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## **DECLARATION**

I declare that this project work as presented in this paper is my original work and has not been presented anywhere else for any degree, diploma or award.

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## **ABBREVIATIONS**

1. **OVC** - Orphans and Vulnerable Children
2. **DCS** - Department of Children's Services
3. **UNICEF** – United Nations International Children's Emergency Fund
4. **ID** – Identification
5. **SMS** – Short Message Service
6. **HIV** – Human Immunodeficiency Virus
7. **ROI** – Return on Investment



## **CHAPTER ONE: INTRODUCTION**

### **1.1 Introduction:**

According to a survey done, there are more than 2.3 million children in Kenya who have ended up losing one or both parents (Skovdal et al., 2011) . These numbers have been increasing over the last years from an approximate of 1.4 million orphans in the year 1998 to 2.4 million in 2007(Article, 2008). Another study done in Meru county (Kiambi, 2017) describes the vulnerable children and associates them with factors like and not limited to; lack of clothing and shelter, lower school enrolment rates and poor school participation, malnutrition, sickness and drugs and substance abuse.

There have been efforts from the government and even the community at large, to come up with ways of helping these children since most of them are usually under the age of eighteen years and cannot be able to fend for themselves. Most orphans are usually located in Orphanages or Children's home.

Despite these initiatives to help provide basic needs for the orphans which include, but not limited to; food, shelter, clothing, good health care and education, most orphans are still not able to access these kinds of support.

The government of Kenya came up with a Cash Transfer Program (John H . Bryant Source, 2009)to assist the neediest amongst those orphaned by giving them funds to help them acquire the basic needs they need. A big limitation to this program is that not all the children's homes in Kenya are able to access these funds as the scope of this project was not wide enough.

Given a scenario where well wishers and donors want to make a donation to these Orphanages, some of them tend to donate to the Orphanages within their locations or to those where their colleagues, family or friends are acquainted with. Some of the donors would want to help Orphanages which are located thousands of kilometers away from them, but since the physical distance will be far and expensive to access by use of transport means, they tend to forfeit that idea and just give the donations to Orphanages that are locally available to them. In regards to

the kind of commodities the donors want to donate for example clothes, you tend to find that they don't usually have full knowledge of what the Orphanage specifically requires unless they get into contact with the caregivers running that Orphanage to make inquiries. In most cases where inquiries are not made, the donor may find that they have; for example, brought clothes for a one-year old baby, but the Orphanage could have the youngest child being three years of age.

These problems can be averted by using a system that gives a platform to the donors and Orphanages where they can interact, such that, the Orphanages locations are given and a need list of what each Orphanage requires is displayed, so that the donor is able to know the exact location of the Orphanage and the specific needs of each Orphanage so that they are able to make a specific donation and even help out Orphanages in a completely different location from them.

## **1.2 Background of the Study :**

### **1.2.1 Background:**

It is supposed to be human nature for those who are well off in the society, to help those who are less fortunate whom in this case are the Orphans and Vulnerable Children in our communities. According to a study done by Dorcas Nthenya Mutiso and Dr. Pius Mutuku Mutie (Mutiso & Mutie, 2018), a majority of Orphans and Vulnerable Children tend to dropout because of the following reasons; 55% are due to sickness, 16.0% due to poor performance, 22.0% due to lack of school uniform and 7.0% was so as to care for their sick guardians. Many a time, these vulnerable children and orphans are forced to be street children, so that they can fend for their needs on their own, as a result of lack the help from the society(Desmond & Gow, 2001).

In order to avoid these social disruptive behaviors from these children, programs like and not limited to Cash Transfer Program, were started by the government to help on providing funding to these vulnerable children. This program did target a number of households to be beneficiaries but still more vulnerable homes have not yet been helped. However, this gap can be minimized by use of technology which can act as a joining factor to the orphanages and well wishers so as

to widen the scope for the outreach to even orphanages that are located in the interior of communities which deem them inaccessible to such kind of help from well wishers.

