Factors affecting adoptions of packaging technology of small-scale entrepreneurs*

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Abstract

The present work was conducted to understand how small-scale entrepreneurs adopted packaging technology which was considered potentials to be utilized by the entrepreneurs.The study utilized qualitative research approach principally using purposive sampling and in-depth interview techniques. Research respondents were small-scale entrepreneurs operating roasted suckling pork, salted egg, fried pork snack and organic rice. Experimental finding showed that human and social capitals are key factors having influences on adoption of packaging technology. These factors included educational background and interest in technology as well as needs to increase marketing channels and shares. The social capital, essentially defined as linkages with academic and professional development institutes was considered an important bridge leading the entrepreneur to opportunities to learn and/or to participate with technology development as well as to customize the technology that is considered to entrepreneur's needs. The study also illustrated that entrepreneurs' age as well as financial asset apparently were considered important driving forces that had pushed them to seek incorporations with institutes. All entrepreneurs showed their willingness to pay for packaging technology developed that they viewed as potentials to create more benefits and to make their products outstanding.

Keywords: Packaging Technology, Technology Adoption, Small-scale Entrepreneur

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Introduction

Small-scale enterprises have significant components in economic development and employment of Thailand, because of their capability to generate incomes for earning livelihoods, the enterprises have been increasingly recognized for their potential to improve living standards and to alleviate the poverty of poor people (Suntornpithug & Suntornpithug, 2008). The entrepreneurs have attempts to increase profits and to maintain their market shares through strategies among which are improvements of products' packaging in terms of both technology (such as for minimizing product quality changes) and designs (such as structural and graphic designs) (Utto, 2013). Small-scale entrepreneurs participated in technology assistant and extension programs operated by Ubon Ratchathani University and other government agencies to obtain assistances for improving their current productions and marketing conditions. Packaging technology development is one of the assistances provided and these include technological improvement e.g. selecting suitable packaging materials for products' shelf life and graphical designs of the packages.

Because the packaging technology development assistances are readily available in the technology assistant programs, it is important to understand key factors affecting the entrepreneurs to adopt the assistances provided. Understanding the factors would assist packaging technology providers to implement the programs in effective ways and being consistent to entrepreneurs' requirements. The present study accordingly was conducted to examine the key factors and to make these available for further outreaches and implementations of the assistant programs.

Research Objectives

To study key factors affecting adoptions of packaging technology of small-scale entrepreneurs.

The study was considered an illustrative case study. Entrepreneurs of small-scale enterprises processing and selling roasted suckling pork, salted egg, fried pork snack and organic rice were kindly participated as research respondents.

Literature Review

Small-scale enterprise sector has emerged as a significant component in economic development and employment worldwide and in Thailand. The benefits, to which the small-scale-enterprises contribute, can be both economic (such as generating income) and non-economic benefits (such as improving livelihood and living standards)(Paulson & Townsend, 2004; Shaw, 2001, 2004). The Thai government have initiated and launched outreaches and extension programs through government agencies including Ubon Ratchathani University to assist entrepreneurs of the small-scale enterprises to sustain their business activities. One of many programs is the One Tambon One Product (OTOP) program in which the government promotes local products from individual districts to national and international markets (Suntornpithug & Suntornpithug, 2008). Because of the OTOP and other programs such as New Entrepreneur creation project operated by the Institute of Small and Medium Enterprise Development (ISMED), the entrepreneurs have participated in the programs for improving their products to suit the marketing needs.

Development of packaging technology is one of activities requested by the entrepreneurs participated in the assistance programs. Packaging has important roles in maintaining qualities of products such as minimizing physical shocks during transports and delaying chemical interactions between water vapor and product components through material barrier properties (Utto, 2013). Packaging also has its marketing importance extensively known as a silent salesman who sells and promotes products to customers through text and graphic information shown on the packages (Stewart, 1996). However there is much evidence to show that packages of, especially, OTOP products (given the same or similar products) look very indistinctly similar (Utto, 2013). In studies on micro- and small-scale businesses, the entrepreneurs are likely to employ ‘copy-cat’ or ‘me-too’ strategies as managerial strategies in order to compete with others to gain or maintain market share of their products and services, because of their limited managerial skills and knowledge. These strategies fundamentally allow the business owners or managers to replicate what is already available in the markets (O'Gorman, 2000) so as to avoid operating different enterprise activities or investing in higher enterprise values compared to what is currently on offer in the markets (Buckley, 1997; Gunatilaka, 1997).The literature information noted above reflects effects of the so-called human

capital i.e. knowledge and skills of the entrepreneurs on adoptions of the available packaging technology.

