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Digital Factors Influencing Small and Medium-Sized Businesses in the Context of COVID

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Abstract

Digital technologies have become one of the most important tools of present day economy. Especially, the level of economy digitalization was experienced during burst out of COVID pandemic in 2019. This has put all businesses, especially SMEs, in severe conditions. Total lockdown regime in Kazakhstan has challenged small businesses to unexpected and rapid change of the economy to the full digital regime. Where business owners were opposed to acquiring and learning new skills at a high speed. The aim of this article is to study the impact of digitalization on sustainable development of SMEs in the context of COVID-19. In this study, there was used statistical data on main indicators of digitalization. For the analysis of the indicators, SPSS software was used. It included definition of indicators, which have higher impact on the development of SMEs. Throughout the literature review there were identified four factors which had impact of the business development in terms of digitalization during COVID-19. Initially the research included four factors: Organizations with ICT Specialists, Organizations using Cloud service, Organizations using computers, Individual users of the Internet. However, according to the conducted research, ICT specialists and usage of Digital tools (as iClouds) have impact on the proficiency of SMEs. Whereas, ICT specialists in Companies had much greater impact. This study defines two main indicators of digital economy development under the COVID-19. The results of this study could be used in the development of the policy of Kazakhstan Digitalization and improvements of policies for SMEs development and support.

Keywords: digitalization, digital tools, SME, digital economy, sustainable development

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COVID-19 аясында шағын және орта бизнестің дамуына әсер ететін сандық факторлар

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Түйін

Цифрлық технологиялар қазіргі экономиканың маңызды құралдарының біріне айналды. Атап айтқанда, экономиканы цифрландыру деңгейі 2019 жылы COVID пандемиясының өршуі кезінде байқалды. Бұл барлық кәсіпкерлікті, әсіресе ШОБ -ты қиын ортаға салды. Қазақстандағы толық окшаулау режимі шағын кәсіпкерлікке экономиканың күтпеген жерден тез цифрлық режимге көшу міндетін қойды. Қай жерде кәсіп иелері жана дағдыларды жоғары жылдамдықпен алуға және үйренуге қарсы болды. Бұл мақаланың мақсаты-цифрландырудың COVID-19 жағдайында ШОБ тұрақты дамуына әсерін зерттеу. Зерттеуде цифрландырудың негізгі көрсеткіштері бойынша статистикалық мәліметтер қолданылды. Көрсеткіштерді талдау үшін SPSS бағдарламасы қолданылды. Ол ШОБ дамуына үлкен әсер ететін көрсеткіштерді анықтауды қамтыды. Әдеби шолуда COVID-19 кезінде цифрландыру тұрғысынан бизнестің дамуына әсер еткен төрт фактор анықталды. Бастапқы зерттеу төрт факторды қамтыды: АКТ мамандары бар ұйымдар, бұлтты қызметтерді пайдаланатын ұйымдар, компьютерді пайдаланатын ұйымдар және жеке Интернет қолданушылары. Алайда, зерттеуге сәйкес, АКТ саласындағы мамандар мен цифрлық құралдарды қолдану (мысалы, iCloud) шағын және орта кәсіпкерліктің дамуына әсер етеді. Компаниялардағы АКТ мамандары әлдеқайда көп әсер етті. Бұл зерттеуде COVID-19 жағдайында цифрлық экономиканың дамуының екі негізгі көрсеткіші анықталған. Бұл зерттеудің нәтижелерін Қазақстанда цифрландыру саясатын әзірлеуде және ШОБ дамыту мен қолдау саясатын жетілдіруде қолдануға болады..

