Contribution of Emotional Intelligence Using Ontology in Enhancement of Farming Methodology

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Abstract—The study of agricultural system is utmost important for India being the land of agriculture. Agriculture is relating to Latin term Ager and Cultura. Ager is land and Cultura is farmimg. Hence the idiom agriculture means farming of land. Agriculture meets the basic amenities of human being and their cultivation by imparting nourishment, shelters, medicine, clothing and leisure. Therefore, agriculture is the most indispensable trade across worldwide. Agriculture consists of growing plants and rearing animals to provide, produce and thus it helps to maintain a biotic symmetry in nature. Farming depends on techniques to promote cultivation and sustain the lands suitable for household species. Farmers undergo countless queries considering the kind of loam and weather for a particular crop, kind of pests within crop, unlike diseases, timelines integrated with each activity related to crop. With this paper, we are trying to provide ways of better farming methodologies to the farmers across the country. Affective Computing we can monitor one's own and emotions of other people, to distinguish the dissimilar emotions and label them properly, and to using emotional information to convey thinking and behavior. The machine should interpret the emotional state of humans and adapt its etiquette to them, giving an appropriate response for those emotions. By using Affective Computing we can utilize emotional instruction to direct intelligence and behavior. The machine should explicate the emotional state of individual and transform its behavior to them, giving a suitable response for those sentiments. We are building mobile application for that aid farmers to improve their ways of cultivation and farming and lift there farming techniques by affective computing and by building ontology. This paper also depicts several problems in agricultural system in India. Agriculture division is changing the socio and economic surrounding of the population due to liberalization and globalization.

Keywords— Agriculture System, Affective Computing, Farmers, Farming Methodologies, Ontology

I.　INTRODUCTION

Agriculture aid to meet the basic requirements of human and their culture by providing food, leisure, clothing, shelters, medicine and restoration. Therefore, agriculture is the most dominant enterprise in the world. It is a prolific unit where the free flair of nature namely land, illumination, air, temperature, water are incorporated into single primary unit essential for human beings. Secondary prolific units namely animals incorporating livestock, chick and insects, sustain on these primary units and impart concentrated products like meat, wool, milk, eggs, honey, silk etc.[1]Agriculture provides feed, food, fuel, furniture, raw materials and materials for and from yard, provides fresh environment and a free fare, plentiful food for moving out famine; courtesy friendship by eliminating fights. Adequate agricultural production brings tranquillity, calmness, pleasure, harmony, health and prosperity to individuals of a nation.[2] It helps to upraise the community consisting of different class and clauses, thus it leads to a better communal, cultural, bureaucratic and economical life.Agricultural evolution is multidirectional having sprinting speed and rapid spread with respect to time and space. Agriculture consists of growing plants and rearing animals in order to yield, generate and thus it aid to maintain a biological equilibrium in nature. After green revolution, farmers started using improved cultural practices and agricultural inputs in intensive cropping systems with labourer intensive programmes to enhance the production potential per unit land, time and input. It supplies suitable environment to all these improved genotypes to foster and manifest their yield potential in newer areas and seasons.[3]Agriculture is defined as the flair, the discipline and the trade of manufacturing crops and the livestock for profit-making purposes. In India, Agriculture has an immense history, from ten thousand years. Currently, India ranks II worldwide in farm output. Cropping arrangement differ among farms and plantation relying on obtainable assets and impediments; geography and climate and atmosphere of the farm; fruitful, societal and governmental imposition and the ideology and cultivation of the farmer. Agriculture serves as an essential mechanism for productive growth in developing countries. The analysis of agricultural system is utmost important for India being the land of agriculture. [4]The sensible ability for expanding yields is by using advanced agricultural methodologies, such as cropping, fertilizers, seeds and techniques. Understanding agriculture as a trade, this report depicts the use of mobile applications in agriculture into a wide outlook and acquires a view of agricultural interest

