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ACIAR INTERNSHIP REPORT

DAKLAK, VIETNAM

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INTRODUCTION

Cassava value chain in Dak Lak province alone sees a transaction volume of A$242 million[1]. It affects the lives of thousands of employees in 11 local factories, hundreds of traders and hundreds of thousands of cassava farmers. More importantly, this large population of farmers comprise of mostly poor farmers who couldn't otherwise grow more sophisticated, more capital intensive crops such as coffee or pepper.

In 2004, Dakfocam – the largest cassava factory in the region, previously state-owned – became privatized. Since then, more factories were also built in the region. In the past 13 years, factory workers' salaries gradually went down from A$800/month to about A$270/month. Frauds became more prevalent. Previously close partnerships between the factory and its farmers were broken. Coupled with recently depress market for cassava products, much of these problems were burdened by farmers. Now when the export market is just about to recover, however, there is such a big shortage of raw materials that many factories are temporarily shut down. Each individual farmer, due to their extreme financial constraints, limited education and disconnect from other farmers, is always at the difficult end of the bargain. In contrast, cassava value chain in Quang Tri province, led by Sepongroup – largest cassava factory in the region, remains very sustainable[2].

Chợ Khoai Mì (Online Cassava Marketplace) represents an opportunity not only to significantly improve the value chain in Dak Lak using Information Technology, but also to improve the livelihood of a lot of people. And this can all be done economically. The first step is to deeply understand the root cause of all the visible problems before plotting an appropriate strategy to solve it.

ROOT CAUSES

The 2 root causes of visible problems in the Dak Lak cassava value chain are found to be:

- There is no governing system to guide behaviour in the cassava value chain and to help it recover from a crisis, such as that caused by a short-term driven factory owner. Because of the absence of a governing body, all transactions are organic and driven by each actor's self-interests. This organic structure relies on human factor to work well, much like how Sepongroup in Quang Tri province is providing a benevolent, far-sighted leadership for the local cassava community. However, even when it works well, an organic structure is susceptible to a negative change of leadership, causing damage to the local cassava community.
- Information in the value chain, price as well as reputation, is either silo-ed, protected or not captured at all. Collectively, farmers should have sufficient information to identify bad traders/factories to avoid, but this information is silo-ed at individual farmer level. Price at factory gate can make the pricing process between trader and farmer easier, but is protected to promote the trader's interests. Each transaction, on the other hand, isn't recorded to aggregate later to inform actors' decisions. With sufficient information, logistical challenges and pricing process can be fixed.

[1] Estimated 2.9 million tons of cassava traded per year between factories and traders/farmers, at a rate of VND 1500VND/kg. This translates to A$242 million/year.

[2] See "Appendix 4c: Meeting with Mr. Sinh Phan"

STRENGTHEN THE CASSAVA VALUE CHAIN

It's necessary to establish a formal, robust marketplace for actors to work under. This will make the value chain more resilient. Such an online marketplace is straight forward, with a variety of technical options to combine in the most effective way. However, the human factor in establishing an Online Cassava Marketplace (Chợ Khoai Mì) is much more challenging. The most challenging aspect is to pull in all the human actors into the IT system and change their economic behaviour, with limited budget and political power.

To do this, Chợ Khoai Mì can first deploy value-added services such as Broadcast and Consultation to pull and keep cassava farmers in Chợ Khoai Mì ecosystem, then leverage this farmer network to pull factories and traders into the system for effective, transparent communication. The transaction information gathered in this IT ecosystem will fix information deficiency in the value chain. The ecosystem, once embedded in the value chain, can then grow into a trusted endorsement platform to reward good actors, prevent/punish bad actors to strengthen the value chain further. Along the way, it's important to monetize the ecosystem as effectively as possible and attract financial donations to pay for the costs.

The next step is to pull in a large number of farmers into Chợ Khoai Mì's Broadcast and Consultation services. There is a lot of valuable information regarding plant diseases, prices, market news, etc. that can bring immediate value to the farmer population. These often come in the form of long articles (online newspapers), in obscure places on remote websites (Vietnam National Cassava Association), or behind pay wall (Agromonitor). They need to be curated, re-designed for farmers to read and enjoy reading on a smartphone. If Chợ Khoai Mì delivers this value proposition successfully, it not only builds brand equity among farmers, but also establishes the communication channel that can be re-used for farmers to seamlessly interact with the core marketplace.

What, then, might fail to go according to plan?

- Cassava farmers have really low productivity, low income and are less educated. Each farmer grows only a small segment of land with limited technology adoption. Besides, 90% of the farmer population is not technologically ready to participate in a technology-driven marketplace.
- Overhead cost is also high given the small expected revenue per farmer, making it even more uneconomical.
- Building a team that is capable and uniquely suitable to execute this plan will be challenging.

To overcome these obstacles, a few key initiatives are:

- There needs to be sufficient product innovation to allow user adoption to be viral, to lower the Farmer Acquisition Cost substantially.
- There needs to be sufficient automation to lower ongoing cost of acquiring and interacting with a large base of farmers on a regular basis.
- Partner with projects of similar nature on other agricultural products to share resources.
- Serve beyond just cassava community. It's more cost efficient for a management team to manage more than one plants, especially when these plants have similar value chains.
- Most importantly, Chợ Khoai Mì needs to gain market power within the cassava value chain in order to extract value that it creates. If it can become the de facto transaction method and capture just 0.1% of transaction value as commission fees (the typical rate found in the stock market is much higher), the total addressable revenue in Dak Lak alone is A$242,000 per year, enough to sustain itself. There is also potential for similar revenue streams in other provinces, countries.

WHERE CHỢ KHOAI MÌ IS AT THE MOMENT

- All the relevant technology options have been investigated to give a realistic look of what is possible, how much it costs, how to build it. Several proofs of concept were made. The latest prototype should be fairly close to what the eventual online marketplace will be.
- Prototyped and demoed Broadcast and Consultation services. Acquired and had 6 interactions with a base of 10 users via Zalo over a period of 2 weeks, amounting to 60 points of contact. 3 interactions resulted in engagement from users: 1 to ask for consultation help, 1 to inquire about plant disease development, 1 to express concerns about the price this farmer has been paid relative to the market price information delivered from Chợ Khoai Mì.
- Multiple marketing channels were investigated and substantiated regarding its costs and likely effectiveness. A more feasible channel via Zalo was found.
- Multiple stakeholders have consistently been engaged in the process to provide a base from which to go further if necessary.

In short, there is now a deeper understanding of the problems facing the value chain from a business perspective, and a blueprint to go forward, including product, marketing, financial model, backed by fairly substantial evidence.

VISION

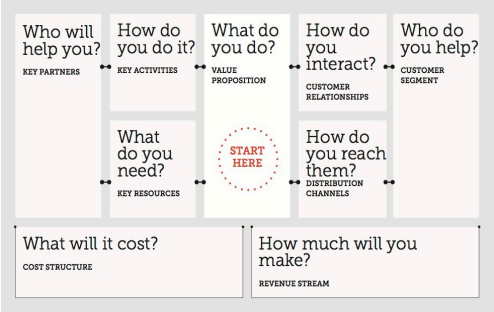
With sufficient funding to provide a runway of 6 months (estimated at A$33,000), a steady rate of 50 new users/day appears to be feasible. First, the Broadcast and Consultation services need to be well refined to deliver the news and consultation that farmers find valuable to receive. This growth rate translates into valuable services delivered daily to 7500 farmers. After that, new development is likely to change expectations for the following phase. However, if everything goes according to plan, 3 years might see an established IT system, with participation of 45,000+ farmers and multiple factories, to serve as the backbone for the cassava value chain in Dak Lak.

Just as important, at this scale, it will be possible for Chợ Khoai Mì to influence production decision of a large enough farmer population through its news service in order to better match production with demand. This is an opportunity that will add huge amount of value into the value chain, perhaps rivaling that of strengthening the relationships among actors.

This system and the operation structure can then be utilised to serve other regions, countries and agriculture products at the same time.

OVERVIEW

OBJECTIVE



This business case describes a blueprint to build a successful business model that will strengthen linkages in the cassava value-chain in Dak Lak, Vietnam. Once such a blueprint is well-constructed, it can be used to replicate similar business models in other provinces of Vietnam, neighbouring countries such as Indonesia and Cambodia, and potentially other agriculture products. The main challenge is that the business case is the consequence of actually building a successful business model. A successful business model takes multiple iterations and should become more solid after each iteration. It's a work-in-progress. The end goal is to improve the livelihood of different actors in the value chain: farmers, traders, cassava processing companies, etc.

STARTING IDEA

The starting idea is to utilise a smartphone app that allows different actors in the value chain to post buying/selling prices and quantity of cassava. There are, however, many factors that would contribute to whether the app can succeed in the marketplace. A few important questions are:

1. How much will it cost to build such a technical solution and keep it going (hosting, customer support, admin, legal, marketing etc.)?
2. Where will the money come from?
3. What goes into the solution? Just posting prices, or follow market news, interact with other actors? Do users have smartphones? Are these smartphones capable? Is the 3G internet sufficient and sufficiently cheap?
4. What partners will help build such a solution and bring it to market?
5. What are the key activities to do and who will perform these?
6. What are ways to maintain relationships with customers and key partners?
7. Which channels are more effective to roll the app out to users (e.g. incentivised referrals, salespeople, TV advertisement, flyers etc.)?

Answering these questions require a lot of market information and planning, along with actual executions to iterate the business case several times.

MILESTONES

There are 2 separate milestones to achieve this blueprint: **Product-market fit** and **Scaling**

1. PRODUCT-MARKET FIT

Modify and validate that the technical solution is fit for target users. This may include not just the app, but possibly digital panels to show prices in community spaces, a website version of the app for people who only use desktop computers, price inquiries via SMS, etc.

