

Investigating the Factors Influencing the Adoption of E-Commerce in Small and Medium-Sized Companies Using the Push-Pull Framework

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Abstract

This research aims to investigate the factors influencing the adoption of e-commerce in small and medium-sized companies using the push-pull framework and with a practical approach in companies that produce and sell building stones in Iran. This research is a descriptive survey correlation in terms of its practical purpose and method. The statistical population of this research is made up of all sellers and producers of construction stone in Tehran province, and with the help of G*Power software, a minimum sample size of 216 people was estimated; But for more certainty, 220 people were selected as samples. The partial least squares technique and Smart Pls software have been used to test research hypotheses. The results of the research show that pull and push variables have an effect on changing the behavior of the company from traditional retail to e-commerce. Perceived time savings by using e-commerce and perceived cost savings by using e-commerce affect supporting customers' information-seeking behavior. Understanding that small and medium-sized companies in the stone industry can provide better service quality and lower prices with the presence of e-commerce has an impact on the perceived value of e-commerce for small and medium-sized companies that produce and sell stones in the stone industry. An increase in sales due to expansion of market access, improvement of external market communication, quality of e-commerce site services, and customer support system on the website also affect understanding the attractiveness of e-commerce adoption for the company.

Keywords: E-commerce adoption, Theory of planned behavior, Push-pull framework, Customer information seeking behavior

Introduction

E-commerce in Iran is an issue that has attracted the attention of many companies in recent years and has developed more rapidly after the Corona pandemic. However, many industrial and service companies in the country are still facing challenges and issues that prevent the development of new and innovative models in e-commerce. Also, informal jobs are more exposed to the damage caused by the coronavirus shock than formal jobs (Shafiei and Zamani, 2022). E-commerce can be defined as "the process of buying, selling, transferring or exchanging

products, services or information through computer networks, mainly the Internet and intranet". In addition, the evolution of traditional business to e-commerce depends on the level of digitization of products or services sold, process, and delivery methods. According to the above definition, many companies in Iran have been able to somehow deliver their services or products to consumers on electronic commerce platforms; But on the other hand, some factors prevent companies from moving towards e-commerce. In general, small and medium-sized companies do not have

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enough money and skills to create a complex and comprehensive website for themselves; While the acceptance of e-commerce is very important for the continuation of the business of these companies. In general, organizations today are operating in the ecosystem space; An environment that may bring threats to businesses from all sides (Ebrahimi and Nurnejadvanush, 2022).

Small and medium-sized companies have recognized that e-commerce increases their ability to compete with larger companies and allows them to operate on a larger scale nationally and internationally. develop their activities globally. Companies can produce their new products with high productivity and market their products, increase their communication, collect information, and identify potential business partners. According to (Wymer and Regan, 2005), Variables affecting the decision-making of small and medium companies and their relationship with e-commerce can be divided into two groups, stimulating and inhibiting. Researchers will not only describe the variables but will also use various theoretical models at the individual and organizational levels to understand the relationship between those variables and the adoption of e-commerce. Among the widely used theoretical models at the individual level, we can mention the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), and the Integrated Theory of Acceptance and Use of Technology (UTAUT).

In this research, using the theoretical model of pull-push (Chang et al., 2017), the study of small and medium-sized companies in Iran's stone industry has been studied, and it is checked that these companies according to pull factors and push factors How will they act in deciding to accept e-commerce? Pressure effects refer to factors that force a person to move from his current point; While the pull effects consider the factors that, due to attractiveness, a person takes a step towards change with his enthusiasm. In this research, pressure effects refer to the factors that forced small and medium-sized

companies to leave traditional marketing; While the pull factors indicate the positive effects that attract small and medium companies to the use of e-commerce. Based on these variables, the main goal of this research is to understand the views of the owners of small and medium-sized companies about e-commerce and the factors that lead these companies to leave physical stores and use e-commerce.

to give in terms of the capacity of construction stone mines and its processing factories, Iran ranks fourth in the world after China, India, and Turkey; But in terms of market prosperity and lack of attention to improving the quality and proper management to enter the world market, in the last two decades, it has exported between 70 and 200 million dollars, which is compared to the global trade volume of this product, which is 23 billion dollars per year. Yes, it is a small share. The market in human history and civilization informs more than anything about communication and human communities (Hatami Nasab, 2022) out of 1900 licensed mineral units in the country, currently about 40% of mines due to economic problems and lack of a market are in It is in a state of stagnation and only 5.7 million tons are extracted from the annual production capacity of 27 million tons of the country's mines. About 10% of the raw stone extracted from the country's mines is also exported, which due to the increase in tariffs Export is currently facing a problem. The reason for choosing to study the companies active in Iran's stone industry is because our country has various stone mines, and for this reason, the stone industry in Iran is considered one of the industries with a long history; But in general, the traditional trade system still prevails in this industry, and compared to countries like India and Italy, which also have many mines, they are more advanced than us in the field of e-commerce.

The digital revolution has led to a transformation in sales and revenue generation models. Global e-commerce retail sales are growing rapidly every day, and more companies are adopting this system.

