspects that are included here – Marketing (how to convince the customer of the value that is being offered), Relationships (ensuring that existing customers continue to use the Village Operator services) and Distribution (how the services are actually provided). In the diagrams that follow, grey elements are outside of the responsibility of the Village Operator, and would need to be performed by the Network, Master Village Operator, or the community.

B.4.1. Dinaledi Schools

Dinaledi schools		
Marketing	**Relationship**	**Distribution**
Visits	Telephonic Support	Office
Flyers	Free Troubleshooting	Telephone
Office Branding	Stationery Sales	DoE Procurement
Community Launch		
Word of Mouth		
Network meet with DoE		
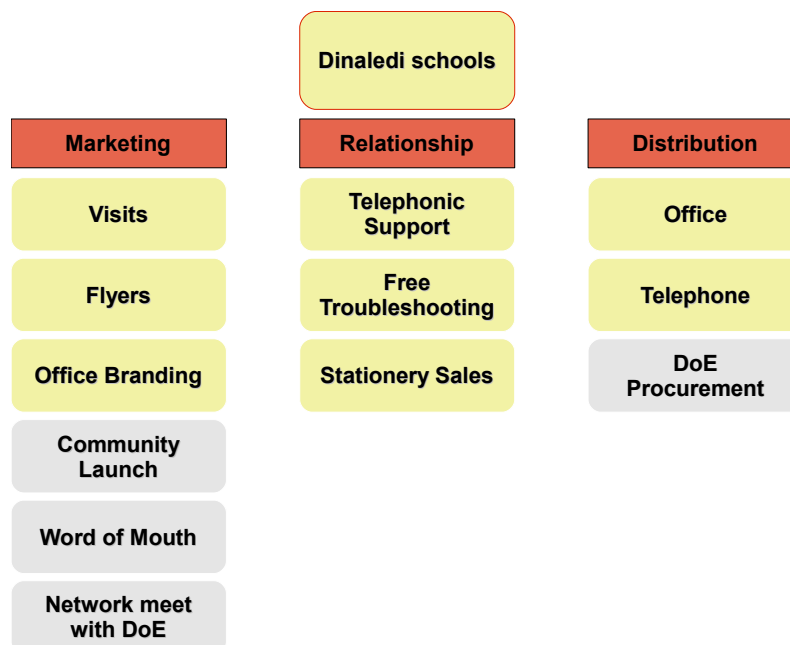
Dinaledi schools are the primary customer segment, so it is important to have effective channels to reach them. One-to-one visits will be important to explain the services and establish trust. Flyers will also serve to increase their awareness of what the Village Operator is offering. A prominent office location and effective branding would keep the VO in the customer consciousness.

The network would be needed to meet with the Department of Education so that they can advocate for the VO services from their side. This might also result in the DoE procuring services for the schools directly. An official launch might also serve to improve the profile of the project through the involvement of VIPs, and word of mouth can also be expected to reach new customers if the existing customers are happy with the services.

Once established, the relationship is maintained through telephonic support, troubleshooting support and stationery sales. Customers can access services by visiting the VO office, by calling the VO, or DoE procurement via the network.

The channels used for non-Dinaledi schools will be the same as those indicated here.

