Leveraging Existing Tools to Help Social Enterprises: A Case Study

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Abstract

The terms social enterprise and resource constraint go hand in hand and appear to be inseparable. While the operation of social enterprises in developing countries brings in a set of resource constraints, the very nature of these organizations imposes a financial resource constraint. Striking the right balance between the mission of a social enterprise to make a difference and its ability to sustain itself financially is quite a challenge. In the Frugal Innovation Lab at Santa Clara University, we try to help social enterprises to achieve this balance by leveraging existing tools, which not only foster their mission but also empowers them to adapt to the changing business needs. In this paper, we present three such cases.

Keywords: Social Enterprises; Mobile Tools; Frugal Innovation

1. Introduction

A social enterprise is an organization trying to address social issues through the use of market-based and civil-society approaches. Most social enterprises operate in developing countries where resources are limited. The usual operational mode of these enterprises is to reach out to disadvantaged people and enable them with the needed resources. To achieve this mission, social enterprises employ local residents to create jobs, which is one of their very
own objectives [1]. For several social enterprises, these residents go to local communities, collect the data in the field and report data back to the headquarters. This poses a challenge that is hard to overcome. These communities are in remote areas and usually do not have internet or Wi-Fi connectivity. Either the data collection has to happen on paper, which is error prone and heavily manual, or electronically with phones and tablets. The data that is collected using electronic media has to be stored locally on the phone or tablet while on the field and then uploaded once the community worker is in a location which has internet or Wi-Fi connectivity. While this is a constraint that arises out of operation, another constraint that comes in naturally is financial resources.

Social enterprises, working for profit or not for profit have to sustain themselves financially to continue their mission to serve the underprivileged and make a difference in the world. To achieve this, they operate under different business models based on factors that might improve their performance eventually [2]. The impact of the financial factor on the success of a social enterprise is hard to ignore. A more abstract representation of the dependency of these interconnecting ideas is depicted in Fig. 1.

In the Frugal Innovation Lab at Santa Clara University [3], we provide mobile solutions to effectively address the operational challenges of social enterprises. In providing these solutions, we ensure that they are accessible, affordable, adaptable and appropriate to be in line with our lab’s mission. In this process, financials play a key role in selecting the solution. Hence we try to leverage existing tools to deliver the solutions which would reduce the associated cost and also have a quick turnaround time. When helping a social enterprise we usually examine different existing tools and evaluate their suitability to the problem at hand. In this paper, we present three social enterprises that were helped by leveraging existing tools.

![Fig. 1. Interlocking concepts of social enterprise, financials and social cause.](image)

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2. Solar Ear

Solar Ear is a sustainable social enterprise that develops high-quality and affordable solar-powered hearing-aid devices, produced by deaf people to hearing impaired ones in deprived areas [4]. Their holistic sustainable solution is depicted by their DREET program, D (Detection – hearing test via touch screen), R (Research – free bi-product), E (Education – 50% hearing loss can be prevented), E (Equipment – ipod body worn hearing aid – sold by micro entrepreneurs, pharmacies), T (Training – build in field capacity of secondary health care workers, teachers, via volunteer sending organizations).

While Solar Ear has created a hearing detection mobile solution, they were looking for a viable and practical technical solution for the “Research” portion of DREET program. The detection application on the mobile generates five audio frequencies in different hertz values, 500 Hz, 1K Hz, 2 K Hz, 4 K Hz, 8 K Hz for the left ear and for the right ear. The application then records the hearing ability in decibels for these 10 readings. Solar Ear’s goal was to store these 10 audiometric readings and demographic details of the patient such as Name, Gender, Age, and Mobile Number on a centralized database to accomplish the “R” part component of their DREET program.

The challenge to provide a technical solution was that the hearing screening test is done in remote areas by community health workers who might or not have access to the internet or Wi-Fi. Solar Ear wanted a solution to enable the community health workers to send the values of 10 readings and demographic details either as SMS or through Wi-Fi. To align with the goal of affordability, we thought open source tools were preferable.

We examined several tools such as Medic Mobile, Frontline SMS, OpenMRS, ODK Collect and ODK Aggregate. We started with Medic Mobile, which provides mobile and web tools that help health workers reach everyone [5]. The tool was in early pre-release, and its features and current set up did not suit Solar Ear’s requirements for storing the recordings and demographics on database. Then we moved on to explore another popular open source tool for its SMS capabilities, Frontline SMS. Frontline provides professional SMS management tools which does not require access to the internet [6]. Though their setup and usage was quite user friendly, to cater to the Solar Ear’s requirement of storing the readings and demographics, it needed us to setup and connect to an external database using ODBC (Open Database Connectivity). Solar Ear had to maintain the database and they did not have technical capability in that area.

