

e-Agricultural innovation using a human-centred systems lens, proposed conceptual framework

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Abstract Historically, farmers have been amongst the most innovative people in the world. However, agriculture now lags behind other sectors in its uptake of new information technologies for the control and automation of farming systems. In spite of decades of research into innovation, we still do not have a good understanding as to why this is the case. With the globalisation of food markets, IT adoption in agricultural communities is perceived to be increasingly important by policy makers. As the most marginalised of rural communities, it is self-evident that agricultural communities in less developed countries are most in need of these systems. This paper proposes a new integral systems framework of e-agricultural adoption and innovation in less developed countries. It opens up a new avenue of research for control and automation systems theory and practice, which informs policy in respect of e-readiness of rural communities.

Keywords Agriculture · Innovation · Technology adoption · Intuitionism · Human culture and values · Community of practice

1 Introduction

Agricultural communities are a mainstay of socio-economic activity in almost every region of the world. As well as providing food and other commodities, they are an

important socio-economic group, which hold together the fabric of rural communities. Technologies and innovations, which affect the economic and social viability of farming, is an important issue for international stability research. The World Bank (2008) report on agricultural development suggests that a global food shortage is likely if agricultural communities do not adopt ICT interventions. ICT allows the sharing of the scientific information necessary to address the problems of food shortage and has a role to play in disseminating information to farmers. Innovative strategies for combining Internet, telecommunications, video, and print technologies at appropriate levels are bridging this gap and empowering farmers to make better production and marketing decisions. However, agricultural communities both in less developed countries and in more developed countries remain reticent to adopt IT (so-called e-agriculture solutions).

In 2012, Somers and Stapleton proposed a new paradigm for technology innovation adoption amongst rural communities. The key question is the following:

What are the key dimensions of a new theory of information technology adoption, which might explain the reasons why ICT control and automation systems are not the site of agricultural innovation?

They suggested a three-dimensional lens approach that does not follow traditional approaches to systems development. The proposed model incorporated tacit knowledge as defined in social technical systems theory, institutional theory, and community culture and values. Carew and Stapleton (2012) reviewed a number of software development paradigms, exposing the different philosophical assumptions and goals underlying systems development. They advocated a human-centred approach to systems development that focused on a combination of personal,

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