Digital Knowledge Ecosystem for Agribusiness; Transforming Agriculture

Athula Ginige PhD,
Professor of Information Technology,
School of Computing,
Western Sydney University,

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Abstract

United Nations in 2015 have formulated 17 Sustainable Goals; "No Poverty", "Zero Hunger" and "Good Health and Well-Being" included. Sustainable well-informed and coordinated agriculture sector is one of the corner stones to achieve these goals. A highly visible symptom of an uncoordinated market is a regular occurrence of oversupply situations leading to large quantities of harvest getting wasted trapping farmers into a poverty cycle. In 2011 a team consisting of researchers from 7 Universities across 4 continents embarked on a project to develop a mobile based information system for agriculture domain, initially for farmers in Sri Lanka to address the overproduction problem. A deeper analysis revealed that the root cause was farmers and other stakeholders in the domain not receiving right information at the right time in the right format. Inspired by the rapid growth of mobile phone usage among farmers a mobile-based solution is sought to overcome this information gap. Farmers needed both published crop knowledge (quasi static) as well as real-time situational information (dynamic) such as current crop production and market prices. This situational information is also needed by other key stakeholders of the domain to ensure food security through effective supply chain planning whilst minimising waste. We developed a user centered agriculture ontology to convert published quasi static information to actionable information. We adopted empowerment theory to create empowerment-oriented farming processes to motivate farmers to act on this information and aggregated the transaction data to generate situational information. This created a holistic information flow model for agriculture domain similar to energy flow in biological ecosystems. Consequently, the system evolved into a Digital Knowledge Ecosystem that can predict current production situation in near real enabling government agencies to dynamically adjust the incentives offered to farmers for growing different types of crops to achieve sustainable agriculture production through crop diversification.

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