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The Effect of Using Information Technology Management on the Car-Parts Manufacturers' Entrepreneurship in Tabriz

Hoshangh Taghizadeh*
Department of Management,
Tabriz branch, Islamic Azad University,
Tabriz, iran
taghizadeh@iaut.ac.ir

Babak Aliari
Tabriz branch, Islamic Azad University,
Tabriz, iran

Abstract. Entrepreneurship is the process of value setting by providing a unique set of sources for making effective use of opportunities; thus, caring about it seems to be a must. The present paper aims to investigate the effect of information technology management on managers' entrepreneurship in Tabriz car-parts manufacturing industry. To this end, four hypotheses were tested in the study. The population of the study includes all the managers of car-manufacturing companies in Tabriz. Sample selection was made using the Morgan Table, whereby 118 people were selected through random sampling. The data collection instrument was a questionnaire, whose validity and reliability had already been determined. Data analysis was carried out by using K-S test as well as pairwise comparison test. The results showed that information technology management, electronic business, management information systems, and automation significantly affect the organizational entrepreneurship.

Keywords: Entrepreneurship, information technology management, electronic business, management information system, automation

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*Corresponding author

1. Introduction

In the early 1980s, due to the great surge towards entrepreneurship as well as organizations' emphasis on innovation for survival and competition with rapidly growing entrepreneurial organizations in the market, entrepreneurial ideas pervaded companies (Hisrich, Langan-Fox, and Grant 2007). Along with the penetration of official and bureaucratic processes into the culture of organizations during 1960s and 1970s, entrepreneurship in organizations increasingly attracted managers' attention, driving them to commercialize their products and provide new services. In the early 1980s, with sudden progress of industries in worldwide competition, the importance of entrepreneurial thought was emphasized more than ever before in the organizations. Researchers focused their attention on the introduction of entrepreneurship into the structure of organizations (Kordnaeech, Akbari, and Rezaeean, 1386). Today, many organizations have realized the importance of organizational entrepreneurship. This change of trend in organizations' strategies is in response to the three needs imposed upon organizations:
a) rapid increase of new competitors,
b) development of distrust towards traditional management methods in organizations, and
c) skilled workforce's quitting their jobs in organizations and setting up independent businesses (Stevenson and Gumpert 1985).
On the other hand, since mid-1990s, the world has witnessed developments in managerial styles and conversion of these styles into entrepreneurial styles, and organizations, in their attempt to improve their strategic and productive activities, have sought the development of entrepreneurial systems. Economists have conducted comprehensive studies on what entrepreneurs do and how they work. Stevenson & Jarilo believe that research on entrepreneurship should address three major questions:
1) what do entrepreneurs do?,
2) what is the output of their work?, and
3) what prompts people to become entrepreneurs? (Entrialgo, Fernndez, and Vzquez 2000).

Of various classifications of entrepreneurship, the one proposed by Cronwall & Perleman has more applications. Based on this classification, entrepreneurship takes three major forms:
1) individual entrepreneurship,
2) intra-organizational entrepreneurship, and
3) organizational entrepreneurship or entrepreneurial organization (Douglas and Shepherd 2000).
Entrepreneurship has been defined as the process of value setting by providing a unique set of sources to benefit from opportunities (Morris and Noel 2001). However, in reality, entrepreneurship is a function of entrepreneurs (Kordnaeech, Akbari and Rezaeean 1386). Scientists have expressed different characteristics for an entrepreneur: internal control center, average risk-taking capacity, tolerance of ambiguity, need for success, independence, innovation, far-sightedness decisiveness, will power, diligence, and ability to make effective use of opportunities [25, 26, 29, 33]. In general, the concept of organizational entrepreneurship emerged from academic writings of the late 1980s and early 1990s. The aim of entrepreneurship in large organizations is to recreate the advantages of flexibility and innovation, which are often related with the establishment of small companies in a big company (Antonic and Hisrich 2001). The operational definitions of organizational entrepreneurship have developed over the past thirty years through practical works. Researchers believe that organizational entrepreneurship is a very comprehensive concept, which includes the development and implementation of new thoughts and behaviors (Prokopenko and Pavlin 1991). Entrepreneurial organizations are dynamic, creative, and often representative of their managers' vision and dynamism (Antonic and Hisrich 2001). Dess et al. (Dess, Irland, and Zahra 2003) believe that organizational entrepreneurship is associated with various and new ideas such as organizational revival, innovation, and creation of risky jobs. Entrepreneurial organizations have such characteristics as linear/horizontal structure, informal relationships, long-term strategies and planning, evaluation based on performance, and efficient use of opportunities. The difference between intra-organizational entrepreneurship and organizational entrepreneurship is that in the former, the individual, referred to as organizational