Through e-commerce websites, customers can easily access information about an organization and its products, read customer reviews and feedback, and compare prices with others. This digital transformation has also impacted consumers, as many now prefer to conduct their transactions and purchases through e-commerce. Furthermore, internet-based technologies enable companies to implement various marketing strategies based on their products, advertisements, and sales services through the e-commerce platform. It is clear that the expansion of e-commerce has not grown equally across all sectors and industries. In some markets, companies have shown more interest in utilizing these tools, while in many markets, traditional methods of sales and marketing are still in use. In these circumstances, it is essential to examine the different factors that influence a firm's decision to move from traditional commerce to e-commerce. Previous research has explored the push-pull framework in various industries to investigate how push or pull factors affect the direction of a firm's transition from traditional retail systems to e-commerce. In our current study, we aim to apply this creative model in the stone industry by considering both push and pull variables along with the factors contributing to success in e-commerce. This research can assist industry stakeholders and policymakers in better understanding the barriers and challenges faced by firms in transitioning from traditional retail to e-commerce, allowing them to take more effective actions to address these obstacles. Another factor driving the need for this research is that the mining sector in Iran, especially the dimensional stone sector and related industries, have significant growth potential due to the country's geographical diversity. However, issues and problems within production units have hindered their development compared to countries like Turkey and India, which have similar mining resources to Iran. This aspect underscores the necessity of strengthening research efforts. For this reason, in this research, this question

has been investigated, what effect do push and pull variables have on changing the behavior of small and medium companies in the stone industry from traditional retail to e-commerce?

Research Background

Electronic commerce

In the early 1990s, the term e-commerce referred to the exchange of electronic data to send business documents such as purchase orders or electronic invoices, later with the expansion of this industry, the term e-commerce was used to refer to trade through the web to buy goods and services (Hakimzadeh et al., 2021). Nowadays, e-commerce is rapidly penetrating organizations and has a profound impact on business, just like people's ordinary life (Rahimian et al., 2019). There are several definitions of electronic commerce. There is a wide variety of definitions and concepts for electronic commerce, which include various topics, applications, and models. In some of these cases, it has been tried to provide general definitions, and in other cases, attention has been paid to the type of activity, communication facilities and equipment used, the organizational scope of activities, and sub-structures. E-commerce can be defined as the process of buying, selling, transferring, or exchanging products, services, or information through computer networks, mainly the Internet and intranet. According to the researchers, e-commerce has increased quality, agility, and faster access to customers and the market, and on the other hand, it has reduced the cost and duration of access to customers and the market. Also, the mentioned business in the present era has caused the globalization of businesses, the removal of time and place restrictions, the creation of employment, the expansion of market coverage, the improvement of productivity, the significant reduction of transaction costs, the increase of sales percentage, etc. E-commerce is related to buying and selling over the Internet or conducting any transaction that involves the transfer of ownership or rights to use goods

or services through a computer-mediated network (Mesenbourg, 2001).

The importance of e-commerce

Electronic business is one of the significant outcomes of the information and communication technology revolution, which, with its various features and capabilities, has created a platform for innovation and entrepreneurship, thereby effectively enhancing efficiency and independence. In general, e-commerce offers advantages such as quick search and access to information, increased accuracy in work, elimination of intermediaries, scale production expansion, overcoming time and location constraints, and electronic execution of many exchange processes for goods, services, and information. Therefore, e-commerce impacts all aspects of the economy, society, culture, and politics, with its penetration and expansion increasing day by day. Market development, reduced communication costs, and improved customer relationships are among the benefits that e-commerce has provided for organizations and economic enterprise (Nasco et al., 2008). In fact, the effective use of e-commerce technology has become one of the main concerns of management (Popa et al., 2016). According to relevant reports, China leads the world in the e-commerce industry and has outpaced India based on growth rate. As expected, online sales in India crossed the \$120 billion mark by 2020 with a growth rate of 51 percent. This upward trend in sales is attributed to the additional features offered by e-commerce platforms compared to offline counterparts, supported by government policies (Singh et al., 2017). With the increase in global competition, access to global markets has also become more difficult and requires new global tools and methods, in this direction, internet marketing and sales and e-commerce can be a great help (Otaru & Enegelese, 2021). Undoubtedly, the use of information technology is one of the necessary links to increase business efficiency in the national economy. Today, the use of the Internet and

the businesses resulting from this technology by companies has become a means to gain a competitive advantage (Mousavi & Karbasi, 2020). Today, for many companies, e-commerce is more than just buying and selling products online. E-commerce is changing the shape of competition, the speed of operations, the flow of interactions, products, and payments from customers to companies and from companies to suppliers. E-commerce is at the forefront, transforming the way business activities are conducted and is referred to as the industrial revolution of the twenty-first century, rapidly advancing and expanding with the emergence of the Internet (Arasteh et al., 2014).

Adoption of e-commerce

The rapid development of information technology and the increasing penetration of the Internet have greatly contributed to the growth of e-commerce around the world. This type of business has changed business relationships and created virtual relationships (Sharifi and Mardani, 2021). Since there is no single definition of e-commerce, the adoption of e-commerce and its development by small and medium enterprises have also been described differently by several authors, including (Xu & Quaddus, 2010) and (Vaidya & Nandy, 2006). The progress of e-commerce implementation in small companies is defined as a sequence of processes in which the company gradually changes and increases its electronic capabilities. According to (Xu & Quaddus, 2010), there are four levels of development; Level 1 indicates no online capability, while Level 4 indicates a fully developed e-commerce strategy. Vaidya & Nandy (2006) divide the use of e-commerce by companies into five levels; At level 1, companies have only one website with extensive information about the company, and at level 5, companies have websites that allow for actual financial transactions.

