# E-COMMERCE ADOPTION: AN INNOVATION-DECISION PROCESS AMONG INDONESIAN SMALL AGRIBUSINESS ENTREPRENEURS

BY

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A dissertation submitted in fulfilment of the requirement for the degree of Master of Information Technology

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**AUGUST 2012** 

## **ABSTRACT**

E-commerce adoption studies by small business in developing countries has received a significant attention in the past decade. However, most of the studies recorded in the literature were mainly focused on manufacturing, distribution and service sector. Limited attention had been given to agribusiness sector. Using Rogers' innovationdecision process model, this study attempts to understand the process of e-commerce adoption among Indonesian small agribusiness entrepreneurs. The aim is to determine the relationship between the entrepreneurs' prior condition, socioeconomic characteristics, personality behavior, communication behavior, the perceived characteristics of e-commerce as well as the communication channels and the stages of the innovation-decision process. A survey method was used and fifty face-to-face guided interviews and a number of in-depth interviews were conducted to collect the data. This study found that non-formal education and IT ownership have significantly influence the knowledge stage; and the perceived relative advantage, compatibility, and complexity of e-commerce have significant affect on the persuasion stage. For communication channels, this study found that information source variance on ecommerce from hybrid media significantly influenced all stages of e-commerce innovation-decision process, except for the confirmation stage. As for information source variance from interpersonal communication, this study found it to be negatively correlated with the persuasion and the decision stage, but positively influenced the confirmation stage. Finally, this study supports Rogers' theory that there are relationships between the stages of the innovation-decision process.

## خلاصة البحث

حازت دراسات تطبيق التجارة الالكترونية على كثير من اهتمام الأعمال الصغيرة خلال العقد المنصرم في الدول النامية والتي ركزت بشكل رئيسي على كل من قطاع الصناعة و التوزيع و الخدمات دون التركيز بشكل كافي على قطاع التجارة الزراعية. تُحاول هذه الدراسة فهم عملية تطبيق التجارة الالكترونية في الاعمال الزراعية الصغيرة من قبل رجال الاعمال في إندونيسيا وباستخدام نموذج روجرز لعملية القرار الابتكاري. تهدف هذه الدراسة لتحديد العلاقة بين الوضع السابق لرجال الأعمال وصفاتهم الاجتماعية و الاقتصادية و تصرفاتهم الشخصية واسلوب تواصلهم والأقنية المستخدمة لذلك إضافة إلى تصورهم المسبق حول التجارة الالكترونية وبين مراحل عملية القرار الابتكاري. أستخدم الاستبيان و المقابلات المباشرة الموجهة لخمسين عينة إضافة الى عدد من المقابلات المتعمقة في سبيل جمع المعلومات المتعلقة بالبحث. وحدت هذه الدراسة ان التعليم غير الرسمي و امتلاك التكنولوجيا كان لها تأثير كبير على مرحلة المعرفة، وأن التصور المسبق للتجارة الالكترونية و مدى توافقها و تعقيدها له أثر هام في مرحلة الإقناع. وفيما يخص أقنية الاتصال، وجدت الدراسة أن مصادر المعلومات المتباينة من وسائل الإعلام المختلطة كان لها تأثير على جميع مراحل عملية القرار الابتكاري باستثناء مرحلة التأكيد. وأخيراً بسبب تباين مصادر المعلومات عن طرق التواصل الشخصية ، وحدت هذه الدراسة أنها مرتبطة بشكل سلبي مع مرحلتي الإقناع و القرار ولكن بشكل إيجابي مع عملية تأكيد اتخاذ القرار.

## APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Information and Technology.

Mira Kartiwi Supervisor

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## **DECLARATION**

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions

Alfi Khairiansyah Machfud

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Dedicated to my mother the zealous researcher and my father the patient teacher.

#### **ACKNOWLEDGEMENTS**

All praise due to the Lord, Allah alone. I praise him, seek his help and forgiveness. I bare witness that there is no god worthy of worship except Allah and that Muhammad sallallāhu 'alayhi wasallam is his servant and his messenger. All grand thanks and glory to Allah for giving me the endurance and strength during the process of conducting this research. It is with Allah's help, guidance, and blessings that this research has been possible.

I would like to mention that this dissertation is a result of combined efforts of a number of cherished persons who have assisted and supported me during the research. Therefore, to them, I would like to express my sincere gratitude and thanks as I am greatly indebted. As the Messenger of Allah *ṣallallāhu 'alayhi wasallam* said, "He who does not thank people, does not thank Allah".