We then chose to explore OpenMRS, which is a well-known open-source enterprise electronic medical record system platform [7]. OpenMRS has a very extensive and elaborate set up to customize to suit the business need of an enterprise. Solar Ear wanted to experiment OpenMRS but was overwhelmed with the multitude of features, the inherent complexity and the technical knowledge needed to add fields to the database. OpenMRS needed changes in the database for it to store the information Solar Ear required. Though OpenMRS comes with a pre-built set of fields, there were other fields needed by Solar Ear such as the readings for left ear and right ear. Solar Ear was looking for a simple and sustainable solution which made us rule out the OpenMRS option and move to ODK Collect and ODK Aggregate. Open Data Kit (ODK) is a set of free and open source tools which help organizations author, field, and manage mobile data collection [8]. While the ODK tools are very intuitive and communicated well with one other, the difficulty was that Solar Ear wanted the option to send details via SMS at locations where there is no internet or Wi-Fi connectivity.

After exploring the various possible open source tools to satisfy the requirements of Solar Ear, we found a compelling mobile technology solution called Magpi. Magpi, which was formerly called Episurveyor, is an advanced mobile data collection solution, which makes data collection, collaboration, and communication in the
field easy and affordable [9]. It is not an open source tool but has a free version which would completely suit Solar Ear. The free version can support 20 forms, 100 questions per form, 6000 uploads per year. The prominent feature of Magpi that made it more attractive to address Solar Ear requirements was that it not only has a built-in database with analytical capabilities but also supports SMS.

Solar Ear started with a simple Magpi form with 14 questions, 4 to capture demographic details of the patient and 10 for the audiometric readings (5 for the left ear and 5 for the right ear). The sample form is shown an in Fig. 2.

![Magpi form for Solar Ear](image)

The form is given an automated form number by the system and it can be shared by a community health worker which enables them to send the details via SMS. The form sharing looks as shown in Fig. 3. In this picture, form number 212060657 can be shared with one or more mobile numbers. The SMS request is sent to the community health worker to send the details in the format as shown in the picture. The community health worker would then respond in the format as suggested in the request SMS and the response SMS data would be stored on the Magpi database. As an example, a sample response for a request sent as shown in the picture would look like this: “212060657#Ben#45#Male#5678934511#11#12#13#14#15#16#17#18#19”. 
Once the details are sent by SMS or via Wi-Fi, the data are stored on the Magpi database. Magpi provides first-order analytical visualizations of the data in the database as shown in Fig. 4. The visualization data can be exported as a PDF, MS Word file, or published to the social enterprise’s stakeholders. If the data needs to be further analysed, data in the Magpi database can be exported as *.txt, *.xls or *.mdb for higher-order mappings and analysis.

Magpi satisfied Solar Ear requirements and enabled them to send hearing detection test results and patient demographics both through SMS and Wi-Fi. It in fact catered to the very crucial non-functional requirements of scalability, extensibility and maintainability. Extensibility in the sense that it enabled Solar Ear to plan future
expansions if the needed forms and number of questions increased. Scalability in the context that Magpi is available both for Android and iPhone. Maintainability is very crucial for social enterprises because of the need to adapt to ever changing business scenarios. Solar Ear has been using Magpi and, in certain cases, where they needed to change the form questions or format, they were able to accomplish the task with minimal support. To sum up, Magpi has not only catered to the need of Solar Ear with a simple and viable technical solution but also empowered them to adapt to change.

3. World Wide Hearing

World Wide Hearing is a non-profit organization that provides youth in developing countries with access to affordable hearing-aid devices [10]. Their requirement was an application that could capture hearing loss’ patient data and hearing-aid device sales and follow-up visits by the hearing-aid technicians, map GPS location of the patients visited and integrate monitoring and evaluation questions. Given our experience with Solar Ear and the versatility of Magpi, we realized Magpi would be the optimal solution for World Wide Hearing needs.

We created forms that satisfied all of their requirements easily. One master form to capture hearing loss patient data, a sub-form for the monitoring and evaluation details, another sub-form for hearing aid sales, and one more sub-form to capture the follow-up visits associated with sales. The GPS location-mapping requirement could be accomplished with the geolocation feature that Magpi already supported as shown in Fig. 5.