Small and medium companies

The definition of small and medium enterprises varies from country to country

and depends on the prevailing economic and industrial conditions. Some criteria used to determine the type of industries (small, medium, and large) include number of employees, capital, total assets, sales volume, and production capacity. Among these criteria, the most common one is the number of employees, which is defined differently from one country to another. In Iran, there is no uniform definition of small and medium-sized enterprises, and it varies from one organization to another (Ekhlasmad et al., 2023).

Push-pull framework

The push-pull framework is one of the most widely used models in human migration research (Moon, 1995). The immigration theory has its roots in the immigration laws of England. These laws have proposed specific reasons for population migration across the country (Gerhart & Koohikamali, 2019; Schreiner and Hess, 2015) and consider migration as the result of interactions between the effects of pressure and tension from the place of origin to a destination. (Chang et al., 2017). Based on this the theory is that if the result of stimulating and inhibiting factors is positive, a person will have a desire to migrate, and if personal factors cannot eliminate this desire and the obstacles in the process of migration cannot have a deterrent effect, then migration is objective. The person starts his movement from the origin to the destination. According to this framework, some factors affect the decision of immigrants to move from one place to another. Some of them, called pressure factors, cause people to distance themselves from the current services (Wang et al., 2019). And they appear as negative factors existing in the current place (current situation). On the other hand, some stretching factors also force a person to change in a direction that has attraction potential (Bansal et al., 2005; Gerhart & Koohikamali, 2019). Pull factors exist as positive factors related to the destination (migration location) that attract users to alternative samples (Wang et al., 2019). The third factor has been added to

the original model to cover all the individual, social, and cultural variables that modify the decision to migrate (Bansal et al., 2005; Chang et al., 2017).

Integrated theory of acceptance and use of technology

The integrated theory of technology acceptance and use is one of the newest models of technology acceptance, which was presented in 2004 by Venkatesh et al. to develop the technology acceptance model. This model, which is the result of combining the main structures of several well-known models in the field of technology acceptance, including the theory of diffusion of innovation, the theory of reasoned action, the theory of guided behavior, the theory of social cognition, etc., specifically, it explains the behavior of people in connection with the use of computers and various types of computer technologies. This theory helps managers to evaluate the possibility of adopting new technology within the organization; It also helps to identify the factors that stimulate the acceptance of new technologies (Gupta et al., 2008).

Customer information seeking behavior

Today, the power of the Internet makes it possible for consumers to easily obtain online information to support the purchase process from external sources, and for customers, this is the most important advantage of e-commerce compared to the physical retail channel. Newness of information engages consumers in exploring shopping sites, while the complexity of information has a good potential to induce impulse purchases (Huang, 2000). Therefore, in terms of information quantity, shopping using the Internet is considered superior to shopping through a physical retail store (Lee et al., 2003). In addition, compared to the physical retail channel, by adopting e-commerce, companies can create a recommender system to suggest products and provide information to their customers to help them choose products. Products can be suggested based on the highest transaction volume on a site,

based on customer demographics, or based on the historical purchasing behavior of consumers as an estimate for future purchasing behavior. The recommendation includes providing personal information about the product, recommending products to the consumer, summarizing the opinions of the community, and providing criticism from the community (Radziszewska, 2013).

Research background

Ekhlasmand et al. (2023) in their research entitled *Identifying the Components and Indicators of Social Marketing in Small and Medium Businesses with a Resistance Economy Approach* They stated that small and medium businesses, as one of the driving forces of the modern economy, play a significant role in improving job opportunities, encouraging increased exports, and enhancing technological innovations. Therefore, the aim of this research is to identify the components and indicators of social marketing in small and medium businesses with a resistance economy approach. The data collection method in this research involved both library and field research, including interviews with 30 university experts in the fields of management and marketing, organizational experts, management and economics, selected through the snowball sampling method. The findings indicated that the main variable of social marketing was extracted in four dimensions. The quality dimension consists of four components: technical quality, execution quality, communication quality, and marketing quality. The value dimension includes two components: functional value and emotional value. The behavioral dimension comprises four components: audience cooperation, motivational desire, tension tolerance, and customer attitude, and finally, the communication dimension also includes two components of creativity and innovation.

Fendereski et al. (2023) in their research *Investigating the Identification of Technological Business Criteria based on Cloud Computing in Small and Medium-*

Sized Bompnies Using Fuzzy Delphi Method This study was carried out with the aim of identifying the criteria of technology businesses based on cloud computing in small and medium-sized companies using the fuzzy Delphi method. The main concern of this research is to identify the criteria of technology businesses based on cloud computing in small and medium-sized businesses using the fuzzy Delphi method. The research method is mixed and information is collected through the background of previous research and expert opinions, and then information is gathered through questionnaires and interviews. In the current research, many factors have led to the formation of technology businesses; therefore, it should not be considered a simple phenomenon, and due to the intensity of electronic commerce in the world, the multi-dimensional concept of this phenomenon should be examined more carefully. Therefore, it is suggested that by collaborating with the system and the customer, cloud computing can achieve security, privacy, trust, and confidence, overcoming identified challenges, and with its high benefits, it can turn risks into opportunities and achieve effective results.

Saeidi Talab et al. (2023) A research study aimed at providing a model for explaining the role of green human resource management in the economic flexibility of small and medium-sized companies. The research method used was a mixed method, incorporating qualitative data analysis for identifying components and indicators, and quantitative descriptive survey method. The qualitative sample population included experts (academic faculty members) in the fields of human resource management, environment, and economy, with 28 interviews leading to theoretical saturation. A small portion of this sample, consisting of 229 employees from industrial companies in Stadt hart, was selected using Cochran's formula. In the qualitative section, 13 codes were identified for process factors, 14 codes for antecedents, and 10 codes for consequences. For economic resilience, a

researcher-designed questionnaire with 31 indicators was utilized. The results of this study indicated that human resources play a significant role in the economy.

