Executive Summary

Project Title: Intelligent Disease Diagnosis System for Livestock in Rural Pakistan

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Rural areas of Pakistan suffer from the unavailability of basic facilities of different types. Cattle are one of the primary sources of economic growth in rural areas, yet people living in villages do not have access to good quality veterinary consultants when their cattle fall sick. Transportation of animals to the veterinary hospitals of main cities is quite costly and a time consuming task. These issues are critical since these cattle serve as the primary source of income for many people in the rural areas in different capacities production of milk, butter, ghee, meat etc. The project aims to address the problem of unavailability of proper consultancy by providing an expert system to diagnose the cattle diseases.

The proposed knowledge management system will be capable of working on a mobile interface as well as on personal computers. It will diagnose the suspected disease in cattle after collecting different symptoms through an easy to use interface. The system is expected to be very user friendly, such that any literate person may use it. Possible places where it can be kept/deployed for public access in rural areas is a literate shopkeeper in the village, school in the village or office of union council. Further extensions can involve the design of interfaces for illiterate persons.

The existing systems in the market have two main bottlenecks which this project aims to address:

1. In Pakistan, there is no such product available to a farmer of rural areas which could help in improving the quality, growth and yield of livestock and bring revolution in this sector

2. All systems are without language localization

3. Few limited approaches [2, 3, 4] have been either developed or prototyped in literature on small scale. Some of them are online commercial solutions which have the capability to gather problems related to health of the cattle but respond after manual consultancy and receipt of the consultancy charges. Some academic solutions have also been prototyped and published. Such systems include web-based disease diagnosis systems for cows in China [2] using evolutionary computing, AI based

disease diagnosis systems using Bayesian theory and support vector machines [4] and fuzzy systems [3]. Main limitations of these approaches that they lack proper validation at practical scale. None of them has been deployed in real life. They are either abstract level proposals or have been implemented at prototype level whose testing has not been done at practical scale. Some of them are that much narrow-scoped that it is hard to adapt them in another context or at wider scale.

In healthcare sector, machine learning and soft computing approaches have been successfully applied to diagnose the human diseases [1]. This project aims to exploit the machine learning and soft computing approaches and build a knowledge management system of cattle diseases. The system would be capable enough to make decisions related to cattle diseases and manage the acquired expert information about the domain. It will have the provision where human experts can enhance its knowledge and it will be incorporated and managed in its central knowledge management system.

Bibliography

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