within their entire productive, social and organizational environment. It tries to perceive existing capabilities and experiences as well as the potential of mobile technologies to encourage the productivity and performance of individual farmers, and the agriculture system as a whole. [5]
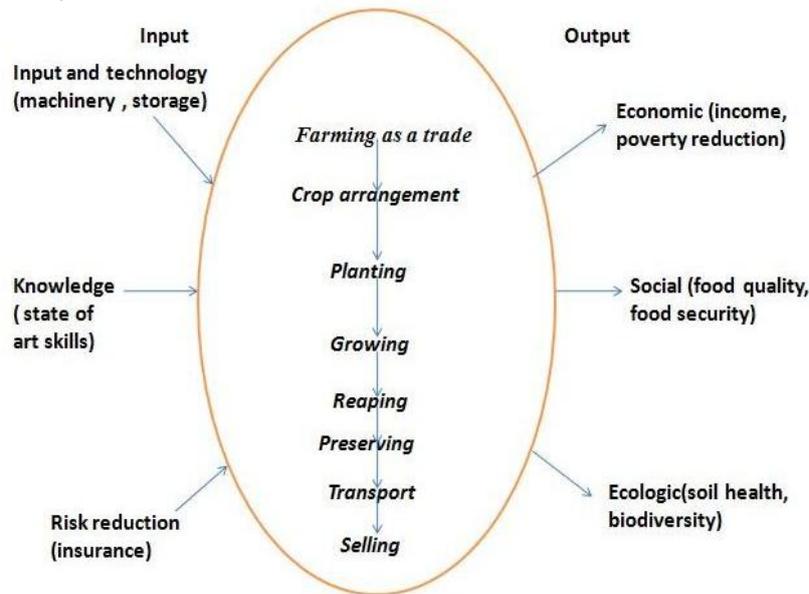

Fig 1.1: Activities occurring during farming as a trade

In our paper, we are attempting to provide ways of better farming methodologies to the farmers beyond the country by using the concept of '**Affective Computing'. Affective Computing** we can monitor one's own and other people's emotions, to differentiate between dissimilar emotions and label them appropriately, and to utilize emotional instruction to direct intelligence and behavior. [8]The machine should explicate the emotional state of individual and transform its behavior to them, giving a suitable response for those emotions. Affective Computing is defined as the subfield of Computer Science that deals with representation and processing of emotions. Affective Computing has always been a field strongly dependent on knowledge and semantics. Whether the goal is to organize emotions using different representations, or to understand or transmit certain emotions in a text, it is necessary to have semantic information to relate meanings of emotions and represent these meanings using several knowledge representation paradigms. **Affective Computing** is the evaluation and evolution of systems and devices that can acknowledge, illuminate, operate, and trigger human affects. It is domain comprising computer science, psychology, and cognitive science. The machine should explicate the emotional state of individual and transform its behavior to them, giving a suitable response for those emotions. In particular, the identification of emotions within a text is useful for studying how people relate textual information with emotions.[9]
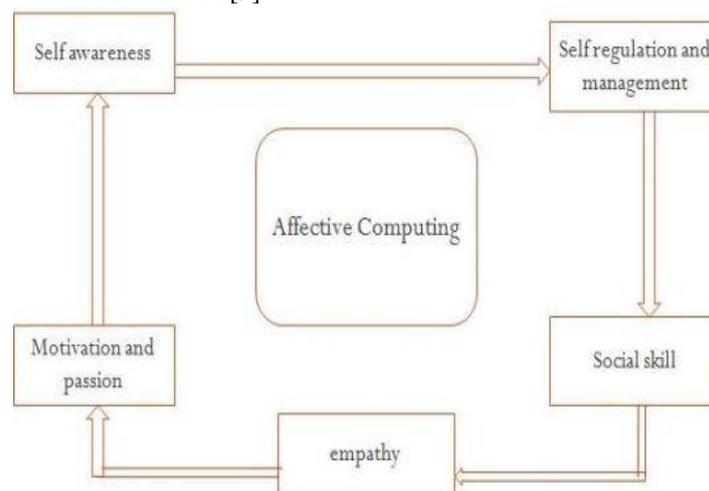