Түйін сөздер: цифрландыру, цифрлық құралдар, ШОБ, сандық экономика, тұрақты даму

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Цифровые факторы влияющие на развитие малого и среднего бизнеса в контексте COVID-19

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Аннотация

Цифровые технологии стали одним из важнейших инструментов современной экономики. В частности, уровень цифровизации экономики наблюдался во время вспышки пандемии COVID в 2019 году. Это поставило все предприятия, особенно МСП, в тяжелые условия. Режим тотальной изоляции в Казахстане поставил перед малым бизнесом задачу неожиданного и быстрого перехода экономики к полностью цифровому режиму. Где владельцы бизнеса были против приобретения и обучения новым навыкам на высокой скорости. Цель данной статьи - изучить влияние цифровизации на устойчивое развитие МСП в контексте COVID-19. В исследовании использованы статистические данные по основным показателям цифровизации. Для анализа показателей использовалась программа SPSS. Он включал определение показателей, которые имеют большее влияние на развитие МСП. В ходе обзора литературы было выявлено четыре фактора, которые повлияли на развитие бизнеса с точки зрения цифровизации во время COVID-19. Первоначально исследование включало четыре фактора: организации со специалистами в области ИКТ, организации, использующие облачные сервисы, организации, использующие компьютеры, отдельные пользователи Интернета. Однако, согласно проведенному исследованию, специалисты в области ИКТ и использование цифровых инструментов (таких как iCloud) влияют на развитие малых и средних предприятий. В то время как специалисты по ИКТ в компаниях оказали гораздо большее влияние. В данном исследовании определены два основных показателя развития цифровой экономики в условиях COVID-19. Результаты этого исследования могут быть использованы при разработке политики цифровизации Казахстана и улучшении политики развития и поддержки МСП.

Ключевые слова: цифровизация, цифровые инструменты, МСП, цифровая экономика, устойчивое развитие

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Introduction

Present-day world is impossible to imagine without digital technology, computers or databases, which store a vast amount of information. Databases allow you to get relevant information quickly and efficiently in a split second. To a wide extent digitalization (digital transformation), represents reconsideration of coordination order of economic agents, business strategies, models, procedures, products, marketing approach, etc. through adoption of digital technologies [1,2]. Digitalization is designed to speed up and qualitatively improve the interaction of businesses with each other, with government bodies and with final consumers. In a more narrow sense, “digital transformation” is “paperless interaction”: the ability to quickly and efficiently get information from digital data stores. The importance of digital transformation has been demonstrated by the coronavirus pandemic around the world.

Business digitalization affects the sustainability of a company during the crisis. Companies mature from the point of view of digital transformation respond quickly to market changes, restructuring business processes to meet the requirements of the circumstances. The same picture has occurred and is developing during the COVID-19 pandemic.

At the end of 2019, in the People’s Republic of China, namely in the province of Wuhan, the coronavirus infection COVID-19 broke out and spread global wide. The number of people infected with the new type of coronavirus SARS-CoV-2 has been growing in the world since January 2020 (severe acute respiratory syndrome coronavirus 2), which provokes pulmonology COVID-19 (Coronavirus disease 2019). Dangerous pathogen identified in more than 210 countries. Governments of many countries had to take drastic measures limiting physical communication between people—lockdown and quarantine. Such measures are awful for small and medium enterprises (SME) since both import and export were limited to the import and export of goods [1]. At the same time wage costs, renting of premises and other fixed costs and production capacity decreased. This means that expenses have become much higher than income; this was one of the reasons for the closure of businesses in many countries of the world, including Kazakhstan. Such sectors as service (hotel business, food service, tourism) were under serious threat since the demand for them decreased, due to self-isolation and the closure of the territory. According to forecasts of experts and economists, the damage from pandemics will be of a long-term nature and will slow down the development of the global economy.

SME play an important role in the economy of any country, as they contribute to the solutions of population employment issues, to the development of competitiveness by providing growth of export potential and filling the domestic market with consumer goods and services. Small and medium-sized businesses are also becoming drivers of innovation. The emergence of new companies that produce innovative products will stimulate the demand for digital platforms for various purposes. However, despite all the advantages of SMEs, they are still more vulnerable to crises than big business. Consequently, SMEs sustained a great damage due to risks associated with pandemic. Although governments of many countries have set up programs and supporting measures for SMEs, such as tax remissions, extended loans, exemption from rent, promptly bringing all financial support measures to business (concessional lending), and more.

