

Communication Device for Micro Trade Networks

Project II
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This project titled ‘Communication Device for Micro-Trade Networks’ by Girish S is approved for the partial fulfillment of the requirement for the degree of ‘Master of design’ in Industrial design.

Guide
Chairperson.
Internal Examiner.....
External Examiner.....
Date.....

THANKS...

God
Mom
Dad
Prof. U A Athavkar
Savi
Pankaj Sanpal
Rahul Kaushik
Ashwini
Vrushali
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Rohan
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Mohan Sir

INDEX

Abstract
Introduction
 Why Micro trade?
 Why Rural areas?
User Study
Data Analysis
 Sequence of operation
 Why Hundekari?
 Why Mobile phone?
 Nature of the Solution
Product Brief
Initial concepts
Final concept
 Form
 Function
 Technology
User Feedback
Annexure
References

ABSTRACT

This project aims at the micro-traders involved in selling of agricultural produce in rural areas and proposes a solution based on a mobile phone platform that would assist them in their trading activities. The focus is on group of people acting as aggregators called *Hundekaris* who aggregate the produce from different farmers and facilitate the selling of the produce in Market yards through agents called *Adatyas*. However, this is only one among the many ways in which agricultural produce is sold. This project proposes a robust process that may be applied in other scenarios as well and is also possible to extend this concept to other micro-trading operations after suitable customisation. This project suggests two solutions...first, as an application that can run on existing mobile phone platforms and the second, with a different hardware specifically designed for micro-trading operations.

INTRODUCTION - *Why Micro trade?*

It is rather difficult to define micro-trade but it essentially is a small enterprise run by one or more person with a net annual income around Rs.60,000 – 1,00,000 at an average of Rs150-250 per day. This includes millions of people in the unorganized sector from a flower seller to a small grocer. Even though this sector is a major source of employment its contribution towards the GDP is rather insignificant.

Statistical data on micro trade and people involved in them are very encouraging. Here is a huge segment that has never been taken seriously before, owing to the small size of an enterprise and its relatively smaller wealth generation. But considering the large number of people who are involved in micro trade anyone who can do basic math will certainly be surprised at the opportunities that this segment offers. Its no wonder that major Banks have already entered this market, so have Insurance companies, FMCG manufacturers and food producers.

Microenterprises in developing countries:

80% of all enterprises

50% of all urban enterprises

2% of GDP

Main provider of employment

500 million microentrepreneurs worldwide

5% have access to financial services

Source :http://www.responsability.ch/en/9_faq.html

INTRODUCTION - *Why Rural Areas?*

The stereotypical image of Indian villages has always been that of a sepia tinted dusty settlement...greenery, cattle, thatched mud houses with its innocent, ignorant, poverty stricken emaciated inhabitants steeped high in superstitions and caste hierarchy, which is true to a large extent. But at the other end of the spectrum are youngsters in some villages who use mobile phones to share videos and latest pop songs via Bluetooth, and use the internet to download videos. One cannot deny the fact that villages and its inhabitants are undergoing a major transformation due to consumer age which has dawned upon them. The ICT revolution which started with a PCO and then cable TV has now been taken over by mobile phones and internet. Major corporations are trying to woo the villagers, which makes commercial sense in a country where about 76% of its population lives in rural areas.

The possibilities that the consumer age has opened up in rural areas is infinite. There are millions of people who need service not only fulfilling their basic needs like food, shelter and gainful employment but needs that rank higher up in Maslow's hierarchy, (Nimmi Rangaswamy and Kentoro Toyoma, 2006) education and entertainment being the major ones.

INTRODUCTION - *Why Rural Areas? Contd...*

It might come as a surprise to many that a section of the rural mass is just as aware as their urban counterparts on global issues.

In one of the poorer families visited, the family lived in a one room mud plastered thatched hut and did not have an electricity connection, but the fifteen year old son was an expert user of a basic level mobile phone. There were other instances of children as young as six being able to use mobile phone with élan. This, however, is a small percentage of a larger population which is still illiterate and unaware of issues like health, hygiene, education etc that have a direct impact on their lives.

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USER STUDY

The major source of employment and income in Indian villages is still farming and farming related activities. So the decision to look into farming and trading practices of farmers becomes an obvious choice. Farmers with smaller land holdings (approx 5-15 acres), who engaged in trading of their excess produce were the targeted users. It was decided to identify the main players involved in this trade and to study them in detail. Apart from their basic information, their community model, social networking, business and accounting practices, their information sources and their tech-savviness were also to be studied. A detailed questionnaire (*See Annexure*) was prepared and armed with this along with students of Symbiosis Institute of Design, Pune we set off to two villages in Rajguruh Nagar district, Pabal and Junnar, and a market yard at Vashi.

Cross section of users interviewed in detail

Farmers	Five*
Hundekaris	Three *
Dependants	Two

* *There is an overlap between farmers and Hundekaris.*

USER STUDY - User 1



Bhagwan Gyanbhau Hande – Farmer/*Hundekari*

- Male, 43
- Married with two sons aged 18 and 16
- His mother aged 75 lives with the family
- Speaks, reads and writes Marathi and Hindi
- Primary Occupation – Farming
- Secondary Occupation – *Hundekari*
- Acts as a *Hundekari* for about 75 farmers in his village
- Provides fertilizers and seeds to farmers in his network. He buys these fertilizers from a retailer in a nearby town
- Takes loans from Janata Sahakari Bank and facilitates loans for other farmers from a co-operative society.
- Wife is a member of a local women's SHG and takes small personal loans from the group.
- Owns a TV with cable network, Blender, refrigerator, Mobile phone (Nokia 1600) and a motorcycle.
- Speaks regularly over his mobile phone or land line to *Adatya*s, family member and friends.
- Contacts *Adatya* mainly to know about the current market conditions which helps him to take decisions about when, where and what to sell. .
- Has never used an ATM or the internet but is aware of it

USER STUDY - User 1

Bhagwan Gyanbhau Hande *Contd...*

- Does not use any other function in the TV remote other than changing channels and adjusting volume.
- Cannot add contacts in his mobile phone and gets it done from his son.
- Cannot send messages
- Can set an alarm and uses snooze.
- He watches daily news on DD1 regularly and soap operas in the evening
- He also watches programs like 'Amchi Mati Amchi Manus' to obtain information about new farming practices and useful tips.
- Reads daily newspapers like 'Sakal' and agriculture magazine and weeklies like 'Agro-One' and 'Baliraja' mainly for market rates, latest farming practices and new farm technology.
- Rarely participates in Gram Panchayat or Sabha. Gram Sabha happens twice a year and Gram Panchayat happens twice or thrice in a month in which only Gram Sadasya participates. In these meetings issues of the village and social issues and a people try to find solutions for them.