Fig 1.2: Affective Computing entities

Agriculture sector is modifying the socio and economic surrounding of the population because of globalization and liberalization. Agriculture continues to play a major role in Indian Economy. The prospective role of agriculture as a mechanism for economic growth has long been acknowledged. Yet despite the importance of agriculture for development, agricultural production and yields have lagged far behind those in developed countries over the past few decades.[6]
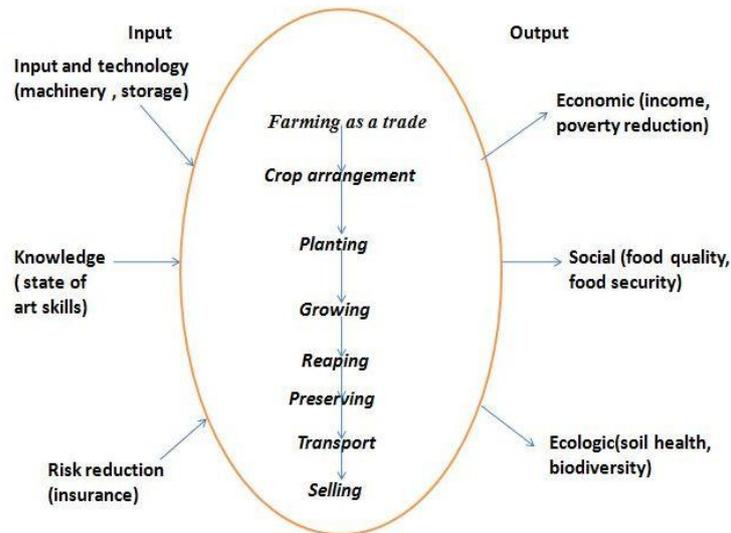
II. PROBLEM STATEMENT AND SOLUTION METHODOLOGY

In India, Existing agricultural system faces various problems due to which farmers are not able to uplift and enhance their farming techniques. Several problems are illustrated below:

- **Ignorance-**Ignorance is due to obsolete knowledge and traditional practices. Farmers believe in their old practices and don't want to upgrade their knowledge.
- **Illiteracy-**Illiteracy is because of backward thinking and poverty. Poverty is the main reason due to which poor people cannot afford good living, education and even the basic amenities.
- **Lack of awareness-**Lack of awareness is due to lack of technology and underutilized resources. Due to lack of knowledge people associated to agriculture are not able to utilize the available resources.
- **Economical Issues-**Economical Issues is because of population explosion and unemployment. Population and unemployment are two major problems which is affecting the growth of our country.
- **Improper Guidance-**Improper guidance is due to no experts training and inadequate facilities.
- **Lack of Exposure-** Lack of exposure to outer world is because of set patterns and social factors.

The major problems in existing agriculture system are shown by a fish bone diagram below:
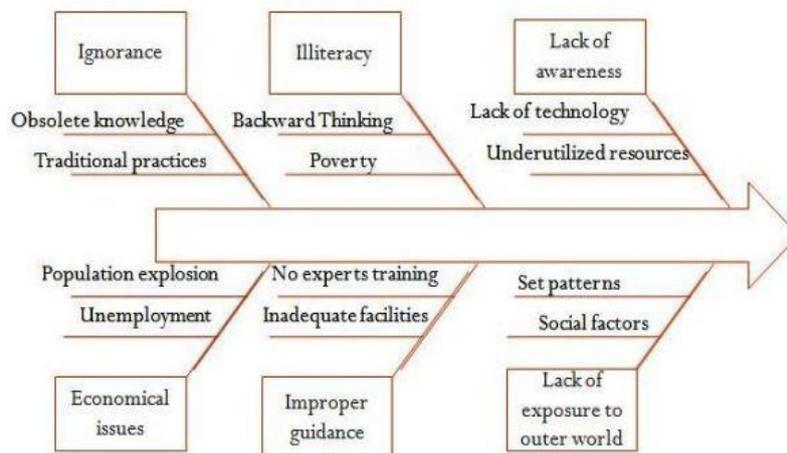