entrepreneur, is the initiator of risky activities in the organization, while in the latter, the whole organization or staff has an inclination towards entrepreneurship. Organizational entrepreneurship consists in fostering entrepreneurial behaviors in the organization. Organizations could develop creativity and innovation by encouraging the staff to think and giving them freedom and flexibility in pursuing their objectives without getting them into bureaucratic trouble. Thus, organizational entrepreneurship is regarded as a system that empowers the managers to tap into the staff's creativity in a systematic and judicious manner (Kordnaeech, Akbari, and Rezaeean 1386). Despite the importance of entrepreneurship, few studies have been conducted on organizational entrepreneurship (Echols and Neck 1998). Organizational entrepreneurship is an important factor in economic and organizational development. It could be important not only for large organizations but also for average and small ones (Bohringer and Maurer 2004). On the other hand, information and communication technology and its close relationship with the organization's knowledge have been brought up as a strategic factor (Irani, 2002). In recent years, the issues relating to organizational development have taken special position in the world literature. One of the major strengths of the activities involved in organizational development is to create conditions in which people themselves find out they should change. Accordingly, due to such reasons as limitation of resources, social problems, downsizing of governments, inefficiency of traditional management methods, rapid environmental changes, and maintenance of efficient staff, organizational entrepreneurship has proved to be an irreplaceable phenomenon in modern organizations. In the modern age, the environmental developments are among the most important challenges which organizations are faced with. Optimal use of people's capabilities in drawing up frameworks and new patterns of thought, identification of customers' real needs, and constant improvement of products and services have taken up considerable importance. To be effective and to get prepared for future challenges, organizations need visionary managers capable of identifying and recruiting the people who can keep up with the latest developments (Hadizadeh Moghaddam and Rahimi Filabadi 1383). On the other hand, while traditional approaches

of management see technology as merely a tool for the staff's more efficiency and productivity, 'human relations' approach views technology as a tool for freeing the staff from tiresome work and creating pleasant and motivating working atmosphere. According to experts, this approach to information and communication technology, with the increase of information processing and optimization of decision-making process, helps enhance the efficacy of staff (Marsili 2002). Many experts believe that information and communication technology, due to creating vital information resources, plays a crucial role in the modern organizations in the management of innovation-related issues [24]. Different studies indicate that appropriate management of information and communication technology can facilitate the organizational entrepreneurship. In response to the question of why appropriate management of information and communication technology affects entrepreneurship, suffice it to say that information, besides its inherent and permanent value, causes the development of sensible behavior and reasonable decisions due to raising awareness and improving knowledge. Communication is of great significance, too. Because of the exchange of information and awareness, it could improve the performance and increase the potentials of the organization. Therefore, communication and information, which are available to the public via the Internet, could serve as two basic and powerful tools whose efficient management could assist and empower entrepreneurs (Alambeygi, Mohammadi, and Moghimi 1388). Information technology management, which is of different potentials, could develop a novel approach within electronic business by using the Internet and other communication systems. Electronic business is an approach to business which is increasingly flourishing with the increasing development of using information technology. Electronic business has had a double effect on entrepreneurial organizations. There were companies which, by entering into the computer market, provided the necessary equipment for electronic business, for example, Microsoft, Apple, and some others were aimed at changing operations so as to benefit from the advantages of electronic business and the Internet (Spanos, Prastacos, and Poulymenakou 2002). One of the potentials of entrepreneurial organizations is to manufacture and distribute electronic equipment and