B.4.2. Other Government Offices

Other Government Offices		
Marketing	**Relationship**	**Distribution**
Visits	Telephonic Support	Office
Flyers	Free Troubleshooting	Telephone
Office Branding	Stationery Sales	Govt. Dept. Procurement
Community Launch		
Word of Mouth		
Network meet with Govt. Dept.		
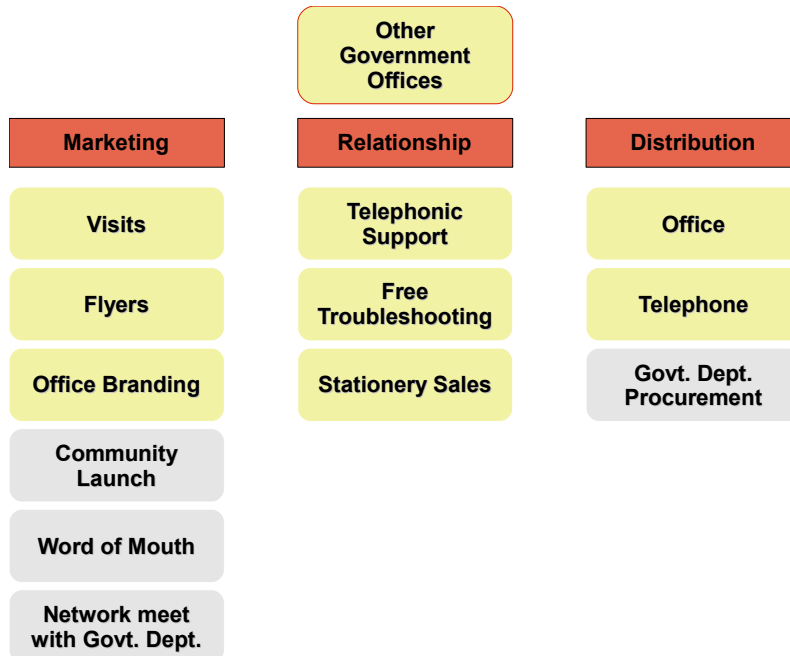
The relationships for other government offices (municipal offices, clinics, police stations, etc.) will be very similar to those of schools, except that the network would need to meet with each individual government department. This would only really make sense if they were advocating for a number of clusters, not just one.

B.4.3. Local SMMEs

Local SMMEs		
Marketing	**Relationship**	**Distribution**
Visits	Telephonic Support	Office
Flyers	Free Troubleshooting	Telephone
Office Branding	Stationery Sales	
Community Launch		
Word of Mouth		
Community Meetings		

Personal visits and relationship building are perhaps more important for local SMMEs, since this customer group probably has the most decision-making autonomy of all the clients. There is little role for the network in this case, since the SMMEs have only a local presence. In the future, there may be the potential for additional services to be delivered with the network as the channel.

B.4.4. Local Franchisees

	Local Franchisees	
Marketing	**Relationship**	**Distribution**
Network meet with Franchisor	Telephonic Support	Office
Flyers	Free Troubleshooting	Telephone
Office Branding	Stationery Sales	Franchisor Procurement
Community Launch		
Word of Mouth		
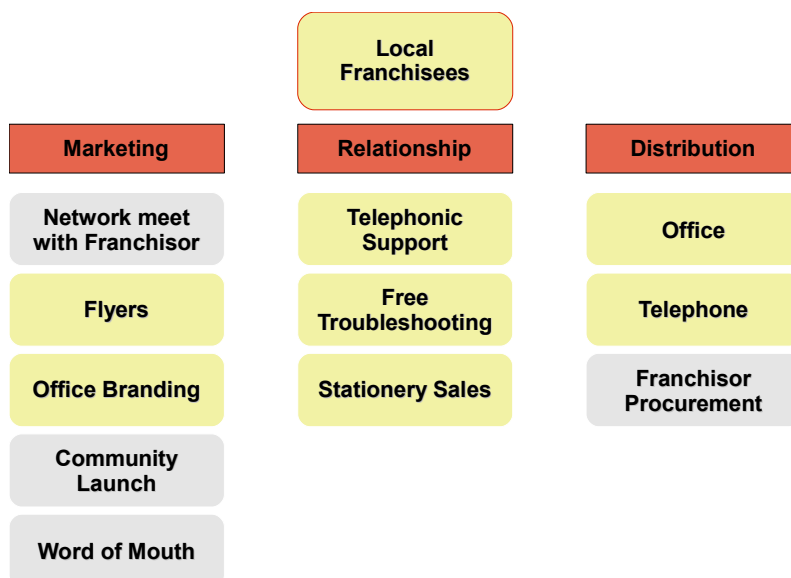
It will be difficult for Village Operators to convince franchisees to use their services, because the decision-making is usually done by the franchisor. The network (possibly Master Village Operator) will need to play a strong role in convincing the franchisor to use their services.