I would like to express my deep gratitude, sincere appreciation and thanks to my supervisor, Assist. Prof. Dr. Mira Kartiwi whose kind attention, assistance, suggestions and encouragement helped me throughout this research and beyond.

My sincere appreciation and thanks to my defense examiner, Assoc. Prof. Dr. Husnayati Hussin who has contributed valuable inputs to make this dissertation more thoughtful. I also would like to thank the International Islamic University Malaysia which has provided scholarship and a convenient learning environment.

My deep appreciation and heartfelt thanks to my family, especially my beloved mother and father for their endless love, support and encouragement to accomplish this study. My appreciation and thank to my wife Mutiara who has provided love, patience and encouragement throughout the years. My love and gratitude go to my daughters Sumayyah and Ruqoyyah who never fail to cheer me up during difficult times.

I am grateful to many friends especially Jawdat Khatib, Ahmed Abdulaziz Haji-Ahmed and Khodashev Aslanbek. I greatly value their friendship and appreciate their belief in me.

I also would like to express my sincere thanks to Asri Sulistiawati who have assisted me in data collection. Finally, my appreciation and sincere thanks to all the participants of this study who have kindly share their invaluable information, experience and precious time for this study.

Jazāhumullāhu khairan.

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## CHAPTER ONE

### INTRODUCTION

#### INTRODUCTION

The rapid development and advancements of information and communication technology (ICT) and the Internet have reshape the plot on how business is done and has taken the competitiveness to a different level. These advancements have created opportunities for small business to strive in todays' competitive market.

The first chapter provides the background of the study and some profile of the country being studied, with a focus on ICT development, small business, and agribusiness. It is then followed by the problem statement, the research question and objectives, significance of study, scope and limitations of the study. Finally, the organization of the report describes an overview of the remaining chapters.

#### **BACKGROUND OF RESEARCH**

Agriculture has been long recognized for its foundational role as an engine for economic development (Byerlee, de Janvry & Sadoulet 2009). It is one of the most contributing sector to developing countries which are relatively rich in natural resources, but poor in human resources; it is commonly the primary export sector and foreign exchange earner, due to its strong comparative advantage in unprocessed commodities (Byerlee et al., 2009). In addition, agriculture's core economic roles include providing food and health security, employment opportunities, reducing poverty, and stimulating rural development (Saragih, 2010). Agriculture proved itself

to be a tough sector during the financial crisis in South East Asia in 1997, where it became a very profitable sector while other industries collapse (Simmons & Daryanto, 1999); and during the global economic crisis in 2008, where it recovers -and excels from large drop in commodity price in just one year (Firdaus, 2009).

The use of electronic commerce (e-commerce), defined as "using the Internet and the Web to conduct business" (Laudon & Traver, 2007: 4); has been been increasing in the past decade in developing countries. According to the International Telecommunication Union (ITU) data, the number of Internet users in developing countries has significantly increased from almost no users per 100 inhabitants in 2000 to around 18 percent of the population in 2009 (UNCTAD, 2010). E-commerce was first introduced and implemented in developing countries' agribusiness in the late years of the 21st century, particularly in China (Xiaoping et al., 2009). Since then ecommerce has been widely applied and reach rural areas. At present time, even farmers in rural Bangladesh, India, China, and many African countries have began using e-commerce (UNCTAD, 2010). As highlighted by Kofi Annan, e-commerce can push economic growth and provide ways for a developing nation to blend in the global economy (UNCTAD, 2002). E-commerce offers small business not only technical advantages such as saving business cost (Ratnasingam, 2006; Chiliya, Chikandiwa & Afolabi, 2011), but it also offers strategic benefits as reported by researchers such as improving communication with clients (Thulani, Tofara & Langton, 2010; Ratnasingam, 2006; Warren, 2004), advertising (Thulani et al., 2010; Warren, 2004), and increasing business prestige (Chiliya et al., 2011).

Indonesia is among the 193 participating countries in the Millennium Development Goals (MDGs) initiated by the United Nations in 2005. The 18th target

of the eighth goal in the MDGs concerns about reaping the benefits of information and communication technologies. Indonesia's consent to this target is reflected in its policy as stated in the National Development Program (PROPENAS), even before MDGs was establish. According to Law No. 20 of 2000 on the National Development Program, entering the reform era, Indonesian government has resolve a policy with regards to economic, communication, information and media development. In the context of economy, the government prioritized the development of agribusiness system and empowering small and medium enterprise (SME). In terms of agribusiness, it is stated that the main program is to empower farmers and fishermen through implementation of ICT to improve their access to capital resources, technology, information and market (Law no. 25 of 2000).

