Chapter 10
ICTs in the Micro–Enterprise: 
An Examination of Usage, Benefits and Firm Growth in Hawaii’s Agricultural Sector

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ABSTRACT
Though there is an extensive body of research regarding information and communication technology (ICT) use in small and medium sized enterprises (SMEs), relatively few studies have examined ICT use specifically in the subset of SMEs known as micro-enterprises. This study compares ICT use among micro-enterprises (MEs) in the agricultural sector. Factors expected to influence ICT adoption include firm size, CEO education, and the type of crop produced. Results indicate extensive use of computers and the Internet, especially for functions like email, online purchasing, and online business-related research, while website ownership is less widespread. Larger MEs are more likely than smaller ones to use a computer. Among those MEs owning computers, larger ones are more likely than smaller ones to have a website and to conduct financial activities online. However, most other ICTs (email, online purchasing, etc.) are used similarly by both smaller and larger MEs. Thus, for most internet ICTs micro-enterprise growth does not result in differing adoption rates. The study also investigates micro-enterprise use of emerging social technologies like instant messaging, chat, blogging, etc. Micro-entrepreneurs’ perceptions of ICT benefits and implications for development are also discussed.

INTRODUCTION
This study presents an investigation into the adoption of information and communication technologies (ICTs) among MEs. The commonly accepted US Small Business Administration (SBA) definition of SME (small/medium sized enterprise) is a firm that employs fewer the 500 workers. While it appears that there is no corresponding SBA definition of a micro-enterprise (ME), the European Commission defines a micro-enterprise as one employing ten or fewer people (European Commission, 2010). This paper follows SBA definition of SME and the EC definition for ME.

Prior research suggests a number of factors influencing computer technology adoption in small

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businesses, including perceptions of benefits and customer needs (Beckinsale et al., 2006; Dhokia & Kshetri, 2004), lack of financial resources (Foong, 1999), lack of personnel with technical expertise (Beckinsale et al., 2006; Igbaria et al., 1998), the CEOs lack of experience with various ICTs (Palvia & Palvia, 1999), and participation in community-based web forums (Deakins et al., 2004). Firm size and age are factors common to many prior studies. While some results suggest that size and age do affect ICT uptake (Teo, 2007; Haugh & Robson, 2005) others have found differently (Teo & Ranganathan, 2004). The mixed nature of prior results suggests a need to view SMEs from different perspectives.

For instance, a preponderance of SME ICT research fails to distinguish MEs from larger SMEs. To be sure, a number of studies have examined ICT use in MEs, but even in these studies the primary perspective includes MEs as SMEs. The current study argues that MEs can be seen as being structurally and functionally different from their larger SME brethren. Furthermore, no prior research can be found to compare ICT adoption among MEs to determine whether smaller MEs adopt differently than larger MEs. This study seeks to bring clarity by introducing an integrated theoretical perspective explaining ICT acquisition and then by examining ICT adoption among MEs as distinct from larger SMEs, and by investigating whether the size of the ME determines different adoption patterns.

Some research indicates that different industry factors can affect ICT adoption. Although no significant relationship was found between information intensity and likelihood of computer adoption, it was significantly related to extent of adoption (Thong, 1999). Other studies have found differences in the complexity of software applications adopted as a function of industry (Kagan et al., 1990). In other words, the characteristics of the industry sector a firm competes in likely affect the company’s technology use. For instance, MEs in manufacturing take up ICT use differently and for different reasons than those in retail services (Teo & Ranganathan, 2004), whose ICT use would be expected to differ from agricultural firms. Extending the same logic it seems reasonable to question whether ME businesses producing different crops will exhibit different ICT usage patterns. Precisely because some research indicates industry differences in ICT usage, researchers must delve more deeply into individual industries, sectors, and sub-sectors to understand when and how differences pertain.

Bharati and Chaudhury (2006) point out that while some studies have examined ICT adoption at the national level, relatively fewer have focused on the local level. For example, no studies to date have examined ICT adoption among Hawaii ME agribusinesses. This is an important issue since local and regional business factors can affect business development and practice. In that regard the current study examines MEs in the agricultural sector in a localized region, Hawaii. Agriculture is an important economic engine for Hawaii. Diversified agriculture in Hawaii constituted over 76% of Hawaii’s gross farm revenue in 2005. Fruits, vegetables, nuts, berries, floriculture, and greenhouse products accounted for $335,000,000 in revenues, about 67% of all Hawaii agricultural revenues in 2008 (USDA NASS, 2008). The sub-sectors examined specifically in this study (flowers, plants, fruits, vegetables, coffee and Macadamia nuts) comprised 65% of revenues from diversified agriculture in 2005 - about half of all agriculture production (excluding food-processing). Historically agriculture employs approximately 5% of Hawaii’s workforce. Hence, diversified agriculture is a critical component of Hawaii’s agricultural economy and an important dimension of the state’s overall economy. As the dominance of pineapple and sugar industries fade from Hawaii’s economic spotlight, and the tourism market (the preeminent economic activity in Hawaii) continues to experience revenue declines, diversified agriculture may be an important contributor to economic sustainability in the near and
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