### **1.2.2 Overview of existing system:**

The government has helped to chip in by providing services such as access to free health care for children, access to free education etc. (John H . Bryant Source, 2009) There are also programs that have been put to place by the government that are an effort to address the needs of the deprived people and mostly the orphans in the society. But these programs have faced challenges more so in selecting recipient households and orphanage institutions that require those programs since the number of orphans in need were more than 2.4 million according to the statistics gotten.(Article, 2008)

There are existing self-help group programs e.g. merry go round funding, to strengthen the ability of caregivers. The money is used to help support the business ideas to minimize dependencies and help also in the long term support.

There are also other initiatives such as cash transfer for the Orphans and Vulnerable Children (OVC) in the society and the government.(Article, 2008) according to this journal, there are still some children who have not been able to be selected for the cash transfer program and also there are those homes that have been inspected and registered by the Department of Children's Services (DCS), but yet there seemed to be no available data on the numbers of children resident in each home and on the children's status so as to be able to conduct an assessment as to whether they really needed to be there. The same case also happened for homes that were unregistered under the cash transfer program.

This Cash Transfer Program that is funded by the government, is only able to assist a small fraction of those who are in need of the help(John H . Bryant Source, 2009). According to the same literature, in 2004 when the Cash Program was first proposed, its primary goal was to foster and take care of the Orphans and Vulnerable Children (OVC) and also support their development. This program was rolled out in phases for purposes of scalability after each phase. Based on the guidelines provided by UNICEF, the community was able to select the families that would be beneficiaries of these programs. After selection, a list was compiled and finally agreed upon in open barazas that were the public meetings held. It was a requirement that for the homes

listed, the home had to have an OVC. Funds were then transferred from the UNICEF bank to the ministry of Home affairs to a government bank that was at the district level from where the responsible District Children's Officers withdrew the funds and then disbursed the funds to the families. At first, there were no conditions put in place on how the families used the money, but after the first phase, it was suggested that conditions be put in place to regulate how the families would use the money so as to help them take care of the most pressing needs first such as ensuring that the under aged children (below eighteen years) in the family get to go to school and are able to access basic needs such as food and proper healthcare. By the end of the year 2015, when the full scale program was to be achieved, it was targeted that a total of 300,000 families spread across 74 districts, would be benefiting from the program. Given that there was an estimate of over 2.4 million orphans in Kenya, the number of people not benefiting from this program was high.

### **1.2.3 Overview of the proposed system:**

The proposed system will be a web-based application that will allow children's home in a region to sign up and get unique ID's assigned to each of them. Each children's home will be required by the system to provide details such as physical location address, emails, phone number to contact, photos etc. They will then be able to display a 'need list' indicating what they require in form of the following; clothing's, food, toys, money for access to education etc.

This need list will be categorized in form of priorities and urgencies e.g. the cold season, the section of clothing's can have "warm jackets needed" as first item in the list, then others like "summer dresses needed" can be last in list.

The web-based application should also allow people to track children's homes near their location. Well wishers or donors will first register and get assigned unique ID's to uniquely identify them and then they can select which children's home they can donate to. There can be an option of choosing more than one children's home thus benefiting the children's home that are going to receive these donations since more of them can gain the support at the same time. The donor should be able to select which of the needs in the 'need list' they can help with through giving donations. The donors can decide to donate physical goods such as clothing's or just chip in electronically and the money distributed to the children's homes.

The app can partner with logistics brands to transport food or clothes to the registered children's home to which the donor has sent them to and also have pickup stations for the donations they get and be able to notify both the donors and the recipients when the donations arrive at the destinations intended through emails or SMS.

The benefit of this system is that the public or the community will be sensitized on the needs of these children's homes and give them a platform for them to take part in helping and provide a solution to the challenges that are there in the children's homes. This will in turn help these children's homes to effectively give proper care to each child that they house.

