

## A Study on Information Technology Adaptation of SMEs: The Case of Denizli

### KOBİ'lerin bilişim teknolojilerine adaptasyonları üzerine bir çalışma: Denizli örneği

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*Datum underlies the information. Datum is a phenomenon which emerged as a result of any event and can be expressed as number, symbol and so on. This form of raw datum does not have a meaning yet. When the datum is processed with the help of information technology (IT), meaningful information can be obtained or needed calculations can be made. Effective use of information technology leads to increase productivity in businesses in accessing to the information, storing of information and monitoring the organizational activities. The ability of adaptation to information technology and using this adaptation for achieving organizational goals depends on the perspective of business executives related to information technology. In this study, it was aimed that determining the perspectives of SMEs for information technology which operate in marble sector in Denizli with the help of a survey. From this point, it was determined that SMEs accepted the importance of information technology and the level of this technology adaptation in SMEs were high.*

**Keywords:** Information technology, SME, Adaptation, Marble Sector

**Jel Codes:** D83, M15.

*Bilginin temelinde veri yatmaktadır. Veri, herhangi bir olay sonucunda ortaya çıkan rakam, sembol vb. şekilde ifade edilebilen bir olgudur. Bu şekilde veri henüz işlenmemiş olduğundan bir anlam taşımaz. Bilişim teknolojileri yardımıyla veri işlendiğinde anlamlı bilgiler elde edilebilir ya da ihtiyaç duyulan hesaplamalar yapılabilir. Bilişim teknolojilerinin etkin kullanılması; işletmelerin bilgiye ulaşma, bilgiyi saklama ve örgütsel faaliyetlerin takibi gibi konularda verimlilik artışına neden olur. İşletmelerin bilişim teknolojilerine adapte olup bunu örgütsel amaçlara ulaşmak için kullanabilmeleri ise işletme yönetiminin bilişim teknolojilerine bakış açısı ile ilgilidir. Bu çalışmada Denizli ilinde mermer sektöründe faaliyet gösteren KOBİ'lerin bilişim teknolojilerine bakış açılarının anket yardımıyla belirlenmesi amaçlanmıştır. Bu noktadan hareketle KOBİ'lerin bilişim teknolojilerinin önemini kabullendikleri ve bu teknolojiye adaptasyon düzeylerinin yüksek olduğu tespit edilmiştir.*

**Anahtar Kelimeler:** Bilişim teknolojileri, KOBİ, Adaptasyon, Mermer Sektörü

**Jel Kodları:** D83, M15.

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## 1. INTRODUCTION

Progress to date has been since ancient times, thanks to information. Datum is a phenomenon which emerged as a result of any event and can be expressed as number, symbol and so on. The meaningful data is the basis of knowledge. From this point of view, the beginning of the production of knowledge is based on the understanding of concrete cases or abstract thoughts. With the help of knowledge, the ages in history have changed thanks to the progress that have been made since the beginning of the production of tools.

Information technology is frequently used same meaning with information and communication technologies (IT term will be used in this paper). IT can be defined as a process of obtaining information and converting to different formats, storing, transmitting from one place to another or accessing to information from any location (Işık & Akbolat, 2010: 367). IT uses software and hardware components in order to achieve these objectives in organizations. These components consist of computers, storing devices, mobile devices, operating systems and computers programs (Laudon & Laudon, 2012: 15).

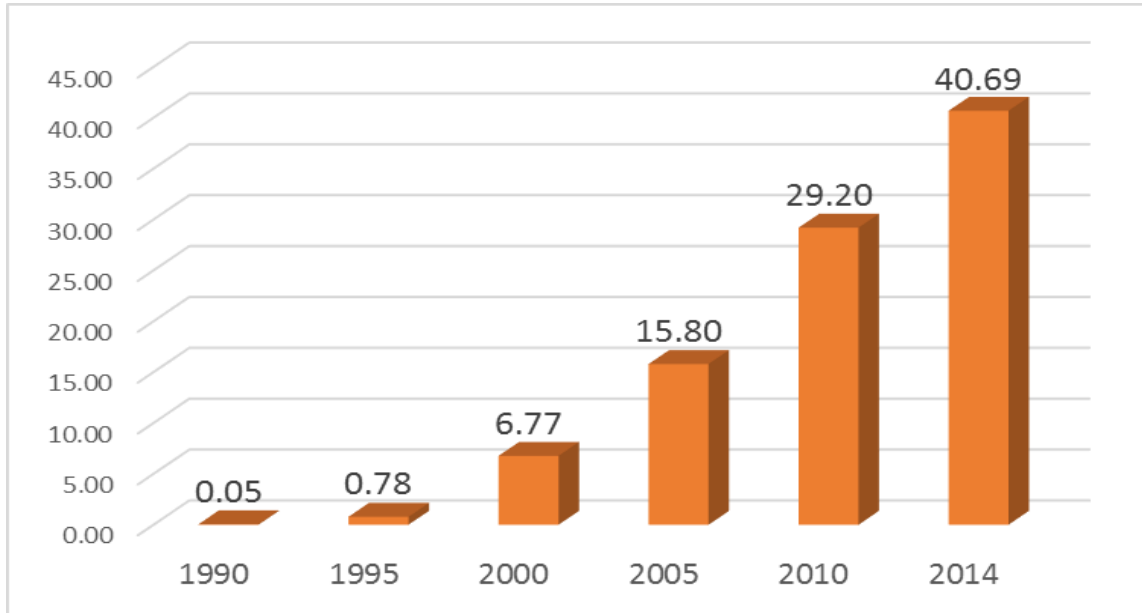
It is possible to say that IT is as old as the history of mankind due to information increases on a cumulative basis. In this regard, it is said to have three important stage of IT. These stages are (Floridi, 2009: 227-228):

- The invention of alphabets: Information was recorded and distributed large regions.
- Patenting the telegraph in the 1800's: Communication has replaced the recording function. It caused the IT associated with communication technologies.
- The invention of the computer: The data began to be processed electronically and automatically. Elaboration has replaced the communication function.