Fig 2.1: Fish bone diagram of problems existing in agriculture system

The problem exists in our present agriculture system can be resolved by effective use of technologies and the resources and can also be solved with the help of affective computing and by erecting ontology and hence farming methodologies can be uplift and upgrade.[7]

III. PROPOSED WORK

We are evolving mobile approach for the agronomist that will assist them to upgrade the mechanism of farming and boost their farming competence with the collaboration of affective computing. In our proposed model various agents are involved depending on service offered namely:

- **Content Provider:** The Content provider is an entity that imparts useful information to the Agriculture Registration Portal. It provides all the meaningful information relevant to the framer. Content providers are generally perceived to be Web sites that supply different types of online information to the farmers.

- **Agriculture Registration Portal:** It is the portal in which farmer can login through his valid email id and password and can provide all the basic information related to his work. An effort has been made through this Portal to deliver inclusive, exact, dependable and one stop source of direction about India and its various features.
- **Mobile service provider:** A mobile service provider is a venture that provides communication facility to farmer through soap messages also known as a wireless resource provider, wireless transporter, or mobile network transporter, is a provider of services wireless communications that controls all the components relevant to exchange and supply services to an end user including radio span proportion, back plunder organizational structure, invoice, consumer protection and merchandise and renovate corporation.
- **Soap message:** Soap is an abbreviation for **Simple Object Access protocol**, is an etiquette description for interchanging arranged statistics in the execution of web services in computer networks. It manipulate XML instruction set for its content format, and depends on other application layer protocols, most primarily Hypertext Transfer Protocol (HTTP) for message completion and communication.
- **Application developer:** Application developer is an agent by which application software is initiated for hand-held machine, for example individual digital lieutenant, undertaking digital lieutenant or mobile phones. These applications can be bundled software on phones during assembling platforms, or delivered as network applications using server-side and client-side to dispense an application within a Web browser.
- **Platform operator:** The platform operator need to produce, establish and organize mobile applications which is made from multiple components, and tools that allow a developers to write, experiment and establish applications into the target manifesto surrounding.
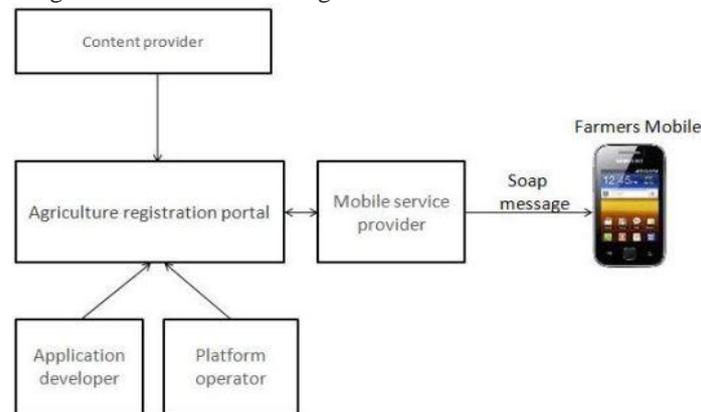