Factors that influence the technical design are: number of users with smartphones, frequency which each user is expected to interact with the online marketplace, performance of the local Internet receptivity, users' fluency with creating a new account/log-in, handling errors during the registration process, comfortability with a new interaction method etc. There are many ways to reconcile these issues if required, such as creating a guest mode to post prices to ease registration, display written address instead of the graphical map to save bandwidth etc.

Before buying advertising and pushing for widespread adoption, seeking feedback from value chain actors will be essential to improve the design. This can be done via door-to-door visits or holding user focus groups. This milestone involves market research, technical development and needs a lot of precision because it's the foundation from which to scale the solution to more users.

Timeline: 2 weeks to reach a product concept that is effective

2. Scaling

Once the product is proven to fit the market, the core value proposition only then is considered solid. After that, a string of operations will be required to iterate the rest of the business case. This includes hiring part-time/full-time staff, advertising, customer support to scale to more users. The unknowns in this milestone may include: which channels are most cost effective to reach target users, what level of customer support is required, how much these operations cost, etc.

This 2nd milestone can involve more complex operations but may encounter less uncertainty. Achieving this 2nd milestone with reasonable success means the business case is complete and well supported. The rest of the work will involve pulling together and organise documentations accumulated during the entire process.

Timeline: 3 weeks to project the scaling roadmap and financial needs

Value Chain Problem Analysis

Background

The problem facing the cassava value chain in Dak Lak is multi-faceted. Stories from different stakeholders' perspectives were often different and even contradictory. For example, farmers reported being squeezed or cheated by the traders/factories through the scaling process. Factories reported being cheated by farmers who mix cassava roots with dirt before the scaling process. Some insiders say it was the traders, not the farmers, who mix cassava with dirt after the farm-gate transactions and before the scaling process[3]. Traders reported being hard-bargained by factories when supply was plenty, and that factory executives pay the traders less than what they report on the company's income statement, pocketing the difference for personal gains[4]. Traders claim to be on top of current price and yet only have a limited number of contacts to call periodically to ask for pricing information. Farmers said there was no more competition among factories for supply, thus depressing the price[5]. Factories denied these claims, saying that the competition was stronger than ever and few factories were profitable any more. The list goes on and on.

The reality is likely to be a mix of all these conflicting stories. The facts, however, are that:

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[3] See Appendix 4a: Meeting with Mr. Mai Nguyen

[4] See Appendix 4h: Field trip to Ea Sar

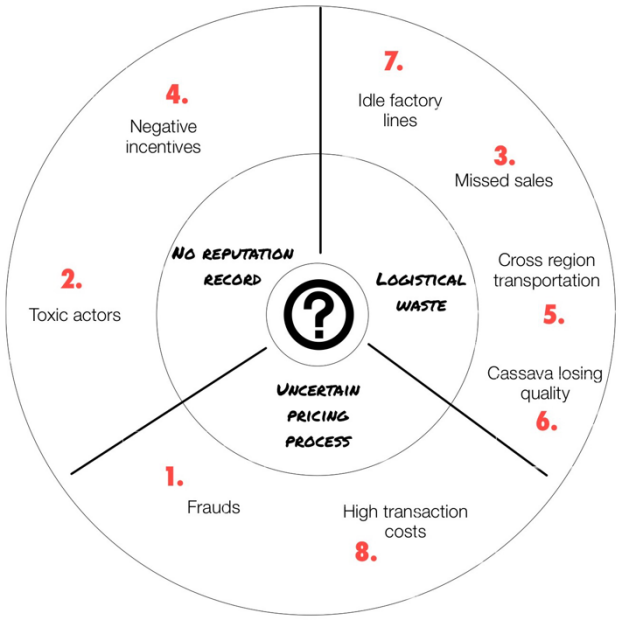
[5] See Appendix 4b: Meeting with Mr. Ngoc Nguyen

- There are many cassava factories in the region now, yet none provides deep support and relationships with farmers any longer. Without this deep coordination, production productivity stagnates or declines while soil is gradually eroded, hurting all actors especially farmers in the long-term.
- Farmers need quality information. Currently they only have a handful traders to call to query about prices, have limited access to internet and limited research skills to follow market development, government planning directives etc.
- Regardless of which side is hard-bargaining against which and who is defrauding against who, there is overwhelming evidence that systematic, recurring frauds exist in this value chain.
- The mismatch between cassava planting amount and actual factories' needs is recurring, severe and hurt all parties. At the moment (September 2017), many factories completely shut down due to lack of raw materials. Other times, excessive planting hurt prices and causes losses against farmers.

Root Cause Analysis

From a business perspective, many critical problems exist in the value chain. Each of these problems is rooted in a more systemic underlying cause.

An overview of visible problems in Dak Lak's cassava value chain:



Examples for each of the 8 problems above:

1. Factory supply managers cutting under-table deals to give preferential treatment to certain traders. They may inflate quality index, underestimate foreign matter content, or give preferential access to the scaling process. Factories use modified equipment/evaluating process to misrepresent starch content of cassava roots. Or traders put more dirt in the truck during the scaling process. Or farmers break contractual agreements with traders/factories to sell for higher prices to other parties.
2. Leading factories in Dak Lak use their market power to impose questionable rules on the value chain. Starch content index used to be rounded to the nearest whole number. Now, it's always rounded down. For example, 29.7% is rounded down to 29%. Or these factories hard bargain against cassava farmers and traders when supply is plenty. This abuse of market power causes serious financial damages to local farmers and unstable swings in cassava supplies in the ensuing years.

    a. These actors can chip away at an estimate of A$690,000/year[6], virtually all of which is burdened by farmers.
3. Dak Lak's value chain routinely misses opportunities to meet market demand, or oversupply, due to coordination problems. In current months, some factories produce only up to half of their capacity. Farmers, on the other hand, lack information to take advantage of higher prices to meet this need.
    a. Dak Lak's planned crop in 2017 is estimated to overshoot government's guidance by 113%[7]. When this happens, it will almost certainly bring down farm-gate price, causing losses to farmers.
4. Without an enforcement system, foreign actors can come in, offering short-term high prices to buy cassava from farmers, creating false optimism and disrupting the existing value chain. This happened a few years before and is still happening to other agriculture products.
5. Without sufficient coordination, factories from Ea Sar routinely buy cassava from Ea Kar and vice versa, simultaneously. The distance can be as much as 50-100km, causing a lot of unnecessary transportation costs.
6. Without sufficient coordination, harvested cassava roots can sit outside overnight while waiting to be processed, causing its quality and the buying price to drop. Again, this inefficiency is born by farmers.
7. Uncoordinated inflow of cassava deliveries means factory's lines stay idle some days while not being able to keep up with production on other days.
8. Pricing process is frequently mentioned as a pain point, especially from farmers, due to its ad-hoc, uninformed nature. This causes frictional costs on each transaction in the form of the negotiation process.

While these are visible problems of the value chain, the 3 underlying causes seem to be:

1. There is no reputation record for each actor in the value chain. Over a long time, this does accumulate, such as the current boycott sentiment among farmers and traders against the cassava factories. However, by this time, the damage caused by the toxic actors is already done. It's also difficult for the value chain to recover without this reputation transparency once the toxic actors are identified. Strong, positive actors need to be identified to take the lead going forward.
2. The uncertain pricing process reflects a systematic deficiency of quality information and established rules in the value chain.
3. The logistical challenges between actors cause wastes and weaken the value chain.

ROOT CAUSES

To go one step further, the root causes of these problems appear to be:

- There is no governing system to guide behaviour in the cassava value chain and to help it recover from a crisis, such as that caused by a malicious factory owner. Because of the absence of a governing body, all transactions are organic and driven by each actor's self interests. This organic structure relies on human factor to work well, much like how Sepongroup in Quang Tri province is providing a benevolent, far-sighted leadership for the local cassava community. However, even when it works well, an organic

[6] Dakfocam buys about 210,000 tons of cassava per year. Price of each kg of cassava is estimated to be A$0.0033 lower than what it should be, due to fraudulent tactics. This translates to about A$670,000/year.

[7] http://www.nhandan.com.vn/chinhtri/item/33827202-kiem-soat-viec-mo-rong-dien-tich-trong-san-o-tay-nguyen.html