### **1.3 Problem Statement:**

Over the years, the country has seen a high increase in the number of orphans yet the number of available resources to help them remain limited (Naushad et al., 2019) , and as a result, there have been challenges in coming up with sustainable ways to help the orphans and vulnerable children with basic needs such as food, clothing, shelter and medical care. Projects are already existing (Kiambi, 2017) like building of more children's homes but still some of these children end up spending nights on the floor, with little food to feed on, inadequate medical care, some attend informal school lessons in non-equipped classrooms, while others are forced out of school due to lack of school fees and some walk bare-footed and partially naked for lack of clothing.

The aim of this study is to come up with the best and effective practice models in the care of orphans and vulnerable children in the society for long term effects through donations of all kind that they get from well wishers and donors. This study should more so target children in homes and institutions that are not under the cash transfer program that already exists in Kenya (John H. Bryant Source, 2009).

### **1.4 Objectives:**

#### **1.4.1 Project Goal (Major Objective) Overall Goal:**

The goal of this project is to come up with a way to provide detailed information that is useful in planning the allocation of resources according to the specific needs of the orphans to better their care and living standards. The orphanages will be able to specify what they require urgently to

avoid a scenario whereby they get donations of items they already have, since all of them have different needs. This will be developed as a web based application that will provide a platform to facilitate this.

#### **1.4.2 Specific Objectives**

1. To develop a web-based application by which children's homes can set their location and specify what they need, and the donors can donate to them.
2. To investigate if every children's home can be accessible using the given location features.
3. To enable integration of online payments like Mpesa to facilitate transfer of cash to the children's homes.
4. To integrate the location feature to identify children's homes signed up.
5. To enable the donors to be able to see the need list of each specific children's home.

#### **1.5 Justification:**

The system will provide the following benefits to the users involved:

- i. The Children's homes
  - a. They will be able to specify the items that they urgently require at given times and seasons according to their needs.
  - b. Well wishers will be able to know their existence as the locations to access them will be given.
  - c. They can minimize the chances of getting donations that they are not in need of for example, if they do not need clothes for a one-year old since they do not have children that they care for in that range of age.
- ii. The Donors
  - a. They will be able to minimize costs like travel costs that they would have incurred if they wanted to physically visit a children's home that was too far from their location.
  - b. They will be able to make donations to more than one children's home at the same time should they desire.

- c. They get to find children's home that are nearest to their location so that they can give physical donations.
- d. Saves them on time used to make inquiries on what they can give as donations as it will be displayed in the need list of each children's home.

## **1.6 Scope of the Study:**

### In Scope

The web-based application will be able to do the following:

- Use the location feature to make viable children's homes accessible.
- Register the children's homes.
- Be an interactive space for children's homes and donors.
- Enable donors to register so that they are able to sign in whenever they please.
- Provide money transfer options like Mpesa.
- To generate a 'need list' that is going to be specific to the needs of each of the children's homes in regards to what they want.
- Transport companies will be able to have their service profiles linked to the application.
- Give the donor an opportunity to select more than one children's home to give their donations.

### Out of Scope

- Achieving the goal of reaching the entire country to access the children's homes will be difficult within the set timeframe of when the project should be done.
- Getting the location of children's homes in the interior within the timeframe of this project may prove to be difficult.
- Communicating with areas that have little or no network coverage is a problem that would require help from communication companies.

## **1.7 Limitations of the proposed system:**

- Reaching children's home in the interior may prove to be difficult as we would need ;
  - a) Manpower

b) Finances to pay them.

- The local terrain may also make it difficult to access some areas.
- Since it is based on the assumption that every institution has at least a phone to access and register, those without may be left out.
- Setting up pickup stations for children's homes in the interior may become a challenge in terms of: high charges to deliver the donations, inaccessible roads to get to the children's homes, lack of a local shopping centre where one can be set up etc.
- Bias on choosing the sample group to participate in the study.