Adoptions of technologies provided by the government as well as private companies vis-a-vis extension and outreach programs operated have been known as means to improve productivities through implementing the technologies adopted to the current ones which can lead to improve incomes, and to alleviate poverty (Minten & Barrett, 2008). There is a number of factors have influences on technology adoptions of small farmers and small-scale entrepreneurs. These, for examples, are awareness on- and access to information regarding available technology or extension programs, cash constraints, labor constraints, marketing access (Lambrecht, Vanlauwe, Merckx, & Maertens, 2014), and extents of interactions with technology providers e.g. participation in demonstration trials (Abdoulaye & Sanders, 2005). Abdoulaye & Sanders (2005) emphasized an importance of on-site or on-farm trials for targeted customers on increasing technology adoption attributed to increases in awareness and tryouts by the customers. Although the factors having influences on technology adoptions have extensively been studied, particularly in areas of agricultural technology adoptions by small farmers such as mineral fertilization (Lambrecht et al., 2014; Linder, Pardy, & Jarret, 1982), studies on packaging technology adoptions by entrepreneurs of small-scale enterprises, at present, have not been reported.

Methodology

The qualitative approach i.e. in-depth interview was employed as a key methodology to collect data in the present work. In the present study, purposive sampling strategy was employed to select respondents because the study does not aim to produce a statistically representative sample (Patton, 2002). The criteria strategy was utilized for selecting entrepreneurs and this was ‘entrepreneurs had participated in technological assistant programs operated by Ubon Ratchathani University and other Thai government agencies’. Their consents were sought prior conducting the interviews. Small-scale entrepreneurs of roasted suckling pork, salted egg, fried pork snack and organic rice were interviewed. All entrepreneurs operated their businesses in Ubon Ratchathani province, Thailand, except the owner of salted egg resides in Si Sa Ket province, Thailand. The field work has been conducted since September 2014-March 2015.

Results and Discussion

All the entrepreneurs interviewed had completed their elementary school (six compulsory years) and higher levels. ENTP1 and ENTP2 have university bachelor degrees. The enterprises have been in their businesses for more than 20 years. Table 1 shows information of small-scale entrepreneurs and the packaging technology which were adopted by them. Principle expectations of the entrepreneurs thereafter the technology were adopted and implemented were referred to extend shelf life of their products. Research findings show that the technology implemented can respond to the expectations for example shelf life of the fried pork snack (Moo Sawan, in Thai) had been extended from 1 month to 3 months (ENTP3) and crispness of roasted sucking pork (Moo Han, in Thai) had been extended from 1 hour to 6 hours (ENTP1). According to Lambrecht et al. (2014), when the clients found that their expectations were responded by the technology they had continuously utilized the technology. All entrepreneurs interviewed continuously employed the technology they adopted. The technology was also utilized as means to illustrate higher product quality which was later endorsed by the relevant agencies. For example ENTP3 gained 4 OTOP stars (i.e. the star represents quality level; 5-stars is the highest level) from Department of Community Development, after a year of utilizations of the oxygen scavenger sachet in the snack package.

Table 1 Types of packaging technology adopted by small-scale entrepreneurs studied.

Entrepreneur codes	Enterprise products	Packaging technology adopted	Applications
ENTP1	Roasted suckling pork	● Moisture controls of pork using moisture absorber	● Maintaining crispness of roasted skin
ENTP2	Salted egg	● Oxygen and moisture controls using vacuum packaging technique	● Delaying microbial growth
ENTP3	Fried pork snack	● Oxygen scavenging in package using oxygen absorber	● Delaying rancid smell and flavor
ENTP4	Organic rice	● Oxygen scavenging using vacuum packaging technique	● Delaying rancid smell, flavor and pest infestation

Table 2 shows that key factors influencing packaging technology adoption can broadly be grouped into human and social capitalsof entrepreneurs according to the capital in the literature relating to household livelihoods[1](Carney, 1998; Ellis, Kutengule, & Nyasulu, 2003; Johnson, Hulme, & Ruthven, 2005). Research findings show that the young entrepreneurs hence ENTP1 (28 years old) and ENTP2 (25 years old) had higher intentions to find technology for improving qualities and marketing shares of their products, compared to the older entrepreneurs (i.e. 50-65 years old). It is interesting to note that the young entrepreneurs are children of the parents who have owned and operated the enterprises. Once the young entrepreneurs finished their university degrees they had jointed their parents' enterprise activities and had got opportunities from their parents to try something new for their products. The older entrepreneurs were likely to continue their enterprise activities as they had done. They acknowledged they had tried certain

[1] The study was not aimed at examining household livelihoods but to utilize the capital categories known as the 'livelihood pentagon' in order to facilitate the data presentation.

technology known from friends, other entrepreneurs or extension government officers. However the technology tried was considered impractical to the current activities. For example, the father of ENTP1 utilized the roasting oven which had been extensively used in Trang province Thailand to roast pork, giving highly crispy skin, and tender and juicy meat. However the oven was highly energy consumption and this affected the selling price and return. The oven subsequently was discarded and left idly. The father of ENTP1 thereafter had continued his traditional roasting technique and had no intention to seek technology to improve his product quality. In cases of ENTP3 and ENTP4 designated as older entrepreneurs, they had no interest in finding the technology for improving their products because the products had been on markets for a long time and were well recognized by customers.