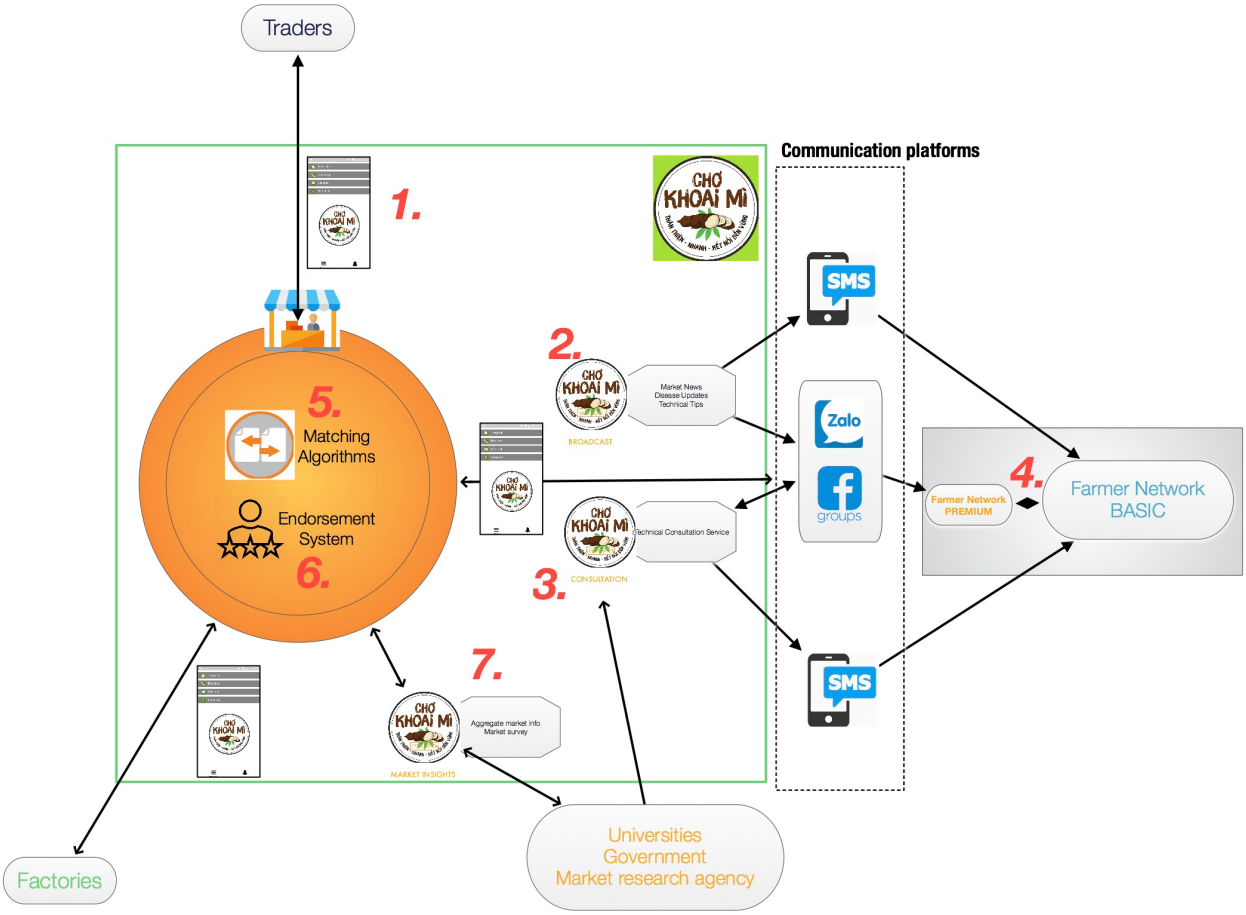
structure is susceptible to a negative change of leadership, much like the incoming of the new owner of Dakfocam factory 13 years ago, causing damage to the local cassava community till now.

- Information in the value chain, price as well as reputation, is either silo-ed, protected or not captured at all. Collectively, farmers should have sufficient information to identify bad traders/factories to avoid, but this information is silo-ed at individual farmer level. Price at factory gate can make the pricing process between trader and farmer easier, but is protected to promote the trader's interests. Each transaction, on the other hand, isn't recorded to aggregate later to inform actors' decisions. With sufficient information, logistical challenges and pricing process can be fixed.

CURRENT PROGRESS

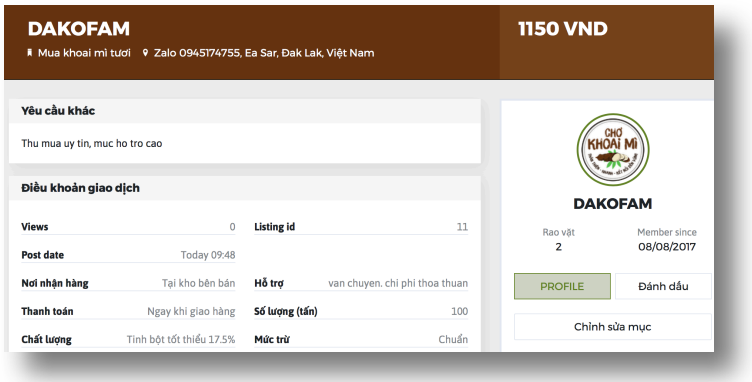
MILESTONE 1: PRODUCT-MARKET FIT

Following is the latest product blueprint, which takes into account the constraints and different needs from each user group. From multiple signals, this iteration best fits market reality. For example, the farmer group, while previously thought as people who own smartphone and would like to advertise their crops, turn out to be completely price-taking, don't own smartphone, only need to transact once or twice per year, and are otherwise very technologically challenged. In other words, farmer group is more suitable to be on the receiving end of the information flow. Please refer to "Appendix 1: Product iterations" for previous versions of the product.



While the orange circle is the heart of Chợ Khoai Mì marketplace and is in the form of a smartphone app, there are more components to address the challenges of connecting farmers into the system.

1. **Current app**



The website and app are designed as a classified ad marketplace where buyers and sellers advertise their needs.

- Website: www.chokhoaimi.com
- Android app: Link

The biggest challenge is to establish the communication relationships with a large number of potential farmers. These users only have the need to interact with the marketplace 1-2 times/year. The timing of such need is unique and unpredictable for each user (driven by urgent financial needs, current market price, relationships with traders, etc.). 60-70%[8] of these users also receive some investment from traders/factories and thus are less motivated to participate in the open marketplace. The rest 30-40% (still a very significant number) are difficult to identify and target. Most notably, a large number of these farmers don't have a smartphone, don't know how to use it, or don't even know how to read SMS that comes to their feature phones. Yet, these hundreds of thousands of farmers in Vietnam will be able to reap huge benefits from participation in the marketplace.

Currently, the farmers are vulnerable against diseases affecting cassava plants, not knowing when such risk is coming, how to respond, how to mitigate risk at the start, how to predict price fluctuations to manage production, or when demand is high to bargain for better deals, which traders/factories are reliable as investment partners, where to sell for the most money should they need urgent cash, etc.

As such, pulling farmers into the ecosystem and providing the right level of technical support at lowest cost possible is a real challenge but very valuable.

2. "Chợ Khoai Mì" BROADCAST service

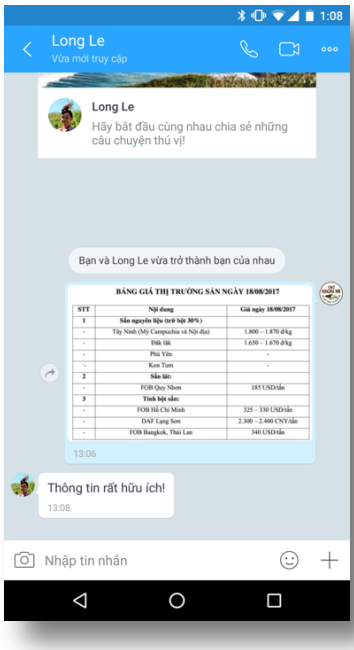
This is both a value-added service for the value chain and a marketing tactic to form initial relationships with a large number of farmers at once. Once the brand name "Chợ Khoai Mì" is known and trusted, this brand can use the same channel to communicate buy/sell orders in the Online Cassava Marketplace ("Chợ Khoai Mì"). There are some positive initial signals from users:

- Nearly all farmers (sample of 8), after receiving Chợ Khoai Mì Broadcast service for 2 days, want to remain subscribed to the service. 2 cases don't know how to read SMS message and so didn't know news was coming in.

[8] See Appendix 4a: Meeting minutes with Mr. Mai Nguyen

- Cassava Disease Updates seem to be the kind of news these users are most excited about. General Market News is also well received.

Examples (collection of actual screenshots are saved in Dropbox):



- *Service description*: Send daily/weekly market information via SMS or Zalo to farmers. Most of these farmers don't have smartphones and/or don't know how to search, follow, aggregate market news from different sources on Google. The hypothesis is that this is a value-added service to establish initial relationships with a large number of farmers at once, even if most of them aren't selling cassava right at the moment. Gradually convert these customers to Zalo, smartphone app platform to save on SMS costs and deliver better value.
- *Implementation*:
    - SMS to customers who don't have smartphones. Need to buy and manage one phone number for each major telecom network in Vietnam (Vinaphone, Mobifone, Viettel) to send to customers on each of these carriers. It's cheaper to send within the same telecom network.
    - Zalo to users with smartphone, text and rich media information (graph, chart). Message customised for smartphone.

3. Technical Consultation service

1/40 farmers requested Technical Consultation Service, and seems to be in dire need for help. To provide this service, Chợ Khoai Mì will need a cassava specialist to help. The consultation process can gradually be automated with common questions & answers.

4. Strengthen the Farmer Networks

There are 2 different networks of farmers:

- Farmers Network PREMIUM: those who use Zalo or at least own a smartphone
- Farmers Network BASIC: those who don't have a smartphone or don't even know how to read incoming SMS

Currently an estimated 90% of farmers still reside in the BASIC network, which is very problematic to deliver to these farmers any kind of value over the Internet. Farmers in the BASIC network currently receive service via SMS only and need to go through a liaison farmer in the PREMIUM network to access much of the rest of the service. Overtime, process needs to be in place to convert these BASIC farmers into PREMIUM to save on SMS costs and deliver better value. SMS is expected to be an important but transitory channel.

5. Match buyers and sellers in the marketplace

Buying orders coming in should be routed to the appropriate sellers based on quantity, quality, location, etc. and vice versa. This process can be done manually at first and programmatically later when the transaction volume is higher.

6. Endorsement system

This is a highly important component of "Chợ Khoai Mì" system but can only be implemented after a sufficient number of actors already participate in the Online Cassava Marketplace. The goal is to record the

trustworthiness of each actor in the value chain overtime and make it visible to all actors in the marketplace. This will reward good behaviour, punish bad behaviour, remove bad agents and prevent disruptive agents from entering the value chain (such as temporary foreign traders).