Today, the computer is the first device that comes to mind when one speaks of information which name comes from Latin "computere" word that means of the calculation (Ekiz et al., 2000: 73). The first electronic working computer was entitled as "Electronic Numerical Integrator and Computer" (ENIAC) and was completed a year later the end of the Second World War in 1946 (Tabak, 2004: 54). The first produced computers were quite large and expensive therefore these computers could not be expanded to a large mass. Over time, thanks to advances in the fields of software and hardware, computers shrank in size and become widespread. Nowadays, computers can be classified according to speed and memory size as supercomputers, mainframe computers, mid-range computers, microcomputers and handheld computers (such as notebooks, tablet computers) (Oz, 2009: 123-125).

In daily life, computers and mobile phones have become indispensable devices. The internet is the only thing that makes these devices indispensable which makes possible accessing to any information at any time. Internet technology laid the foundation with ARPANET which was a military project in USA 1960's (Marson, 1997: 36). Thanks to advances in the technical field, at the beginning of the 80s, Internet technology was split into half daily use and military purposes (Leiner et al., 2009: 26). As a result, in 1986, "edu" for universities, "com"

for trade, "mil" for military etc. extensions have begun to be used (Winston, 1998: 331). In the 1990s, although the vast majority of Internet users are from the United States and other industrialized countries; increasing in the number of Internet users and Internet traffic is observed from year to year (Wilson & Peterson, 2002: 452). The number of internet users per 100 people in the world is given for 5 years between the years 1990-2014 in Figure 1.



**Figure 1.** Number of Internet users per 100 people in the world (Source: The World Bank)

When Figure 1 is examined, the number of Internet users has increased continuously from 1990 until 2014, it is observed that the number of internet users increased approximately 819 times. It is clear that this is an enormous increase, but when viewed from the other side for the year 2014 it is seen that 59.31% of people do not have the opportunity of using the internet yet. Innovative projects such as "Project Loon", developed by large companies for non-Internet access areas, are expected to increase the Internet access rates.

The rapid spread of information to the world by the help of IT resulted in globalization. Due to the fact that developments in any place can quickly affect rest of the world with globalization, it can be said that the borders in the world disappeared. If it is looked from the viewpoint of businesses, it is seen that emerging the results such as increasing competition, simplification of accessing to markets and resources. For instance, when a company that operating in Europe wants to make a meeting with a supplier that operating in Asia, it can get rid of the costs of such as travel and accommodation by organizing the meeting in a virtual environment. Businesses often use the IT in the process of making strategic decisions. The general characteristics of the Information Technologies used by the enterprises are as shown in Table 1 according to the periods.

**Table 1.** Periodic Classification of IT uses in business (Source: Pearlson & Saunders, 2013: 46)

	Era I 1960s	Era II 1970s	Era III 1980s	Era IV 1990s	Era V 2000s	Era VI 2010+
<b>Primary role of IT</b>	Efficiency Automate existing paper-based process	Effectiveness Solve problems create opportunities	Strategic Increase individual and group effectiveness	Strategic Transform industry/organization	Value Creation Create collaborative partnerships	Value Extension Community and social business
<b>Justify IT expenditures</b>	ROI	Increasing productivity and better decision quality	Competitive position	Competitive position	Adding value	Creating relationships
<b>Target of systems</b>	Organization	Organization/group	Individual Manager /group	Business processes ecosystem	Customer/supplier ecosystem	Customer/employee/supplier ecosystem
<b>Information models</b>	Application specific	Data-driven	User-driven	Business-driven	Knowledge-driven	People-driven (or relationship driven)
<b>Dominate technology</b>	Mainframe, "centralized intelligence"	Minicomputer, mostly "centralized intelligence"	Microcomputer, "decentralized intelligence"	Client Server, "distributed intelligence"	Internet, global "ubiquitous intelligence"	Social platforms, social networks, mobile, cloud

When the use of information technology firms periodically examined, it is seen that the businesses are primarily focused on automation, and later on they are creating value by increasing their productivity. The using goal of this technology was introverted in the beginning, as the time progresses this goal has become facing stakeholders. While the dominate technology was mainframe after 2010 mobile approach was adopted and it began to spread wide areas.

Businesses, thanks to information technology, provide the flow of information within the enterprise and outside. Some types of communication networks used for information flow for this purpose are:

- Intranet: Private company networks that use Internet technologies and protocols. This network is for employees and has functions such as the spread of information between departments, provide the necessary forms and even completing the old paper-based transactions online (McNurlin et al., 2014: 51).
- Local Area Network (LAN): LAN enables communication of computers and other information processing devices in limited physical areas such as office, classroom, building, manufacturing plant or any work site (O'Brien & Marakas, 2011: 239).
- Wide Area Network (WAN): WAN covers large geographical areas such as state, province or country. WAN is vital in terms of information flow to the stakeholders of businesses and government institutions (Baltzan, 2014: 254).