Research to compare PW and RW models in profit forecasting for small and medium companies has been carried out by (Elahi Shirvan et al., 2023). The results obtained from the analysis presented in this research indicate that the new model presented for profit forecasting is more efficient than the profit forecasting of PW and RW models and this issue is the ability of regression models to forecast profit in the fields of finance and strategy profitability for small companies and it has confirmed the average.

In research entitled "Evaluation of key factors of success in e-commerce during widespread crises" (Sharifi and Mardani, 2022), the research findings indicate that the quality of website services and customer support system is more important than personalization components and electronic word-of-mouth advertising. Also, the findings showed that in addition to paying attention to hardware and software factors related to information technology in e-commerce, paying attention to human factors can also increase the efficiency of e-commerce even more.

An article entitled The Effect of Customer Knowledge Management on the creation of Organizational Value in B2C e-commerce was published by (Sharifi et al., 2021). The findings of this research show that the variable dimensions of customer knowledge management have an impact on the creation of organizational value in e-commerce (innovativeness, efficiency, customer retention, and supplementary services), and the greatest impact is related to the relationship of customer knowledge on customer retention and also, knowledge about the customer is a supplementary service.

Research with the title of presenting a media model based on social networks to increase trust in e-commerce (Fouladikia et al., 2021) has been conducted to investigate the conditions for increasing trust in e-

commerce. The findings of this research show that in the causal conditions, the role of media and social networks in building trust in e-commerce in the intervening factors of the underlying factors and insecurity problems in the virtual space and the case of the strategy of managerial and practical strategies., infrastructural and motivational are the most frequent and important. Also, the results indicate that a reliable brand name, performance transparency, and increased transactions have a direct effect on increasing customer trust in an e-commerce website.

In a research titled Investigating the Perceived Effectiveness of E-commerce Platforms on the Perceived Economic Advantage of the Consumer in Predicting Sustainable Consumption in an Epidemic (Jalali, 2021), the results showed that the perceived effectiveness of e-commerce platforms affect the perceived economic advantage of the consumer; That is, about 47% of the total perceived effectiveness of e-commerce platforms is explained on consumers' perceived economic advantage in predicting sustainable consumption.

In research titled pull-push-restraint framework for the adoption of e-commerce in small and medium-sized companies (Susanty et al., 2020), a study was conducted on the batik industry (a model of handicrafts in Indonesia). The findings show that factors such as the change in information search behavior by customers, which used to be done in the form of field observations, and now these searches are mostly done electronically, changing the approach of companies from traditional marketing. to e-commerce. Research also shows that companies believe that e-commerce creates more value for the company.

In a research titled Finding the determinants of success in e-commerce (Sharma & Aggarwal, 2019), the authors sought to find a correlation between the success of the e-commerce system and other success factors such as website service quality, customer support system (online sales service before and after purchase), personalization (the ability of the platform to

provide a specific offer to each customer) and electronic word-of-mouth (product or brand-related communications provided by previous buyers and offline buyers). The findings of this research indicate that the mentioned variables have a direct effect on the success of an e-commerce system. The related research study shows that although the concept of e-commerce has been in the research field for a long time, many aspects of it, including the concept of "e-commerce acceptance by companies", have received less attention. Knowing this concept is vital because we know that the company can be completely digitalized when the digitalization process is carried out at all its

levels and in this way identifying the factors affecting this process to successfully go through the transition stage from Physical to digital is vital. Therefore, it is important to study "investigating the factors affecting the adoption of e-commerce in small and medium-sized companies" by referring to well-known and valid scientific models and theories, such as the push/pull model, which is less discussed. The current research tries to create a better understanding of the concept of "acceptance of e-commerce by small and medium-sized companies" and investigate valid models such as the push/pull model to further understand the factors affecting this concept.