7. Market Insights

Once the marketplace is live for some time, Chợ Khoai Mì will have sufficient data and relationships with all actors in the value chain to leverage as a source of revenue and to provide even more value to 3rd parties such as universities, governments and market research agencies.

MILESTONE 2: EXECUTION

There were 2 important questions to serve as the foundation for this phase:

1. Is it sustainable to provide the given product to the specified users at scale?
2. How much financial resources are needed before embarking on the scaling journey?

Whether a product/service is sustainable is also related to how it's being marketed to users and the internal components it was made of. For example, if a marketing communication channel is too expensive, the cost of reaching each farmer may be higher than the benefits Chợ Khoai Mì can extract from the farmer. Or if the service is provided primarily by human employees, cost of providing the service may be excessively high compared to a computerised automation system.

MARKETING COMMUNICATION CHANNEL

The first 3 channels being investigated include:

1. Direct phone call: Calling to get farmers to sign up for Chợ Khoai Mì service on Zalo platform
2. Conference[9]: Running training sessions for farmers and sign them up for Chợ Khoai Mì service
3. Government-assisted[10]: Utilise government support to sign farmers up for Chợ Khoai Mì service

All 3 of these channels, as shown below, are either not effective enough (1 & 2) or not viable (3). Please see "Appendix 2: Financial Model" for more detailed calculations.

[9] See "Appendix 4e: Meeting with Mr. Minh Nguyen"

[10] See "Appendix 4d: Meeting with Mr. Tuan Anh Dang"

An overview of how much revenue a farmer is expected to bring in for Chợ Khoai Mì as a member, how much it costs to acquire this farmer at the beginning, and at what scale Chợ Khoai Mì becomes sustainable

Revenue per farmer per month	**AUD**	**1.0**
COGs - Service cost/farmer/month	AUD	1.0
# of years farmers stay in system	AUD	5.0
Nominal farmer lifetime value (FLV)	AUD	-
Interest rate		10%
Actual FLV after interest	**AUD**	**-**

Marketing channel	**Direct Phone Call**	**Conference**	**Government-assisted**
Farmer Acquisition Cost	AUD 22.00	AUD 8.67	AUD 4.38
Lifetime contribution/farmer	**AUD (22.00)**	**AUD (8.67)**	**AUD (4.38)**

		Projected net profit/loss per farmer		
# farmers	**Lifetime overhead cost/farmer**	**Direct Phone Call**	**Conference**	**Government-assisted**
5000	AUD (65.37)	AUD (87.37)	AUD (74.04)	AUD (69.75)
10000	AUD (32.68)	AUD (54.68)	AUD (41.35)	AUD (37.07)
15000	AUD (21.79)	AUD (43.79)	AUD (30.46)	AUD (26.17)
20000	AUD (16.34)	AUD (38.34)	AUD (25.01)	AUD (20.72)
40000	AUD (8.17)	AUD (30.17)	AUD (16.84)	AUD (12.55)
60000	AUD (5.45)	AUD (27.45)	AUD (14.11)	AUD (9.83)
80000	AUD (4.09)	AUD (26.09)	AUD (12.75)	AUD (8.47)
100000	AUD (3.27)	AUD (25.27)	AUD (11.94)	AUD (7.65)

One channel that seems to work is via Zalo scan feature to connect with strangers in a given area, combined with GPS fixing technique to teleport a smartphone's GPS location to a target cassava growing area. This will significantly reduce Farmer Acquisition Cost, but have inherent limitations:

- One Zalo account can only scan for ~15 other users per day. This means Chợ Khoai Mì will need to manage ~20 such Zalo accounts in order to acquire new users more quickly. There are potential technical implications down the line, such as Zalo blocking unusual activities. It's likely avoidable, but still has some implementation risks.
- This channel can only reach farmers who already own and use Zalo on their smartphones. The rest 90% of farmers will need to be reached eventually, though gradual smartphone penetration will ease this problem over time.

While using Zalo scan feature along with GPS fixing is a necessary innovation, the full-featured marketing communication strategy will need to be more sophisticated, such as giving away cheap goodies, placing billboards, partnering with local household businesses etc. Some of these media will be more cost-effective than others and some will work better in combination.

Implementing automation

Information Technology cost is predictably low. For example, running the app costs about A$40/month via Google Cloud, while being free in the first 12 months via promotion[11]. The messaging platform via Zalo is free. However, hiring employees to run the services will be expensive. As such, much of the information services will need to be automated[12].

Seed funding required

Seed funding below is calculated based on current market salaries for comparable positions and skills required. The objective of this seed funding round is to bring Chợ Khoai Mì Broadcast and Consulataion services to a large number of farmers within 6 months. This is only part of the vision for the larger cassava online marketplace, but achieving this will both validate the execution path as being effective and gain new, invaluable insights into the years ahead.

[11] See "Appendix 5: Technical Assets" for login credentials

[12] See "Appendix 3: Key contacts" for Mr. Dan Phan to develop such an automation system

Chợ Khoai Mì

Monthly Cost Projection

2017-2018 | Based on a more simplified operation

Monthly Expense	Projected	Actual	Variance	
IT infrastracture (GoDaddy, Google Cloud)		45	0	45
Marketing communication agency		500	0	500
Technical agency		500	0	500
Legal, design & other agencies		400	0	400
Salary: CEO		1,500	0	1,500
Salary: Marketing Head		1,000	0	1,000
Salary: Product Head		1,000	0	1,000
Office space		500	0	500
Total		5,445	0	5,445

TOTAL 6 MONTHS AUD 32,670

ROADMAP

In 3 years, it's necessary to establish a formal, robust marketplace for actors to work under. This will make the value chain more resilient. Such a marketplace is straight forward, proven and relatively inexpensive to make: an online platform to facilitate, capture transactions and to enforce an endorsement system. Effect of the endorsement system is similar to how Uber's, Grab's rating system changed Vietnamese taxi drivers' behaviour dramatically for the better in the past few years. Or how Lazada, Tiki.vn successfully promotes trustworthy sellers and keeps out malicious actors on their e-commerce platforms in Vietnam.

The human factor in establishing an Online Cassava Marketplace (Chợ Khoai Mì) is much more challenging. The most challenging aspect is to pull in all the human actors into the IT system, with limited budget and political power. To do this, Chợ Khoai Mì can first deploy value-added services such as Broadcast and Consultation to pull and keep cassava farmers in Chợ Khoai Mì ecosystem, then leverage this farmer network to pull factories and traders into the system for effective, transparent communication. The transaction information gathered in this IT ecosystem will fix information deficiency in the value chain. The ecosystem, once embedded in the value chain, can then grow into a trusted endorsement platform to reward good actors, prevent/punish bad actors to strengthen the value chain further. Along the way, it's important to monetize the ecosystem as effectively as possible and attract financial donations to pay for the costs.

As such, the roadmap can be planned in 2 phases. The seed funding phase will work out the important unknowns such as team forming, actual marketing expenses, building partner network etc. From this stronger foundation, Chợ Khoai Mì can then grow faster and more sustainably.

SEED FUNDING PHASE | 6 MONTH

With the seed funding, a local team of 3 can be formed to execute the 6-month plan. This team will work to pull in a large number of farmers into Chợ Khoai Mì's Broadcast and Consultation services. There is a lot of valuable information regarding plant diseases, prices, market news, etc. that can bring immediate value to the farmer population. These often come in the form of long, difficult-to-read articles (online newspapers), in obscure places on remote websites (Vietnam National Cassava Association), or behind pay wall (Agromonitor). They need to be curated, re-designed for farmers to read and enjoy reading on a smartphone. If Chợ Khoai Mì delivers this value proposition successfully, it not only builds brand equity among farmers, but also establishes the communication channel that can be re-used for farmers to seamlessly interact with the core marketplace.

With 1 month of preparation and then achieving a target acquisition rate of 50 farmers/day, a population of 7,500 farmers may be part of Chợ Khoai Mì ecosystem by the end of 6 month. Some groundwork was laid out for team to operate, including:

- Core brand elements ("Appendix 7: Brand elements" for details)
- Facebook Workplace, Zoho email for team communication and coordination ("Appendix 8: Internal management tools" for details)
- Wave for accounting purposes ("Appendix 8: Internal management tools" for details)

GROWTH PHASE | 2.5 YEARS

Growth phase will largely be based on what was achieved in the Seed Funding Phase. If all go as planned, Chợ Khoai Mì ecosystem will by the end of 3 year have a network of 45,000 farmers engaged in its digital platform, making it a robust and viable platform for factories and traders to participate. Besides, at this scale, it will be possible for Chợ Khoai Mì to influence production decision of a large enough farmer population via its news service in order to better match production with demand. This is an opportunity that will add huge amount of value into the value chain, perhaps rivaling that of strengthening the relationships among actors. Currently, every year farmer households either produce too much, incurring losses as a result, or too little, causing many factories to close the production lines. However, there are a variety of factors that will contribute to the success of this phase.

A few factors that may cause things not to go according to plan:

- Cassava farmers have really low productivity, low income and are less educated. Each farmer grows only a small segment of land with limited technology adoption. Besides, 90% of the farmer population is not technologically ready to participate in a technology-driven marketplace. As a result, cost of pulling a farmer into the system and providing services to this farmer is likely greater than revenue that can be made from this farmer. It appears uneconomical at the unit level.
- Overhead cost is also high given the small expected revenue per farmer, making it even more uneconomical. At a base of 10,000 farmer, overhead may work out at A$0.8/farmer, which is really high considering these farmers have very little purchasing power and awareness.
- Building a team that is capable and uniquely suitable to execute this plan will be challenging.