Table 2 Key factors influencing packaging technology adoptions of entrepreneurs of small-scale enterprises.

Human capitals	Social capitals
• Ages • Educational background • Interest in technology • Needs to increase marketing channels and shares	• Linkages with academic and professional development institutes

Research findings show that the entrepreneurs having higher educational background (ENTP1 and ENTP2) had higher interest in technology and intentions to increase their marketing channels and shares. The findings are consistent to the knowledge on that highly educated persons tend to adopt new technology faster than those with less education(Wozniak, 1987). It is interesting to note that there is an apparent relationship between age and educational background observed in the present work. The young entrepreneurs (hence ENTP1 and ENTP2) had higher educational qualifications aforementioned i.e. university undergraduate degrees in information technology (IT) and international business management, respectively. In a review on

family business, Dyer (1989) highlighted that the family required its members, particularly referred young generations, to get formal education (referred to as higher qualifications than parents' one) and set of skills which would be utilized back to its businesses. Some families had encouraged their children to get different degree in different areas. Different expertise would be subsequently implemented into the family business. Because both ENTP1 and ENTP2 had IT skills, these allowed them to search for potential technology which could open opportunities for their products in the current and future markets. ENTP1 acknowledged that he would require packaging technology which was able to maintain the crispy of pork skin for at least 6 hours because he had aimed to send the roasted suckling pork to markets elsewhere in Thailand via airplane and inter-city delivery services. ENTP2 required the technology that would extend shelf life of salted egg for 2 months as she would ship the egg to ASEAN markets.

The present work pointed out that the social capital had influences on the entrepreneurs to adopt the packaging technology. The social capital among the entrepreneurs interviewed is commonly referred to the linkages with academic and professional development institutes. The academic institute was focused on Ubon Ratchathani University (UBU) meanwhile the professional development institutes were government agencies including Department of Agricultural Extension, Department of Community Development, Center for Industrial Promotion (7^{th} regional office) among others. The linkages developed between the entrepreneurs and the officers from individual institutes had led the entrepreneurs to the technology. ENTP3 and ENTP4 had participated in various professional development programs arranged by both UBU and the government agencies. They acknowledged their awareness on available technology learnt while attending the programs. The entrepreneurs consulted the officers regarding how to adopt the technology and to implement to their products. The research findings evidently support the knowledge on the social capital which is referred to as networks that connect groups and society provide benefits to the enterprises (Coleman, 1988; Fafchamps & Minten, 2002; Granovetter, 1995; Putnam, 1993). The research evidence also shows that the linkages of ENTP3 and ENTP4 were initiated by the officers. In such cases, the officers approached the entrepreneurs and provided suggestions on quality improvement for increasing market opportunities and invited them to join the extension programs. The programs provided them technology and linkages with other agencies including the market channels.

The research findings show that there were no cash constraints acknowledged among the entrepreneurs interviewed. Tesema (2006) argue that one of the key constraints to small-scale entrepreneurs and farmers to adopt new technologies is known to the associated capital requirements and the cash constraints. The entrepreneurs interviewed in the present work pointed out that they would be willing to pay for new packages (such as new design) or technologies (for example oxygen and moisture scavenger), once they became ascertained with benefits that they would obtain from using the new packaging technology. Tesema (2006) emphasized extent of income could affect probability and intensity of technology adoption. Entrepreneurs and farmers having alternative source of income can relax their financial constraints and become likely to tryout and adopt the new technology.

Conclusion

The present work evidently highlighted key factors having influences on the entrepreneurs of small-scale enterprises. These are classified into 2 main groups: human and social capitals of entrepreneurs. The research findings obtained from this work importantly contribute to the knowledge of technology adoption, particularly that of the packaging technology adoption which is considered limited available.

Some implications developed upon the research evidence for packaging technological extension program implementations are proposed and these include (i) young and university-qualification entrepreneurs could be prime targets, (ii) well-off entrepreneurs or those having low (or without) financial constraint are likely to pay and to adopt for the technologies, (iii) so-called ‘cost-sharing’ extension programs in which the entrepreneurs pay to participate would be attractive the entrepreneurs who have high intentions to adopt the technology, and (iv) linkages between the entrepreneurs and technological providers have to be developed and maintained for creating entrepreneurs’ opportunities to aware availabilities of the technologies and to adopt them.

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