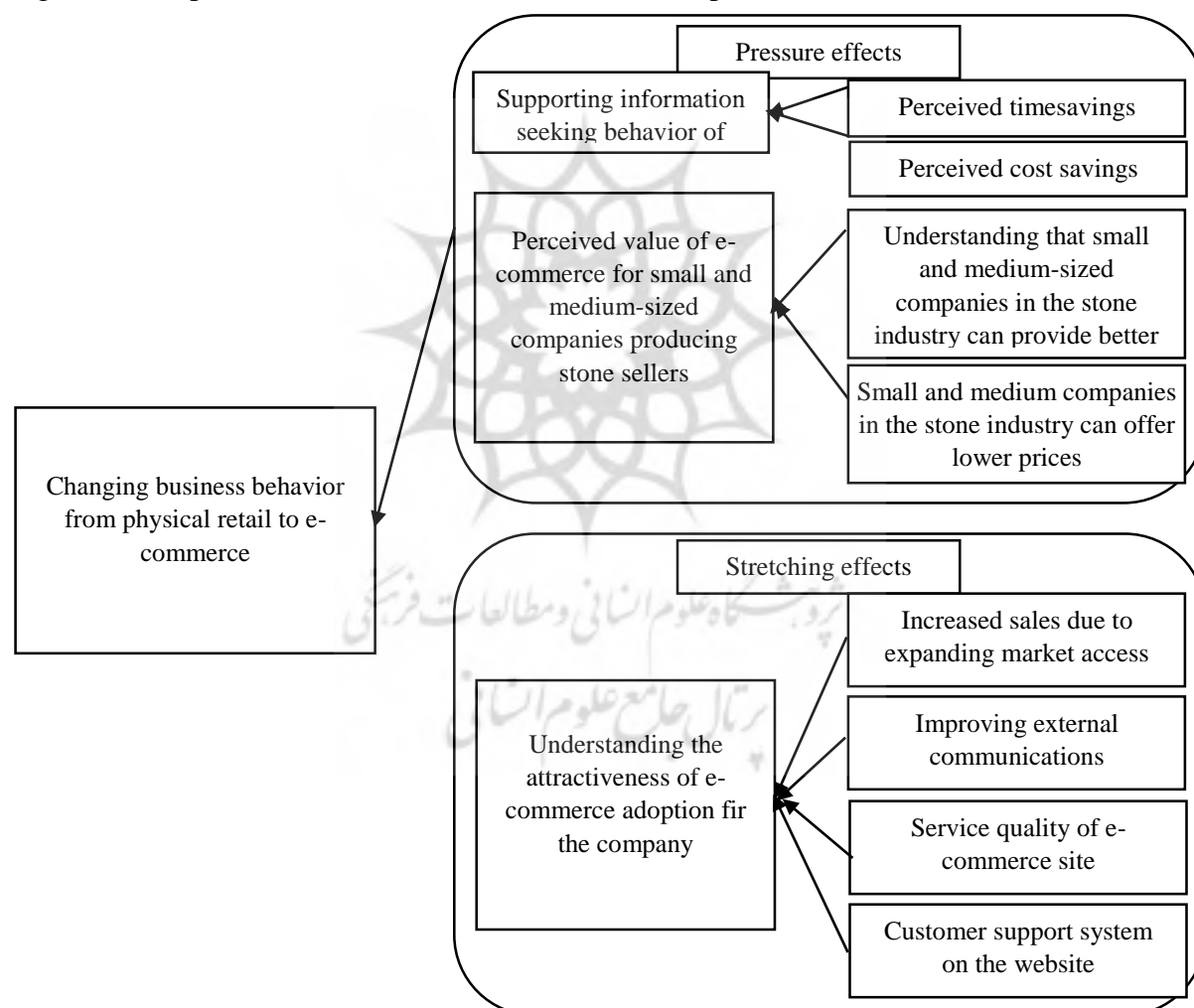


Figure 1- The conceptual model of the research taken from the research of Susanty et al., (2020) - Sharma & Aggarwal, (2019)

Figure 1 shows the conceptual model of the research. This research is designed with the main purpose of investigating the effect of push and pull variables on changing the behavior of the company from traditional retail to e-commerce. Therefore, the hypotheses of the research are presented as follows:

- Pulling and pushing variables affect changing the company's behavior from traditional retail to e-commerce.
- Perceived time saving by using e-commerce has an effect on support of customers' information-seeking behavior.
- Perceived cost savings using e-commerce affect support for customers' information-seeking behavior.
- Understanding that small and medium-sized companies in the stone industry can provide better service quality with e-commerce has an impact on the perceived value of e-commerce for small and medium-sized companies that produce and sell the stone industry.
- The perception that stone SMEs can offer lower prices with e-commerce has an impact on the perceived value of e-commerce for stone producers and sellers.
- The increase in sales due to the expansion of market access affects the understanding of the attractiveness of e-commerce adoption for the company.
- Improving external market communication affects understanding the attractiveness of e-commerce adoption for the company.
- The quality of e-commerce site services affects the understanding of the attractiveness of e-commerce adoption for the company.
- The customer support system on the website affects the perception of the attractiveness of e-commerce adoption for the company.

Research Methodology

Research methods in management and behavioral sciences are usually divided according to two criteria, the objective and the data collection method (Sarmed et al., 2013). The purpose of this research is to investigate the factors influencing the

adoption of e-commerce in small and medium-sized companies using the push-pull framework (case study: construction stone manufacturing and selling companies in Iran). The current research is of applied type and considering that in descriptive research, the researcher is looking for how the subject is and wants to know how the phenomenon, variable, object, or matter is, the current research is of descriptive and survey type. In other words, this research investigates the existing situation deals with the regular and systematic description of its current situation, and studies its features and characteristics. Also, since the relationship between the variables is investigated, this research is of the correlation type.

The main tool for collecting data in this research is a questionnaire that has been adjusted with the opinions of the relevant professors and experts. Content validity (opinion from experts), construct validity (external model validity), convergent validity (AVE), and divergent validity have been used for the validity of the questionnaire. The reliability of the questionnaire was also measured with Cronbach's alpha and composite reliability (CR). The statistical methods used in this research can be divided into two categories: inferential statistical methods and descriptive statistical methods. Descriptive statistics methods such as frequency distribution tables and averages have been used to evaluate and describe the general characteristics of the respondents. Before choosing the statistical test, the Kolmogorov-Smirnov test was performed to ensure the normality of the data. Finally, the analysis of the obtained data has been done using SPSS and Smart PLS statistical software.

The statistical population of this research is made up of all sellers and producers of building stones in Tehran province. It should be noted that in this industry, generally, producers have stone-cutting units and sellers do not have stone-cutting units; But in terms of the sales model that we are looking for in this research, they are not fundamentally different from each other. Cohen's power

analysis rule (1992) and G*Power software were used to calculate the sample size. At a confidence level of 95% with an effect size of 0.15 and a statistical power of 80%, the minimum sample size was estimated to be 216 people. For more certainty, 220 people were selected as a sample in a stratified cluster random manner.