USER STUDY - User 2



Rajendra Ghadge - Farmer/*Hundekari*

- Male, 24
- Unmarried
- Lives with his parent
- Speaks, reads and writes Marathi and Hindi
- Can read and write English reasonably well but does not speak.
- Primary Occupation – Farming
- Secondary Occupation – *Hundekari*
- Owns a TV with a satellite dish, Mobile phone, Refrigerator, DVD player and calculator.
- Speaks regularly over his mobile phone or land line to *Adatyas*, Family member and friends.
- Contacts *Adatya* mainly to know about the current market conditions which helps him to take decisions about when, where and what to sell.
- Loans money to friends when they need.
- Has never used an ATM
- Has seen his friend using the internet to download songs and videos and has browsed in his Mobile phone.
- Is an advanced user of the TV remote control. Can change the settings, swap channels and can do almost all functions.

USER STUDY - User 2

Rajendra Ghadge *Contd...*

- Owns a Motorola L6. his twelfth phone in three years. When he buys second hand mobile he checks the call duration of that mobile phones and he checks the phone's manufacturing date by typing *#0000# in Nokia mobiles
- Can add contacts and can categorise them like residence, office.
- Can set passwords.
- Uses SMS. Can type Marathi words in English as its easier than devanagari. Can type devanagari script too but finds it rather time consuming. Inserts smiley, pictures, templates etc.
- Can toggle between T9(dictionary) and normal mode of entering alphabets.
- Sets alarm and uses reminders
- Checks call duration and call cost in the call register.
- Can assign different tunes to different contacts.
- Can change themes, plays games and uses camera.
- Assigns names to pictures, retrieves them, sends them and deletes them.
- Has used the internet on his mobile phone but doesn't use it anymore because of its high tariff.

USER STUDY - User 3



Dasrath Dhondiba Kumkar - Farmer

- Male, 50
- Studied upto 4th standard.
- Married with two sons ages 20 and 15
- Speaks, reads and writes marathi.
- His parents stay with him and elder son lives in Pune with relatives
- Primary Occupation – Farming
- Secondary Occupation – Livestock - three goats and one cow.
- Own Earns about Rs.30,000 per annum from live stock.
- Has no electricity connection and hence does not own any electrical appliance.
- Has a radio that is connected to the battery of a flashlight which is used by his elder son when he comes during weekends.
- Maintains a separate daily ledger for farming and livestock activities
- Notes down daily activities, labourers attendance, accounts etc in his ledger.
- Takes loans from banks but prefers relatives or friends to avoid paperwork and interest.

USER STUDY - User 3

Dasrath Dhondiba Kumkar *Contd...*

- Sells a major portion of the produce through *Hundekari* and rest in local market directly
- *Hundekari* helps him to make decisions about farming as he owns a shop that sells fertilizers, pesticides, seeds etc and is trustworthy.
-
- Wife is a member of local SHG and takes small personal loans from the group.
- Calls his relatives from a PCO and speaks to his elder son once every three or four days
- Is aware of ATM, e-mail and internet but has never used them
- Doesn't read newspapers
- Visits the 'chavdee' every day and talks about market rates, farming related topics and information is shared about new farming practices, technology etc. Also other village level activities are discussed.
- Has been following new farming methods after attending demonstration by officials from 'Krushi Vidyapeeth'

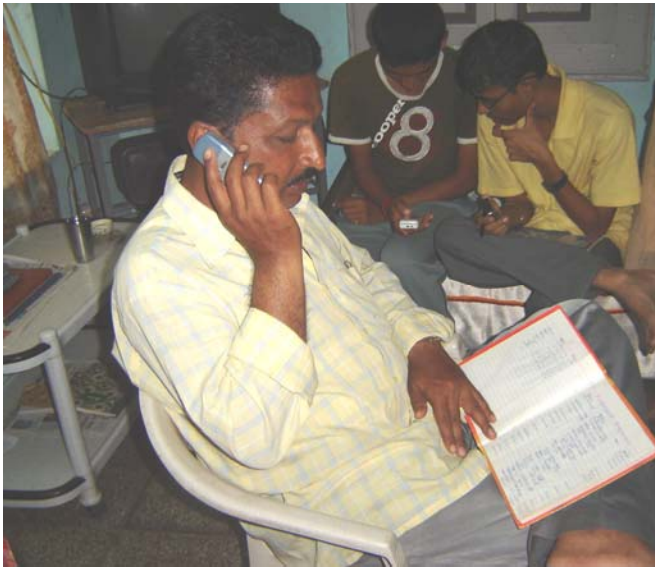
USER STUDY - User 4



Ganpat Kumkar

- Male, 15
- Son of Dasrath Dhondiba Kumkar (User 3)
- Goes to local school
- Listens to FM radio and can adjust amplifier levels.
- Does not own a mobile phone but has learnt to use it from friends at school.
- Can make, receive, redial calls
- Can store, edit, delete search for contact information
- Can send SMS. Does not use the dictionary mode but toggles to normal mode.
- Sends marathi SMS in English as its easier than typing marathi.
- Can set time/date and change ringtones.
- Can set alarm but does not set reminders.
- Knows about network selection and can select network manually.
- Can change the language option to Hindi, Marathi or English, but thinks English is easier.

USER STUDY - User 5



Rajendra Vajge - Farmer

- Male, 47
- 10th pass.
- Married with two kids
- Speaks reads and writes Marathi and Hindi.
- Occupation – Farmer.
- Owns two bullocks and two buffalos.
- Owns a TV, landline phone, mobile phone, VCD player, radio, cassette player, calculator, Dish TV. Plans on buying a computer.
- Own washing machine, blender, refrigerator, iron box, Bicycle, Motorcycle, and a Pick-up truck
- Maintains a daily ledge to keep track of his farming practices, amount spent, labourer's attendance etc..
- Takes loans from banks, relatives or friends and never from local money lenders. Takes small personal loans from a local SHG of which wife is a member.
- Uses the TV remote control only to change channels and adjust volume.
- He is aware of ATM and internet but has never used them

USER STUDY - User 5

Rajendra Vajge *Contd...*

- Makes at least 20-25 calls from his mobile phone everyday. Calls friends, relative and *Adatyas*.
- Cannot store numbers on the phone and asks his son to do the same.
- Asks son to set reminders for him.
- Watches programs like 'Krushi Darshan', 'Amchi Mati Amchi Manus' to get weather updates, information regarding fertilizers and seeds, market rates etc
- Watches popular soap operas apart from these programs.
- Experiments with a small portion of the land with the information available from TV about new farming practices.
- Reads newspaper daily and gets daily market price.
- Networks with officials from local Agricultural office and asks about new farming practices and subsidies etc.