- Virtual Private Network (VPN): VPN is the extension of private intranet network across a public network. It provides a secure and cost-effective connection between two communicating parties (Gupta, 2003: 4).
- Cloud Technology: Cloud technology is an infrastructure that allows accessing business and users from anywhere in the world in their time of need any application (Buyya et al., 2009: 599).

## **2. SMEs AND IT**

There are generally two approaches in classifying the business as "small", "medium" and "large". The first of these approaches is the quantitative approach. In quantitative approach, businesses are classified according to number of employees, sales turnover and total assets. The second approach is the qualitative approach. In the qualitative approach the classification is done according to criteria such as a comparatively limited number of types of performance, comparatively limited resources and capabilities, lesser developed management systems, administrative procedures and techniques necessary to evaluate and control the strategic position of the company, management style is unsystematic and their training is informal, senior management positions and the majority of shares are held by the either the founders of the company and/or their relatives (Brooksbank, 1991: 18-21; Van Hoorn, 1979: 85). As the businesses are classified as "small", "medium" and "large" with a variety of methods, SMEs are in a very important position in terms of the country economies. According to the OECD, SMEs are defined as independent companies with employees less than a certain number. However, this may vary from country to a country in terms of a specific number of employees. In the European Union, a business is defined as SME according to the number of staff and a turnover or balance sheet total. Accordingly, businesses are defined as SME that number of employees fewer than 250 and either have an annual turnover does not exceed 50 million € or an annual balance sheet not exceeding 43 million € (European Commission, 2015: 11). In Turkey, the definition of SMEs has been made with the regulations. According to this regulation enterprises are classified as "micro", "small" and "medium". Business classification is as follows (Resmi Gazete):

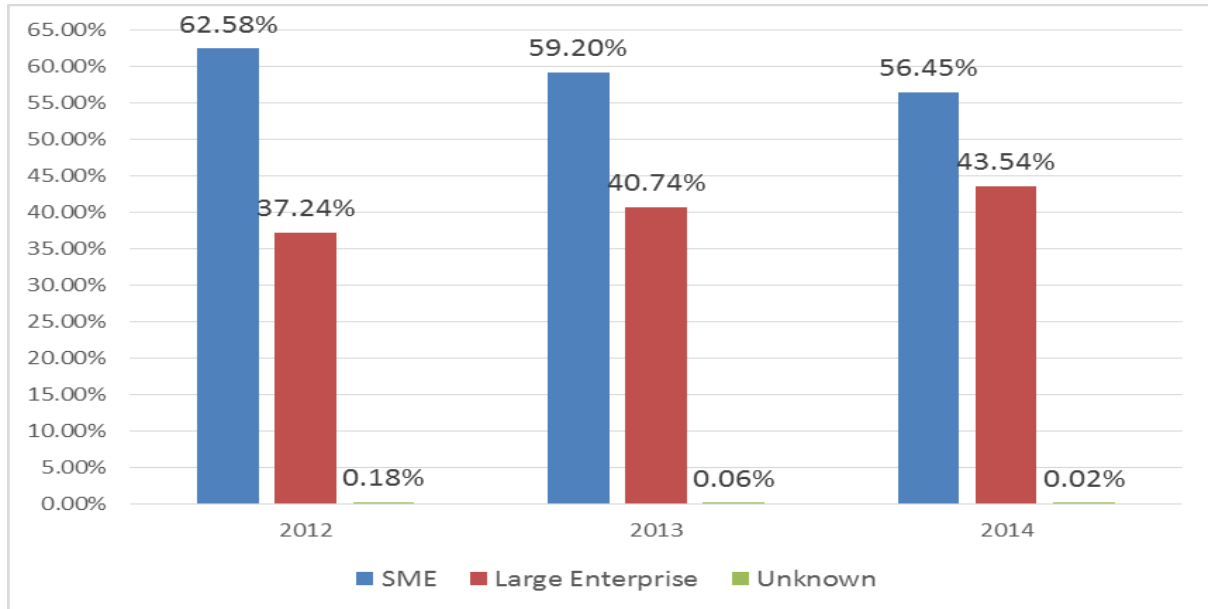
- Micro Enterprise: Businesses are defined as Micro Enterprise that number of annual employees fewer than 10 and either have an annual net sales revenue or annual financial balance sheet doesn't exceed 1 million TRY.
- Small Enterprise: Businesses are defined as Small Enterprise that number of annual employees fewer than 50 and either have an annual net sales revenue or annual financial balance sheet doesn't exceed 8 million TRY.
- Medium Enterprise: Businesses are defined as Medium Enterprise that number of annual employees fewer than 250 and either have an annual net sales revenue or annual financial balance sheet doesn't exceed 40 million TRY.