Fig 3.1: Proposed diagram of our agriculture system model

IV.   ONTOLOGY

Ontology is primarily Formal, Explicit specification of a Shared Conceptualization in which Formal means machine-understandable; explicit specification means concepts, properties, functions principles are explicitly defined; Shared means Consensual Knowledge and finally Conceptualization means abstract model of some phenomenon in real world. Building ontology is a complex task that requires a high degree of analytical and abstract thinking. Ontologies are organized in hierarchical structures which means a set of concepts describing a domain serving as skeleton foundation for a knowledge base. Ontologies is considered as conceptual schemata, deliberate to represent knowledge in the most conventional way. Formal ontologies are represented in rational formalisms, such as Web Ontology Language, which allow automatic speculation over them. In the context of database systems, ontology is viewed as a level of abstraction of data models with an intention to model knowledge about individuals, their features, and their association to other individuals. Ontologies are indicated to be at the "semantic" level, whereas structured set of data are models of data at the physical level. [10]
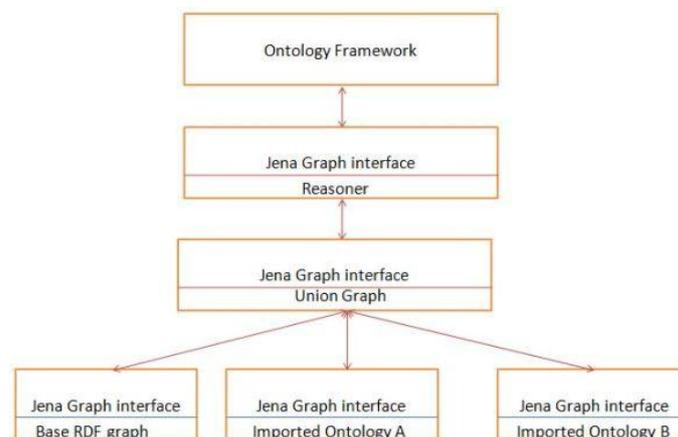

Fig 4.1: Ontology Model Layers

There are the basic seven steps to develop ontology:
- Identify the domain and extent of the ontology
- Ponder reusing existing ontologies
- Specify important terms in the ontology
- Define the classification and the classification hierarchy
- Define the premises of classes slots
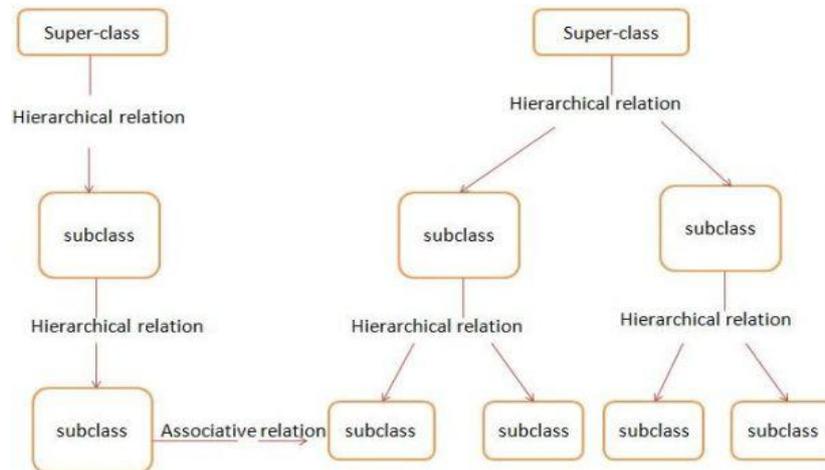- Define the surface of the slots
- Create sample

Fig 4.2: Ontology Structure Model

V. CONCLUSION

Many consulting systems were developed to execute search on acquittance but with the incorporation of Ontology into visualization very strained way of analysing mechanism can be achieved. This report mainly focuses on process of building ontology with the incorporation of affective computing for farmers and to depict how much productive the ultimate results of queries are by adding awareness to such systems in terms of Ontology. Here Ontologies play vital role to assign schemata and intelligent view over information expedient. Therefore, Ontologies for Crop production generated by this research, may be a very meaningful expedient for processing Generic Crop agricultural knowledge base. Hence it was a colonist and assessment work to build an ontology prototype for agriculture production as a test case study. This prototype will be a representation for further agricultural ontology development later and through this productivity of agricultural knowledge organization will be enhanced.

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