USER STUDY - User 6

Vighneshwar Vajge



- Male, 16
- Son of Rajendra Vajge
- Studies in 11th standard
- Speaks, reads, writes Marathi, Hindi and English.
- Own a Nokia 5300.
- Can make, receive, redial calls
- Can save, edit, delete or search contact information.
- Uses silent profile in the classroom
- Can send receive SMSes.
- Can set alarm, reminder, change settings, add notes in calendar
- Collects wall papers and MP3 songs which he sets as ringtones.
- Uses camera to take pictures and record videos.
- Shares videos and MP3's with friends using Bluetooth.
- Plays games and views cricket scores.
- Very advanced user and uses almost all functions of the mobile.
- Has used a Sony Handycam before and could understand cryptic clues like Centre AF from the LCD screen of a Sony Cybershot which he has never used before.
- Knows to use a computer and is taking courses from a nearby town.

USER STUDY - User 7



Suresh Jadhav - Farmer/Hundekari

- Male, 49
- 12th pass
- Married with two kids
- Reads, writes, speaks Marathi and Hindi
- Can read and write a little English
- Primary Occupation – Farming
- Secondary Occupation - *Hundekari*.
- Owns a TV with cable network, landline phone, mobile phone, VCD player, radio, cassette player, calculator, Dish TV.
- Maintains a separate daily ledgers for farming activities and *Hundekari* activities
- Has seen a computer at Vigyan Ashram, a local NGO which helps farmers and educates the village kids.
- He is aware of ATM and internet but has never used them
- He uses the TV remote control only to change channels and adjust volume.

USER STUDY - User 7

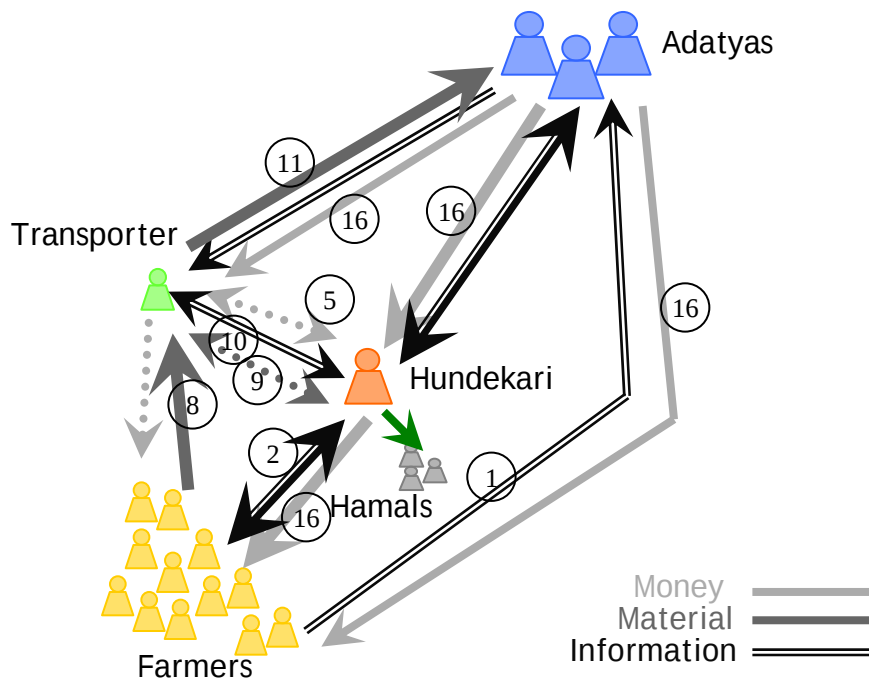
Suresh Jadhav *Contd...*

- Makes at least 10-15 calls everyday to friends, relatives and *Adayas* and transporters
- Gives missed call to *Adayas* who calls him back
- Cannot store numbers on the phone and asks his son to do the same
- Can read messages but has never sent one.
- Watches programs like 'Amchi Mati Amchi Manus' to obtain information about new farming practices and useful tips.
- Reads daily newspapers like 'Sakal' and agriculture magazine and weeklies like 'Agro-One' mainly for market rates, latest farming practices and new farm technology.
- Visits the '*chavdee*' every day and talks about market rates, farming related topics and information is shared about new farming practices, technology etc. Also other village level activities are discussed.

DATA ANALYSIS

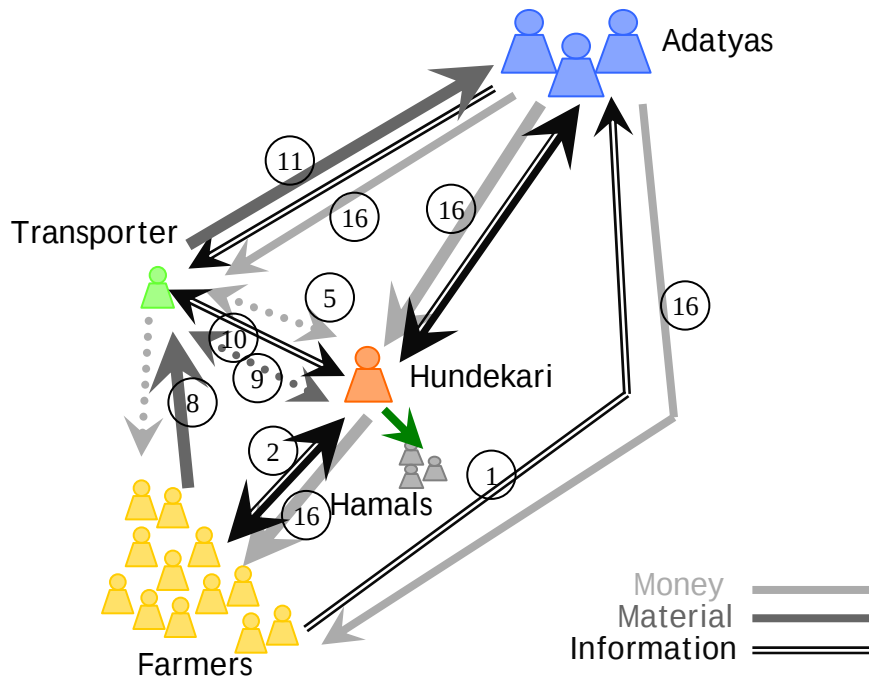
The entire trading operation was broken down into a sequential manner and scrutinized in detail. The striking feature that one observes is the organic yet highly accurate nature of their business processes and the fact that the entire operations runs on mutual respect and trust.