During the period of independence of Kazakhstan since the 2000, the country GDP run at a deficit for the first time (-2.5%). In comparison, during the 2008 crisis, Kazakhstan’s GDP fell to 1.2%, the indicator has not dropped below zero since 1998. At that time, the economy of Kazakhstan was influenced by the consequences of the crisis of the “Asian Tigers” and the Russian crisis (GDP -1.9%). During the pandemic, the greatest damage was done to the fitness industry (-100%), air travel (-72%) and the restaurant business (-80%). This information became known at the presentation of the KPMG study “Impact of COVID-19 on key sectors of the economy of Kazakhstan. Market Participants’ Opinion “as part of Online Astana Finance Days 2020 [3].

The present situation with the pandemic has shown that the new economic reality dictates its own terms. Online business dealing formats, remote services and government services, artificial intelligence technologies have shown relevance as never before.

Since the early weeks of the pandemic, companies had to accelerate the adoption of digital tools that have helped adapt to the new conditions. Having faced with the global crisis, the heads of organizations have become acutely aware that digitization is the key to business continuity. Moreover, majority are confident that data-driven digital transformation can be the foundation of a sustainable future for all.

The aim of this article is to study the impact of digitalization on sustainable development of SMEs in the context of COVID-19. The following objectives are set:

- To analyze digitalization factors as Internet access, Internet users, ICT specialists, Usage of digital tools in SMEs.

- To identify main indicators of digital economy which influence on the development of SME in the context of COVID-19

Current article is studying problems of digitalization of SMEs, which became apparent during pandemic COVID-19. Such problems were revealed: lack of ICT specialists, low level of digital technologies usage, in particular iCloud. The share of SME in GDP is dependent variable, ICT specialists and Organizations using iClouds are independent variables. The novelty of this study is in identifying the relationship between variables, as well as the impact on sustainable development of SME overall in the context of COVID-19

Literature review

Sustainable development of businesses in the context of digitalization has become one of the main topics of recent years. The fourth revolution has invaded all sectors of economy, so there have been developed various research directions.

Some studies discuss the process of business digitization. The introduction of information technologies (IT) in the structure of organizations functioning has also, led the development of new fields of study as the impact of IT etc. [4]. Majority of these studies discuss the importance and positive impact of business development. In particular, data collection, big data management, low expenses, higher communicative process etc. These increases the productivity of a company [5]. Thus, such IT integration results in the transformation of business. IT or business digitization are regarded as key tools for maintaining business sustainable development in such conditions as COVID-19.

Based on the previous studies of [6,7] introduction of digitalization in SMEs contributes to the organizational change through digitization (as computing or information and communication technologies). Accordingly, business digitalization creates great potential for SMEs development or transition to sustainable business through this organizational change [6,8].

Other studies talk about the importance of human resources. Particularly the importance of qualified staff. Moreover, Michaelidou et al. (2011) and Peltier et al. (2009) in their studies underlined the significance of qualification of senior managers or business owners, as well as the age [9,10]. Where eLeadership is one of the key factors of business successful development. This is because understanding of IT necessity is important when adapting a new software or during the process of data collection etc. [11]. This is also explained by the fact that top management not only deals with opportunities adapting digital tools, but risks as well [12]. Depending on the size of an enterprise the level of digital technologies (as iCloud, dig

data, etc.) adaption is different. In addition, small enterprisers mostly lack of ICT specialists. At the same time, the usage of social media is similar both for small and large enterprises [13].

At present, a number of studies devoted to business models is growing. These studies suggest that sustainable development of businesses under digitalization needs a prescribed plan in the form of a business model. Acciarini et al. (2021) in their study emphasized that sustainable business and business digitalization has been studied separately. Whereas sustainable business development is achieved through business digitalization [14].

Priyonoet al. (2020) in their study divided small and medium businesses into large and small groups. This is due to smaller organizations find it easier to survive under such sever conditions as COVID-19 pandemic, than larger organizations. For small ones it is easier to adapt and transform their functioning unlike large companies. To develop sustainable business large organizations need to achieve higher level of digital competence [15]. We can assign to these digital tools as special software and qualified personal, which contribute to the transformation of a company to digital way of functioning [16]. To sum up, the fact that SMEs are flexible help them to adapt and survive in severe conditions of economy. However, a small business in order to survive has to develop fast and to a higher degree. Thus, they substitute the lack of larger business. As they succeed, they must maintain their advancement, which is difficult for majority of SMEs with the recovery of large companies. Therefore SMEs are always in the risk category [17].