SMEs complete the shortcomings of large businesses and fulfill the need of sub-industry of these businesses (Çatal, 2007: 335). Due to SMEs sustain their operation in almost every region of the countries, they contribute to regional development with creating added value and the spread of national income throughout the country in a balanced way (Oraman, 2004:

208). From this point, the contribution of SMEs to the country's economy can be grouped under five headings (Bayülken & Kütükoğlu, 2012: 15):

- Employment creation
- Flexibility
- Encourage entrepreneurship
- Product differentiation
- The supply of goods to large enterprises

When businesses are considered in terms of their contribution to the national economy, large enterprises may be considered to have contributed more; however, when the statistics are examined, it is seen that SMEs are how important to the country's economy. The share in the exports of enterprises operating in Turkey as shown in Figure 2.



**Figure 2.** Share of enterprises in total exports in Turkey between the years 2012-2014 (Source: TÜİK, 2015)

Figure 2 is examined, it is observed that the share of SMEs in exports of Turkey in TRY made between the years 2012-2014 is more than large enterprises. Over the years, the gap between SMEs and large enterprises has begun to decrease, but SMEs continue to make more than half of total exports. This is an indication that SMEs are a vital part of the country's economy. Similar results can be obtained from the statistics of TÜİK such as employment, number of enterprises.

In today's world, the ability of businesses to survive like a living thing can only adapt to changing conditions. Businesses will be able to make their operations sustainable if they can gain an advantage in a competitive environment. The key factor of this advantage is IT. Unless, a business does not have information about its stakeholders, processes, products, customers or markets, it can never retrace its problems. This situation will cause costs and

dissatisfaction and probably result in losing out market share to its competitors. In the face of this threat, SME managers should not consider IT investments as a cost. On the contrary, IT is replicable, since a byte of data endlessly and perfectly reproducible at virtually no cost (Carr, 2003: 44).

IT is very helpful for business managers in the decision-making process, however, managers must know how to use and how to effectively manage these systems (Baltzan, 2014: 14). In this regard, IT investment does not guarantee the success to the businesses without adopting it. For a sustainable success as the SMEs invest, it will be useful to employ staff for information systems or establish IT-related department at the same time. Otherwise, SMEs will often need to receive consulting services by outsourcing for problems. This may also open the way to the costs and potential information security problems.

Lefebvre et al. (1991) summarize the factors related to enterprises' adoption of new technologies under four headings:

- The characteristics of the firm
- The firm's competitive and manufacturing strategies
- The influences of internal and external parties on the adoption decision process
- The characteristics of the new technologies adopted

In order to adapt an enterprise to IT primarily, enterprise management must be open to innovations; otherwise, the business is not expected to be open to innovations. Innovative businesses can reduce costs and develop marketing (competition) strategies that deliver the right production to the right customer by technological investing. Technology adaptation is directly related to the user-friendly of the technology owned at the same time. Impractical systems may not produce the expected benefits of the whole business.

### **3. ADAPTATION OF SMEs TO INFORMATION TECHNOLOGIES**

#### **3.1. Aim of the Study**

The purpose of this research is to measure the level of use of Information Technologies by SMEs operating in Denizli and the effects of Information Technologies on business, and identifying the problems SMEs face when using IT technologies. By evaluating these measurements, it is aimed to determine the adaptation levels of SMEs to the Information Technologies.

#### **3.2. Material and Method**

Within the scope of this study, a questionnaire was conducted to the businesses which operating in the marble sector in Denizli province in the SME status. The main reason why the marble sector is chosen for the study is that the marble sector has a significant contribution to the economy of the city and country, as Denizli has the second largest marble reserve in Turkey (Denizli Ticaret Odası, 2016: 40). In the study 47 businesses were determined as the universe of study, after that, it has been requested to fill in a questionnaire via sending e-mail from these businesses. 31 of these businesses sent backfilling in the questionnaire. The questionnaire used for research were prepared by largely benefiting from the papers of Karalar et al. (2005) and Sayılır et al. (2006). The questionnaire consists of 56

questions. The questions in this questionnaire are composed of questions open-ended questions, multiple choice questions, and 5-point Likert scale. The obtained data were analyzed via MS Excel 2010 and IBM SPSS Statistics 22 software.

### 3.3. The Findings of the Research

It has been found that 19 (61.3%) of the businesses operating in manufacturing and 12 (38.7%) of the businesses operating in sales (marketing) fields. The number of employees and SMEs classification results according to the regulations are shown in Table 2 and Table 3 respectively.

**Table 2.** Distribution of the employee number

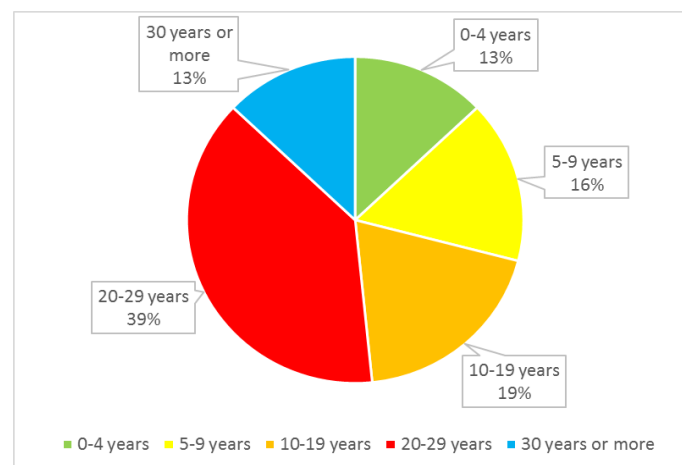
	Frequency	Percentage (%)
Fewer than 10	11	35.5
Between 10-50 employees	13	41.9
Between 50-250 employees	7	22.6
Total	31	100

**Table 3.** Scale of Enterprises

	Frequency	Percentage (%)
Micro	8	25.8
Small	12	38.7
Medium	11	35.5
Total	31	100

Considering the number of employees of surveyed businesses 41.9% of enterprises have between 10-50 employees, 35.5% of enterprises have fewer than 10 employees and 22.6% of enterprises have between 50-250 employees. Similarly, it is seen that 38.7% of the enterprises have a small-scale classification, 35.5% of the enterprises have a medium-sized classification and 25.8% of enterprises have a micro-scale classification according to the regulations. This is due to some enterprises of sales revenue or financial balance sheet exceeds the limits of the regulations.