DATA ANALYSIS - Sequence of Operation



1. The farmers contact the *Adatyas* in the market yard and enquire about the current market prices of produce.
2. The farmers communicate to the *Hundekari* about the nature, amount of produce, the *Adatya* and the date on which it has to be sent
3. Some farmers collect gunny bags from the *Hundekari* to pack their produce, the cost of which is deducted from the final bill.
4. The *Hundekari* writes these down in his *chopadi* or ledger which is maintained date-wise.
5. The *Hundekari* after collecting this data from the farmers decides on the capacity of transport and calls the transporters to enquire about the availability.
6. The drivers of the truck collect a rough sheet or *kachha chitta* which has the details of the farmer, produce and quantity along with printed labels of different *Adatyas* with to be given to the farmers from the *Hundekari*.
7. The drivers give the labels to the farmers which are then attached to each gunny with the name of the farmer and quantity of produce is written on it.
8. The gunny bags are loaded into the truck by the *Hamals* engaged by the *Hundekari* and brought to a weighing point usually at the transporters office.

DATA ANALYSIS - Sequence of Operation



9. The gunny bags containing vegetables are taken out, weighed and then loaded again. This is necessary to determine the transportation charges. In case of produce like Potatoes and Onions which are usually in large numbers the charges are based on flat rates per bag.
10. Bills for the transporter and the *Adatyas* are made by the *Hundekari* and sent along with the drivers.
11. The produce is unloaded at the market yard at each of the *Adatya's* place
12. The bags are weighed again and noted down in a *Chopadi* or ledger. This is necessary to determine prices. These weight records are monitored by APMC officials.
13. The weight of the bag, the price at which it is sold and the person to whom it is sold is written on the back of the label.
14. The labels along with bills from *Hundekaris* and *chopadis* are handed over the clerk at the *Adatyas* office who then updates the records usually maintained in ledgers or in an electronic format.
15. Bills are made for each farmer. Each bill includes the price, quantity, *Hundekari* and *Adatya* commission, transportation charges and other details.
16. Money is collected by the farmer along with the bill or the bill and money handed over to the driver or is retained by the *Adatya* and is collected by the *Hundekari* at the end of the week to be distributed among respective farmers.

DATA ANALYSIS - Data Fields

The image shows a handwritten bill in Devanagari script. The bill is divided into several sections. The top section contains the title 'Hundekari Bill' and the date. The middle section contains the names of the farmer, Adatya, and Hundekari, along with the destination. The bottom section contains the produce, quantity, weight, and various charges. The bill is numbered 16 in the bottom right corner.

Field Number	Field Description
1	Date
2	Name of the farmer
3	Name of the Adatya
4	Name of the Hundekari
5	Destination
6	Produce
7	Quantity
8	Weight
9	Refund (For gunny bags)
10	Vehicle Number
11	Name of the driver
12	Transportation charge
13	Hamali (Labour- loading)
14	Thapi (Labour- arranging on the truck)
15	Commission for Hundekari
16	Total

A sample of the bill made by a *Hundekari* to the transporter. It must be noted that all data is written in *Devanagari*.

- Date
- Name of the farmer
- Name of the *Adatya*
- Name of the *Hundekari*
- Destination
- Produce
- Quantity
- Weight
- Refund (For gunny bags)
- Vehicle Number
- Name of the driver
- Transportation charge
- *Hamali* (Labour- loading)
- *Thapi* (Labour- arranging on the truck)
- Commission for *Hundekari*
- Total

DATA ANALYSIS - *Why Hundekari?*

Looking at the entire operation holistically it is not hard to miss that the two key players in the entire operation are the *Hundekaris* and the *Adatyas*. Generally the *Adatyas* handle more information and are the most critical players of the entire process. A communication device that would help them in trading would be a formidable challenge, yet the ideal one, but the *Hundekaris* are more relevant to us because of their mobile nature. *Adatyas* generally operate from an office whereas *Hundekaris* do not have fixed establishment and their operation requires them to be mobile. A solution based on mobile platform would ideally suit such people. They are often the early adopters of mobile phones in villages and others usually follow suit. Moreover *Hundekaris* play more than just one role of being aggregators of produce in a village. They usually are farmers themselves or shopkeepers that sell fertilizers, seeds, pesticides etc. They often give loans to the farmers, act as advisors on agricultural matters and play a pivotal role in the social drama of the village.

DATA ANALYSIS - *Why Mobile Phones?*

Never before has any product captured consumer imagination in the way mobile phones have done and never before has any product such high penetration levels among households in such a short span of time like mobile phones. With call rates dropping almost 32 times for outgoing, incoming becoming absolutely free and obtaining a mobile connection becoming cheaper and faster than a regular landline connection and its inherent advantage of being 'mobile' have made it the most successful technological products ever sold in the market. Mobile phones stopped being phones a long time back. They can tell time, take pictures, send messages, play songs, record videos, connect to the internet, plan your day, help you to do basic math, wake you up in the morning, remind you about a task, act as a flashlight ...one can play games, know about the latest movies, cricket scores, good restaurants, compose tunes, etc.

These little technological wonders are becoming smaller, cheaper and more powerful by each day. They have become as more ubiquitous than any other consumer product. They are cheap, affordable and one can select from a very wide range.

DATA ANALYSIS - *Why Mobile Phones? Contd...*

In spite of all these advantages, to implement a mobile based solution for a complex operation like trading, accounting and billing is rather cumbersome owing to the small size of the screen. The limited number of keys and their small size makes it rather impossible for typing alphabets and data entry operations especially in complex scripts like *Devanagari*. The inherent problem like being unable to carry out more than one function at the same time makes it very difficult to carry out a complex operation like trading which requires a high flexibility. Moreover, the extensive data entry and manipulation is very difficult with the existing keypad.

To develop a model that overcomes these shortcomings and also that is easy to learn and use is rather a lofty challenge. However, the encouraging factor is that technology is becoming cheaper by the day and technologies like voice recognition software, touch screen etc. would eliminate a lot of these issues without making the final product too expensive.

DATA ANALYSIS - *Nature of the Solution*

A solution based on an existing ERP (Enterprise Resource Planning) platform need not necessarily succeed because it has nothing in common with the existing mental model. All transactions are written down on notebooks and each transaction has a different notebook. More over transactions are written down date-wise and seldom person-wise like a grocer. There are multiple entries of the same information and retrieval is rather time consuming as it involves sifting through the carbon copies of the bills or date wise entries on their notebooks. Possibilities of errors are higher as multiple entries of same data takes place. There are sixteen fields most of which are repetitions or can be generated automatically.

It may seem easier to write down data on a notebook which probably is, for a person who has been doing it for years but an automated system is more powerful because it can do multiple things like faster calculation, easier retrieval and ability to generate multiple copies of the same data within seconds. They are more legible and have lower percentage of error. Transferring large amounts of data becomes easier and fool proof. Interaction between two or more different automated systems for sending, receiving and referring data becomes faster, easier and without error.