To overcome these obstacles, a few key initiatives are:

- There needs to be sufficient product innovation to allow user adoption to be viral, to lower the Farmer Acquisition Cost substantially. The news content over Broadcast service, for example, may be designed to encourage discussions, thus making user referral more likely.
- There needs to be sufficient automation to lower ongoing cost of acquiring and interacting with a large base of farmers on a regular basis. Use of Zalo's scanning feature in combination with GPS fixing, for example, is a novel approach to reach out to more farmers more cheaply.
- Partner with projects of similar nature on other agricultural products to share resources. For example, these projects can share their user base, thus expanding each other's user base at little cost.
- Serve beyond just cassava community. It's more cost efficient for a management team to manage more than one plants, especially when these plants have similar value chains.
- Most importantly, Chợ Khoai Mì needs to gain market power within the cassava value chain in order to extract value that it creates. If it can become the de facto transaction method and capture just 0.1% of transaction value as commission fees (the typical rate found in the stock market is much higher), the total addressable revenue in Dak Lak alone is A$242,000 per year, enough to sustain itself. There is also potential for similar revenue streams in other provinces, countries.

APPENDIX 1: PRODUCT ITERATIONS

Product Iteration No. 5

Value proposition: A classified ad system for factories to post orders. Farmers can advertise selling price for their crops (minor use case but may be important in the long term). A combination of smartphone app and Zalo personal account to broadcast these orders to traders, farmers.

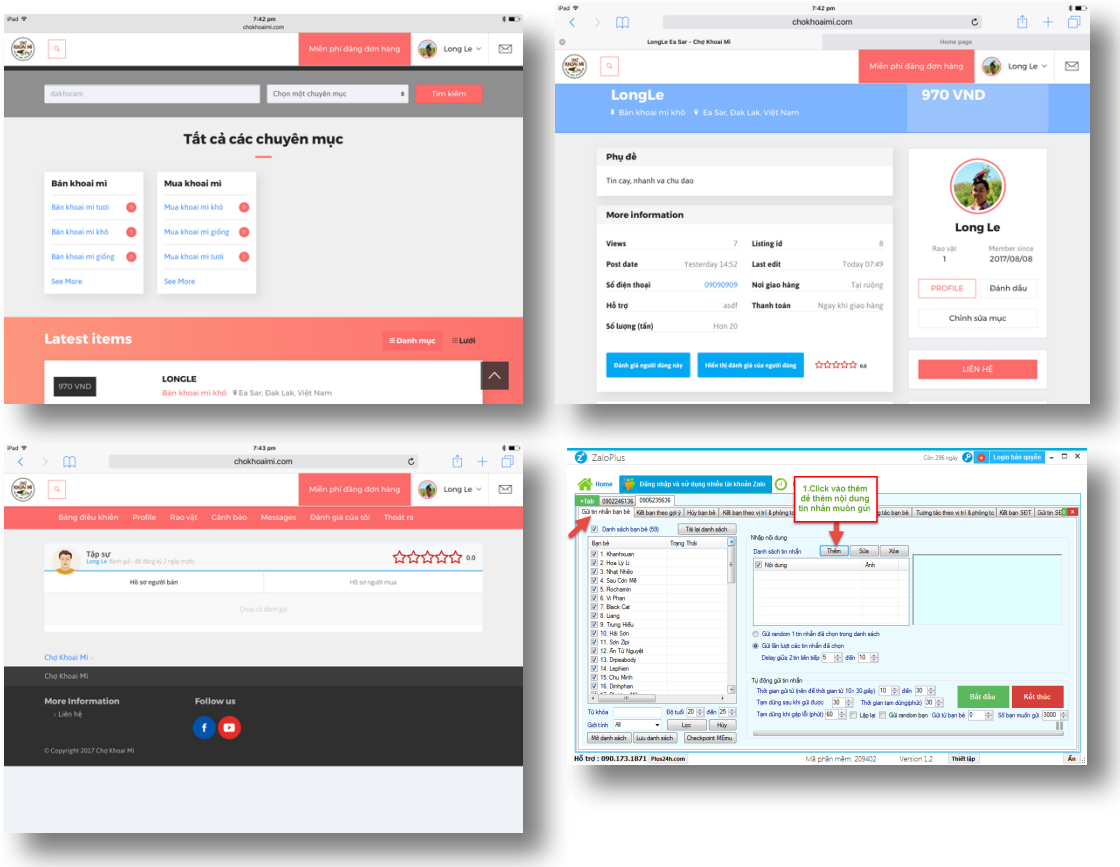
Value proposition and technical design comes hand in hand because:

- ✓ Value proposition represents the end goal of what the technical design should be
- ✓ In turn, what is technically feasible constrains what the value proposition can be

Guiding criteria for this iteration:

- This design is a scalable solution expected to successfully fit into the incentive structure within the cassava value chain (factories want to reach out directly to farmers).
- A classified ad system is sufficiently light-weight to work with farmers' devices and slow Internet.
- Zalo personal account can utilise 3rd party software (ZaloPlus) to send out mass messages to different segments of users.
- This communication channel also has lower learning curve for users, scalable performance, and lower adoption barrier to adoption because an estimated 70% of users already have Zalo app on their phone. Zalo users then can be gradually migrated into using the smartphone app.

In short, this combination system (Osclass backend + smartphone app frontend + Zalo) is able to deliver the essential requirements and most of the important requirements. See System Specifications for details.



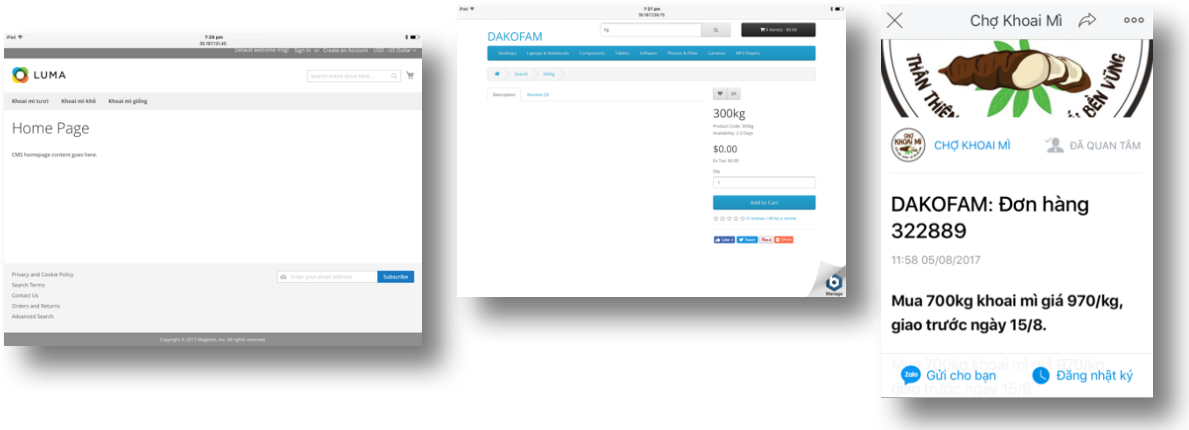
<u>Product Iteration No. 4</u>

Value proposition: An e-commerce platform for factories to post orders and manage backend logistics. A separate Zalo ('Vietnamese WhatsApp') community channel to broadcast these orders to traders, farmers.

This design is a scalable solution expected to successfully fit into the incentive structure within the cassava value chain (factories want to reach out directly to farmers). Backend logistics is a nice-to-have hook to increase product adoption among factories. Zalo channel is an inexpensive way to communicate to farmers, which also incurs a lower learning curve.

Failed assumptions:

1. E-commerce software solutions (Magento and OpenCart) are feature-rich but relatively slow.
2. Initial development and configuration was prohibitively difficult. Unable to hire technical help at low cost.
3. Doesn't support rating for users or stores
4. Permission structure doesn't allow individual users to own and manage a single store
5. Zalo channel can't segment groups of users and have restrictions on outgoing messages.



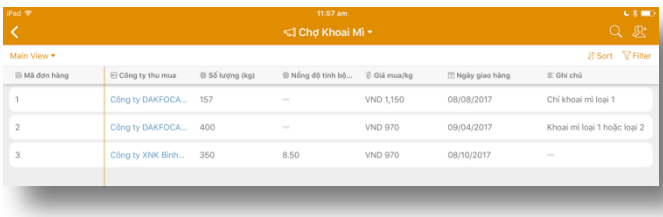
<u>Product Iteration No. 3</u>

Value proposition: Real-time cassava market information delivered straight to farmers, and a separate interaction platform for factories to broadcast prices to farmers/traders in the local region.

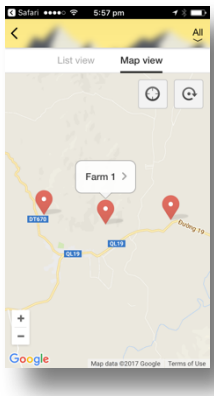
Failed assumptions:

1. LED panels are relatively inexpensive (~A$100/each), but adding wireless capability to receive market information over the Internet will make it quite expensive (~A$700/each)
2. Sending SMS at volume will be quite expensive
3. Integrating the Airtable database system with app is more development-intensive than previously thought

There are 4 components to this product (built on Airtable and Shoutem):



1. An online server to receive, hold and process information
2. LED panels that display real-time cassava market information in community spaces
3. Smartphone apps for users with a smartphone to receive/post prices
4. SMS gateway for users to receive/post prices via SMS



These 4 components are chosen because:

- Information is expected to be updated, processed and sent out very frequently, so a server with sufficient computing power is needed.
- Very few users have a smartphone. Using LED panels is a cost-effective method to deliver real-time market information to all actors. LED panels are durable and large enough to be left unattended in

community spaces or on the side of the road for consumption. They are sufficiently cheap and each can serve a large portion of population. They also serve as billboard advertisement for "Chợ Khoai Mì".