B.4.5. Private Individuals

	Private Individuals	
Marketing	**Relationship**	**Distribution**
Flyers	Telephonic Support	Office
Office Branding	Free Troubleshooting	Telephone
Community Launch	Stationery Sales	
Word of Mouth		
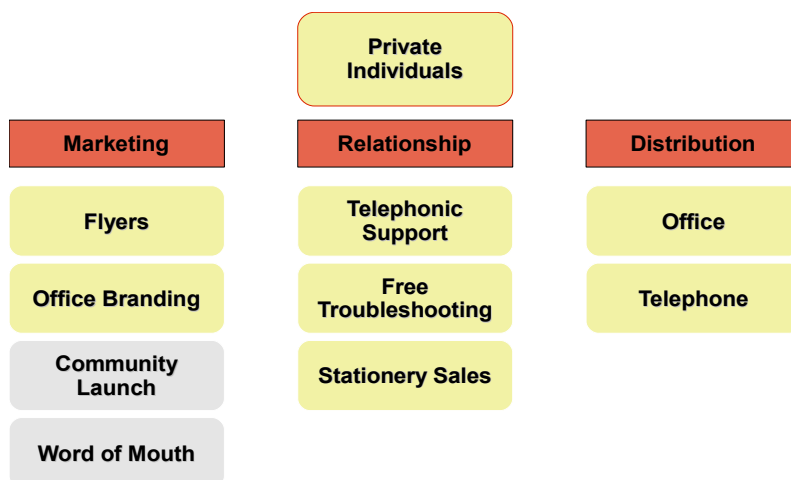
It won't be possible to do direct marketing to private individuals. These clients will have to find out about the services through fliers, office branding and word of mouth. A prominent office location would be most important for this customer segment.

B.5. Revenue Streams

It is impossible to quantify revenue streams without a better formulation of the services, and a far more developed picture of the market. At this stage, all that can be considered is the nature of the revenue that might be expected for the different services.
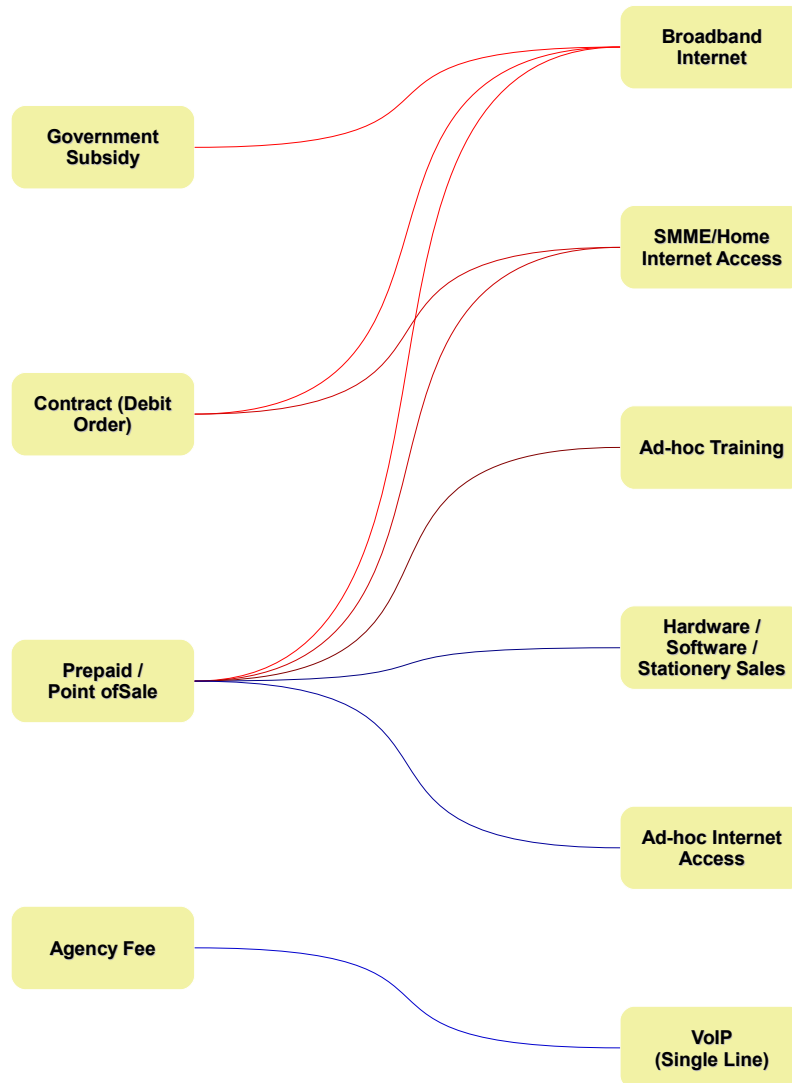
The different revenue forms that are anticipated are as follows:

