Agro Advisory Interface for Agriculture Contingencies

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Abstract - Increasing growth in the field of ICT helps in basic aspects of mankind like- agriculture, education, healthcare, industries etc. However, the moderate technical growth of ICT applications is confined to the community of a limited number of people, who live in digital pockets. The illiterate people like – farmer, shopkeeper etc. are unable to take the advantages of the ICT revolution. The essential agriculture information is very useful to a farmer for taking effective decision, thus we proposed to develop an iconic interface which is integrated with speech based interaction in Indian languages. The proposed interface is critically evaluated with the farmer from different states of India. The evaluation results proved the effectiveness of the proposed interface [1].

1. Introduction

In the Agro Advisory Interface for Agriculture Contingencies, user can only interact with the system through icons and results back with their intended agricultural information in Indian language text and spoken forms both. To access the intended agricultural information from internet and local repository, users have to form proper query. The query is generated by selecting the corresponding icon(s) displayed in the interface [1]. All the icons are displayed in hierarchical fashion to reduce the conceded visual search time during icon search. After selecting an icon, the icon to natural language generation module convert the selected icon to text in Indian language. However, illiterate users are unable to read the generated textual query. The interface has also integrates a text to speech system to provide the textual query in spoken from. User can be search into our local repository (data base) or internet's global repository with the query string [11].

In this interface, users can only access their intended agricultural information from internet and local repository through icon based interaction. For this, user has to select or click the proper icon shown in the interface. All icons are arranged in a hierarchical order. In first level of the hierarchy, different icons are shown to represent the seeds, vegetable, fertilizers, fruit, flower and other product like jute, tea etc. respectively. After clicking or selecting any icon from the first level, second level of the hierarchy is opened on the basis of the selected icon of first level. As an example, we can say if we select vegetable in first level, then different vegetables and first level icons are only shown in second level. Then, similarly third level is opened by selecting any particular icon from second level. The third level shows all information regarding to a specific selected icon like its name, image, information and needed fertilizers etc. This level consists of several related icon to the previous selecting icons and some general purpose icons like back, forward, delete etc [8].

Moreover, it is also to be noted that all the icons of second and third level are to be arranged according to the accessing frequency. The interface also provides a textual tooltip associate with each icon for easy understanding [2].

2. Proposed Approach

In this section, we discuss our proposed methodology of our developing interface for the Indian farmers to access the agricultural information from the global internet repository and store them into local repository. The overall procedure of the interface is illustrated in Fig. 1. It. The detailed description of our developing interface is given into the following section [8].

When users locally search, the returned Indian textual information are stored and are shown to the user by text format. However, illiterate users are unable to read that textual information. There also an alternative provision of speech base interaction for those language illiterate user [5]. They can select text to speech module to listen to textual information in Marathi language. On the other case of global search, user get direct connection to Internet.

Here, the interface also has the similar text to speech provision for mother language illiterate user as discuss earlier [5].
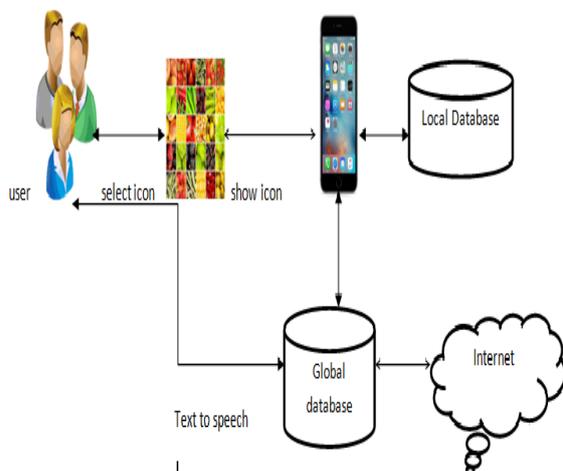

fig.1 Overall Procedure

3. Agro Advisory Interface implementation

The above mentioned methodology is implementing in our Agro Advisory Interface with PHP and Android. In this interface, user searches their agriculture related query through icons and gets the required information in both textual and spoken form. Here, we will restrict our development to Marathi language by which all the resulting information are provided to the user [8].

In this interface, users can only access their required agricultural information from internet and local repository through icon based interaction. For this, user has to select or click the proper icon shown in the interface. All icons are arranged in a hierarchical order [9].

In first level of the hierarchy six different icons are shown to represent the seeds, vegetable, fruit, flower etc. respectively. After clicking or selecting any icon from the first level, second level of the hierarchy is opened on the basis of the selected icon of first level. As an example, we can say if we select vegetable in first level, then different vegetables are only shown in second level. Then, similarly third level is opened by selecting any particular icon from second level. This level consists of several related icon to the previous selecting icons and some general purpose icons like back, forward, delete, print, download etc. Moreover, it is also to be noted that all the icons of second and third level are to be arranged according to the accessing frequency [1].

Here, the interface also provides a text to speech converter engine to listen the generated

query string. Then the query string is fitted to the Google search engine or local repository according to the user's choice [2]. In the case of local search, the query string as it is the search send to the local database and corresponding results are shown to the user English and Marathi. So, our interface integrated with a text to speech engine to give the output in spoken form. Here, we use Festival6 text to speech engine. The configuration has been changed to obtain the support for Marathi. It should be provide special help for getting the information to the illiterate user [9].

4. An overview of the relevant literature

In the Agro Advisory Interface for Agriculture Contingencies, users can only access their intended agricultural information from internet and local repository through icon based interaction. For this, user has to select or click the proper icon shown in the interface. All icons are arranged in a hierarchical order.

There are three levels, in first level of the hierarchy different icons are shown to represent the flower, fruit, vegetable respectively. After clicking or selecting any icon from the first level, second level of the hierarchy is opened on the basis of the selected icon of first level. Then, first level got deactivated. As an example, we can say if we select vegetable in first level, then different vegetables are only shown in second level. Then, similarly third level is opened by selecting any one particular icon from second level. This level consists of several related icon to the previous selecting icons and some general purpose icons like back, forward, delete, print etc. Preliminary studies reveal that farmers require information at the right stage of the farming life cycle to take the right decisions [2].

All the aforementioned observations motivate us to conduct in depth research toward making an interface for Indian farmer community, which will be more useable, systematical, and needful for them irrespective of language and technical proficiency. Here, we propose an iconic interface integrated with a text to speech (TTS) engine to access the agricultural information from the internet's global repository for Indian farmer community [11]. Further, we also integrate a local repository with the interface to access urgent information without connecting the internet.[5]

The above mentioned scenario states that there is a requirement of alternative interaction technique(s). By considering this fact, Plauché et al. proposed a speech-driven agricultural query system for Tamil Nadu state of India [8]. However this work does not able to address the scenario of total India. Patel et al. designed an interactive voice application for small-scale farmers in Gujarat, India [9].

5. Future scope

An interface to accessing the agricultural information from the global repository of internet and the local repository has been proposed in this paper. The proposed interface is able to overcome the digital and language confinement of the Indian farmers by employing the multiple modes of interaction techniques. The empirical evaluation through large diversified users reveals that this interface adequately caters the need of the user. It also be concluded that the proposed interface is very much usable, applicable in the desired context. At the current stage this interface is limited to access the agricultural information in the context of Indian languages. However, it can be extended toward the agricultural context of any country in the world, which proves that the approach is generic.

In future, using translators either online or offline, one can translate the query in various languages. We also incorporate other different major Indian languages like- Hindi, Bengali, Tamil, etc. with this interface.

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