The Technology Acceptance of Small and Medium Enterprise towards Vegetable Cutting Technology

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ABSTRACT

Small and Medium Enterprises (SMEs) are major contributor to the economy of a developed country. It is estimated that more than 90% of enterprises are SMEs and they accounted for more than 70% of sales of goods and services around the world. In Malaysia, the food industry is dominated by SMEs. However, the contribution of SMEs could be improved by increasing the use of technology in SMEs. Therefore, this study utilized the constructs from Technology Acceptance Model (TAM) to evaluate the intention to use new vegetable cutter technology among SMEs. A theoretical model based on TAM was tested empirically through survey and data obtained from 35 employees of SMEs who are potential users of the vegetable cutting technology. The results indicated that the employee have the desire to use the technology based on their perceived usefulness and ease of use of the technology to replace their manual work. The SMEs that have participated in this study are still using manual methods to cut vegetables for the purpose of producing their products.

KEYWORDS: Technology Acceptance Model, Small Medium Enterprise (SME), Vegetable Cutting Technology.

INTRODUCTION

Small businesses medium enterprises (SMEs) play an important role in contributing to economic growth in Malaysia. During the Industrial Malaysia Plan 2006-2020 (IMP3). In 2013 the Ministry of International Trade and Industry has targeted the food processing industry investment will reach RM24.6 million [1]. This shows the importance of SMEs in contributing to the national economy. Although Malaysia has a large number of SMEs in the food industry, Malaysia still depends on food imports. The use of technology has become an issue among the SMEs where they require a large expenditure to utilize technology in order to enhance their production. Other issues faced by SMEs include limited knowledge on technology, financing, low productivity and restricted access to current and new technologies. However, the contribution of SMEs in the food industry can be improved by increasing their competitiveness by upgrading the technology that they use to produce their products.

In the past few decades, the theory of technology acceptance and adoption is widely utilized among researchers in the field of information and communication researchers from other fields of technology [2]. There are several theories that study the behaviour of individuals who use technology that focuses on human desires in a particular behavioural setting such as Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB). Technology Acceptance Model (TAM) is a theory that explains how the information system users receive and use a technology. Previous researchers have been using the theory of adoption in the field of information technology, internet banking and education. However, limited research has utilized TAM to study the technology adoption among small and medium businesses (SMEs) especially in the food industry [3]. Technology adoption among SMEs in Malaysia are considered inadequate due to limited use of technology and they usually are unable to determine the suitable technology needed to enhance their production. Although there are various programs in terms of financial support and training given by the government, the use and acceptance of technology among SMEs in Malaysia are still at a low level. Therefore, adopting constructs from TAM; this study is focused on the intention to use vegetable cutting technology of 35 employees from five SMEs in order to improve the company's competitiveness and productivity.

Research Scope and Delimitation

The scope of this study is focused on the food industry SMEs involved in the preparation of vegetable based products. The respondents of this research are SMEs that are still utilizing manual techniques to cut vegetables. This study is a preliminary study to gather information on the intention to use the vegetable cutting technology before this technology is fully commercialized. Based on the results of this study, the researcher will focus on the construction of the appropriate technology that is built specifically for the needs of SMEs. Finally, a follow-up study to evaluate the acceptance of the technology used will be pursued in the future.

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LITERATURE REVIEW

Technology Acceptance Model (TAM)

Innovation has been a popular focus of various studies, such as the success of innovation projects [4], types of innovation [5], innovative environments and cultures [6] and the role of leadership [7]. This study will focus on the factors affecting the intention to use vegetable cutting technology for SMEs that need to cut vegetables to produce their products. Rogers' diffusion of innovation (DoI) theory divides the attributes of the innovation into five broad factors: relative advantage, compatibility, complexity, trialability and observability. The relative importance of these factors will have different definition and detailed meaning will vary across different contexts. Therefore, this study is vital in understanding intention to use of the vegetable cutting technology in Small Medium Enterprises (SMEs) in Malaysia as a developing country [8]. Relative advantage refers to the degree to which an innovation is perceived as being better than the idea it supersedes [9]. Compatibility relates the innovation's relationship with organisations as the potential adopter's existing values, past experiences and needs. Complexity refers to the number and difficulty of processes and activities involved in adopting and implementing the new technology. Furthermore, trialability is the degree to which an innovation may be experimented with on a limited basis. Finally, observability pertains to the visibility of innovation to other potential adopters.

Additionally the technology acceptance model (TAM) [10-11] has utilised used two general unweighted beliefs on the decision to accept or reject a certain technology: perceived usefulness and perceived ease of use of the technology. While this model has empirical support [12], it does not include other beliefs that may also be relevant. In [11] examined much of the same literature and concluded that only three beliefs have consistently been identifies as relevant to the adoption of innovations: relative advantage, complexity and compatibility. Accordingly, this research focuses on this reduced set and tests the antecedents as well as outcomes of technology transfer. Empirical studies [11, 12] support the importance of relative advantage or usefulness in predicting adoption behaviour and technology transfer.

H1: The perceived usefulness of the vegetable cutting technology has a relationship with intention to use the technology.

Perceived ease of use is 'the degree of ease associated with the use of system' which means the system or technology is easy to use, learn and understand. This construct is developed based on two innovation adoption models namely TAM (perceived ease of use) and DOI (ease for use).