- Users with smartphones can get richer information about the market, such as price at each location. However, only 10% of actors have a smartphone and they may post prices only once a year, having only smartphone as a gateway to post prices won't be sufficient. Technical support for the smartphone app is also expected to be expensive given its complexity.
- In the short to medium term, because virtually everyone has a non-smartphone and knows how to send/receive SMS, SMS may become a more dominant means for users to interact with the market. In the long-term, smartphones will inevitably be the more dominant gateway.

The assumptions are:

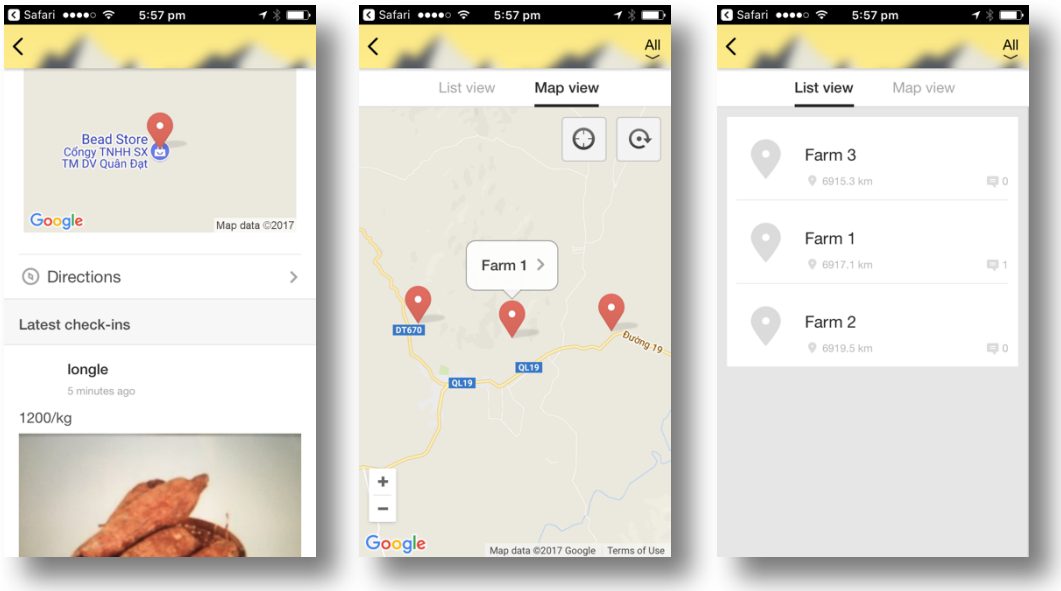
1. Consumption of this real-time market information is of value to actors in the cassava value chain
2. Actors are able to interact with this market under minimal technical support
3. Actors proactively interact with this market to keep the market information up-to-date *(weakest assumption at the moment)*

Product Iteration No. 2

Value Proposition: Farmers can advertise selling price to factories with a geolocation marker on the map, along with pictures. Factories/traders can look at the map to look for nearby farms offering good prices to buy from.

Failed assumptions:

1. Exact geolocations are of little value, as long as the name of specific area is written out in text. Meanwhile, processing map data is resource-intensive, making the app slower and is also more difficult to use.
2. Farmers are primarily price-getters. Many also have existing contracts with certain traders and rely on these traders for financing, transportation of goods. The ability to post prices is of little value to a majority of these farmers.
3. Farmers also participate in the market only once a year. More often, they're on the receiving end of information. As such, identify a farmer who currently has the need to send out selling price and get to this specific farmer will be difficult and expensive.



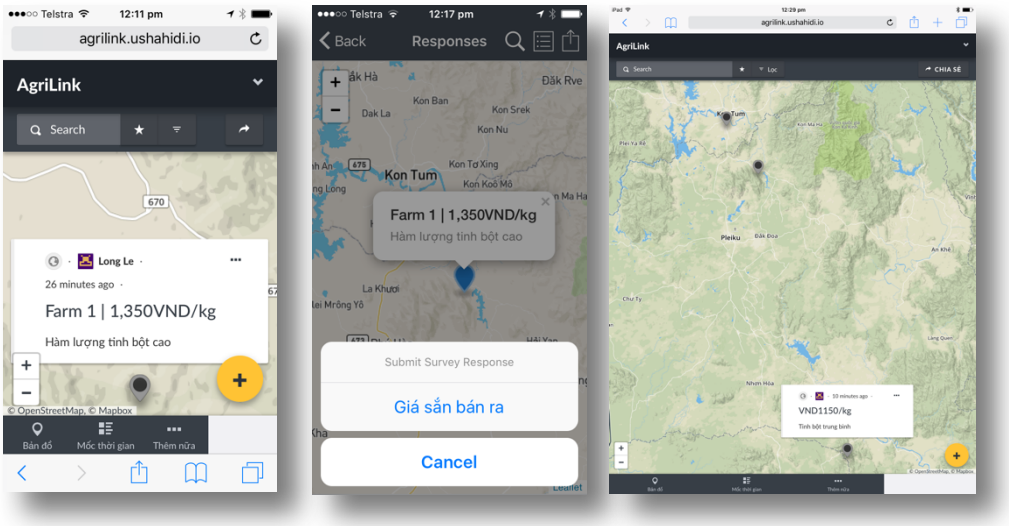
Product Iteration No. 1

Value proposition: Farmers, traders can crowd-source price data of their cassava products on a map. This map will be a source of valuable information for all participants, showing average market price in real-time and the locations currently selling. Factories can look up prices and reach out to buy from farmers with best offers.

Failed assumptions:

1. Authentication of each piece of data is important. There's too much incentive for agents in the value chain to post erroneous price information to distort market realities (such as traders, factories, etc.). So crowd-sourcing will likely fail when it hits the market.
2. There are a lot of negative incentives for all agents in the value chain to withhold information. Traders don't want farmers to know what the factory-gate price is, so they have more bargaining power over farmers. Factories don't want traders to know what the whole-sale price is, so they have more bargaining power over traders. Although market information will benefit everyone, altruism likely won't work in this case.

Product prototype (built-on Ushahidi):



APPENDIX 1A: SYSTEM SPECIFICATIONS

Essentials:

- Rating system for Factories, Traders, Farmers: highly valuable to nudge cassava value chain actors towards good behaviour, discourage bad behaviour, gradually remove negative agents in the value chain.
- Light weight: Most devices among farmers are low-end Android phones, along with slow Internet connection. Product needs to be very light-weight, low on media consumption such as photos and backend processing.
- Broadcast news to a specific group of users: Factories set price for an order. It's highly valuable to broadcast the order to a given group of users.
- Customisable fields: Transactions in the cassava value chain are highly specific (e.g. support transportation or not, discount based on quality etc.) and are highly regional. Each transaction in the system needs to be able to record all these different pieces of information.
- Login with Facebook: Very few farmers use emails at all (even though they use it once to setup Facebook). A long registration form will certainly be a high barrier to app adoption.
- Support Vietnamese language.

Important:

- Support multiple languages (including Indonesian and Khmer) in the same system: The same backend and front-end smartphone app should work across countries so that the technical framework doesn't have to be duplicated. Duplicating systems will lead to inefficient use of computing servers and more expensive maintenance.
- Can be packaged as a smartphone app, not just a mobile website: Farmers are not accustomed to using a web browser on a smartphone. An app install base will also allow for long-term development flexibility (in-app messaging between users, notifications, etc.).
- Messaging capability: Not critical in short-term, but necessary in the long term as a means for users to easily communicate from within the smartphone app.
- Login with phone number: This is the most intuitive way for farmers to login, but quite difficult to setup because it interacts with telecommunication networks, not just the Internet.

- Catalog management: User/company needs to have a record of orders they place in the system in the past.

Nice to have:

- Logistics management: From a company perspective, if this ordering system can integrate with their backend logistics system, it will have efficiency value.

Note: It's unlikely that a single system can tick all the boxes. More likely the system will be a combination of more than 1 components.

APPENDIX 2: FINANCIAL MODEL

Please find the dynamic financial model in a separate Excel document. The following is a few key information:

For the first 6 months, please see "Financial Model – 0 to 6 months.xlsx":

Chợ Khoai Mì

Monthly Cost Projection

2017-2018 | Based on a more simplified operation

Monthly Expense	Projected	Actual	Variance	
IT infrastracture (GoDaddy, Google Cloud)		45	0	45
Marketing communication agency		500	0	500
Technical agency		500	0	500
Legal, design & other agencies		400	0	400
Salary: CEO		1,500	0	1,500
Salary: Marketing Head		1,000	0	1,000
Salary: Product Head		1,000	0	1,000
Office space		500	0	500
Total		5,445	0	5,445

TOTAL 6 MONTHS AUD 32,670

For 6 months to 3 years, use the attached "Financial Model – 6 months to 6 years.xlsx" to estimate funding required, projected income, balance sheet and cashflow statements.

APPENDIX 3: KEY CONTACTS

Mr. Mai Nguyen
Former Vice President at Dakofam
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Current Supply Manager at Dakofam
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Mr. Tuan Anh Dang
Farmer relationship specialist at Department of Foreign Affairs, Quang Tri Province
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Mr. Minh Nguyen
Cassava training specialist, Faculty at Tay Nguyen Univeristy, Department of Agriculture
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Mr. Thang Tran
Vice Director General at Institute of Policy and Strategy for Agriculture and Rural Development
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Mr. Dan Phan
DB/Web Developer at Information Center for Agriculture and Rural Development
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Ms. Hoang Anh Nguyen
Qualitative Market Research Division Manager at Nielsen Vietnam
(+84) 90 9226010

APPENDIX 4: MEETING MINUTES

Appendix 4a: Mr. Mai Nguyen

Former Vice President at Dakofam

Purpose: Learn more in-depth about the value chain in the region and its problems.