Research Findings

Descriptive statistics indicators have been used to check the demographic characteristics of the sample. In Table 1, the frequency of respondents based on gender, age, level of education, and service history is checked.

Table 1.

Demographic description

Demographic description		Abundance	Frequency
gender	Man	163	74
	Female	57	26
Age	Less than 30 years	68	31
	Between 31 and 40 years	62	28
	Between 41 and 50 years	69	31
	More than 51 years	21	10
education	Associate degree	49	22
	Masters	57	26
	Graduate	114	52
Years of service	3 to 5 years	57	26
	6 to 10 years	56	25
	More than 11 years	107	49

If the correlation between the scores of tests that measure a single trait is high, the questionnaire has convergent validity. This correlation is necessary to ensure that the test measures what it is supposed to measure. Convergent validity can be calculated based on the external model and average variance extraction (AVE). The AVE criterion, which is another convergent validity index, indicates the average variance shared between each construct and its indicators. In simpler terms, AVE shows the degree of correlation of a structure with its indicators, the higher the correlation, the better the fit. Fornell and Larcker (1981) introduced the AVE criterion to measure convergent

validity and stated that an AVE value higher than 0.5 indicates acceptable convergent validity for measurement models. But composite reliability (CR) in structural models is considered a better and more valid measure than Cronbach's alpha; Because in the calculation of Cronbach's alpha, for each structure, all indicators are included in the calculations with the same importance; But in the calculation of composite reliability, indicators with higher factor loadings are more important and make the CR values of the constructs a more realistic and accurate measure than Cronbach's alpha (Davari and Rezazadeh, 2013).

Table 2.

Convergent validity and reliability of research variables

Research variables	AVE	Composite Reliability	rho coefficient	Cronbach's Alpha
Pressure effects	0/592	0/790	0/714	0/866
Stretching effects	0/560	0/791	0/749	0/813
Perceived value of e-commerce for small and medium companies producing and selling stones	0/640	0/899	0/869	0/859
Increased sales due to expanding market access	0/540	0/823	0/733	0/713

Improving external communications	0/555	0/786	0/757	0/898
Changing business behavior from physical retail to e-commerce	0/555	0/748	0/766	0/838
Supporting customer information seeking behavior	0/627	0/867	0/835	0/789
Understanding that small and medium companies in the stone industry can offer lower prices	0/557	0/780	0/781	0/885
Understanding that small and medium companies in the stone industry can provide better service quality with the presence of e-commerce	0/519	0/836	0/862	0/812
Understanding the attractiveness of e-commerce adoption for the company	0/664	0/887	0/831	0/827
Customer support system on the website	0/563	0/837	0/779	0/767
Perceived time savings	0/653	0/849	0/757	0/733
Perceived cost savings	0/556	0/788	0/741	0/898
Service quality of e-commerce site	0/535	0/876	0/889	0/848

In this study, Cronbach's alpha of all variables was greater than 0.7, so in terms of reliability, all variables are confirmed. The value of average variance extracted (AVE) is greater than 0.5, so convergent validity is also confirmed. Finally, the value of composite

reliability (CR) is also greater than AVE, and in all cases, it is greater than the threshold of 0.7, so the third condition is also fulfilled. Table 3 shows the correlation between research variables.

Table 3.
Correlation between research variables

Variables		Number	Average	Middle	Mode	standard deviation	Variance	variation range	minimal	the maximum
Pressure variables	Supporting customer information seeking behavior	220	3/49	3/83	4/00	0/96	0/92	3/67	1/33	5/00
	Perceived time savings	220	3/25	3/50	3/60	0/85	0/73	3/20	1/40	4/60
	Perceived cost savings	220	3/96	4/00	4/00	0/53	0/28	3/50	1/50	5/00
	Perceived value of e-commerce for businesses and customers	220	3/82	3/88	4/00	0/53	0/28	3/44	1/55	5/00
	The idea of providing better quality services for small and medium companies	220	3/85	3/92	4/00	0/44	0/19	3/76	1/07	4/84
	The idea of offering better prices by small and medium companies	220	3/82	4/00	4/00	0/54	0/29	3/50	1/50	5/00
Stretching variables	The attractiveness of e-commerce adoption for business	220	3/96	4/00	4/00	0/53	0/28	3/50	1/50	5/00
	Increase sales with market expansion	220	4/12	4/16	5/00	0/62	0/38	3/33	1/66	5/00
	Improving external communications	220	4/09	4/16	4/00	0/65	0/42	2/83	2/16	5/00
	Website service quality	220	3/96	4/00	4/00	0/75	0/56	4/00	1/00	5/00
	Customer support system	220	4/11	4/220	4/00	0/68	0/46	3/20	1/80	5/00
	Changing business behavior from physical retail to e-commerce	220	3/46	3/33	3/33	0/64	0/40	3/00	1/67	4/67

Skewness is a measure of symmetry or asymmetry of the distribution function. For a completely symmetric distribution, the skewness is zero, and for an asymmetric distribution with a skew toward higher values, the skewness is positive, and for an asymmetric distribution with a skew toward smaller values, the skewness value is negative. Skewness represents the height of a distribution. In other words, elongation is a measure of the height of the curve at the maximum point, and the elongation value for normal distribution is equal to 3. Positive skewness means that the peak of the desired distribution is higher than the normal distribution, and negative skewness is a sign that the peak is lower than the normal

distribution. Considering that the skewness and kurtosis results for all research variables are not within the permissible range, it can be concluded that the precondition of normality of data distribution is not established and therefore partial least squares technique can be used for model testing. Therefore, to check whether the distribution of the scores of the research variables is normal or not, the Kolmogorov-Smirnov one-sample test is used. The result of this test is shown in Table 4. Since the Sig values are less than 0.05, the null hypothesis is rejected with an error of 5%. So, with a significance level of 5%, it can be accepted that the distribution of the scores of the research variables is not normal.