PRODUCT BRIEF

To design a communication device to assist the *Hundekari* in trading of agricultural produce as well as act a device that will permit synchronous/asynchronous communication for personal needs.

The device must enable making/receiving calls, sending/receiving messages. It must have the ability to support local languages for navigation and messaging.

The device must be able to assist in the following functions

1. Taking down orders
2. Selecting suitable transport
3. Arranging the collection of produce
4. Preparing bills for Transporter and *Adatya*.
5. Sending the bills electronically or printing hard copies.
6. Maintain archives for reference
7. Maintenance of accounts

It must have a robust conceptual model which is easy to learn and use even by a semi-literate person.

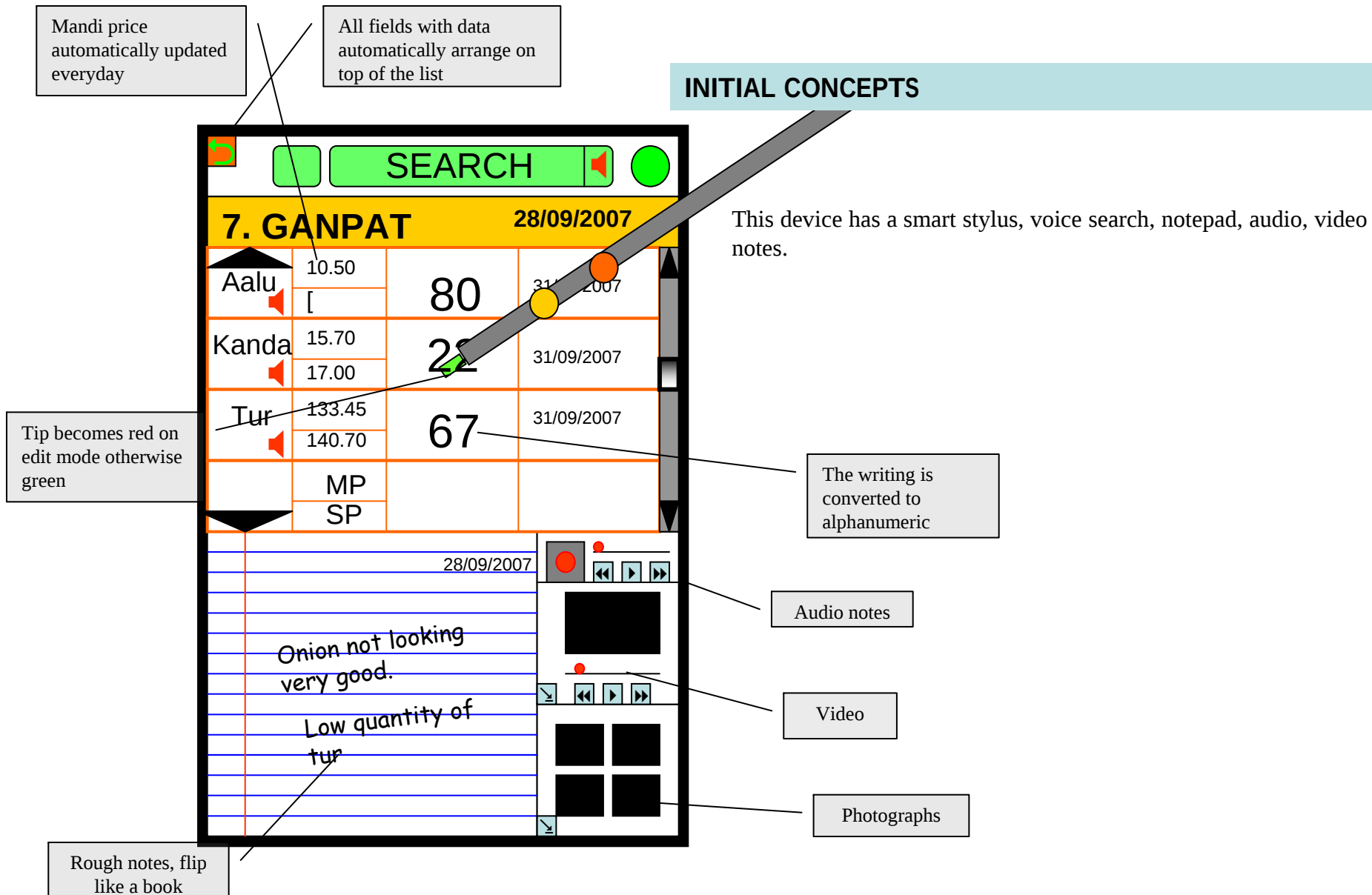
The communication device must be able to simplify the process and make it more efficient, transparent and aim at a zero error process which can be easily applied to other similar micro trade processes as well.

INITIAL CONCEPTS

It was decided to approach the problem in two ways. One, as an application that can be run on existing mobile platforms and other as a device whose major function would be assist in trading operations.

All interfaces shown in these concepts are in English and are only indicative. The final concept would be able to support local languages.