Agribusiness contribution to the nation's economy is not only from the monetary, but more importantly from the workforce it absorbs. According to Statistics Indonesia (BPS), in 2010, around 41.5 million people are working in the agriculture sector, which is about 38.8 percent of the country's workforce. In the same year, the number of micro, small and medium enterprise (MSME) reach 53.8 million businesses, involving around 99.4 million manpower. Micro and small business is the biggest portion, reaching around 99.92 percent of the total SMEs in Indonesia. In terms of MSME development, the government has committed to empower entrepreneurs to be more efficient, productive, and competitive, as well as to create a conducive business environment and open more business opportunities. Aids and facilities are given selectively by the government in a form of protection from unhealthy business environment, education and training, business and technology information, finances, and location (BAPPENAS, 2010). In terms of communication,

information and media, the government pledge to increase the role of communication through both modern and traditional mass media and to ensure the security of ICT users (BAPPENAS, 2010).

Indonesia's commitment to achieve the goals of MDGs and RPJMN (The Midterm National Development Program) were then followed up by the introduction of Cyber Extension initiative through several programs such as (1) the Unlimited Potential program, a combined effort program between Microsoft and non-profit organizations to develop Community Training and Learning Centre (CTLC), (2) the Partnership for e-Prosperity for the Poor (Pe-PP), a joint action program by BAPPENAS and UNDP to introduce technology to poor people through telecenter, (3) Poor Farmers' Income Improvement through Innovation Project (PF13P) program introduced by the Ministry of Agriculture and Loan ADB, (4) Farmer's Empowerment through Agricultural Technology and Information (FEATI) program, to empower farmer and farmers organization to increase their productivity, income and welfare through accessibility to information, technology and production facilities, agribusiness development and partnership (Sumardjo, Baga & Mulyandari, 2010). Moreover, the Ministry of Agriculture have lunch e-Petani, a website with information on agriculture commodity and products, and an e-commerce portal. Likewise, the Ministry of Communication and Information introduce the Universal Service Obligation (USO) program, aiming to give remote villages access to communication and information. In addition to voice and SMS service, this program aimed to provide Internet access to villagers.

At the present time, BAPPENAS (2010) Report on Indonesia's achievement in MDGs, stated that there is an increase of 212 percent in total teledencity per 100

inhabitants with wireless proportion of 95.8 percent. The introduction of various government programs is believed to be among the reason agribusiness entrepreneurs began to adopt e-commerce. It can be seen in the Internet that agribusiness websites, blogs, portals, mailing lists, etc. began to flourish sharing myriad of information and improving market penetration.

To date, a number of studies have investigated the adoption of several aspects of ICT in Indonesia (e.g., Mulyandari, 2011; Kartiwi, 2010; Purnomo & Lee, 2010; Kartiwi & MacGregor, 2007; Kurnia, 2006}. Other than studies conducted by Purnomo & Lee (2010) and Mulyandari (2011), these research focus on manufacturing and service sector. Purnomo and Lee (2010) studied agriculture extension officers' perception of readiness and barriers towards ICT programs implementation in Central Java and Yogyakarta. The results showed that farmers readiness to ICT implementation is very low. Technological and organizational cultures were found to be the barriers to ICT implementation. Mulyandari (2011) studied the implementation of cyber extension as a communication medium to empower horticulture farmers in West and East Java Province. The result showed that cyber extension can improve farmers accessibility to information on market and agricultural technology.

The growth of micro, small and medium businesses, the development of communication infrastructures, as well as ICT introduction to agriculture community in Indonesia, particularly West Java, is reckoned to have encourage agribusiness entrepreneurs in this region to access and use the Internet to expand their business. However, until today, published empirical studies on e-commerce adoption by agribusiness entrepreneurs are still limited. Therefore, study on the adoption of e-

commerce by agribusiness entrepreneurs in West Java is important. West Java is the biggest province in Indonesia where most people are working in agriculture sector. According to Statistics Indonesia, the number of people working in the agriculture sector reaches around 16.7 million people (about 39 percent) of the total 43 million people living in West Java (BPS, 2010).

