

VoiKiosk: Increasing Reachability of Kiosks in Developing Regions

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ABSTRACT

One of the several initiatives to bridge the digital divide in developing countries has been the deployment of information kiosks or knowledge centers in villages in rural parts of the country. These kiosks provide services ranging from email, chat and browsing to distance education programs, agricultural services and eGovernance services. A kiosk typically comprises of a computer with printer, web cam, multimedia system and Internet connectivity and is owned by a local entrepreneur. Moving away from the PC based kiosk model, we present an alternative platform to create and host such information kiosks in the telephony network. We call these as VoiKiosks and they are accessible through voice interaction over an ordinary phone call.

Categories and Subject Descriptors: H.5.2 [User Interfaces]: Voice I/O

General Terms: Design, Human Factors

Keywords: Developing Regions, VoiGen, Kiosks

1. INTRODUCTION

Though kiosks have simplified access to information and services hitherto unavailable to the rural population, there remain problems associated with this model. Firstly, end-users do not have direct access to the kiosk. The kiosk operator acts as a mediator since most end-users are not computer literate. Secondly, a lot of the information that is required on a daily basis, especially locally relevant information, is simply not available on the world wide web. Information such as the schedule of the daily electricity blackout, the local bus schedule, visiting hours of the doctor from the near-by village etc. Thirdly, in some villages in India, people may have to travel a few kilometers to the neighboring village to access the kiosk facilities. Kiosks are also susceptible to hardware failures, and the more than 9 hour power cuts make their use difficult at times. And lastly, the current kiosk models enable a one way interaction where the end-users are consumers of information and services.

As opposed to PCs, the phone penetration in rural India has been significant and continues to grow. Also based on field studies and literature reviews semi-literate and illiterate people are more comfortable with speech based interfaces to access information services [5]. Leveraging the increased mobile penetration and comfort with speech based interfaces,

we present an alternate model to create and host village kiosks (VoiKiosks).

2. TECHNOLOGY

VoiKiosks act as information and service portals for a village. It can be a central point of access for a community where information relevant to the community can be posted/accessed directly by the users themselves. VoiKiosk enables the convenience of accessing services using phones which are more pervasive and affordable than PCs. This solution doesn't rely on Internet connectivity which is most often not available in the rural areas and most importantly it allows end-users to directly interact with the services removing the dependence on the kiosk operator. VoiKiosk is a voice based service available on the Telecom network. There are two types of users for this system. First is the *kiosk operator* who configures the VoiKiosk for the village. Second is the *end-user*, who can either access or post information on the VoiKiosk depending on the services that it supports. VoiKiosk is created and deployed as a spoken language interaction system using VoiGen [2]. The kiosk operator navigates through the VoiKiosk application to configure it to offer various services for the village. Currently the VoiKiosk is configured based on a pre-created template. However, the kiosk operator can add or remove different service categories based on his preferences. Figure 1 shows a sample operational scenario for the VoiKiosk.

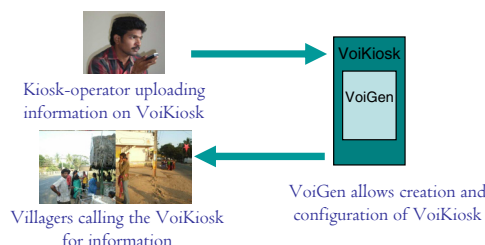


Figure 1: VoiKiosk Usage Scenario

The VoiKiosk is envisioned to be actively used by the local community to exchange information and services in addition to accessing standard services available through PC based kiosks. Some of the services that can be made available through the VoiKiosk are:

a) Information dissemination applications: This constitutes information that is primarily relevant to the local community. For example, the schedule of the local doctors weekly visit, the prices of crops in the nearest market.

b) Interactive Services: Services of this type cater to specific user requirements. For example, applying for a utility such as gas connections, consulting services.

c) Service provider application: These are services where end-users become content/service providers. For example, a VoiKiosk can be used to provide or advertise micro-business services to the local community. Matchmaking technologies can be used to match user requests for local services. This enables a two way interaction where end-users can become content providers instead of just being consumers.

3. PROTOTYPE AND DEPLOYMENT

We have developed a kiosk template for a group of villages in Andhra Pradesh. Figure 2 shows a part of the call flow where the kiosk operator configures the kiosk for his village.