INITIAL CONCEPTS

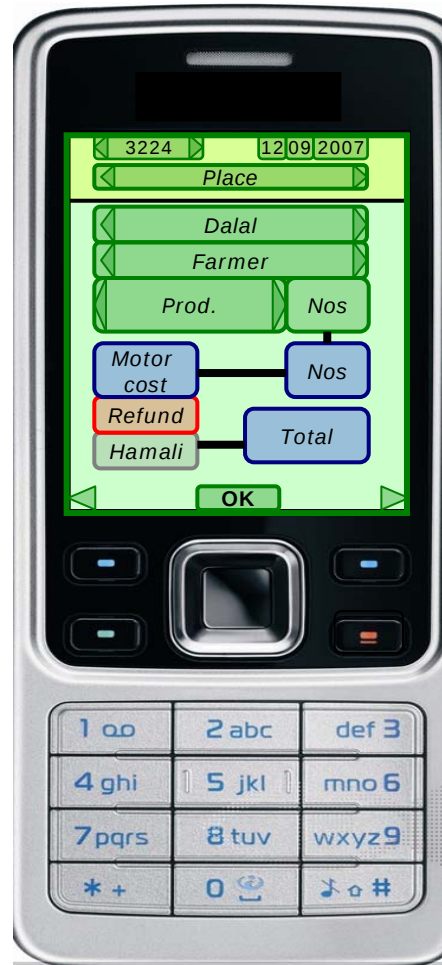




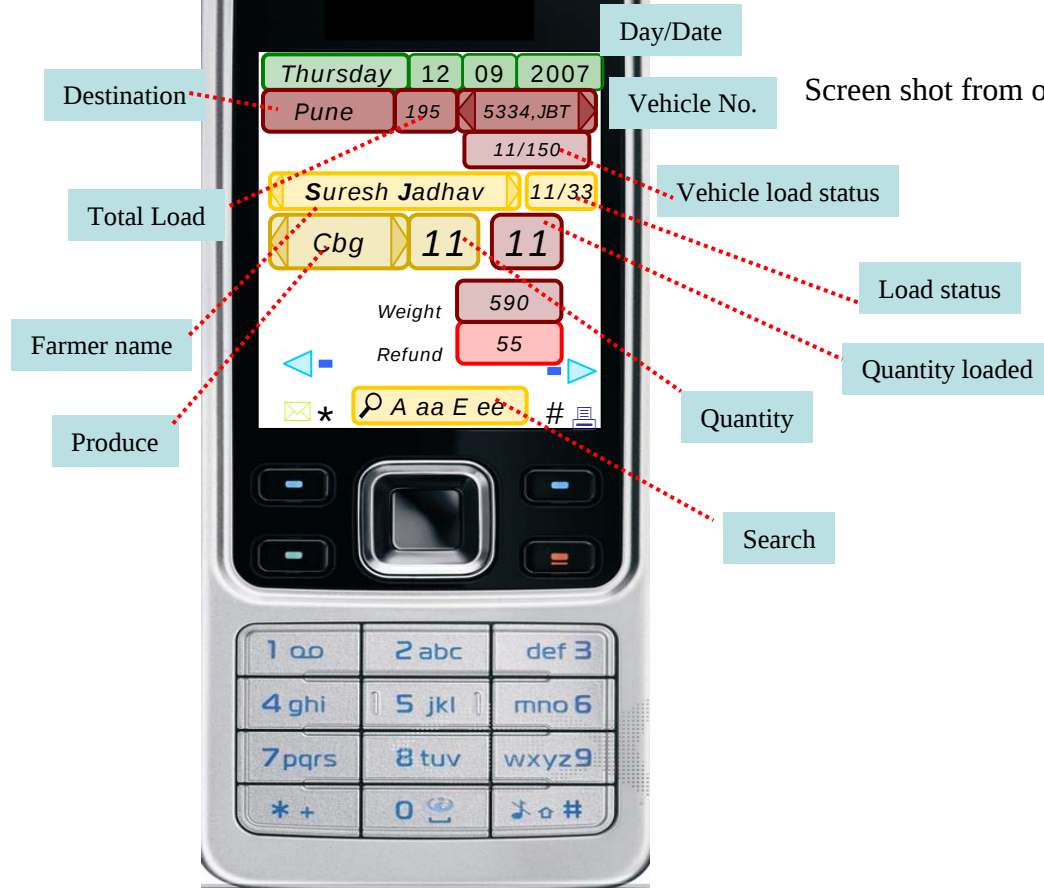
INITIAL CONCEPTS

This is an application based on NOKIA Platform. Several iterations were carried out in this concept.

INITIAL CONCEPTS - One of the iterations...



INITIAL CONCEPTS



Screen shot from one of the iterations that showed promise.

INITIAL CONCEPTS



Order form



Scroll to select the name



Completed order form

INITIAL CONCEPTS

This is a concept with a printer attachment to which the phone can be docked.



INITIAL CONCEPTS

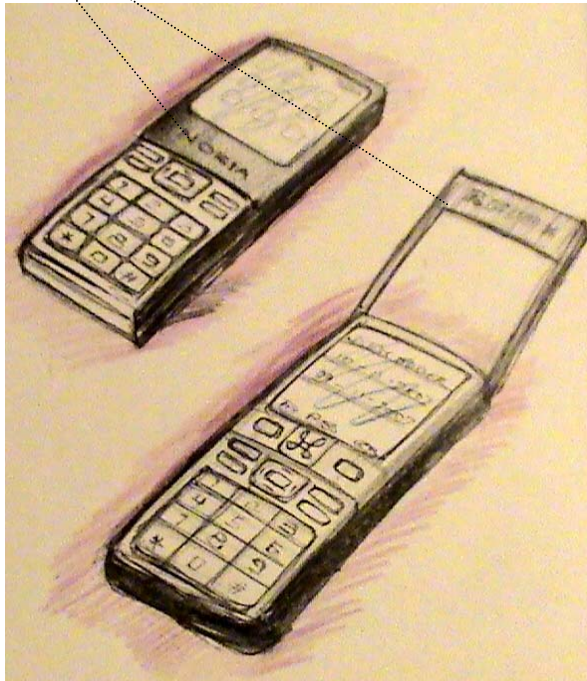
A sample print of the bill.

							12/09/2007
Pabal to Pune *** T S Shevale and Co .*** JB Trasport *** 3224							

Farmer	Nos.	Produce	Weight	Motor	Refund	Hamali	Total
Nageshwar	35	Aalu	1000	750	---	---	
Nageshwar	22	Kanda	700	440	---	---	
Nageshwar	16	Cabbage	216	216	---	---	
Nageshwar	22	Tur	980	440	---	---	
Rajesh	12	Cabbage	270	270	12	50	
Rajesh	16	Tur	650	320	32	---	
Rajesh	7	Kanda	150	140	7	---	
Suresh Jad	10	Aalu	330	200	10	110	
Suresh Jad	14	Kanda	300	240	14	---	
Suresh Jad	22	Tur	1000	440	44	---	

Thapi 350	Commission 3000	Refund 133	Hamali 160	TOTAL	11643.00		

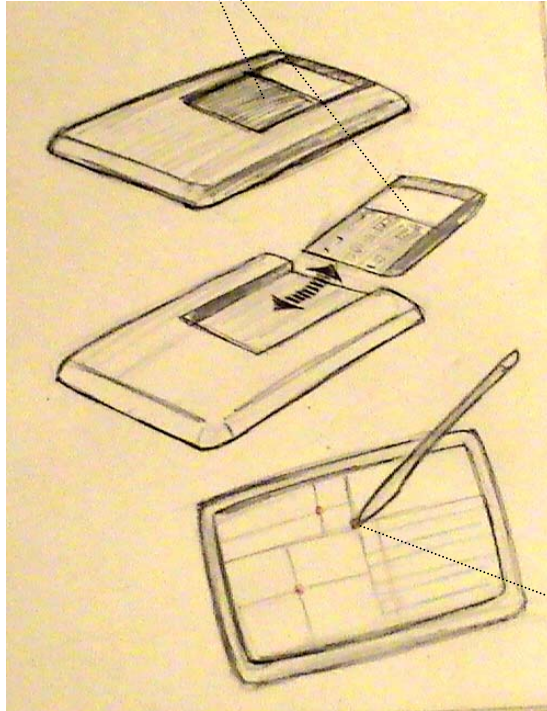
Flipping this open activates the tagging mechanism



INITIAL CONCEPTS

In this concept RFID tags are attached on gunny bags by the farmers and all bags are tagged either partly by farmer and partly by *Hundekari* or wholly by the *Hundekari*. Each tag would contain information regarding the Day/Date, Farmer, *Adatya*, Produce, Weight, Refund etc. The weighing machine directly updates the weight in the tag. Only data to be entered by the keypad in the order form would be the quantity.