- *Government Subsidy*. If the costs of providing services to government institutions (including schools) is higher than what the institutions can afford to pay themselves, it may be possible to convince government that the benefits to the community and society would still be greater than the costs, so that they would pay part of the costs as a subsidy, with the institution paying the balance.

- *Contract*. The best scenario for the Village Operator would be to have a contract with the customer so that they are legally obligated to make regular payments for services. Ideally, payments would be taken directly from the customers' accounts by debit order.

- *Prepaid / Point of Sale*. It is likely that many potential customers would only be willing to pay on an ad-hoc basis as they can afford it. This would be done in cash, probably at the Village Operator office. To protect the VO from financial risk, the service would need to be paid up-front. Stationery, Desktop Publishing and other incidental services would also be paid in this way.

- *Agency Fee*. For VoIP and other services where the Village Operator acts as an agent for an external organisation, the bulk of the payment would go to the service provider, but the VO would receive a commission payment from them.

B.5.1. Key Resources
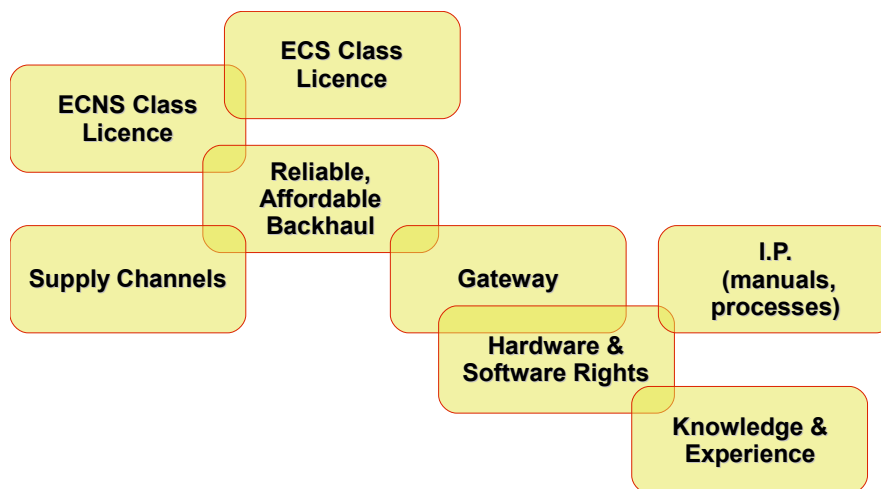
The Village Operator would be relying on a number of vital resources in order to provide their services. Without these being in place, many of the services would not be viable. Note that the clustering in the above diagram is only loosely by association, and no greater relationships should be inferred.

- *ECNS Class Licence*. By law, an Electronic Communications Network Services (ECNS) licence is required in order to install network equipment of any sort. The class version of the licence enables the licence-holder to operate within a Local or District Municipality area.