Guo et al. (2020) defined two ways of measuring digitalization of a company based on the works of Sebastian et al. (2017) and Vial (2019) [6,7,8]. The first one measures overall digitalization of an organization. It includes five items as digital artefacts, platforms, business model, management model and infrastructure. The second one includes seven items, which measure the degree of digital technologies adoption. The seven items are social, mobile, big data, cloud computing, Internet of Things, development of a platform and artificial intellect.

Digitalization promotes rapid reaction of business to crisis through available resources diversification. Kane et al. (2015) in their study concluded that information technologies favor flexible distribution of resources by reducing expenses for coordination of activities internally within a firm [18]. Nambisan et al. (2019) also discuss that digitalization considerably reduced costs for transfer of resources, as digital technologies have changed and facilitated business processes, the sale of products and services [19].

Technologies used in digitalization reduce the time for a new product launch; it gives a quick start to the business. During the COVID-19 outbreak firms, which had, high level of digitalization responded quickly and were able to minimize their losses and even derive their benefit by transforming their business.

According to the literature review, following hypothesis is developed:

Hypothesis 1: The number of ICT specialists has a positive impact on development of SME digitalization in the context of COVID-19.

Hypothesis 2: Usage of iCloud service has positive impact on the development of SME digitalization in the context of COVID-19.

Based on the provided literature review there were identified 6 factors which influence on SMEs sustainable development conditioned to digitalization during COVID-19. However, majority of studies talk about usage of digital technologies as one of the main pushers of SMEs digitalization as well as the availability of qualified staff in ICT. Accordingly, this article will study SMEs digitalization in the context of Kazakhstan, conditioned to the identified factors.

Methodology and theoretical framework

Majority of the recent studies are provided through literature review studies [12,17]. They include all topics related to sustainable business digitalization as IT introduction into business, business transformation through digitalization, sustainable business development, tools for maintaining sustainable development etc.

Another part of studies are concerned in the study of appropriate business models of development that would contribute to business progress, sustainability in the context of the pandemic. This is done mostly through a survey among employees, in particular senior staff, which is more of a case study.

Others studies provide analysis of the degree of digitalization of different businesses, depending on their digitization process.

Based on the literature review we have developed indicators of sustainable business development through digitization, which are shown in the table 1. Due to limited data, the considered period is between 2016 and 2020.

Table 1 - Statistical data used in the analysis

№	Data statistics	Data collected/developed
1	Share of SME in GDP	https://stat.gov.kz /Ministry of National Economy of the Republic of Kazakhstan Committee on Statistics
2	Organizations with ICT Specialists	https://stat.gov.kz /Ministry of National Economy of the Republic of Kazakhstan Committee on Statistics
3	Organizations using Cloud service	https://stat.gov.kz /Ministry of National Economy of the Republic of Kazakhstan Committee on Statistics
4	Organizations using computers	https://stat.gov.kz /Ministry of National Economy of the Republic of Kazakhstan Committee on Statistics
5	Individual users of the Internet	https://stat.gov.kz /Ministry of National Economy of the Republic of Kazakhstan Committee on Statistics
6	Individual users of computers	https://stat.gov.kz /Ministry of National Economy of the Republic of Kazakhstan Committee on Statistics

For provision of the regression analysis, SPSS software was used. The initial model of the analysis included 1 dependent variable (Share of SME in GDP) and 4 independent variables (Organizations with ICT Specialists, Organizations using Cloud service, Organizations using computers, Individual users of the Internet). During the analysis 2 independent variables (Organizations using computers, Individual users of the Internet) were excluded due to high correlation rate. The final model included 1 dependent variable (Share of SME in GDP) and 2 independent variables (Organizations with ICT Specialists, Organizations using Cloud service)

Results and discussion

In the Republic of Kazakhstan, a great attention is given to the state of business. The aim of the strategy of the country is to be one of the 30 competitive countries globally. First, this objective is directed at improving of well-being of the citizens of the country. For the development of the country in 2017 there was introduced a State program “Digital Kazakhstan 2017-2020”. In the framework of the program implementation there were created 8 thousand work places in 2019. Total Economic Impact of the program in 2018 and 2019 overdrove 600 billion tenge. Considerable success was achieved through introduction of digital technologies in public service delivery, education, healthcare, finance, transport and

mining and smelting sectors. After the adoption of the government program a new economy model is being developed, in which not only basic industries and business are digitized, but the whole life of society.