accessories. If an organization could carefully analyze the present and future markets, it will find out what type of hardware or software is needed by the operators. Entrepreneurial organizations are moving into new market sectors. Their objective is to transfer a product from one market to another. With the development of the applications of information technology, information systems were formed in organizations, which came to known as 'management information systems'. The main purpose of these systems in the organization was to provide the management with needed and processed information for taking quick decisions. Management information systems, through providing the managers with information in a timely manner, could inform them of the status of entrepreneurial activities so that they can effectively use created opportunities. In the early years of the invention of the computer, specialists hardly cared about the managers' informational needs, using the computer only to process data from accounting. Over the period, which lasted until mid-1960s, the focus of attention was upon the calculation capability of the computer. In the early 19960s and after the invention of new kinds of computers, which were able to process more information at lower expense, novel methods were developed to introduce new equipment like management information systems. After a decade, and due to the appearance of new informational needs, a new information system, Decision Support System, was developed. After the completion of the decision support system, given the advances in computer equipment, the issue of enhancing productivity and efficiency of managers' and staff's offices and facilitation of relations between the manager and employees by using electronic equipment was proposed, and in 1980, official automation systems were designed. The official automation systems were a response to highly variable environmental and competitive conditions dominating the organizations. Official automation allows organizations to do the activities related to organizational entrepreneurship with more speed and accuracy. Automation has made it possible for organizations to register the activities related to idea registration and proposal submissions and make necessary investigations and decisions (Hosoda and Disney 2009). While there have been a plenty of research studies on both entrepreneurship and information technology, not many studies have ad-

dressed the effect of using information technology management on the producers' and manufacturers' entrepreneurship. Some of the studies conducted on the subject by both Iranian and foreign researchers can be summarized as follows:

Doliba and Kafman challenged the issue of investment on information technology as well as the effects of the balance price recycling in international banking. They suggested reconsideration of the current measurement and debated issues in the research whose purpose is to discover and document the outputs resulting from the companies' investment on information technology (Duliba and Kauffman 1996). Having selected a number of articles from PAKM Conference, Burguff and Parschi asked the authors to provide them with the extended versions of the articles. The selected articles were about supporting different types of organizational knowledge in different stages of the organization's lifetime (Borghoff and Pareschi 1997). investigated the effects of entrepreneurship in poor countries, arguing that in the absence of the term 'entrepreneurship' in defining growth and development, entrepreneurship is not a necessity for growth and development (Naude 2011). Erasmus & skippers showed that there was a relationship between institutions, levels of entrepreneurship and their financial performance (Erasmus and Scheepers 2008). Gulledge & Hasszko conducted a study with the aim of empowering the organization through information technology (Gulledge and Huszko 1997). Zain et al. attempted to identify a relationship between the acceptance of information technology and organizational agility, focusing on the way of incorporating technological aids into companies' competitive capacity (Zain, et al. 2005).en jay et al. addressed the role of information technology and managerial competitions in preparing chain agility. The study dealt with the effect of relationship between the competition of supply chain and agility of supply chain on the company's operations (Ngai, et al. 2010). Alambeygi et al. 1388, investigated the way in which features of information and communication technology affect the development of organizational entrepreneurship in the Agricultural Promotion Organization in Iran. Amirkabiri & Mahmoodian 1386 carried out a research into the effects of organizational factors on the potential results of intra-organizational entrepreneurship in information and