Time: 1.5 hour | 25.8.2017

- Cassava price at any given time varies a lot from one transaction to another due to value chain factors instead of actual quality factor. This variation is estimated at about 30-40% depending on location of the crop, how much competition is buying from each source, quantity etc. This is a signal that the value chain is weak and unstable.
- 50% of factories in the area (3 ready to adopt the service, 1 on the line, 3 don't want to adopt) willing to pilot sending out orders to farmers via Chợ Khoai Mì IT system. These are factories located outside of the "supply zone" (vùng nguyên liệu) and struggling to secure supply to ensure smooth operation. They are willing to offer better terms to attract more supply but haven't been able to do it. The other 50% who don't want to participate in Chợ Khoai Mì are located within the "supply zone" and are understandably skeptical about this because it potentially disrupts their source of supply.
- Logistics coordination is again mentioned as a big pain point. The loss in value is up to 50% for cassava roots sitting overnight after being harvested but not yet processed.
- Factories really need stable supply because 70-80% of the cost structure is for raw material (i.e. cassava root). Price fluctuations are very damaging to profits.
- Traders get better terms by providing large supply quantity to factories.
- Many problems exist at factory gate: caused by prior relationships/under table dealing between the factory supply manager and the trader. A few typical problems are: factory supply manager slightly inflate cassava content for a given trader, factory supply manager slightly prioritised entrance for certain traders.
- Farmers require very flexible logistics service, thus individual trader serves them well
- Cross-region transportation of crops happens a lot (e.g. factory in region A buys from region B while at the same time factory in region B buys from region A). This is highly inefficient and indicates an uncoordinated value chain.
- A Mai's estimate about 60-70% of farmers receive investment from traders. Trader network is highly valuable as a logistic service provider and sometimes storage provider.
- About 2 million people in Dak Lak, 1/3 of which are farmers and about 1/6 of which are cassava farmers (rough estimate). This translates to about 100,000 farmers in Dak Lak. Each household has about 3.3 farmers (average of 50 households in Ea Sar). This translates to about 33,000 points of contacts in Dak Lak
- Reputation management in the value chain is again mentioned as a big pain point. Factories sometimes beg farmers to supply materials when they're in need but later on treat these same farmers very badly. This calls for the need of an endorsement system (as mentioned many times before).
- Right at the moment some factories need 800 tons/day but could secure only ~400 tons/day. This is the time when the buy side has a bigger pain point. This will likely reverse in November-December.

The insight here is that while the problems in value chain are highly complex, Chợ Khoai Mì can aim to be the market maker by being the online place where buyers can meet sellers, and vice versa. There's no need to intervene in the actual negotiation process.

Appendix 4b: Mr. Ngoc Nguyen

Tay Nguyen University Faculty | Department of Economics

Purpose: Get feedback on the app, learn more about past research and look for new ideas

Time: 1 hour | 23.8.2017

Value chain problem hypotheses:

- Hypothesis 1: Cassava factories hold monopoly power over farmers in the past few years. In fact, competition among traders and factories to secure cassava supply seems to have disappeared. This is potentially caused by oversupply, but may also point to cartel behaviour among existing factories. This needs more investigation.
- Hypothesis 2: Uncoordinated inflow of cassava deliveries at factory gate causes bottleneck at times and idle capacity in other times (same problem that was previously mentioned by a Mai). This weakens the value chain in 2 ways:
    - harvested cassava sitting outside for long will lower in starch content,
    - farmers perceive this as a tactic done by the factory to lower the price (whether this is true will need more investigation)
- Hypothesis 3: lack of information regarding reliability of each actor is a problem in the value chain. On the one hand, these actors have worked with each other for years and potentially know each other's reliability very well. On the other hand, there's no record of reliability of each transaction and no means of making an actor's reputation transparent throughout the value chain. If this lack of transparency allows bad actors to exist in the value chain, this weakens the value chain in 2 ways:
    - trust is damaged, causing more friction and cost in future transactions
    - bad actors take away businesses of the good actors, preventing them from growing
        - For example: Chinese traders came in and damaged the existing relationships in the local value chain a few fears before. By offering high prices, they encouraged local farmers to break existing contractual relationships with local traders and factories. Factories, in turn, stopped financing these farmers after that. This hasn't happened since the overall cassava market became depressed. However, it's still an imminent weak point in the value chain that may happen again in the future.

Segmentations:

- Hypothesize 3 segments of farmers: (1) Those who receive financing from trader/factory thus whose price bargaining is low (2) Those who don't receive external financing and have the means to direct sell to factory, thus price bargaining is medium (3) Those who don't receive external financing and don't have the means (i.e. transportation/scale) to direct sell to factory, thus sell to traders.
- Hypothesize 2 segments of traders: (1) traders who provide financing thus act more like an investor (2) traders who don't provide financing thus act more like an arbitrager
- 5 local cassava factories seem to be very similar, thus potentially have very similar needs

Appendix 4c: Mr. Sinh Phan

Chairman of Sepongroup

Purpose: To discuss insights about the differences between the value chains in these 2 provinces

Time: 1 hour | 1.9.2017

- Unlike that in Dak Lak, cassava value chain in Quang Tri is working very well. Sepongroup enjoyed strong profits from cassava in the past few years, though also affected by the falling market prices
- Sepongroup was privatised a few years ago, but is still 51% owned by the government. ~ 35 billion VND (A$2 million), about 5% revenues, are contributed as Value Added Tax to the government every year, thus a significant source of income for local government. (This information was cross-checked with the publicly available financial statements of the company)
- Internal management dedicates a significant portion to give out as benefits to workers at end of year.
- Have many initiatives to connect with farmers to educate about cassava growing techniques. Strong relationships with farmers.
- Everyone, from management to workers, farmers, government officials, shareholders, is interrelated. Internal management appreciates this reality and acts accordingly.

Appendix 4d: Mr. Tuan Anh Dang

Farmer relationship specialist, Department of Foreign Affairs, Quang Tri Province

Purpose: Discuss the viability of getting government resource support for Chợ Khoai Mì

Time: 30 mins | 6.9.2017

- Department of Foreign Affairs in Quang Tri Province maintains relationships with multiple overseas non-profit, most of which have initiatives up to 5 years from now. It's unclear about the prospect after the 5-year mark, given Vietnam is gradually becoming a middle-income country.
- PLAN - a somewhat similar group - had budget to give free computer tablets to groups of farmers in Quang Tri. May collaborate with them instead of organising farmer groups ourselves.
- He specialised in organising and leading farmers groups and often worked with overseas NGOs as contractor.
- Government departments don't have resources to spend on this kind of project, more often on larger projects

Appendix 4e: Mr. Minh Nguyen

Cassava training specialist, Faculty at Tay Nguyen University, Department of Agriculture

Purpose: Discuss the viability of running training sessions for farmers and sign them up for Chợ Khoai Mì service

Time: 1.5 hour | 8.9.2017

- Introduced current Zalo-based service concept
- Went through all the expenses paid for a typical training session and likelihood of signing up farmers for the service
- Result: This is not a viable marketing communication channel

# of farmers		*50*		*75*		*100*
Participation financial incentive	VND	5,000,000	VND	7,500,000	VND	10,000,000
Compensation for event cleaner, staff	VND	400,000	VND	400,000	VND	400,000
Compensation for gov officers to recruit participants	VND	400,000	VND	400,000	VND	400,000
Compensation for gov leader to direct the gov officers	VND	300,000	VND	300,000	VND	300,000
Compensation for cassava specialist to	VND	2,000,000	VND	2,000,000	VND	2,000,000
Transportation cost	VND	1,000,000	VND	1,000,000	VND	1,000,000
Other team member	VND	500,000	VND	500,000	VND	500,000
Total event cost	VND	9,600,000	VND	12,100,000	VND	14,600,000
Cost/farmer	VND	192,000	VND	161,333	VND	146,000
Sign up rate		50%		50%		50%
Farmer Acquisition Cost	VND	384,000	VND	322,667	VND	292,000
FAC in AUD	**AUD**	**21.33**	**AUD**	**17.93**	**AUD**	**16.22**

Appendix 4f: Mr. Thang Tran

Vice Director General at Institute of Policy and Strategy for Agriculture and Rural Development

Purpose: Discuss about use of SMS system to connect with farmers, and similar past initiatives from IPSAR

Time: 30 minutes via Skype | 30.8.2017

- IPSAR used to provide services similar to Chợ Khoai Mì Broadcast, though only limited to market price, weather information and targeting all kinds of plants instead of just cassava. Each agriculture product is assigned a numeric code to communicate.
- Have a network of traders who send in price information across a range of agriculture products. Utilise software to interpret incoming data and convert into readable Excel spreadsheet.
- Some 3rd-party (Agrimedia) provides technical assistance to farmers via phone call, but not yet proven to be effective because of lack of visual information.
- To get over low adoption of smartphones among farmers, it may be feasible to organise farmers into groups with one dedicated point of contact. It's likely necessary to pay this contact person financial incentive to serve as a bridge.
- Introduced a Dan, a personal friend of a Thang and a software developer at Information Center for Agriculture and Rural Development in Hanoi, to develop the SMS automation system.
- Follow up with a Dan suggests that an efficient, partially automated, Q&A system to interact with farmers via SMS and Zalo is feasible and isn't too difficult. A Dan will be a good resource should this need to be developed.

The challenges IPSAR faced in past attempts to deliver technology benefits to farmers speak for the similar challenges that Chợ Khoai Mì is facing. However, Chợ Khoai Mì also has a much narrower focus and is built on a stronger understanding of very specific groups of actors in a single value chain.