- *ECS Class Licence*. In order to provide telecommunications services over any network, the Village Operator will need to be in possession of an Electronic Communications Services (ECS) licence. The class version of the licence precludes access to the national numbering plan.

- *Reliable, Affordable Backhaul*. Many of the broadband services rely on Internet access. The Village Operator will thus need to have a reliable connection that can link the mesh to the wider Internet, at a cost that is reasonable when averaged across the customers.

- *Gateway*. The gateway unit is essential for customer and network management.

- *Hardware and Software Rights*. The mesh network is built on a complex hardware and software platform, involving the work of many collaborators. Without the rights to use this system, the VO could not establish a network.

- *Intellectual Property (manuals and processes)*. The Village Operator does not have sufficient skills and experience in the industry to perform all of the activities that are required to be a Village Operator. They will need to have some of these activities codified in documents that they can follow, or the enterprise would not be able to function properly.

- *Knowledge and Experience*. Despite having access to process documents, the Village Operators still require some knowledge and experience to be able to function in the role of a Village Operator.

- *Supply Channels*. The Village Operator will need to be able to get supplies from larger centres, and these supply channels must be established and protected. Supply channels will be needed for stationery and general hardware and software sales, as well as for the more specialised equipment that is needed to build the mesh. A third channel will be needed to ensure that Internet access is reliable.

B.5.2. Partners
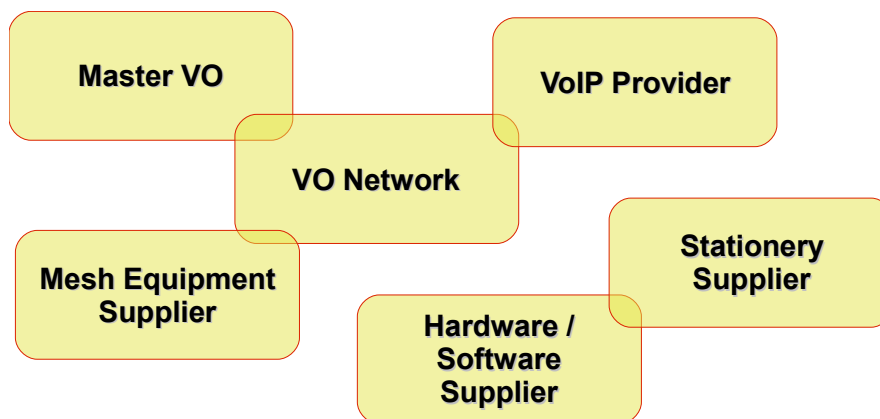
The partners are the external entities that are required in order for all the Key Activities to be performed. The diagram above provides an indication of who these partners would be. The clustering is only loosely by association, and no greater relationships should be inferred.

- *VO Network*. The Village Operator Network is required for many essential functions, including access to the hardware and software needed for the platform, operating processes and training, mentoring and technical support. Many of the establishment processes must also be performed by the network. It is assumed that the legal processes of establishing the Village Operator will be facilitated through the network, and that accounting and financial reporting processes will also be performed by the network. The network is also needed for facilitating the establishment of relationships with some customer segments at a national or provincial level (eg. Department of Education), and for the development of new services (particularly when the services are delivered with the network as a channel).

- *Master VO*. The Master Village Operator is needed for mentorship and some technical support activities. They will also be required for establishing relationships with potential customer segments at a Local or District Municipality level, and

could also provide complimentary services that are beyond the skills of the Village Operator (accredited training, website development and computer networking could be examples).

- *VoIP Provider*. The Village Operator will have an ECS Class licence, which does not allow for the allocation of phone numbers to customers. They will have to partner with a service provider who is able to allocate these numbers.

- *Mesh Equipment Supplier*. The High Performance Nodes and Linksys routers running the mesh protocol will need to be assembled and delivered to the VOs when needed. This may be performed by the Network, but it is assumed at this stage that it will be a third party.

