

# Designing for the Indian rural population: Interaction design challenges

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## ABSTRACT:

The paper discusses issues related to human computer interaction involved in designing the interface for an information system <sup>(1)</sup> to be used in rural areas. The product used computer driven kiosks as a medium to disseminate knowledge and facilitate communication between the rural users, the entrepreneurs and the academicians. In order to support illiterate and multilingual users the content was developed using images and multilingual text and videos. Even then the rural users had problems in using the kiosk. This study analyses the problems based on tests done on the interface in villages of India.

## KEYWORDS:

Interaction design, rural kiosk, user motivation, community network.

## INTRODUCTION:

Sakha Ram Lokhande is a progressive farmer from village Pabal in Maharashtra, India. He comes to know about a kiosk being setup in his village, and wants to try it out. He has been experimenting with organic farming for some years now and is excited to find other experiments in the field, all in one place, the kiosk. The kiosk also brings him in contact with fellow farmers and specialists interested in organic farming. Through the kiosk database and discussions he learns about a solution to avoid the pest in his onion crop and is ready to implement his newly acquired knowledge in the field. In the next year of his experimentation he discovers a solution for another pest affecting his crop. He comes back to the kiosk and shares it with the networked community.

This is an ideal scenario where information exchange is supported using technology. The product aims at bringing this scenario to reality. It is a challenging task and an understanding of the creative processes is required to design an appropriate system for it. Based on the genex [7] framework for generating excellence using information systems, the creative process can be divided into four phases:

- **Collect:** learn from previous works stored in digital libraries, the web, etc.
- **Relate:** consult with peers and mentors at early, middle and late stages

- **Create:** explore, compose, evaluate possible solutions
- **Donate:** disseminate the results and contribute to the digital libraries

The product supported the collect relate and donate phases of the process.

- *Collect:* by going through the work done by others and documented in the digital format

- *Relate and Donate:* by using discussion forum and email facilities of the kiosk.

For the *Create* phase the product relied on the traditional knowledge and field experiences of people.

The paper discusses interaction design challenges while designing for a kiosk in the current Indian rural scenario.

## BACKGROUND:

### Kiosk:

The kiosk was a multimedia PC offered as shared community resource helping users to exchange information. The shared resources provide access to a number of people without requiring them to own the equipments individually. It was envisaged that initially a kiosk operator would facilitate wide spread use of kiosk just like the PCO (Public Call Office) operator presently does. Typically the PCO users give the number written on a piece of paper to the operator and he makes a call for them. He also keeps a directory of important phone numbers and passes incoming messages to people. This model of a person assisted facility runs to be the most common way of interacting with products in India. However, later people were expected to use the kiosks by themselves. This shift is important, as it would prevent introduction of middleman in the kiosk model and will open the doors of opportunity and knowledge to a common man.

### Users:

There is a spectrum of probable users to be addressed by the kiosk in rural areas. There are the "haves" and "have-nots". There are also "will-nots" who resist technology intervention believing it to be "demeaning of their intellect,

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(1) The source of the study and the exact product details cannot be revealed at this point of time because of development and copyright issues.

social stature, and humanity“ [6]

Further, as applicable to any technology driven business and hence the kiosk, there is a group of technology enthusiasts and early adopters [2]. These are the people who demand technology and drive the market initially. Unfortunately there are relatively few people of this category in rural areas, adding to the chasm between the technology centered youth and consumer centered maturity of the product, kiosk.

With this background, the user group coming to the kiosk were classified as:

- Literate or illiterate [4]
- Familiar or unfamiliar to computer and desktop environment
- Novice/experienced users of the kiosk
- With defined goals (having specific tasks to perform) or with undefined goals (people who want to explore the kiosk)

User sample breakup:

Total users studied - 28

- Literate - 20
  - Illiterate - 8
  - Familiar to computer and desktop environment- 7
  - Unfamiliar to computer and desktop environment - 21
  - Novice users of the kiosk application- 24
  - Experienced users of the kiosk application - 4
- The goals of users visiting the kiosk varied with each visit.

**Problems:** people did not use the kiosk regularly.

## PROBLEM ANALYSIS:

### **The present scenario of information exchange:**

It is necessary to understand the present scenario of information exchange in rural settings to be able to complement it using the new technology.

There are influential people in the villages like doctors, teachers, rich farmers and the elderly who are trusted sources of information for the village. These are the people accessible to almost all the villagers and can influence individual and collective decisions.

Presently, much of the communication in rural areas is restricted to physically close locations, the nearby towns and villages. For this intra and inter village communication, word of mouth information exchange is most widely used. People gather at public places like local market, bus stop etc. and discuss various issues concerning them. This is also the place where social consensus is made and decisions taken. However inaccuracy is a major problem with this communication system. [3]

Apart from this post and telephone are other means of communication in villages.