Appendix 4g: Ms. Hoang Anh Nguyen

Qualitative Market Research Division Manager at Nielsen Vietnam

Purpose: Discuss a field trip for Ms. Hoang Anh to come to Dak Lak to run a market research focus group

Time: 1 hour | 1.9.2017

- Planned for the weekend of 17-18/9

- Planned to run 3 groups of 8 farmer each, divided by quantity produced and/or income level

See "Appendix 6: Market Research Brief" for more details

Appendix 4h: Mr. Tan & Mr. Tinh

Current supply manager at Dakofam & Professional Cassava Trader

Purpose: Observe cassava factories' operations on-site and get a trader's perspective about the value chain

Time: 6 hours | 19.09.2017

Mr Tan:

- Pointed to cassava roots mixed with dirt on the factory ground as evidence that farmers cheated on the factory.
- His income dramatically reduced in the past few years due to lower transaction volume (volume-based compensation)
- His workers and colleagues also had their income reduced drastically and already quit. He himself was looking to quit soon if the situation wouldn't improve.
- Reported that the factory owners were gaining a lot of profits by having tight control over expenses
- Went on a tour to observe other local factories that were either closed or undersupplied due to shortages of raw materials

Mr Tinh:

- Currently a difficult period for all because raw materials aren't enough, less trading than usual
- Sometimes received order from neighbouring areas
- Claimed to be well connected with all other traders and always be on top of current market price (yet everything was done through phone calls within personal network, so this is unlikely to be true)
- Claimed that farmers are typically updated about current prices (previous ACIAR research in Dak Lak suggests the opposite, however)
- Thought that the factory executives cheat by paying him and other traders less than what would be recorded in the company's accounting book, pocketing the difference.

A few photos from the on-site visits:

APPENDIX 5: TECHNICAL ASSETS

Log with muabansan@gmail.com (password will be communicated separately for security reason) via www.lastpass.com to see a list of login credentials to the following technical assets:

- Facebook Workplace
- Zoho Mail
- Zalo
- Apple (to publish later on iOS App Store)
- Chokhoaimi.com Admin
- GoDaddy
- Google Mail
- Osclass (software purchases to make chokhoaimi.com)
- Wave Accounting
- Dropbox

APPENDIX 6: MARKET RESEARCH BRIEF

While the following brief has not yet been executed, it could be reused to perform the market research. A professionally done market research can provide valuable insights into the long-term project, guiding product development and marketing activities.

Farmer insights

Initial Exploration

Dear …,

Chợ Khoai Mì is a research aid project coming from Australia, with the support of a group of researchers from University of Queensland, Tay Nguyen University, and leaders at Australian Center for International Agriculture Research. Cassava is a very special crop, whose growers are primarily poor farmer population in developing countries such as Vietnam, Indonesia and Cambodia. This industry in the Southeast Asia region has undergone tremendous challenges in the past few years due to falling prices and broken supply chain linkages, affecting livelihood of millions of these farmers and their families. Yet, there's a very big potential in cassava as the crop of the century, with high nutritional and economic value. Working on this value chain at the same time means helping people who need help the most.

Chợ Khoai Mì is looking for relevant insights about the farmers population to guide our long-term product development and marketing communication initiatives. Market research at this stage will be highly impactful on future success of Chợ Khoai Mì and potentially contribute to the livelihood of millions of farmers in Vietnam. Thank you from Chợ Khoai Mì team!

In this exploration phase, there's no need yet for quantified market numbers but rather a deeper understanding of the unmet needs and smartphone proficiency of the farmers population. If Chợ Khoai Mì is a feasible and sustainable business, there's a potential for further financial investment, at which stage there will be a need for more quantitative research.

- Target farmer population: Dak Lak area
- What Chợ Khoai Mì knows about this population:

  1. Only about 10% uses a smartphone

  2. A larger percentage likely have smartphones (for their kids) and/or computer in the house

  3. Most likely have smartphone access through a farmer friend in the area

  4. There seems to be a strong demand for Chợ Khoai Mì Consultation and Broadcast service,

  though interaction is challenging. Consultation provides technical assistant for growers when they encounter issues with their crop. Broadcast provides useful tips, market news, spread of plant diseases.

- What is unknown about this population:

  1. Smartphone adoption factors and costs: This is an open-ended question, but a few

  questions came up during initial contacts with these farmers are:

      a. How much efforts will it take to train one farmer to register for Chợ Khoai Mì

service and interact via Zalo
b. What influence these farmers' decision to adopt this new technology-driven service
c. Will re-training be necessary
d. Is there willingness to pay for these services

e. What, if any, would make adoption of technology viral within this population and how much would it cost to create, maintain this virality

2. User segments within this population:

a. Are there separate groups who demand different things from Chợ Khoai Mì, e.g.

information vs. technical help

b. Are there any other unmet needs about farmers' cassava business not yet discovered

These insights are important to design a product that farmers can use and to reach out to a lot of farmers with a very limited marketing budget.

Chợ Khoai Mì's big challenge is the relationships with a large number of potential farmers (estimated at 100,000 in Dak Lak alone). These users only have the need to interact with the marketplace 1-2 times/year. The timing of such need is unique and unpredictable for each user (driven by urgent financial needs, current market price, relationships with traders, etc.). 60-70% of these users also receive some investment from traders/factories and thus are less motivated to participate in the open marketplace. The rest 30-40% (still a very significant number) are difficult to identify and target. Most notably, a large number of these farmers don't have a smartphone, don't know how to use it, or don't even know how to read SMS that comes to their feature phones. Yet, these millions of farmers in Vietnam will be able to reap huge benefits from participation in Chợ Khoai Mì online marketplace.

Currently, the farmers are vulnerable against diseases affecting cassava plants, not knowing when such risk is coming, how to respond, how to mitigate risk at the start, how to predict price fluctuations to manage production, or when demand is high to bargain for better deals, which traders/factories are reliable as investment partners, where to sell for the most money should they need urgent cash, etc.

As such, pulling farmers into the ecosystem and providing the right level of technical support at lowest cost possible is a real challenge but very valuable.

Hopefully this background information will be useful for your work. Please don't hesitate to ask for more clarifications. And many thanks again for your invaluable time and expertise contribution!

Sincerely yours,

APPENDIX 7: BRAND STRATEGY

Brand is one essential element of the business case because it is the focal point for all marketing activities, including internal and external communication, product design, advertising, promotion, customer support, partnerships, public relations, and potentially hiring, company culture later on. The existence of a brand also allows users to remember about the app, try it, communicate to others about it, and develop trust towards the brand identity over time. This brand equity if successfully developed will be very useful for any future related projects via brand extension.

In the longer term, not just one, but an architecture of brands is needed. For each country that the app runs in, a brand name for the app in local language is needed for the app to relate with local farmers. At the same time, a parent brand in English language is needed to keep all these local apps rooted in a single project and thus can share resources, such as computing power to run the apps, personnel, internal IT infrastructure. The parent brand also allows the local projects to fundraise in Australia, as an additional, important source of revenues in the future.

LOCAL BRAND IN VIETNAM

"Chợ Khoai Mì" (i.e. 'Cassava Market') was chosen as the brand name for the app and the project. The corresponding chokhoaimi.com domain was purchased via GoDaddy. Multiple other names were considered such as "Bạn Nhà Nông", "Chợ Nông Sản", etc. but these broader names were all taken. Besides, the wider the scope of the brand, the weaker it will be. "Mua Bán Sắn" was also registered as a secondary brand name for the project along with muabansan.com domain and can potentially be used to expand app usage beyond Dak Lak where "sắn" is a more commonly used word for cassava.

These names were intentionally crafted to be easy for farmers to understand, and down-to-earth enough for them to relate to. The message behind the brand is "Thân thiện. Nhanh. Kết nối bền vững" (Friendly. Fast. Sustainable connections). These 3 keywords are chosen to convey as efficiently as possible what Chợ Khoai Mì does and why it's relatable, trustworthy.

Elifepartners – a group of graphic designers in Vietnam – was commissioned to develop the basic visual elements of the brand/app. This supplier can potentially be long-term partner to take care of all visual work for the project such as flyers, advertising, animation etc.

OTHER BRAND ELEMENTS

Signature

Business card

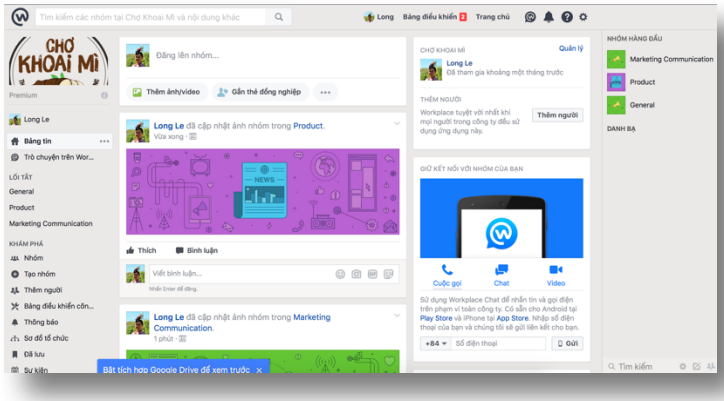
Letterhead

APPENDIX 8: INTERNAL MANAGEMENT TOOLS

The following tools were found to be free for non-profit use and essential for team communication, accounting purposes

Facebook Workplace

A great tool for keeping records of online interactions between team members, including video conferencing, project management tool, event organisation etc. This is setup as a free account for non-profit use only.



Wave Accounting

Free and versatile solution to keep track of expenses and income. It can also automatically produce financial statements such as Balance Sheet, Income Statement, Cashflow at any given time.