#### THE RESEARCH PROBLEM

E-commerce use in agriculture sector has been growing in developing countries. Small business entrepreneurs have began to embrace e-commerce to improve their business activities. Until today, several studies on e-commerce adoption by small businesses in developing countries have also been recorded. However, despite there is an increasing number of attention had been given; the number is still far from sufficient. Most of the studies recorded in the literature were mainly focused on manufacturing, distribution, and service sectors. Limited study had been done in agribusiness sector. On top of that, studies on e-commerce adoption in Indonesia had been strictly to manufacturing and service sectors such studies done by the Asia Foundation (2002), Kartiwi (2010) and Kartiwi & MacGregor (2007), or had been restricted to general review such as the study done by Kurnia (2006). Although there are few studies on agricultural sector, particularly by Mulyandari (2011) and Purnomo and Lee (2010); Mulyandari (2011) focuses on cyber extension and farmers, while Purnomo and Lee (2010) focuses on ICT readiness of extension officers. To date, there has been no published empirical study on e-commerce adoption by agribusiness entrepreneurs in Indonesia. Therefore, this study attempts to address this knowledge gap in the literature.

Furthermore, the fact that there are many agribusiness websites on the Internet as well as the fact that government together with non-government organizations (NGOs) have initiated programs and aids to support agribusiness entrepreneurs to embrace e-commerce, it is believed that many agribusiness entrepreneurs in West Java have used Internet for their business. However, since the dissemination of the programs and aids are disparate throughout the region, it is likely that the use of e-commerce by agribusiness entrepreneurs also varied. Therefore, to what extent agribusiness entrepreneurs use e-commerce for their business? What kind of Internet applications are they using? What benefits do they get from adopting e-commerce?

There are many theories used to explain technological adoption behavior. One of the most widely used is the theory of innovation-decision process by Everett M. Rogers. A theory that explain stages through which a person gets initial knowledge about an innovation, to forming a perspective towards the innovation, to making a decision to adopt or reject, to implementation of the innovation and to confirm his or her decision (Rogers, 2003). According to the diffusion scholar, these stages are influenced by a number of factors, namely communication channels, characteristics of the decision-making unit (i.e., socioeconomic characteristics, personality variables, and communication behavior), and the perceived characteristics of the innovation. Referring to the theory and to a number of empirical studies on e-commerce adoption in various developing countries, what are the characteristics of the adopter (i.e., the entrepreneurs) in their social, economic, personality and communication behavior aspects that may contribute to their knowledge on e-commerce? What are the perceived characteristics of e-commerce that may influence their willingness to adopt

e-commerce? What are the communication channels that may affected their decision to adopt e-commerce?

On these accounts, this study investigates e-commerce adoption by Indonesian small agribusiness entrepreneurs in West Java, Indonesia, using Rogers' (2003) innovation-decision process model.

## RESEARCH QUESTIONS AND OBJECTIVES

The research questions of this study relates to the factors that influence the adoption of e-commerce by small agribusiness entrepreneurs in Indonesia. The specific questions to be assess are:

- i. What are the profiles of e-commerce adopter among agribusiness entrepreneur: their socioeconomic characteristic, their personality traits, and their communication behavior? What are the profiles of the business: the type of agribusiness product, and the firm size?
- ii. Do the prior conditions, socioeconomic characteristics, personality traits and communication behavior of Indonesian agribusiness entrepreneur affects their degree of knowledge on e-commerce? Do the perceived characteristics of e-commerce affected their attitude towards e-commerce? What are the factors that affected their decision to adopt e-commerce, to implement e-commerce and to continue to use e-commerce?

The general purpose of this research concerns with answering the research questions above, which is to study the factors that have an impact on the adoption of e-commerce by Indonesian small agribusiness entrepreneurs. The specific objectives are:

- i. To study the profile of e-commerce adopter (i.e., agribusiness entrepreneur) as well as their business profile.
- ii. To investigate various factors that influence the stages that take place in the innovation-decision process of e-commerce, which include stages of: knowledge, persuasion, decision, implementation and confirmation; as well as to study the relationship between stages in the innovation decision process of e-commerce.

#### **SCOPE OF RESEARCH**

This research is limited to particular aspect of e-commerce that utilizes the Internet as the technological infrastructure to communicate, distribute and conduct information exchange that would lead to commercial transactions between businesses and consumers. The study focuses on the agribusiness sector, which includes up-stream agribusiness (input production), on-farm agribusiness, and down stream agribusiness (processing); and covers not only farming, but also food crops, fisheries, forestries, and livestock. More detailed discussion on agribusiness is provided in Chapter 2.

The target area for the survey is Bogor area (city and district). Bogor region is located in West Java province, which is one of the most populated region in the country. Due to its geographical location as the neighboring region of the capital city Jakarta, business activities are very lively in Bogor. Decent telecommunication infrastructure and technology as well as transportation infrastructure and facilities have also reach mostly its remote areas, providing a backbone for e-commerce and more business opportunities.