The operating periods of the businesses in the questionnaire are shown in Figure 3.



**Figure 3.** Operating periods of businesses



When the period of business activity is analyzed; it is seen that 13% of businesses operating in 0-4 years, the rest of businesses which operate in a longer time, and the vast majority of them (39%) between 20-29 years. This indicates that SMEs in the marble sector in Denizli have sufficient knowledge because of the periods they are operating.

The findings of SMEs' using time of Information Technologies are as shown in Table 4.

**Table 4.** Computer using time of SMEs

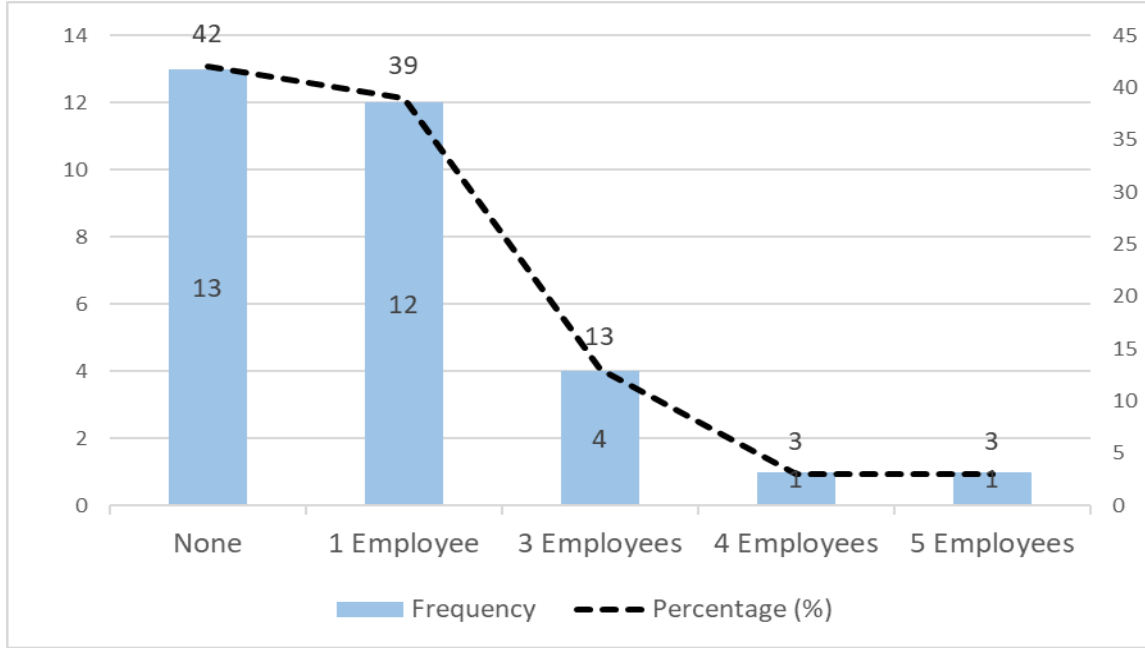
	Frequency	Percentage (%)
1-4 years	4	12.9
5-9 years	5	16.1
10-14 years	10	32.3
15-19 years	7	22.6
20 years or more	5	16.1
Total	31	100

Table 4 shows that all businesses have computer ownership and IT is used in all enterprises. The results of the types of communication networks used by the enterprises are shown in Table 5.

**Table 5.** Using of the communication networks in businesses

	User		Nonuser	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Internet connection	31	100	0	0
Local area network (LAN)	25	80.6	6	19.4
Intranet application	20	64.5	11	35.5
Corporate website	27	87.1	4	12.9

When analyzing communication networks that are used in businesses, it is observed that all businesses have an Internet connection. This situation suggests that in interaction with the outside world for all businesses. Similarly, it is seen that using rate of LAN which enables the sharing of information within the enterprise is 80.6% and rate of owing Intranet application is 64.5%. This indicates that some enterprises use different channels for the information flow. 87.1% of the surveyed enterprises have been found to have a corporate website. The easiest source of information about a company is its corporate website in the present circumstances, so businesses that want to maintain a presence in a competitive environment, they should take care of their corporate website. For this reason, 4 businesses that do not have a corporate website are required to take measures in this area. The number of staff employed by the enterprises to carry out data processing activities is shown in Figure 4.