- *Stationery Supplier*. Stationery sales will be a relatively simple service, but the VO will need to have a relationship with a reliable supplier.

- *Hardware / Software Supplier*. Basic hardware and software sales may be viable, but stock would probably need to be sourced from a different supplier to stationery.

B.5.3. Key Activities
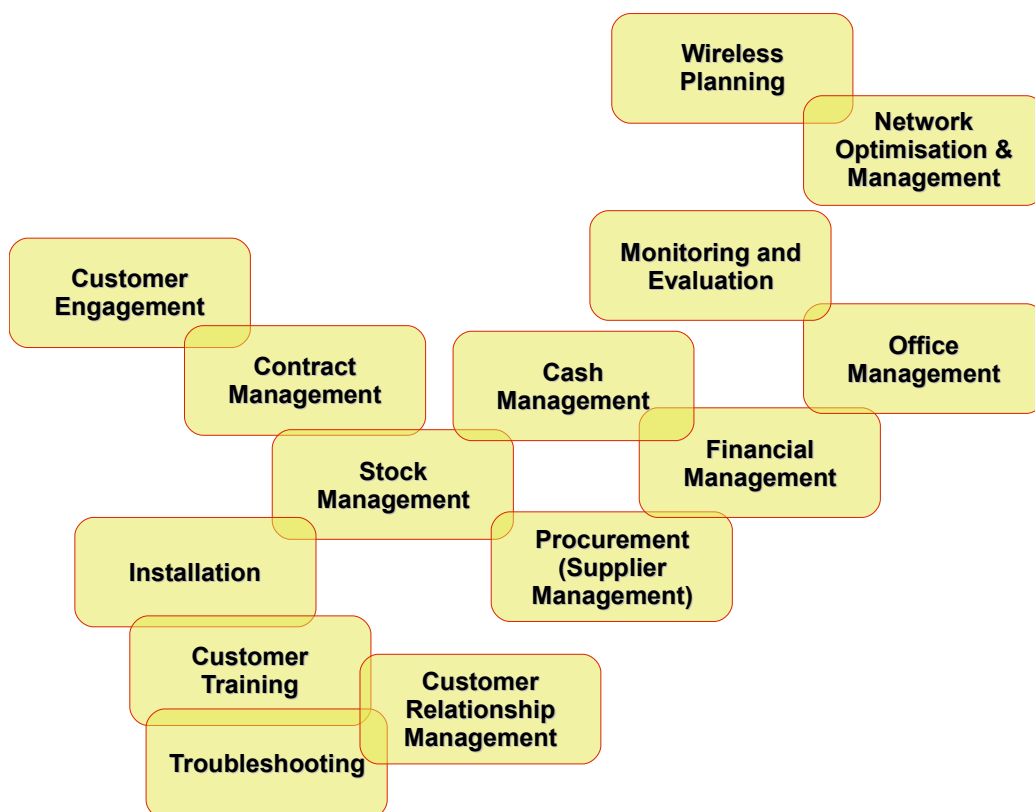
The main activities that the Village Operator will need to perform are given in the diagram above. Each of these should be governed by processes that are either encapsulated in software, or codified in manuals.

- *Wireless Planning*. This is the process of working out how a new customer can be connected to the mesh. It includes concepts such as sightlines, range, antenna selection and gain, power supply and physical security requirements.

- *Network Optimisation and Management*. Includes the monitoring and tweaking of the network to ensure optimum performance for all customers.

- *Installation*. The physical installation of the necessary hardware and software at the client's location.

- *Customer Training*. Giving the customer the necessary training to be able to use the services of the Village Operator, as well as the transfer of skills that are needed by the customer to perform their own functions more effectively (how to use email, word processing, etc.).

- *Troubleshooting*. Diagnosing and dealing with technical problems that are affecting customers and the network. This activity may be performed by the Village Operator, the Master Village Operator or Network, depending on the nature and severity of the problem.