### **1.8 Project Risk and Mitigation:**

- Laptop device may crush- This is mitigated by constantly checking the operational status of the laptop to ensure that it is optimized at all times and also having a back-up.
- Viruses and malware attack- This risk can be caused by access to the internet as it will be a web based application and external injections of malware and viruses by inserting flash drives that are infected. This risk will in turn cause the loss of data or even data about the project being stolen from the laptop. This risk can be mitigated by ensuring an antivirus is installed in the laptop.
- Being robbed- This involves the possibility of the laptop containing the project being robbed. It can be mitigated by ensuring that there are several back-ups at different locations containing the same project for example, flash drive, CD, cloud etc.
- Safety of manpower- In regards to obtaining data to verify these children's homes. It can be mitigated by liaising with local authorities such as the chief's office to ensure their safety.



## 1.9 Project Schedule:

This project will take a minimum of six months to develop and come up with a full and working solution in form of a system.

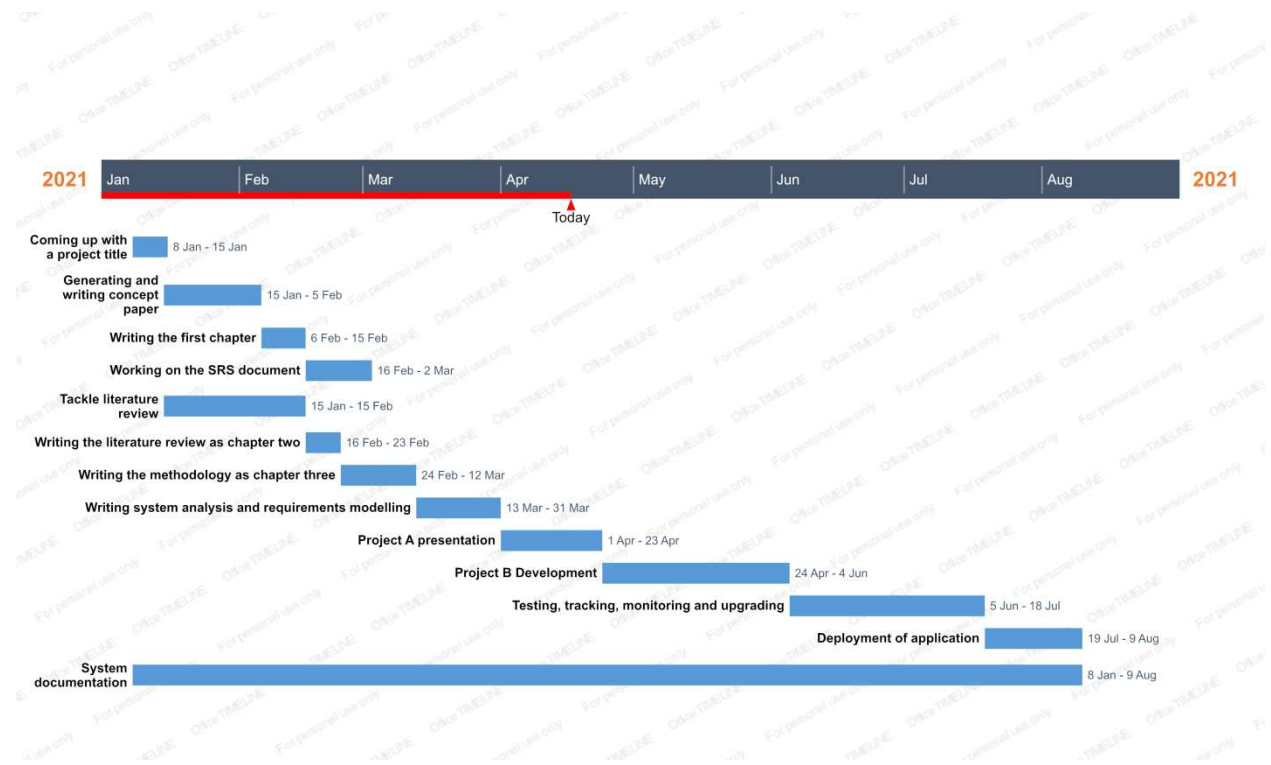


Figure 1: Project Schedule

### 1.10 Budget and Resources:

RESOURCES	DESCRIPTION	SPECIFICATIONS	UNITS	PRICE
Laptop	For the coding of the web-based application	Minimum requirement of a HP core i5, RAM 4 GB and storage space of 500GB	One	Ksh 40,000 (Available)
Mobile phone	To do testing	Smartphone	One	Ksh 20,000
Internet access	To facilitate access to online features	At least 25 Mbps	-	Ksh 4,000 monthly
Cloud backup storage	To back up the progress of the web-based application	At least 15 GB	-	Ksh 3,000
Antivirus	To protect the laptop from viruses that may destroy the data	Kaspersky anti-virus	One	Ksh 2,000
Miscellaneous	Typing, printing cost throughout the project	-	-	Ksh 5,000
Manpower	To verify children's homes mostly the ones in the interior	-		Ksh 1,000 per day for approximately 15 days
TOTAL				=Ksh 89,000

Table 1: Budget and resources

## **CHAPTER TWO: LITERATURE REVIEW**

The idea of creating applications to ease the process of donations to various children's homes is not a new one. In this section, we are going to analyze the existing systems put in place, to help the Orphans and Vulnerable Children (OVC's), and provide solutions to errors in order to help build a better system.

### **2.1 Reviewed Similar Systems**

#### **2.1.1 The Cash Transfer Program in Kenya**

(Njeru, 2019) This program dates back to 2004 when it was first introduced and rolled out in Kenya. Given that in for example Isiolo County, the determinant factor leading to the high number of OVC's in the county is the number of HIV prevalence in the country that is at 4.2%.