**Figure 4.** Number of data processing employee

According to information on the number of data processing employee, 13 (42%) enterprises have no data processing employee, 12 (%39) enterprises have only 1 employee, 4 (13%) enterprises have 3 employees and 2 enterprises have 4 and 5 employees respectively. These findings show that almost half of businesses use outsourcing in IT-related activities. When asked to the enterprises whether they approved adequately themselves in terms of the use of IT, 14 (45%) of the enterprises surveyed have described themselves as inadequate in terms of the use of IT. The findings of the investigation about reasons of inadequacy are shown in Table 6.

**Table 6.** The reasons of inadequacy\*

	Frequency	Percentage (%)
Lack of sufficient knowledge about the use of Internet and IT	8	30.8
Lack of labor and technical infrastructure	7	26.9
High application costs	6	23.1
The customers not working via the Internet	5	19.2

\*More than one option can be marked.

The main reasons for the inadequacy of the level of using IT by enterprises are lack of knowledge labor and infrastructure. 23.1% of enterprises stated that they do not invest because of the costs and 19.2% of them do not invest because of their customers that not working via the Internet. The problems encountered by businesses when using IT are shown in Table 7.

**Table 7.** Encountered problems when using the IT

	Frequency	Percentage (%)
Connection speed, line connection problems	18	18.6
Infrastructure and costs	14	14.4
Staff training	14	14.4
Lack of information	13	13.4
Lack of technology and materials	9	9.3
Technical problems	8	8.2
Inadequacy of local connections	8	8.2
Insufficient technical staff, lack of foreign languages	7	7.2
Operating system-based problems	4	4.1
Not advanced Internet usage	2	2.1

The most common problems that SMEs face in the use of Information Technologies, connection speed and line connectivity problems, infrastructure and costs, staff training and the lack of information. The first two of these problems are the issue that concerns service providers. The other problems are issues that can be solved with the new investments or training programs.

Before moving on to the analysis of attitude questions, when the reliability of the questionnaire is tested, Cronbach's alpha has been found as 0.938. According to the results of the test, the reliability of the questionnaire is evaluated as very good (Zikmund & Babin, 2010: 249) and then, the analysis has started. Questions to measure attitudes about IT of SMEs have been grouped under three headings such as what extent to the contribution of using IT in the enterprises, the status of utilization of information technology in business operations and purposes of use of information technology in the enterprises. Three variables that contribution, purpose, and benefit were obtained by calculating the average of answers to questions under each heading. Then by taking the average of these three variables to measure the adaptation level of SMEs to the IT a variable that named as the adaptation was obtained.

**Table 8.** Level of variables

	N	Minimum	Maximum	Mean	Std. Deviation
Contribution	31	2.33	5.00	4.1935	.54789
Purpose	31	3.00	5.00	4.3192	.60223
Benefit	31	1.19	5.00	3.3891	.97944
Adaptation	31	2.44	5.00	3.9673	.52859
Valid N (listwise)	31				

When the average values of the variables labeled as low, medium and high,  $1 < \bar{x} < 2.33$  interval means low,  $2.34 < \bar{x} < 3.66$  interval means medium and  $3.67 < \bar{x} < 5$  interval means high. Accordingly, it is found that contribution level of using IT is high, purpose level of using IT is high, benefit level from IT is medium and generally, adaptation level of SMEs to the IT is high. The distribution of adaptation variable fits normal distribution according to the Kolmogorov-Smirnov test so that parametric tests were used in the analyses.

For examining whether there is a difference in the adaptation levels of SMEs to the IT according to the data processing employee, primarily businesses are grouped as having the

staff or not. Then examined the differences between groups of data processing staff employing, it has been found that adaptation level of IT is higher in SMEs that have data processing employee.

**Table 9.** Adaptation level of SMEs according to data processing employee

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Adaptation	Equal variances assumed	1.214	.280	-2.579	29	.015	-.45522	.17648	-.81617	-.09426
	Equal variances not assumed			-2.413	19.298	.026	-.45522	.18867	-.84969	-.06074

When the difference in the adaptation levels between the SMEs that answered as yes or no the question of whether they approved adequately themselves in terms of the use of IT is tested it has been found that there is a statistical difference between the groups and the level of IT adaptation is higher in the SMEs that approved themselves as adequately.

**Table 10.** Adaptation level of SMEs according to approve themselves

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Adaptation	Equal variances assumed	0.006	.939	3.331	29	.002	.54961	.16502	.21210	.88712
	Equal variances not assumed			3.300	26.725	.003	.54961	.16654	.20772	.89149

In order to examine whether there is a relation with adaptation of SMEs to the IT and operating periods when ANOVA test applied the groups that stated in Figure 3, it is seen that there is no difference in adaptation level of SMEs according to operating periods. This is a reasonable result when all of the SMEs are associated with computer use and Internet access.

**Table 11.** Adaptation level of SMEs according to operation period

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.017	4	.254	.897	.480
Within Groups	7.365	26	.283		
Total	8.382	30			

When analyzing to determine whether there is a difference in adaptation level of SMEs according to the scale of enterprises, it has been found that there is no statistical difference.