It suggests that perceived ease of use and perceived usefulness are the two most important factors in explaining system use. In its original version, the TAM consisted of five constructs including perceived ease of use, perceived usefulness, and attitude towards using, behavioural intention and actual system use [13] Perceived ease of use and perceived usefulness has a positive impact towards the actual use of the technology. Perceived usefulness is responsible for the greatest influence on people's intention and lead to an acceptable level of internal consistency [14].

H2: The perceived ease of use of the vegetable cutting technology has a relationship with intention to use the technology.

Based on the previous discussion, the following constructs are tested to test the intention of users to use the vegetable cutting technology.
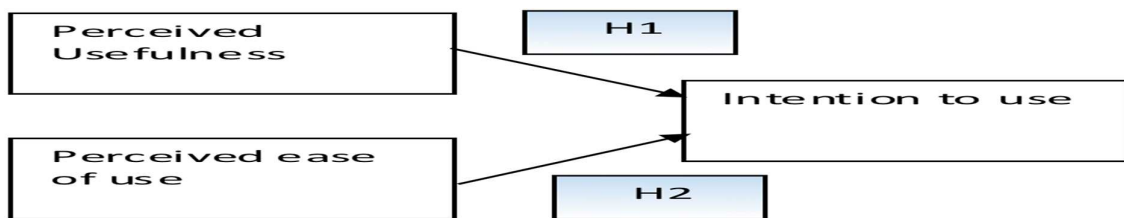
Figure 1: Theoretical framework

METHODOLOGY

This study uses a quantitative method using questionnaire distributed to 35 respondents from 5 different SMEs (refer Table 1). In order to ensure the transparency of the review, the company's identity is kept secret since these companies are competitors. The survey for this study is divided into two sections. Section A consists

of three questions on the company's background such as annual sales, number of employees and years the establishment (see Table 2). While Section B contains questions related to the technology in terms of its useful, easy to use and the employees' desire to use the technology. Items the constructs perceived usefulness, perceived ease of use and intention to use are measured using Likert scale of 1 to 5 where 1 represents strongly disagree and 5 represents strongly agree. The entire survey has been adapted from previous studies that utilized TAM. Five companies were selected based on the food preparation process in which the primary process involves the preparation of vegetables and cutting vegetables. A total of 35 employees have answered the questionnaire distributed to reveal the desire to use the new vegetable cutting machine to replace their manual work processes.

Table 1: Number of respondents according to company

Company	No. of Respondent
A	6
B	5
C	7
D	9
E	8
Total	35

Table 2: Company profile

Items	Category	Frequency	Percentage (%)
Annual sales	1. Less than RM30,000 (USD 6,644) per year	2	40
	2. RM30,000 (USD 6,644) to RM50,000 (USD 11,074) per year	2	40
	3. More than RM50,000 (USD 11,074) per year	1	10
Number of employees	1. Less than 5 employees	1	20
	2. 6 to 10 employees	2	40
	3. 11 to 15 employees	1	20
	4. 16 to 20 employees	1	20
Years established	1. Less than 5 years	3	60
	2. 5 to 10 years	1	20
	3. More than 10 years	1	20

RESULTS AND DISCUSSION

Reliability and Validity Analysis

Before further analysis could be carried out, the satisfactory level of reliability and validity of the measures and constructs were analysed (refer Table 3). Firstly, the items of each construct were assessed using the Cronbach's α coefficient and the items-to-total correlation. All constructs have values of more than 0.7 of the cut-off level set for basic research [15].

Table 3: Cronbach's alpha value of constructs

Constructs	Cronbach's Alpha	No. of Item
Perceived usefulness	0.83	5
Perceived ease of use	0.82	7
Intention to use	0.76	5

Note: N=35

Correlation Analysis

Correlation analysis was carried out to test the relationship among the constructs tested in this study. The correlation analysis results are illustrated in Table 4. The results indicate that each construct has a positive and significant relationship with each other at $p < 0.01$, where H1 and H2 are accepted.

Table 4: Correlation analysis

Constructs	Perceived Usefulness	Perceived Ease of Use	Intention to Use
Perceived usefulness	1	0.58**	0.47
Perceived ease of use	0.58**	1	0.64**
Intention to use	0.47**	0.64**	1

Note: N=35
** Sig. at 0.01

CONCLUSION

The result of the analysis indicates that there is a significant positive relationship between all constructs. The strongest relationship can be seen between perceived ease of use and intention to use, r (35) = 0.63, p <0.01. Whereby, the intention to use the technology increases when the employees' perceived ease of use increases. Relationship between perceived usefulness and intention to use is also positive and significant at r (35) = 0.47, p <0.01. Therefore, this indicates that respondents have a desire to use technology in their work environment when they see it as easy to use [13]. All SMEs that have participated in this study are still using manual methods to cut their vegetables for the purpose of selling them. When the technology proposed is simple, useful and easy; SMEs will have higher intention to use the technology thus increasing their productivity and revenue of their companies [16]. In addition, SMEs that adopt this technology to cut vegetables will be able to reduce the work time of their employees enabling them to focus on other tasks that are more useful [17]. Therefore, the improvement of technology in SMEs is in line with the Malaysian government's desire to improve the ability of SMEs to contribute more significantly to the national economy.

Future Research Suggestion

Future research could extend this research by carrying out a similar research on respondents from other SMEs to gauge the level of acceptance and adoption of new technologies. Moreover, studies could be carried out to measure SMEs' level of technology use between various developing countries [18]. Through this initial research, more innovative products may be as a result of the utilization of appropriate technologies that are built and designed specially to tailor the needs and capabilities of SMEs.

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