The patient form could be associated with multiple sub-forms. As an example, consider the scenario where a patient gets an ear exam and is diagnosed with hearing loss, and a hearing-aid device is sold by World Wide Hearing. Then this patient is regularly monitored and evaluated and has follow-up visits by the hearing aid technicians to check the hearing-aid device. All these steps can be captured by a patient form, which has demographic details and sub-forms such as Ear_Exam, Sales_Form, Monitoring_Evaluation and Follow_up_Visit as shown in Fig. 6.

![Fig. 5: Mapping the geolocation of the patient](image-url)
Magpi has helped us fulfill World Wide Hearing requirements with the help of a single form associated with multiple sub-forms, which perfectly suited the business scenario in which World Wide Hearing operated. Though the sub-forms do not come in the free version of the Magpi, the pro version costs World Wide Hearing 500 USD per month, which is financially viable given the technical support and online storage that Magpi offers.

4. Rags2Riches

Rags2Riches, a social enterprise based in Philippines, aims to transform poor Philippine women’s lives by creating stylish eco-ethical products. It partners with high-end designers to create eco-ethical fashion and home accessories out of recycled scrap cloth, organic materials and indigenous fabrics, by working with women living in the poor communities across the Philippines [11].

Rags2Riches has a field research survey for social impact measurement. This community survey captures personal information such as name, gender, age, birthday, marital status, education information, income and financing information, banking and loan information, food security information, healthcare information, household service information, etc. This survey was done on paper by the community worker going from house to house, and the information was then later compiled. This was easily solved with the Magpi free version. As the free version supports 100 questions per form and 20 forms per account, this was transported onto Magpi with little effort and huge impact. The data visualizations with which Magpi provides Rags2Riches are very useful in assessing the current situation and in taking decisions accordingly. The form that was created for Rags2Riches is shown in Fig. 7(a) and (b).
Table of Form Questions:

- **1) Name** - Name
- **2) Gender** - Gender
- **3) Age** - Age
- **4) Birthday** - Birthday
- **5) Marital Status** - Marital Status
- **6) Community** - What community are you from?
- **7) Time** - How long have you been in Rags2Riches?
- **8) Involvement** - What type of involvement do you have with Rags2Riches?
- **9) Education** - What is your highest level of education?
- **10) Children1** - What is the age of your child?
- **11) Children2** - Is your child male or female?
- **12) Children3** - Is your child currently attending school?
- **13) Income1** - How many people work in your family/household, including you?
- **14) Income2** - Do any members of your family/household earn a regular salary?
- **15) Income3** - How much is the total household income per week?
- **16) Income4** - For you, does R2R provide a steady source of income?
- **17) Income5** - About how much do you earn from Rags2Riches (R2R) per month?
- **18) Income6** - Besides R2R, do you personally have other means of income?
- **19) Income7** - Was there ever a time when you fell short or couldn’t meet your monthly expenses? If so, when and why?
- **20) Income8** - How much do you normally spend on each of the following?

**Fig. 7 (a) Rags2Riches survey form**
5. Conclusion

Social enterprises, which aim to maximize livelihood improvement and human wellbeing, need to sustain their organizations financially to keep serving the disadvantaged and to make a difference [12]. The business sustainability comes by incorporating lean management approaches [13] in reaching out to underprivileged and in making wise technical choices. Some of their technical requirements can be fulfilled by either having a full-blown solution, which needs substantial resources including time, people, and software or by leveraging existing tools. The full blown solution might not be adaptable to the changing business needs or might prove to be expensive. The open source tools might be technically challenging for social enterprises to adapt. The intermediate solution would be tools such as Magpi, which is a combination of the two. While the free version would suit the majority of the social enterprise’s requirements, a few need the pro version, as in the case of World Wide Hearing. However even the pro version may be still more economical than the full blown approach. Magpi has helped us at the Frugal Innovation Lab to help three social enterprises, Solar Ear, World Wide Hearing and Rags2Riches.

As shown in Fig. 8, our frugal solutions fit well in the social benefits business. The solutions were obtained by customizing the Magpi tool to suit each of their requirements with minimal support. Leveraging existing tools not only proved economical for the three social enterprises but also empowered and enabled them to adapt to changing business needs.
Fig. 8. Frugal Innovation in the interlocking concepts of social enterprise, financials and social cause.

References