Paper title: Mobile Based Data Retrieval using RDF and NLP in an Efficient Approach

Paper link:https://sci-hub.se/10.1109/ICONSTEM.2017.8261416

1.Summary

Young people are becoming more interested in agriculture as a self-sustainable energy source, including those in the IT industry and other fields. But there is a lack of transmission of traditional agricultural expertise from seasoned farmers to city dwellers who possess family farms. A digital strategy is suggested to solve this, which involves using RDF and Natural Language Processing (NLP) techniques in a mobile application to leverage Subject Matter Expertise (SME) in agriculture. With the use of WordNet text mining and SPARQL queries, the system seeks to effectively record and move farmers' traditional wisdom into the digital sphere for the benefit of coming generations.

1.1 Purpose

This effort aims to close the widening gap between modern farming methods, which are mechanized and centered around medicine, and traditional agricultural techniques. The White and Green Revolutions have eclipsed the essence of traditional agricultural practices in an era dominated by the import of Fast Moving Consumer Goods (FMCG), particularly in the cultivation of fruits, vegetables, and different types of rice. Reviving and advancing healthier farming methods that are based on the knowledge of seasoned farmers is the main objective. By reintroducing the younger generation to traditional farming knowledge, the effort hopes to encourage a return to regionally appropriate and sustainable agricultural practices.

1.2 Contributions

The contribution is in combining modern technology and conventional knowledge to provide a complete support network for beginning and experienced farmers alike. The method uses ontology-based repositories, semantic search, and the Resource Description Framework (RDF) to document farmers' experiences and mental processes in real time. By doing this, the initiative hopes to ensure quick and easy access to essential agricultural data by streamlining the retrieval process. A comprehensive and data-driven approach to farming is made possible by the modules that include farmer registration, soil testing using a mobile app, suggested plants based on soil test results, intercrop pest information, and weather updates. With the help of the program, a knowledge-sharing platform that provides farmers with individualized insights based on their unique soil, climate, and water circumstances will be built.

1.3 Methodology

The concept entails integrating technology into conventional farming operations through a multifaceted approach. Using an easy-to-use mobile application, comprehensive soil testing and new farmer registration are the first steps. Semantic search techniques are then used to the obtained data to transform it into ontology-based repositories. Retrieving data from these sources is more efficient when the SPARQL query language is used. The project is divided into modules, each of which has a specific function. For example, Module 1 recommends appropriate plants based on soil test findings; Module 2 offers information on intercrop pests; and Module 3 provides real-time weather updates and marketing insights. This methodical approach guarantees that farmers receive information and advice that are specifically adapted to their farming situations, promoting a farming community that is knowledge-driven and sustainable.

1.4 Conclusion

To sum up, this all-encompassing strategy has the ability to restore and enhance the relationship between farmers and the younger generation, opening the door for a society that is healthier and better informed. The initiative's dedication to continuous study, adaption, and integration of emerging technology presents it as a viable step towards constructing a productive and sustainable agricultural future.

2.Limitations

2.1 First Limitation

The main obstacle to the suggested agricultural information system is the possibility of traditional farmers being reluctant to adopt new technologies. Convincing farmers to register and utilize a mobile app for soil testing and suggestions may present difficulties, despite the goal of bridging the gap between traditional farming techniques and modern agricultural information. For a variety of reasons, including age, lack of technology knowledge, or a strong loyalty to traditional agricultural practices, some farmers can be reluctant to use digital technologies. The system's success is largely dependent on its acceptance and use, and getting beyond this opposition may be a big challenge.

2.2 Second Limitation

The use of ontology-based repositories and semantic search results in yet another drawback. The precision and comprehensiveness of the information kept in these repositories determine how well the system works. A significant difficulty is ensuring that different agricultural methods and the experiences of real-time farmers are effectively reflected. Information may be out of current or incomplete due to regional farming idiosyncrasies, local dialect variations, and the changing nature of agricultural operations. Furthermore, the quality of the data intake and the ongoing, often resource-intensive, upkeep of the ontology determine how accurate the SPARQL queries are.

3.Synthesis

One important lesson to be learned from analyzing these constraints is the need for a careful balance between traditional agricultural methods and technology improvements. Even while the suggested approach seeks to combine digital solutions with the knowledge of seasoned farmers, widespread acceptance is still a challenge. The success of such programs hinges on overcoming opposition and guaranteeing inclusiveness among farmers with differing degrees of technical comfort. It is crucial to preserve the relevance and accuracy of the data in the ontology-based repositories at the same time. The synthesis emphasizes the need for a flexible, inclusive strategy that respects the variety of farming methods while utilizing technology to increase productivity and sustainability.