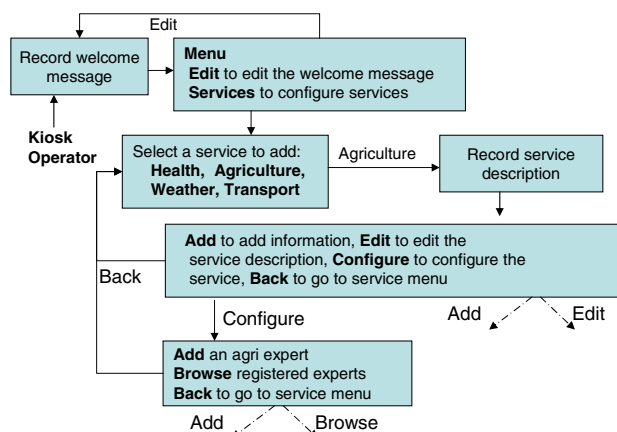


Figure 2: VoiKiosk Configuration

We have identified the following three basic services that are most useful for the initial kiosk deployment with the help of the local people from these villages:

V-Agri: Farmers use this service to consult agriculture experts regarding their crop related problems. Currently a picture of the crop is taken and sent to an expert, who then sends a reply back to the farmer through the foundation. The turn-around time for this process is 24 hours. With VoiKiosk, the expert will be able to post his advice for the farmer on the VoiKiosk, reducing the turn-around time to 4 hours. VoiKiosk identifies users based on their caller IDs.

Ashwini Center: Ashwini Center is a distance education school in the village where students are taught by a teacher in the nearest city using a video conferencing system. Information regarding new programs, schedule of daily classes or changes in the schedule are advertised by word of mouth, local newspapers or fliers that are stuck at various spots in the village. Often people go to the the ashwini centers to get this information in person. The VoiKiosk now has a Ashwini Center section where a kiosk operator can post the latest news related to the distance education program.

Local Advertisements: In this section users will be able to record their personal advertisements, much the same way advertisements are posted in newspaper classifieds. In the current practice, micro-businesses such as mechanics, drivers, daily wage skilled laborers use word of mouth advertising to reach out to clients. VoiKiosk provides an opportunity to increase their client base and increase business opportunities

for them. Users call the VoiKiosk and record their advertisement which other users can browse by calling the VoiKiosk.

The VoiKiosk is deployed in the local language of Andhra Pradesh - Telugu. The template developed has been tested with two kiosk operators in the villages of Vandram and Juvalla Palam in Andhra Pradesh for development purposes. We are planning to deploy the VoiKiosk in two villages in the next quarter and conduct user studies with the help of volunteers from the villages. The pre-pilot demos have been encouraging and we received useful inputs from the kiosk operators regarding the design and the content of the kiosk.

4. RELATED WORK

There are several Village Kiosk based projects that have been deployed in India in the past few years. ITC's eChoupal [3] enables farmers to sell their products directly to ITC by-passing the middle man and fetching them better prices. eChoupals also enable farmers to learn the best farming practices. In this case, the operator acts as the intermediary between the farmers and the kiosk. Drishtee [4] also optimizes the supply chain system by aggregating orders from retailers in the villages. Orders are placed through the kiosk or by calling their call center. Voice Based News Group (VOBA) [1] is an online discussion forum that enables illiterate users to access the group by accepting voice inputs and rendering voice outputs. VoiKiosk moves away from the PC based model and enables delivery of such services over the telephony channel.

5. CONCLUSION

We presented a technology to create and deploy service portals over the telephony network that are accessible by ordinary phones. The solution enables the end-users to directly interact with the system and become active content uploaders instead of remaining information consumers.

6. ACKNOWLEDGMENTS

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7. REFERENCES

- [1] U. Desai, N. Balachander, P. Dinakar, and V. Madhavan. *VOBA- A Voice Based Newsgroup*, volume 3285, pages 271–278. Springer Berlin, 2004.
- [2] A. Kumar, N. Rajput, D. Chakraborty, S. Agarwal, and A. A. Nanavati. *Voiserv: Creation and delivery of converged services through voice for emerging economies*. In *WoWMoM'07 Proceedings of the 2007 International Symposium on a World of Wireless, Mobile and Multimedia Networks*, Finland, June 2007.
- [3] R. Kumar. *E-Choupals: A Study on the Financial Sustainability of Village Internet Centers in Rural Madhya Pradesh*. *Information Technologies and International Development*, 1:45–73, 2004.
- [4] R. Kumar. *e-Governance: Drishtee's Soochana Kendras in Haryana, India*. In *Proc. South Asia Conference: Trends in Computing for Human Development in India*, 2005.
- [5] T. S. Parikh and E. D. Lazowska. *Designing an Architecture for Delivering Mobile Information Services to the Rural Developing World*. In *Proc. Intl. Conf. on World Wide Web (WWW)*, May 2006.