communication technology. Abdolmaleki et al. [3] studied the relationship between entrepreneurship skills and organizational entrepreneurship among the managers of Iran Khodro Company. Jahangiri & Saghafi 1387 investigated and evaluated the characteristics of the managers' entrepreneurship in Iran Tele-Communication Company. Yadollahi-e Farsi et al. 1387 conducted a study on intra-organizational entrepreneurship in the Agricultural Crusade Company in Khoozestan Province, Iran. Vilaseca et al. 2007 did a study under the title of 'using information and communication technology as a contributor to the success of innovation'. The study, which was conducted in Spain with 2038 employees, showed that there was a positive relationship between using information and communication technology and improvement of the phenomena pertaining to innovation in the organization. In a study conducted in eight organizations in Finland entitled 'the measurement of organizational entrepreneurship, Heinone & Krovela 2004 emphasized the role of support and encouragement by the management, the staff's motivation, and transparency of methods of information processing in the development of organizational entrepreneurship. Shirivastava & Show 2004, in a study conducted in China, concluded that there was a positive relationship between the development of communication and information technology, optimal management of human resources, and entrepreneurship. Wang and Tsui & Lau 2002, in a study carried out in China's state-run organizations, concluded that there was a positive relationship between the development of information and communication technology in an organization and the optimization of the organization and encouragement of the organization staff in the direction of entrepreneurship.

2. Model of the Study

The conceptual model of the present study, which aims to investigate the effect of using information technology management on the organizational entrepreneurship of car-parts manufacturers in Tabriz, Iran, is demonstrated in the Figure 1.

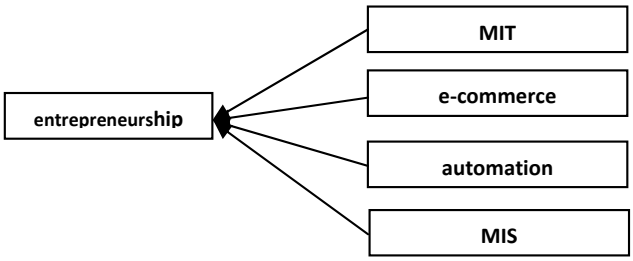

Figure 1: The conceptual model

3. Methodology

This study is an applied one considering its purpose, and a descriptive one considering its methodology.
The population of the study was comprised of the managers of the car-parts manufacturing companies in Tabriz. Based on the existing statistics, the population amounted to 180 part manufacturers. Using the Morgan Table and through stratified random sampling, 118 people were selected as the sample of the study. To collect data, a questionnaire prepared by the researcher was used. Face validity was used as the measure of the validity of the instrument (questionnaire), and the reliability of the instrument was calculated using Cronbach Alpha coefficient. The coefficient for the questionnaire was 0.895, indicating an acceptable reliability for the designed questionnaire.

4. Data Analysis

The demographics of the respondents were analyzed in terms of three categories of sex, age, and education, and the results were portrayed in tables.

4.1 Demographic Analysis

The demographics of the respondents were analyzed in terms of three categories of sex, age, and education, and the results were portrayed in

tables.

Table 4.1: frequency of respondents in terms of sex

Sex	Frequency	Percent	Cumulative frequency
Male	115	97.5	97.5
Female	3	2.5	100.0
Total	118	100	

4.1.1. Sex

Table 4.1 shows that out of 118 participants in the study, 97.5% (115 respondents) were male and 2.5% (3 respondents) were female. Thus, the overwhelming majority of the sample constituted male participants.

4.1.2. Age

Table 4.2 shows that out of 118 participants, 3.4% (4 respondents) were within 20-30 age range, 33.9% (40 respondents) were within 30-40 age range, 40.7% (48 respondents) were within 40-50 age range, and 20.3% (24 respondents) were over 60 years of age. Therefore, the participants within 40-50 age range constituted the majority of the respondents

Table 4.2: Frequency of respondents in terms of age

age	Frequency	Percent	Cumulative frequency
20-30	4	3.4	3.4
30-40	40	33.9	27.3
40-50	48	40.7	78.0
50-60	24	20.3	98.3
Over 60	2	1.7	100.0
total	118	100	

4.1.3. Education

Table 4.3 shows that out of 118 participants, 6.8% (8 respondents) had high school diplomas or lower degrees, 29.7% (35 respondents) had associate degrees, 54.3% (64 respondents) held B.A./B.S. degrees, and 9.2% (11 respondents) held M.A./M.S. degrees. Thus, B.A./ B.S. holders are the most frequent participants, and those having high school diplomas or lower degrees are the least frequent ones.