Postal service provides a relatively inexpensive means of communication and is popular in Indian villages because of its outreach. Before the telephone became accessible in these areas post was the only mean of long distance communication. The service became successful because anyone having a house has an address, making the communication system available to the masses.

Most of the written communication done by the illiterate population like filling up government forms, Insurance formalities, and even writing letters is through agents/middlemen. This can be attributed to low literacy levels, unfamiliarity with the “official” language used and lack of information resources.

The introduction of PCO changed the communication scenario in rural India. Along with telephony's "way of extending our auditory senses beyond what is represented by the human ear" [8] it was the telephone's ease of use, support of the analphabetic user and faster communication that made it popular in the villages. It brought about economic benefits such as “savings in time and money, better prices for agricultural produce, increased sales (on rural retail circuit), quicker access to medical facilities and health services” [1]. Families whose members moved away to school or new jobs could stay in contact with each other over the phone. Perhaps high cost is the only factor hampering its extensive use by the rural users.

### **Computers and expectations:**

Most of the users either did not know about computers or had a wrong conception about it. Computers were perceived as a panacea to all the problems.

When interviewed about their expectations, the most common responses were

- Can it solve water availability problem
- Can it help in earning money
- What crop should be grown in next season
- What is the disease on my crop and what are the solutions

It needed to be told to the users that the computer can assist them in solving a problem instead of directly providing “high level” solutions.

Further the users related computers to television. Many of the villagers were familiar with television and hence expected a passive interaction with the computer too. The users were uncomfortable with the additional use of tactile sense (typing and mouse handling). While mouse and keyboard are frequently used in computers there is hardly any interaction with television, other than switching on/off and rare use of a remote.

### **The interaction:**

The user-kiosk interaction was analysed based on the following factors:

- Motivation
- Interface
- Media
- Content

### *Motivation:*

It appears that fear of technology makes people hesitant to use computers. The hesitation was more pronounced with the rural users because they are not exposed to new technologies. The first time users were overwhelmed by computers and some were scared of even touching it. Fair amount of motivation and pursuing was needed to get the users started with the kiosk.

Interestingly, while using the kiosk, users blamed themselves for not being able to go through the content, even when it was the application which did not respond or provided an irrelevant result.

### *Interface:*

1. Visual interface: The first time users saw computer screen as a whole like a television and the found it difficult to visualize the screen broken into different functions by the icons. The users also had problems in identifying the clickable and non-clickable areas on the screen. Square and round buttons were identified as clickable but any variations from these caused problems.
2. Navigation: Users had problems in understanding the tree structure navigation of the system. Back and forward buttons, supporting linear navigation were clear to many users but the branched structure of organizing information was confusing. Further drop down menus and scroll bars were difficult to use. Few users used search option provided in the interface and fewer were able to use it successfully to get to a relevant result. The users found it difficult to frame a query for the search.
3. Mouse based interaction: While learning to use the mouse, users were able to relate mouse button as "something to be pressed" but were not clear about the timing of the clicks. Some users' clicked 7-8 times in three seconds and some made one click last for 10-14 seconds.

### *Media:*

Various media (video, picture and text) were used in the kiosk to deliver information to the user. However there was a mismatch between the real and perceived affordance [5] of these mediums.

1. Videos: Viewers compared video with production values they see on television and in the movie theater. This led to a lack of interest in the videos. The use of changing video display size and jumping from one frame of video to another was minimal.
2. Animations: Animations were considered unrealistic, meant for children and were not taken seriously.
3. Text and images: Most of the users found it difficult to use hyperlinks in images and text.

### **Content/Application:**

Relevant, useful and reliable content is a major problem with most of the applications in rural areas. It is difficult for users to understand and relate to the

content. Presently the content available on the web is text intensive that too in English making it unusable for rural users.

The users were motivated by watching videos of people like them displaying their works and one of the ladies even asked the testing team to document her innovative use of cardamum and cloves in making jewellery for ladies. It was intended that discussion forum and email facilities would be used by users to communicate amongst themselves. However login-password system used for user identification was a bottleneck in navigation where most of the users got stuck. Most of the users found it difficult to remember passwords when they returned to the kiosk after a few days. In addition to that the analphabetic users were unable to key-in their login name making it almost impossible for them to go through the process. Furthermore many of the womenfolk did not prefer to disclose their names in public domain.

### **CONCLUSION:**

The users gave positive feedback on the use of the application for supporting communication between communities. However there is a long way to go because the interaction styles, both at software and hardware levels, available with present information systems were found to be difficult to use by many rural users. One of the aspects to be noted here is that major decisions in rural areas are taken by collective social approval. Therefore a consensus needs to be developed towards the approval, acceptance and trust of technology amongst the rural community.

A major limitation of the study was absence of already established computer network in the villages. Moreover the study was not based on extended use of the application, which would have given deeper insights into the problems faced by the users. The application also needs to enable *create* phase of the genex framework to help the system become self-sustainable.

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