**Table 12.** Adaptation level of SMEs according to their scale

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.885	2	.443	1.653	.210
Within Groups	7.497	28	.268		
Total	8.382	30			

#### **4. CONCLUSION**

With the popularization of Information Technologies, the needed information has become easily available at low cost. Businesses are also closely following developments in IT, latest technologies are integrated into the processes by them. When the information technologies are analyzed periodically, it is seen that the mainframe is in a dominant position and a transformation towards social platforms and mobile devices over time is experienced. Thanks to this transformation in IT, enterprises have adopted the processes human-oriented based relation rather than business-oriented based on profitability by changing their business models. For example, in today's world, while businesses can reach their target customers through social media, customers can also announce their satisfaction or dissatisfaction about businesses because of received goods or services, through social media to the very wide audience. This causes the business names of frequently discussed. At this point, businesses must be aware of what is happening both inside and outside for maintaining their presence nowadays. The key factor of this is to be able to adapt to Information Technologies.

SMEs are organizations of vital importance for the country's economy. SMEs have key roles such as employment, entrepreneurship, spreading the national income throughout the country, product differentiation and completing the shortcomings of large businesses. Due to competitive conditions in the world are difficult today, SMEs need to adapt the conditions of the time. For this purpose, with the help of IT, SMEs sell the right product to the right market by lowering costs. In this study, it is aimed to measure adaptation the level of 47 SME status businesses that are operating in the marble sector in Denizli to IT. For this purpose, it has been requested to fill in a questionnaire via sending e-mail from these businesses. 31 of these businesses sent back the questionnaire by filling. In the analysis of the questionnaires, it was used in IBM SPSS 22 and Excel 2010 software.

Primarily, the frequency analysis of surveyed enterprises for the activity area, number of employees, scale size and operating period were examined. Then, one of the indicators of adaptation to the IT surveyed SMEs, computer using time and using of communication technologies were investigated. According to the findings of all SMEs use computers and the Internet; but it was seen that 81.7% of the businesses have a corporate website. It has been commented that businesses that do not have a corporate website may have a disadvantage in terms of promoting themselves to potential customers.

As long as businesses operate, information production proceeds so that every moment there is a need of businesses to IT. Therefore, when computing how many staff employed by SMEs investigated; it has been found that 42% of businesses that do not employ IT staff, 39% of the business employing only one staff and 19% of them employing more than 3 staff. Doubts about the implementation of the IT related jobs and adaptation of SMEs to the IT arises due to almost half of the businesses does not employ data processing staff. Similarly, when asked whether businesses find themselves adequacy in terms of IT use, it was determined that 45% of businesses found inadequate themselves. SMEs have expressed that lack of information, employee, and infrastructure are the main reason of this inadequacy. It has been seen that the major problems of SMEs about the using IT are connection, infrastructure, staff training

areas. This situation can be resolved investments by service providers and care the staff training by SMEs.

To determine the adaptation of SMEs to the IT, three variables that contribution of IT to the business processes, benefiting from the IT in business transactions and purpose of using IT were created based on the responses to questionnaires. The level of these variables was found that high for contribution and purpose variables and medium for benefit variable. By taking average of the obtained values of these variables, the level of adaptation was determined, and it was seen that the level of adaptation was high. It was decided to use parametric tests as a result of the normality test. Then, the level of adaptation tested statistically using t-test and ANOVA test according to the factors such as employing data processing staff, approving themselves as adequacy or inadequacy, operating period and scale. According to test results adaptation level of SMEs has a difference in employing data processing staff and approving themselves as adequacy or inadequacy, but contrary it is seen that there is no difference according to operating period and scale in terms of adaptation level of SMEs to the IT. It is thought that SMEs can increase their adaptation level of IT and efficiency by employing data processing staff, investing infrastructure and training the employees.

## REFERENCES

- Baltzan, P. (2014). *Business Driven Information Systems*. Fourth Edition, New York: McGraw-Hill/Irwin.
- Bayülken, Y., & Kütükoğlu, C. (2012). *Küçük ve Orta Ölçekli Sanayi İşletmeleri (KOBİ'LER)*. Genişletilmiş Dördüncü Baskı, Oda Raporu, Yayın No: MMO/583, Ankara: TMMOB Makine Mühendisleri Odası.
- Brooksbank, R. (1991). Defining the Small Business: A New Classification of Company Size. *Entrepreneurship & Regional Development*, 3(1), 17-31.
- Buyya, R., Yeo, C. S., Venugopal, S., Broberg, J., & Brandic, I. (2009). Cloud Computing and Emerging IT Platforms: Vision, Hype, and Reality for Delivering Computing as the 5th Utility. *Future Generation Computer Systems*, 25(6), 599-616.
- Carr, N. G. (2003). IT Doesn't Matter. *Harvard Business Review*, 81(5), 41-49.
- Çatal, M. F. (2007). Bölgesel Kalkınmada Küçük ve Orta Boy İşletmelerin (KOBİ) Rolü. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 10(2), 333-352.
- Denizli Ticaret Odası. (2016). *Ekonomik Yönüyle Denizli: 2016*. Denizli Ticaret Odası Yayınları-43, Accessed on: 27.01.2017, URL: <http://www.dto.org.tr/images/site719/yayinlar/PDF/Ekonomik%20Rapor%202016.pdf>
- Ekiz, H., Vatansever, F., Zengin, A., & Demir, Z. (2000). Hesaplamanın Tarihi ve Bilgisayarların Gelişimi. *SAÜ Fen Bilimleri Enstitüsü Dergisi*, 4(1-2), 73-81.
- European Commission (2015). *User Guide to the SME Definition*. Luxembourg: Publications Office of the European Union. Accessed on: 01.08.2016, URL:

- <http://ec.europa.eu/DocsRoom/documents/15582/attachments/1/translations/en/renditions/pdf>.
- Floridi, L. (2009). Information Technology. In Olsen, J. K. B., Pedersen, S. A. & Hendricks, V. F. (Eds.), *A Companion to the Philosophy of Technology* (pp. 227-231). UK: Wiley-Blackwell.
- Gupta, M. (2003). *Building a Virtual Private Network*. Ohio: Premier Press.
- Işık, O., & Akbolat, M. (2010). Bilgi Teknolojileri ve Hastane Bilgi Sistemleri Kullanımı: Sağlık Çalışanları Üzerine Bir Araştırma. *Bilgi Dünyası*, 11(2), 365-389.
- Karalar, R., Eroğlu, E., & Sevim, N. (2005). AB Perspektifiyle Türkiye'deki Küçük ve Orta Büyüklükteki İşletmelerde (KOBİ'lerde) Bilgi Teknolojileri Kullanımı ve Eskişehir Uygulaması. *Uluslararası "Avrupa Birliğine Giriş Sürecinde Kobiler: Türkiye ve Benzer Ülke Deneyimleri" Sempozyumu*, 19-22 Mayıs 2005, Bandırma.
- Laudon, K. C., & Laudon, J. P. (2012). *Management Information Systems: Managing the Digital Firm*. Twelfth Edition, New Jersey: Prentice Hall.
- Lefebvre, L. A., Harvey, J., & Lefebvre, E. (1991). Technological Experience and the Technology Adoption Decisions in Small Manufacturing Firms. *R&D Management*, 21(3), 241-249.
- Leiner, B. M., Cerf, V. G., Clark, D. D., Kahn, R. E., Kleinrock, L., Lynch D. C., Postel, J., Roberts, L. G., & Wolff, S. (2009). A Brief of the Internet. *ACM SIGCOMM Computer Communication Review*, 39(5), 22-31.
- Marson, S. M. (1997). A Selective History of Internet Technology and Social Work. *Computers in Human Services*, 14(2), 35-49.
- McNurlin, B. C., Sprague, R. H., & Bui, T. (2014). *Information Systems Management*. Eighth Edition, Essex: Pearson Education.
- O'Brien, J. A., & Marakas, G. M. (2011). *Management Information Systems*. Tenth Edition, New York: McGraw-Hill/Irwin.
- OECD. *Glossary of Statistical Terms, Small and Medium-Sized Enterprises (SMEs)*. Accessed on: 01.08.2016, URL: <https://stats.oecd.org/glossary/detail.asp?ID=3123>.
- Oraman, Y. (2004). KOBİ'lerde CRM (Müşteri İlişkileri Yönetimi) İçin Stratejiler. *Yönetim ve Ekonomi: Celal Bayar Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 11(1), 207-217.
- Oz, E. (2009). *Management Information Systems*. Sixth Edition, US: Thomson Course Technology.
- Pearlson, K. E., & Saunders, C. S. (2013). *Managing and Using Information Systems: A Systematic Approach*, Fifth Edition. US: John Wiley & Sons.
- Project Loon. *What is Project Loon*. Accessed on: 26.01.2017, URL: <https://x.company/loon/>.
- Resmi Gazete. *Küçük ve Orta Büyüklükteki İşletmelerin Tanımı, Nitelikleri ve Sınıflandırılması Hakkında Yönetmelik*. Accessed on: 02.08.2016, URL: <http://www.resmigazete.gov.tr/eskiler/2012/11/20121104-11.htm>.

- Sayılır, A., Dirlik, S., & Mercan, S. (2006). KOBİ'lerin Bilişim Teknolojilerine Adaptasyonları (Muğla İlinde Faaliyet Gösteren KOBİ'ler Üzerine Bir Araştırma). 3. KOBİ'ler ve Verimlilik Kongresi, İstanbul Kültür Üniversitesi, 17-18 Kasım 2006.
- Tabak, J. (2004). *Numbers: Computers, Philosophers and the Search for Meaning*. New York, NY: Facts on File.
- The World Bank. *Internet Users (per 100 people)*. Accessed on: 29.07.2016, URL: [http://data.worldbank.org/indicator/IT.NET.USER.P2?end=2014&name\\_desc=true&start=1990&view=chart](http://data.worldbank.org/indicator/IT.NET.USER.P2?end=2014&name_desc=true&start=1990&view=chart).
- TÜİK (2015). *Küçük ve Orta Büyüklükteki Girişimler, Ülke Grubu ve Çalışan Sayısına Göre İhracat, 2012-2014*. Accessed on: 03.08.2016, URL: [http://www.tuik.gov.tr/HbGetir.do?id=21864&tb\\_id=6](http://www.tuik.gov.tr/HbGetir.do?id=21864&tb_id=6).
- Van Hoorn, T. P. (1979). Strategic Planning in Small and Medium-sized Companies. *Long Range Planning*, 12(2), 84-91.
- Wilson, S. M., & Peterson, L. C. (2002). The Anthropology of Online Communities. *Annual Review of Anthropology*, 31, 449-467.
- Winston, B. (1998). *Media Technology and Society: A History from the Telegraph to the Internet*. London: Routledge.
- Zikmund, W. G., & Babin, B. J. (2010). *Essentials of Marketing Research*, Fourth Edition. Mason, OH: South-Western Cengage Learning.