This program was rolled out in phases for purposes of scalability after each phase. Based on the guidelines provided by UNICEF, the community was able to select the families that would be beneficiaries of these programs. After selection, a list was compiled and finally agreed upon in open barazas that were the public meetings held. It was a requirement that for the homes listed, the home had to have an OVC. Funds were then transferred from the UNICEF bank to the ministry of Home affairs to a government bank that was at the district level from where the responsible District Children's Officers withdrew the funds and then disbursed the funds to the families. The program was either conditional or unconditional based on ways of ensuring the regulation of how the families would use the money so as to help them take care of the most pressing needs first such as ensuring that the under aged children (below eighteen years) in the family get to go to school and are able to access basic needs such as food and proper healthcare.

#### **2.1.2 Helping Hands- An android based donation system**

Helping Hands (Sai & Elapanti, 2018), is an android based application developed to aid in the donations of pre-owned items and money to Orphanages, Old age homes and non-profitable organizations that are listed in the system. For pre-owned items that want to be donated, they appoint an individual to come to the specified address of the donor and collect the items then deliver them to the respective orphanages. For those making donations in form of money, the

application provides a direct portal that is available to donate to the orphanages. They make sure that only the orphanages in the valid list are able to get the donations.

This platform also allows the tracking of orphanages that are around. Whereas there are a lot of benefits seen to this application in the form of easing the process of donations, it however proves to be a challenge in terms of security. This is in terms of the donor having to share their locations so that the pre-owned clothes can be taken and sent to the destined orphanages.

### **2.1.3 Support Orphans - Location Based Orphanage Finder Application for Google Android Phones**

This application (Muthuselvan, 2018) is available for android phones users, developed to curb the issue on how the wastage of foods and unused clothes has been increasing yet the needs of the helpless people is increasing too. This application provides data about the inspiration to come forward to donate easily as well as without waste of the donor's money in the form of time.

It allows the donor to donate by posting in the application through notification and also tracking the location of the orphanage. The input to the system is the information added by the donors in response to them wanting to make donations to the users whereas the output is the response the users get from the donors in response to the items they requested for and also accepting them.

## **2.2 Tools and Methodologies used in Reviewed Systems**

### **2.2.1 The Cash Transfer Program in Kenya**

(Huang et al., 2017) This program used a two-step verification process to enroll OVC's into the program. This process begins with identifying of households in the community based on known and observable poverty measures. For a household to qualify to be legible, they have to meet the following requirements: a) having the presence of one OVC of under eighteen years of age who has at least one parent who is deceased or chronically ill, or whose main caretaker is chronically ill b) being extremely poor c) not receiving aid from any other social program at that moment.