Table 4.

Skewness and kurtosis and Kolmogorov Smirnov one sample test for research variables

	Variable	crookedness	Elongation	Kolmogorov Smirnov	Significance level	Result
Pressure variables	Supporting customer information seeking behavior	-3/414	3/964	0/418	0/000	It is not normal.
	Perceived time savings	-3/220	4-603	0/408	0/000	It is not normal.
	Perceived cost savings	-3/698	3/116	0/429	0/000	It is not normal.
	Perceived value of e-commerce for	-3/838	3/790	0/433	0/000	It is not normal.
	Businesses and customers	-3/573	3/188	0/403	0/000	It is not normal.
	The idea of providing better quality services for small and medium companies	-3/544	-3/083	0/467	0/000	It is not normal.
Stretching variables	The attractiveness of e-commerce adoption for Business	-3/367	-3/076	0/430	0/000	It is not normal.
	Increase sales with market expansion	-3/289	-3/367	0/422	0/000	It is not normal.
	Increase sales with market expansion	-3/546	3/000	0/412	0/000	It is not normal.
	Improving external communications	-3/508	-3/299	0/400	0/000	It is not normal.
	Website service quality	-3/776	3/459	0/408	0/000	It is not normal.
	Changing business behavior from physical retail to e-commerce	-3/694	3/680	0/439	0/000	It is not normal.

The GOF index evaluates the fit of the overall model based on both measurement and structural model parts. This index is calculated using the square root of the product of the "R2 average index" and "common index average" (Tennhaus et al., 2004). The goodness of fit value in this study is equal to:

The average values of the coefficient of determination index $((R^2)^-) = 0.745$

The average values of redundancy index $((Community)^-) = 0.747$

$$GOF = \sqrt{(2 \times 0.745 \times 0.747)} = 0.746$$

According to the relationship, the GOF index is equal to 0.746; Therefore, the model has a good fit. Finally, in Table 5, the general result of the hypothesis test based on the structural model of the research is presented.

Table 5.

The results of the research hypotheses test

	assumptions	Path coefficient	t statistic	P Values	Result
1	Perceived time savings using e-commerce -> supporting customers' information-seeking behavior	0/507	20/657	0/000	confirmation
2	Perceived cost savings using e-commerce -> supporting customers' information-seeking behavior	0/536	7/093	0/000	confirmation
3	Understanding that small and medium-sized companies in the stone industry can provide better service quality with e-commerce -> perceived value of e-commerce for small and medium-sized companies that produce and sell stone industry	0/546	2/041	0/000	confirmation
4	Realizing that small and medium-sized companies in the stone industry can offer a lower price with e-commerce -> Perceived value of e-commerce for small and medium-sized companies that produce and sell stone industry	0/524	21/939	0/000	confirmation
5	Increase in sales due to expansion of market access -> Understanding the attractiveness of e-commerce adoption for the company	0/523	20/243	0/000	confirmation
6	Improving external market communication -> understanding the attractiveness of e-commerce adoption for the company	0/533	20/221	0/000	confirmation
7	Service quality of e-commerce site -> Understanding the attractiveness of e-commerce adoption for the company	0/500	7/627	0/000	confirmation
8	Customer support system on the website -> Understanding the attractiveness of e-commerce adoption for the company	0/407	2/319	0/000	confirmation
9	Pulling variables-> changing behavior from traditional retail to e-commerce	0/541	3/463	0/000	confirmation
10	Push variables-> behavior change from traditional retail to e-commerce	0/592	21/550	0/000	confirmation

Conclusion and Recommendations

As observed in the inferential part of the findings, the results of the analysis of the data obtained from the research show that the pull and push variables affect changing the company's behavior from traditional retail to e-commerce. The results of this hypothesis

are consistent with the research results of (Fouladikia et al., 2021) and (Susanty et al., 2020). In explaining the current results, it can be said that the pull variable means the factors that cause the company to change its behavior. For example, changes in the market and new technologies can be a pull variable

to change the company's behavior. On the other hand, the pressure variable means the factors that put pressure on the company to make changes in its behavior. For example, competition with other companies and the need to attract new customers can be a pressure variable to change the company's behavior. With the emergence of the e-commerce phenomenon, the working methods and activities of commercial companies have changed. In other words, the emergence and rapid growth of e-commerce and online business tools have made it easy for customers to trade all kinds of services and products online. With the help of e-commerce, customers can access information related to the products and services they need easily and by spending the least amount of time. In addition, by providing accurate and complete information about products and services, customers can get to know these products and services directly and do not need to search for more information. For this reason, it can be said that saving time can have a positive effect on the information search behavior of customers in e-commerce.