Table 4.3: Frequency of respondents in terms of education

education	Frequency	Percent	Cumulative frequency
high school diplomas or lower degrees	8	6.8	6.8
associate degrees	35	29.7	36.5
B.A./B.S. degrees	64	54.3	90.08
M.A./M.S. degrees	11	9.2	100.0
total	118	100.0	

4.1.4. Working Experience

Table 4.4 shows that out of 118 participants, 8.5% (10 respondents) had less than 5 years of working experience, 18.6% (22 respondents) had 5-10 years of working experience, 16.1% (19 respondents) had 10-15 years of experience, 38.1% (45 respondents) had 15-20 years of experience, and 18.7% (22 respondents) had over 20 years of working experience. Hence, the respondents having 15-20 years of working experience were of the highest frequency and those with less than 5 years of experience were of the lowest frequency.

Table 4.4: Frequency of respondents in terms of

working experience	Frequency	Percent	Cumulative frequency
less than 5 years	10	8.5	8.5
5-10 years	22	18.6	27.1
10-15 years	19	16.1	43.2
15-20	45	38.1	81.3
over 20 years	22	18.7	100.0

4.2 Hypothesis Testing

After collecting and summarizing the data, they were tested for normality. To test the normal distribution of the data for the organizational entrepreneurship before and after using information technology management, electronic business, automation, and management information system, the K-S test was employed. The results are shown in Table 1.

Table 1: Results of K-S test

(sig)	Kolmogorov-Smirnov Z	variable	
0.896	0.575	Before using y_1	Management of Information Technology
0.613	0.758	After using y_2	
0.098	1.653	Before using y_1	e-commerce
0.138	1.408	After using y_2	
0.086	1.713	Before using y_1	automation
0.094	1.398	After using y_2	
0.101	1.709	Before using y_1	Management of Information System
0.153	1.134	After using y_2	

In the test of normal distribution, the null hypothesis (H0) was that the data had a normal distribution, and the alternative hypothesis (H1) was that the data did not follow a normal distribution. The significance level for all the data was set at $p > \%5$. Thus, based on the Table 1, it could be implied that the distribution of all the data from the questionnaires involved in the study was normal. This allowed the study to employ parametric tests to test the hypotheses.

Given the normal distribution of the data, to test the hypotheses, the pairwise comparison test was used to investigate the effect of information technology management on the entrepreneurship of the organization. The null hypothesis (H0) and alternative hypothesis (H1) are stated as follows (In calculating d, it is assumed that $d_1 = y_1 - y_2$):

4.2.1. Hypothesis 1:

Information technology management affects the organizational entrepreneurship. The results of testing this hypothesis are shown in Table 2. According to the Table 2, the t observed is -33.613, and $p \leqslant \%5$, indicating

the rejection of the null hypothesis. In other words, it could be claimed with 95% confidence that information technology management affects the organizational entrepreneurship.
The pairwise correlation coefficient is 0.628, which, considering the level of significance, implies that there is a significant relationship between the organizational entrepreneurship scores before and after using information technology management.

4.2.2. Hypothesis 2:
Electronic business affects the organizational entrepreneurship. The results of testing this hypothesis are demonstrated in Table 3. As the Table shows, the t observed is -9.734, and $p \leqslant \%5$, implying that the null hypothesis is rejected. In other words, it could be claimed with 95% confidence that electronic business affects the organizational entrepreneurship.
The pairwise correlation coefficient is 0.432, indicating that there is a siegnificant correlation between the organizational entrepreneurship scores before and after using electronic business.

4.2.3. Hypothesis 3:
Automation affects the organizational entrepreneurship. The results of testing this hypothesis are shown in Table 4. As the table shows, the t observed is -20.103, and $p \leqslant \% \leqslant 5$, testifying to the rejection of H0. To put another way, it can be claimed with 95% confidence that automation affects the organizational entrepreneurship.
The pairwise correlation coefficient is 0.137. Considering the significance level ($p \leqslant \%5$), it could be claimed that there is significant correlation between the scores of the organizational entrepreneurship before and after using automation.