To determine whether a household was leaving under extreme poverty status, analysis was done based on: asset measures like the possession of less than two acres of land, low educational acquirement or unemployment of the adults living with the vulnerable children etc.

Community-based targeting was also employed and Location OVC Committees (LOC's) formed which comprised of members from each community under study. The members of the LOC's are then provided with information about the eligibility criteria to use and are asked to identify potentially eligible households based on these criteria's and their knowledge of community membership. Later on, follow up visits are made by the program and if considered eligible, households are invited to apply to be beneficiaries of it. The applications are verified at the district-level and beneficiary households receive a cash transfer of roughly Ksh 2000 monthly.

#### Pros

- Used the help of chiefs and their assistants, religious leaders, teachers in the schools, elders of the village and community health workers to help identify the OVC's thus making the process flexible.
- A majority number of respondents were aware of this cash transfer program. (Njeru, 2019)The number according to this study was at 68.2% which is a relatively good number.

#### Cons

- The cash transfer funds meant for the OVC's were given through local banks and had delayed periods of up to three months before getting to the beneficiaries.
- The payments were made manually and in turn resulted to exploitation and embezzlement of the funds. This in turn does not translate to improved service delivery despite the involvement of more donations.
- The amount of money disbursed to each household was Ksh 2000 on a monthly basis despite the number of OVC's in that household, given that some would have more children to fend for as compared to others.
- This program is only eligible to children that are less than one year and have a maximum age of eighteen years. For those above eighteen years, they are left to fend for themselves even though most still have no means.

- There is still a gap of 31.8% of deserving families who were not aware of this cash transfer program(Njeru, 2019). The community requires sensitization on the existence of the program.
- The implementation mechanism used by the program is based on factors such as geographical locations, the communities and individual selection which in turn may lead to biasness when it comes to selection of the OVC's to benefit from it.

### **2.2.2 Helping Hands- An android based donation system**

This system has two modes that interact with the application: A) The donor. B) The requester. The application provides various information about the orphanages and the programs that those orphanages conduct. The system allows those willing to donate to register.

#### Pros

- Donations in form of money are directly linked to the children's homes.
- Only the children's home listed are to get the donations for transparency purposes.
- Donors get to access the children's homes around them as they are tracked.

#### Cons

- Security challenges in terms of the donor having to share their locations so that the pre-owned clothes can be taken and sent to the destined orphanages.

### **2.2.3 Support Orphans - Location Based Orphanage Finder Application for Google Android Phones**

This program has users like; Admin of the system, the donor and the beneficiary (orphanages or homes). The donor gets first a register and login module whereby they are prompted to enter the username and password if they have an account already, but if not, they are directed to the registration module form.

Upon registering successfully the details are saved in the database and the donor can access the donate foods module. This module allows the donor to mention the type of foods they want to give as donations, quantity of the foods and a time period of how long the foods can last. The donors should also clearly tell the recipients if they will bring the donations by self or they

require volunteers to pick the donations up. There is also a donate clothes module where the donor specifies; the type of clothes which they have either for children, men, women, or old people, the quantity of the clothes they will donate and the time duration of those clothes. The donors should also clearly tell the recipients if they will bring the donations by self or they require volunteers to pick the donations up as specified too in the donate food module.

The donate money module will allow the donor to donate by either the credit card or debit card option. There is also a page showing the details of the orphanages and homes listed in the app which are made visible to the donor to see by the admin. By selecting any of the homes, they can be easily located using google maps. Finally, there is a notification module whereby if the donor wants to donate the food, they can turn on the location and tick the food is available or the clothes are available and send to the receivers who will be notified.

#### Pros

- Provides the email id as optional, to cater for those who might not be email having accounts, and gives the phone number as a compulsory field to fill.
- Gives a clear option for the donor to decide the option of either dropping off the donations themselves or if they need someone to pick them up.
- Has the donate money module that allows payment through use of debit card or credit card.
- Has a selective page that displays selected orphanages using google maps once an individual option is selected.
- Has a notification module that helps the donors and beneficiaries to send or receive texts in a speech to text format useful to the illiterate too.