RFID Tagger/Hands free Unit with numeric keypad



INITIAL CONCEPTS

In this concept the *RFID tagger* doubles up as a hands free unit which allows multi tasking. The touch screen work pad eliminates most of the navigation issue and the 'quadrant drag' makes working on two or more areas very easy.

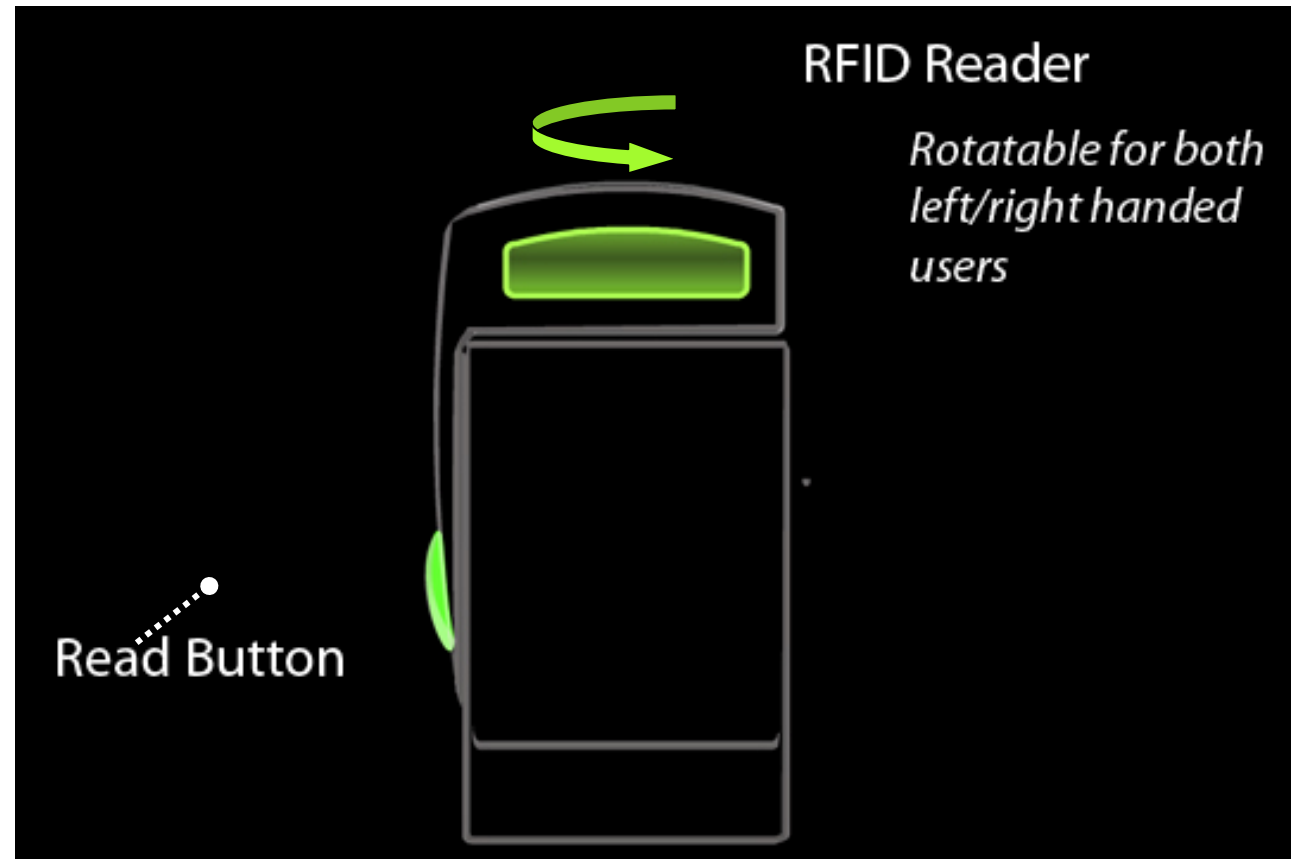
In 'quadrant drag' the screen is divided in four quadrants which in turn are divided into four. By dragging the centre point where the quadrants meet one can manipulate the size of the each quadrant. So theoretically one can work on sixteen files simultaneously.