4.2.4. Hypothesis 4:
Management information system affects the organizational entrepreneurship. The results of testing this hypothesis are demonstrated in Table 5. As the Table shows, the t observed is- 15.930, and $p \leqslant \%5$, implying that H0 is rejected. In other words, it can be claimed with 95% confidence that management information system affects the organizational

entrepreneurship.
Pairwise correlation coefficient is 0.501, indicating that there is a significant correlation between the scores of organizational entrepreneurship before and after using management information system.

Table 2. Results of testing the first hypothesis

significance (sig)level	t	Degree of freedom	Standard deviation	mean	significance (sig)level	Coefficient of correlation
0.000	-33.613	117	0.2808	-0.86917	0.000	0.628

Table 3. Results of testing the second hypothesis

significance (sig)level	t	Degree of freedom	Standard deviation	mean	significance (sig)level	Coefficient of correlation
0.000	-9.734	117	0.624	-0.559	0.000	0.432

Table 4. Results of testing the third hypothesis

significance (sig)level	t	Degree of freedom	Standard deviation	mean	significance (sig)level	Coefficient of correlation
0.000	-20.103	١١٧	0.7555	-1.3983	0.040	0.137

Table 5. Results of testing the fourth hypothesis

significance (sig)level	t	Degree of freedom	Standard deviations	mean	significance (sig)level	Coefficient of correlation
0.000	-15.930	117	0.6125	0.8983	0.000	0.501

5. Conclusion

In general, the results of testing the hypotheses of the study show that:
1. Information technology management affects the organizational entrepreneurship.
2. Electronic business affects the organizational entrepreneurship.
3. Automation affects the organizational entrepreneurship.
4. Management information system affects the organizational entrepreneurship.

Based on the results of this study, it could be argued that accessing and using information seem essential not only for managers and executives but also for all groups of the society like researchers, scholars, and business people. The operators of the information system use information as a highly valuable source, considering it on a par with capital and manpower. Since information is crucial for all the activities of the organization, systems should be developed for producing and managing information. The purpose of such systems is to ensure accuracy, validity, and usability of the available information. Today, information systems play a fundamental role in all the activities of a company. Successful companies owe their success to a large extent to information systems. The real challenge companies are faced with is not simply the application of computer-oriented information systems, but rather, the main objective is how to use information systems effectively. Information systems are highly valuable resources that that increase the capabilities of managers and employees alike, making it possible for an organization to fulfill its objectives. Successful management of information technology based on optimal use of available information could help organizations have quick access to information from ever-changing business environment. On the other hand, based on what was previously mentioned, organizations today need entrepreneurial activities on order to survive in the competition arena. Information and communication technology has caused different companies and organizations to compete with each other and make entrepreneurial opportunities through efficient management of it.

In general, the results of this study are in agreement with those obtained

by the studies conducted by Vilaseca et al. in Spain, Shrivastava,S. & J.B. Shaw 34 in China, and Wang,Tsui & Lao [37],[40], in China's state organizations, which have attested to the positive relationship between the development of information and communication technology and organizational entrepreneurship.

6. Suggestions

1. The suggestion based on the main hypothesis: The results obtained from testing this hypothesis indicates that Tabriz car-parts manufacturers need information technology management to improve entrepreneurship. Thus, considering the findings of the past and present literature as well as the results of this study, it is suggested that car-parts manufacturers use information technology management.
2. The suggestion based on the first peripheral hypothesis: the results show that information technology management affects the organizational entrepreneurship. Accordingly, it is suggested that managers of companies pay special attention to the information technology management, for information and communication technology, with the increase of information processing and optimization of decision-making phenomenon, could substantially contribute to employees' efficiency. Also, information and communication technology services, due to the creation of vital information resources, can be enormously valuable in the management of innovation-related phenomena.
3. The suggestion based on the third peripheral hypothesis: It is suggested that managers make use of automation. This can be achieved by making changes to the production line and customer services, and by replacing old systems with fully automatic ones.
4. The suggestion based on the fourth peripheral hypothesis: Management information systems, through quick and prompt supply of information, could inform managers of entrepreneurship activities in the organization so that they could take the necessary steps towards effective use of created opportunities. Therefore, it is suggested that managers use management information system for improving organizational entrepreneurship.

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