#### Cons

- On the page for details of the foods to be donated to the homes or orphanages, if the quantities given are not sufficient for that particular home, a reply is given to transfer the given amounts to another home or orphanage.
- The donor has to confirm whether the clothes they want to donate will be helpful for the age group of children in the orphanage and the orphanage can revert them before they receive them.

### **2.3. Gaps in the existing systems**

For the Cash Transfer program, it only allows beneficiaries who are OVC's aged from less than a year old to a maximum of eighteen years and from there the "adult" is expected to fend for themselves. This ends up pushing more OVC's to join the street families and result to begging to feed themselves or become domestic workers to get money to sustain themselves.

This program also provides a fixed amount of cash to each household benefiting from the program despite the fact that one household could actually be housing more than five OVC's for instance. The distribution of these resources and funds does not key in such factors.

Security becomes an issue whereby an individual is given the mandate to go and collect the pre-owned clothes from the donor. Given that both parties are complete strangers to each other, trust may be an issue as the donations have to be taken from the donors homes.

Transparency is also a major problem in regards to management and the individuals sent to disburse the funds donated by the government. Given that man is to error, the funds tend to be embezzled since they have to go through a number of authoritative people before reaching the beneficiary homes thus making the whole project lose its purpose which is to help the OVC's and support them.

### **2.4. The proposed solution**

The proposed solutions to the previously discussed challenges include:

- a) Coming up with be a web-based application that will allow children's home in a region to sign up and get unique ID's assigned to each of them. Each of the children's home will be required by the system to provide details such as physical location address, emails, phone number to contact, photos etc. This will help get rid of the biasness involved when selecting beneficiaries in terms of their geographical locations as seen in other systems.
- b) The children's homes will then be able to display a 'need list' indicating specific details of what they require in form of the following; clothing's, food, toys, money for access to education etc. This will help curb the problem of deciding the amount of resources allocated to each individual children's home. This need list will be categorized in form of



priorities and urgencies e.g. the cold season, the section of clothing's can have "warm jackets needed" as first item in the list, then others like "summer dresses needed" can be last in list.

- c) The web-based application should also allow people to track children's homes near their location. Well wishers or donors will first register and get assigned unique ID's to uniquely identify them and then they can select which children's home they can donate to. There can be an option of choosing more than one children's home thus benefiting the children's home that are going to receive these donations since more of them can gain the support at the same time.
- d) The donor should be able to select which of the needs in the 'need list' they can help with through giving donations. The donors can decide to donate physical goods such as clothing's or just chip in electronically and the money distributed to the children's homes.
- e) The app can partner with logistics brands to transport food or clothes to the registered children's home to which the donor has sent them to and also have pickup stations for the donations they get. This option factors in improved security as the donations do not necessarily need to be gotten from the donor's home. The application should be able to notify both the donors and the recipients when the donations arrive at the destinations intended through emails or SMS.

By allowing the community members to take part and be stakeholders in this platform through sensitization, they can get to more effectively provide a solution to the challenges that are there in the children's homes, which will in turn help these children's homes to effectively give proper care to each child that they house.

## CHAPTER THREE: METHODOLOGY

### 3.1 Methodology and tools

Methodology refers to the specific procedures that are usually adopted in research in order to help collect, identify, select, assemble and analyze information about their particular area of study.

This chapter will focus on the methodology that I intend to use in my project and the various tools that will be used to analyze the data.

#### 3.1.1 Methodology

For this project, Agile Methodology will be used. This methodology offers an iterative approach to the design and development of the software project.



Figure 2: Agile Methodology

The methodology consists of the following phases:

1. Concept

This phase will deal with envisioning of the project, determining the viability of the project and determining the feasibility of the project in relation to technical feasibility, economic feasibility and operational feasibility.

2. Inception

This phase involves initiating the project and prioritizing it by allowing for requirements modeling through defining the user requirements. The initial architecture is also developed.