Using e-commerce and online platforms to buy and sell goods and services allows customers to have a better understanding of costs and prices. This improved understanding of costs and prices can increase the desire of customers to search for more detailed information about the products and services they need. Using e-commerce, customers can easily compare different products and check prices, features, reviews, and opinions of others. These conditions help customers to make the best deal and benefit from more optimal costs for their purchases. According to the results of the second hypothesis, increasing the use of e-commerce and online shopping methods can lead to an increase in customers' search behavior. Customers show more desire to search for information and compare and research the products and services they need. This process can improve the perceived costs, prices, and value provided by vendors. In general, the second hypothesis suggests that e-commerce, by creating more transparency about costs

and prices, can encourage customers to conduct more accurate and improved information searches. The results of this hypothesis are consistent with the research results of (Fouladikia et al., 2021) and (Susanty et al., 2020). This more information-seeking behavior can help customers make better-informed purchasing decisions and, as a result, make the most cost-effective deals. By using e-commerce, small and medium-sized companies in the stone industry can benefit from many benefits. For example, they can easily provide their services to customers around the world without geographic restrictions, and this allows small and medium-sized companies to access the international market and connect with new customers globally. In addition, the use of e-commerce allows small and medium-sized companies to improve their buying and selling processes and do the work online and automatically. This issue can reduce the time and costs related to the buying and selling process and improve the quality of services. In explaining the results of the fourth hypothesis, it can be said that the use of e-commerce and online platforms in the stone industry allows small and medium-sized companies to offer lower prices for their products and services, and as a result, the perceived value of e-commerce for Increase Yourself. The results of this hypothesis are consistent with the research results of (Fouladikia et al., 2021) and (Susanty et al., 2020). By expanding access to the market through e-commerce, companies will be able to increase their sales and this increase in sales can strengthen the attractiveness of e-commerce for them. E-commerce allows companies to come up with new business plans and offer their services and products to customers around the world. By increasing access to new markets and expanding geographic boundaries, businesses can reach more customers and increase their sales. Also, by using e-commerce, companies can optimize their sales processes. This means reducing costs and improving productivity, which can lead to increased profitability and more sales.

Through the use of customer relationship management (CRM) systems and data analysis tools, businesses can examine customer patterns and behaviors and improve their strategies based on them.

The quality of services provided by the company's e-commerce site can affect the understanding and attractiveness of e-commerce for that company. The results of this hypothesis are consistent with the research results of (Fouladikia et al., 2021) and (Susanty et al., 2020). The e-commerce site, as the main interface between the company and the customers, plays a very important role in shaping the customers' experience and their understanding of e-commerce. The quality of the services provided by the site can include factors such as the design and appearance of pages and user interface, loading speed, ease of use, security, customer support, and appropriate user experience. The quality of e-commerce site services can have a significant impact on understanding the attractiveness of e-commerce for the company. If the company's site has fast loading, appropriate and attractive design, ease of use, and proper navigation, customers will probably use the site more easily and with pleasure and have a positive experience of online shopping in that company. In addition, the security features of the site also affect the understanding of the attractiveness of e-commerce for the company. If the company's website provides strong security features and keeps customer information correctly, customers' trust in the company and e-commerce will increase. Also, customer support plays an important role in promoting the understanding of the attractiveness of e-commerce for the company. Providing fast and effective answers to customers' questions and problems by the company can strengthen the trust and satisfaction of customers and thus increase their understanding of the attractiveness of e-commerce for them. Therefore, the quality of e-commerce site services can have a direct and important effect on the understanding and attractiveness of e-commerce for the

company. A quality and user-friendly site can improve the customer experience and create effective interaction with them, and finally strengthen the understanding of the attractiveness of e-commerce for the company.

In summary, the impact of e-commerce for small and medium-sized companies includes the following:

- ≠ Increasing access to global markets: E-commerce allows small and medium-sized companies to easily access international and global markets and supply their products to customers around the world.
- ≠ Reducing costs and time: Using e-commerce reduces costs and time related to business processes and allows companies to reduce costs related to sales, marketing, advertising and communication.
- ≠ Increased flexibility: E-commerce gives small and medium-sized companies more flexibility to market changes and customer needs. They are able to react quickly and easily respond to customer needs.
- ≠ Increasing credibility and trust: Online presence and offering services through the Internet can help small and medium-sized companies to increase the credibility and trust of their customers and establish more successful relationships with them.
- ≠ In general, e-commerce provides small and medium-sized companies with many possibilities for growth and success, giving them the opportunity to outpace their competitors and experience more growth.

Practical Suggestions

- It is suggested to provide financial support including credit facilities, tax discounts, or financial support through government programs to encourage the company to change its behavior from traditional retail to e-commerce.

- It is suggested to implement an advanced and powerful search system on the company's website to help customers quickly and accurately find the content and products they need. Of course, make sure that your search system provides features such as advanced search, relevant suggestions, and various filters.
- It is suggested to provide added value for customers to provide better service quality. For example, providing useful guidance on how to use products, providing technical and industrial advice, as well as providing design and consulting services, can help to provide better services to small and medium-sized companies producing and selling stone industry.
- It is suggested to use new technologies such as management software, order tracking systems, and online payment methods to provide better service quality.
- Make sure that your site is fully responsive and displays correctly on different devices such as computers, tablets, and mobiles. This helps customers to access your content and products without time and place restrictions.
- The loading speed of the site is very important and can have a great impact on the customer experience and the understanding of the attractiveness of e-commerce for the company. It is suggested to use image compression, code optimization, and content distribution network (CDN) services to improve site loading speed.

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