- *Customer Relationship Management*. This includes all activities that are necessary for ensuring that the customers are happy with the services they are receiving.

- *Customer Engagement*. The process of engaging with customers to convince them of the value of the Village Operator's services. It may include direct engagement (visits) or indirect marketing (flyers, etc). The Village Operator, Master Village Operator and Network will all be involved at different levels.

- *Contract Management*. The process of negotiating services and terms with clients, and ensuring that all commitments are followed through on both sides of the agreement. Includes followup on late payments and the termination of services to non-paying customers.

- *Stock Management*. Ensuring that there is sufficient stock on hand for day-to-day sales and office use, while not tying up too much capital in slow-moving items. Includes regular counts to protect against theft and account for losses.

- *Procurement*. Managing the process of ordering materials when stock levels are too low, and ensuring that delivery is efficient. Making sure that payment is made promptly and maintaining communication to ensure a smooth relationship.

- *Office Management*. Maintaining a smooth operating environment through communication and partnership building, planning and decision-making, and effective leadership.

- *Financial Management*. Ensuring that all costs and revenues are properly accounted for, and are in balance, as well as having a good awareness of the financial position of the business. Includes whatever financial reporting may be required.

- *Cash Management*. Effective management of petty cash and till moneys, and banking the daily takings of the enterprise.

- *Monitoring and Evaluation*. Tracking the performance of the enterprise in order to evaluate and align services to strategic objectives, and to refine and improve services to be more relevant to the customers.

Appendix C. Abbreviations and Glossary

BB4ALL – Broadband 4 All™. A collaborative effort spearheaded by the Meraka Institute to bridge the digital divide and bring the social and economic benefits offered by broadband connectivity to rural communities in South Africa and other developing countries. The objective of the project is to offer broadband access to rural communities in an affordable and sustainable fashion.

cluster – the area covered by a Village Operator, and which defines his or her market.

CRM – Customer Relationship Management

CSIR – Council for Scientific and Industrial Research.

Dinaledi schools – schools participating in a South African Department of Education initiative to make science and mathematics more accessible at higher-grade level in disadvantaged schools.

DoE – Department of Education.

DST – Department of Science and Technology.

EC – European Commission.

ECNS – Electronic Communications Network Services.

ECS – Electronic Communications Services.

EMIS – Education Management Information System. A system which supports the collection and analysis of information relevant to education planning.

GIS – Geographic Information Systems. Computer applications which are designed to analyse spatially referenced data.

HPN – High Performance Node. A device developed by the Meraka Institute to enable high performance mesh networking.

ICT – Information and Communications Technology.

ISP – Internet Service Provider.

LURITS – Learner Unit Record Information Tracking System. A system which stores and manages learner data, tracks learners who move from one school to another, and identifies learners who have dropped out of the education system.

wireless **mesh** – a wireless network topology based on intelligent protocols that extends network connectivity by relaying signals between nodes that are within range of each other. It is self-forming, in that the protocols establish the links and routing automatically, and self-healing, in that the routing is automatically recalculated if one of the nodes goes dead.

MVO – Master Village Operator. An individual who provides mentorship and business or technical assistance to Village Operators in a defined area.

Network or **Village Operator Network** – the supporting structure that provides the high-level relationships, infrastructure, processes, services and support necessary for the effective functioning of the Village Operators.

NGO – Non-Governmental Organisation.

POS – Point of Sale.

SMME – Small, Medium and Micro Enterprises.

SWOT – Strengths, Weaknesses, Opportunities and Threats. A strategic planning method that can be used to analyse factors that are either favourable or unfavourable for the achievement of an objective.

VO – Village Operator. A community based ICT SMME providing connectivity using wireless mesh network technology according to the model being developed by the BB4ALL project of the Meraka Institute. The term can refer to either the enterprise as a formal entity, or to the individuals operating the enterprise and providing the services.

VoIP – Voice over Internet Protocol.