Chapter VIII

Technology-Push or User-Pull? The Slow Death of the Transfer-of-Technology Approach to Intelligent Support Systems Development

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ABSTRACT

This chapter describes a study of the adoption of intelligent support systems in agriculture. The aim was to investigate the apparent low uptake of these systems and the approaches used in development—whether ‘user-pull’ or ‘technology-push.’ Data was collected for 66 systems, mainly through telephone interviews. An interpretative approach to research was adopted. The nature of user influence in the development process and the nature of the outcomes for the systems were found to be complex and multidimensional constructs. A pattern emerged showing the technology-push approach was associated with low levels of user influence in the development process and comparatively low levels of system impact. This relationship was more evident in systems developed by government organizations.

INTRODUCTION

There has been considerable effort and money spent on the development of intelligent support systems for Australian farmers, but few systems appear to be adopted for regular use. In this chapter it is suggested that this low uptake of intelligent support systems is due to the use of a particular approach in intelligent support systems development—a ‘transfer-of-technology’ approach. This paradigm involves a linear model for the dissemination of scientific knowledge. The aim is to transfer knowledge generated by scientists to the farmer recipients. It appears this approach may still be widely used, despite many calls for more ‘socio-technical’ approaches to system development and knowledge transfer. In a socio-technical approach, users and their needs are the main focus and driver of systems development. That is, there is a ‘user-pull’ rather than a ‘technology-push.’

Proponents of user-focused approaches argue for the involvement of users in the development process (Checkland & Scholes, 1990; Mumford, 1996). It is believed that participation of users in the system development process leads to systems that are truly useful to users because they better meet the needs of potential users. These approaches are participatory, have an adopter focus (Surry & Farquhar, 1997) rather than a developer, ‘transfer-of-technology’ focus and incorporate ideas from ‘softer’ systems methodologies (Checkland, 1981; Checkland & Scholes, 1990). That is, the developers focus on the needs and expectations of the users—the adopters of the technology—rather than on research and technical issues.

This chapter reports on a study that focused on the adoption of a certain type of software system, intelligent support systems, in Australian agriculture. For this study, intelligent support systems include expert systems and decision support systems—computer systems that can be used to assist in problem solving and decision making. The developers of these systems obviously perceive potential benefits to farmers from the use of these systems. There is, however, a body of literature indicating very limited adoption of intelligent support systems by farmers (Brown et al., 1990; Cox, 1996; Foale et al., 1997; Glyde & Vanclay, 1996; Greer et al., 1994; Hamilton et al., 1990; Hilhorst & Manders, 1995; Wilde, 1994).

Barrett et al. (1991) examined concerns that farmers were not using the intelligent support software developed for them. They believed that there had been limited acceptance of such systems because of lack of understanding by software developers of the decision-making process of farmers, inadequate user involvement in their development and improper problem definitions. Barrett et al. argued that there was a need to determine not only the critical success factors but also to define the logic used by expert producers when they make decisions. The beneficiaries of intelligent support systems were, they suggested, primarily the scientists or the programmers.
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