Work screen divided into quadrants which can be manipulated by a stylus

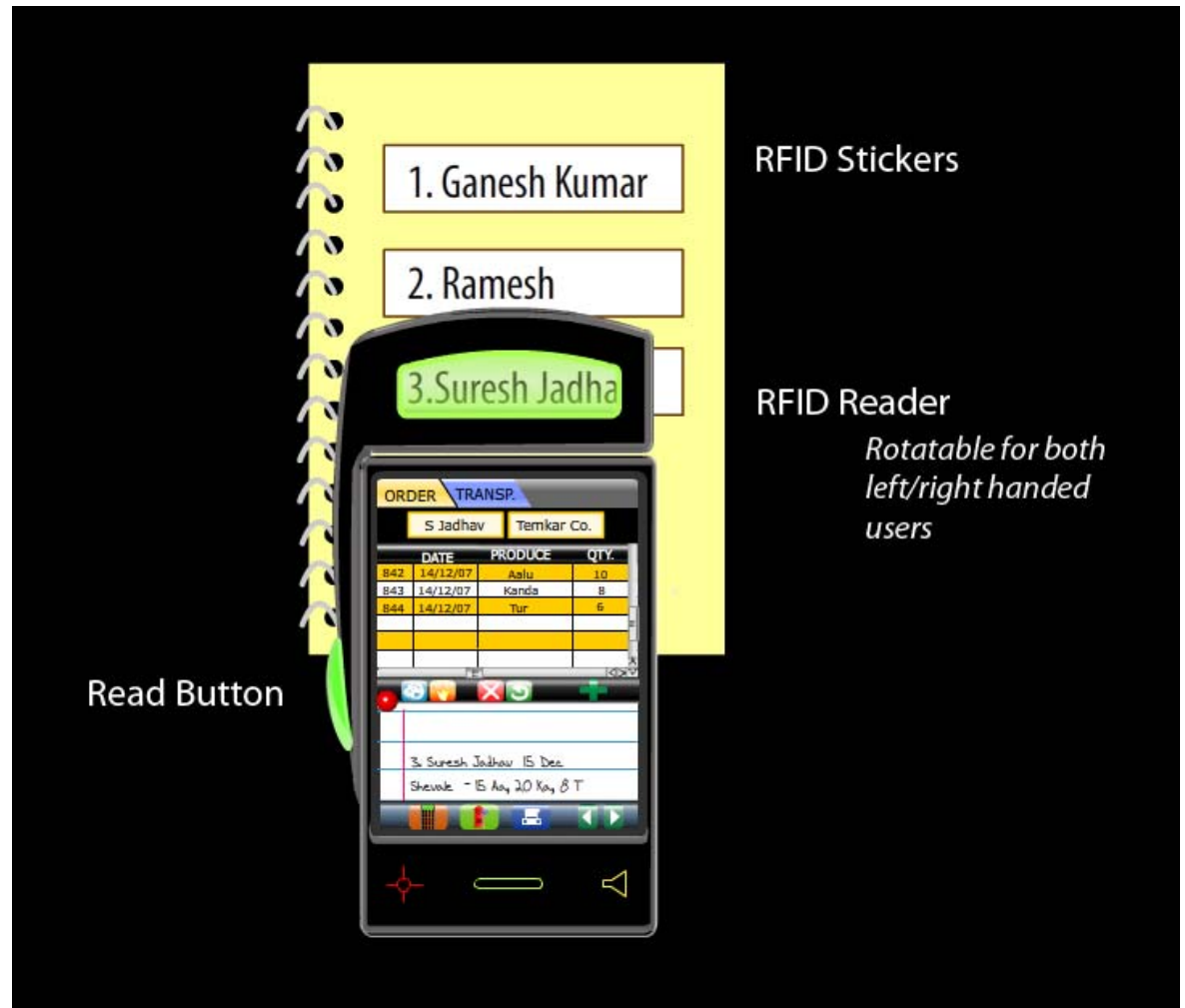
FINAL CONCEPT



FINAL CONCEPT



FINAL CONCEPT



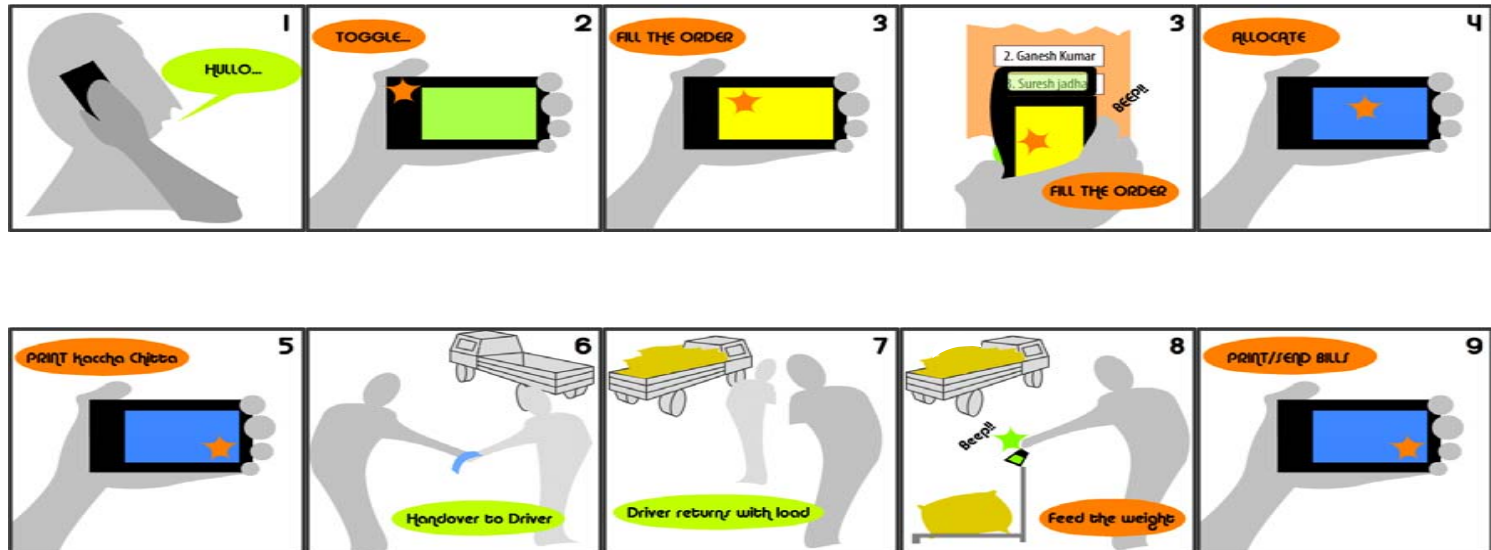
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ANNEXURE – *Questionnaire for User Study.*

1. Name
2. Age
3. Gender
4. Family details
 - Single/Married/Children
 - Type: Joint/Nuclear
 - Number of people living together
5. Education
6. Profession
7. Languages Known
 - Read/write/speak
8. Do you have any livestock?
 - How do you manage them?
 - Heath/Lifecycle/breeding etc.
 - How do you sell their produce?
9. Any member of the family living away from the village.
 - If yes how often do you communicate?
 - How often do you write a letter and to whom?
 - How often do you speak over phone, to whom and how?
10. Who are closest to you or your family? Where do they stay and how often do you meet them?
11. Whom do you approach when you need money?
12. What is your agricultural/business process?
13. What are the cycles that you follow?

ANNEXURE - *Exposure to devices and Technology*

Do you own these and how frequently do you use them?

1. TV
2. Remote control
3. Landline Phone
4. Mobile Phone
5. DVD/VCD player
6. Radio
7. Cassette Player
8. MP3 Player
9. Calculator
10. Computer
11. DTH/Satellite dish
12. Washing Machine
13. Blender
14. Refrigerator
15. Iron Box
16. Tractor
17. Tiller
18. Harvester
19. Bicycle
20. Scooter/Motorcycle
21. Three/Four wheeler

ANNEXURE - *Exposure to devices and Technology*

Have you used these? How did you learn? How often do you use these? How do you use them? Do you use it independently or with somebody's help? What difficulties do you face?

1. PCO
2. ATM
3. Coin phone
4. Fax
5. Internet and e-mail

ANNEXURE - Detailed Task Study

1. TV Remote
 - Channel settings
 - Volume settings
 - Menu
 - Other setting like timer, favorite etc
2. DVD/VCD player
 - Basic functions like Play ,Stop, FFWD, REW
 - Advanced functions like subtitles, zoom etc.
3. Mobile Phone
 - Make and receive calls
 - Address book
 - SMS and settings
 - Other functions and their setting like alarm clock, reminder, FM, ringtones etc
 - Camera
 - Games
 - Web
 - Bluetooth

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