3. Construction iterations

In this phase, working closely with the users to improve communication will be key. The functionalities of the system will also be implemented in order of priority to allow for

possible changes of requirements afterwards. Confirmatory testing will also be done as a part of testing, and end goal will be to deliver a working system that will meet the changing requirements the user has.

#### 4. Transition

This phase, final testing of the system will be done and release of the application to the users to give room for reworking on the application in the case of errors found that need fixing. There will be finalization of the documentation and training of users and other necessary staff on how to use the system.

#### 5. Production

The goal of this phase will be to allow the system to keep running and keep offering assistance to any of the users in regards to how the system should work.

#### 6. Retirement

This phase involves the removal of the final release of the project.

Reasons for using agile methodology:

- a. It will be responsive to change in the requirements of the project and errors can be fixed in the middle of the project.
- b. It will make it easier to cope with the changes due to the constant feedback needed in the system and also due to short sprint or iteration. This will also give users early access to the application.
- c. There development process will be clear as frequent updating on the progress of the project is needed to be done.

### **3.1.2 Tools to be used in the methodology**

This methodology will be able to utilize a number of tools to show the conceptual and logical flow of the processes in the application.

#### a) Use case diagrams

They will be used to describe the interaction between the system and the external world who are users represented by actors. This diagram will represent the actions and steps that the actor will take to get the benefit of interacting with the system. These diagrams will be designed using an open source tool called Lucidchart.

b) Flowcharts

They will be used to show the breakdown of the systems processes e.g. from the time a user signs up, to them being registered if successful etc into logical parts that are going to be easily understood by the users. They communicate the steps in a project efficiently. They will be drawn using an open source tool for drawing flow charts called Lucidchart.

c) Data flow diagrams

They are traditional visual representations of how the information is going to flow through the application. It will show how data will enter and leave the system and also where the data is stored. The design of these diagrams will be done using an open source tool called visual paradigm.

### **3.2 Source of data**

In order to properly develop this project, it is necessary to collect data from different sources both primary and secondary.

#### Primary Sources

Primary data refers to information obtained firsthand on the variables of interest for the specific purposes of study. The sources I will employ will include; interviews, questionnaires and observation.

#### Secondary Sources

Secondary data refers to information that is gathered from sources that already exist. Some of the sources I will imply to get this data will include; reviewing of literature and analyzing systems that already exist.

### **3.3 Data collection Methods**

For me to ensure that the data I collect will be accurate, I will use the following techniques;

a. Observations

This will entail watching, listening, touching and reading so as to get the actual point of view of the problem. This method will eliminate the problem of getting bias feedback from the users since the sample group will be unaware of this process going on.

b. Questionnaires

This will involve the interaction between possible donors and the orphanages and getting each of their input on how they would prefer the system to be. This will be beneficial from the view of providing anonymity to the users end.

c. Interviews

This method will help me get fast feedback from the sample group that will be involved. I will also be able to gauge the sincerity of the interviewees from understanding their facial expressions. But this method may prove to be a challenge because of language barrier.

d. Reviewing of literature

I will look at recent already existing systems and derive the data that they have collected to help me develop my project. I will get this literature by checking published documents and online journals.

e. Analysis of the existing system

This will involve having an analysis of similar projects and checking how they have been operating and also how to mitigate the risks they have been experiencing so as to come up with a project to solve them.

### **3.4 Resources required / materials**

#### Hardware Specifications

- Laptop – Used as the working platform for the project
- Processor speed – Intel (R) Core i5 ,2.60GHz
- Memory requirements – Minimum of 4 GB RAM.
- Hard disk capacity – Minimum of 500 GB.

#### Software Specifications

- Kaspersky anti-virus - Used to scan any virus that may be in the external devices to protect them from destruction of the data.

- Android Studio Development Environment – This is an Integrated Development Environment for android based development
- Backend development tools – They will include: Firebase real-time database (to store files and data that will be used in the project), Firebase authentication (to signup, sign in and sign out users in and out of the system).
- Software configuration management tools – Include github and bitbucket to track changes in the software.
- Operating System – Windows 10.

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