The digital economy necessitates digital skills from public, which allows enjoying its benefits. The ability to use the Internet and computer technologies, thereby increasing digital literacy and the population affects the development of businesses and the country as a whole. Therefore, it is important to know to what extent citizens use them.

In the table 1, it is clear that the share of Individual users of computers is increasing every year, i.e. over a 10-year period; the number of people who use the Internet and computers has increased by over 35%. One of the tasks of the Digital Kazakhstan program is to expand the coverage of communication networks and ICT infrastructure throughout the country. According to the data, it is clear that the program has coped with this task. During the restrictions associated

with the coronavirus pandemic since 2019, there has been a rapid increase in the use of the Internet and computer technologies.

Experts talk about the insufficiency of IT-specialists. In the Republic of Kazakhstan in 2020, the number of higher educational institutions reached 129 and more 80-train ICT specialists. In universities, training in the IT direction is carried out in the following specialties:

- Computer science
- Informatics (by profile)
- Automation and control
- Information Systems
- Computing equipment and software
- Mathematical and computer modeling
- Instrument making
- Radio engineering, electronics and telecommunications
- Information security systems
- Mathematics Informatics
- Physics-Informatics
- Project management
- Informatics, computer technology and management.

Table 1 – The share of Individual users of the Internet and computers (%), aged 6-74, 2011-2020

No	Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	Percentage of computers users aged 6-74 years, %	51,3	62,6	63,2	64,1	74,2	76,2	78,2	80,3	82,2	85,8
2	Percentage of Internet users aged 6-74 years, %	50,6	61,9	63,3	63,9	72,9	76,8	78,8	81,3	84,2	88,2

Note - Compiled based on data from source [20]

In 2020-2021 academic year, 69,134 educational grants were allocated for the training of specialists with higher and postgraduate education, of which 9209 were allocated for the training of ICT specialists, which is 13% of the total (Table.2).

However, at present in the country's economy there is a shortage of ICT specialties with professional knowledge, skills and abilities in the chosen profession.

Digitalization is generations ahead of current system of production requirements to the composition of professions in the labor market. Absence of the operational relationships between the labor market and the system of education

can simultaneously lead to training of no longer demanded personnel and the release of personnel in «dying» professions. A complete revision of the content of all levels of education through the development of digital skills for all specialists is needed.

In Kazakhstan, special attention is paid to the support of small and medium businesses, as well as through improvement of the procurement system. According to the International Institute for Sustainable Development, the active participation of SMEs in the procurement system contributes to the achievement of significant economic and social benefits.

Table 2 -Total number of training grants and grants in ICT specialties

No	Year	2013	2014	2015	2016	2017	2018	2019	2020
1	Number of grants	86861	87620	82670	81337	102380	63000	53785	69134
2	Number of grants for ICT specialties	8439	8624	6592	5701	9048	11000	7499	9209

Note - Compiled based on data from source [20].

Table 3 – Main indicators of ICT usage. Annual data(thous.,uni.)

No	Main indicators of ICT usage. Annual data(thous.,uni.)	2018	2017	Growth
1	Number of reporting organizations	132,2	114,9	15,10%
2	Number of organizations using computers	104,4	83,5	25,10%
3	Number of organizations using Internet access	100,7	79,7	16,40%
4	Number of organizations using cloud IT services	8,6	5,9	47,50%

Note - Compiled based on data from source [20].

Of the 132.2 thousand organizations that reported for 2018, the share of enterprises using computers amounted to 79% (104.4 thousand enterprises). In the previous year, the share was equal to 72.7%. The share of organizations with access to the Internet increased from 69.3% to 76.2%. The number of such enterprises in 2018 amounted to 100.7 thousand units (or 96.4% of all using computers). The share of organizations using cloud-based IT services also increased - from 5.1% to 6.5%.

At present, 150 companies with different directions and specifics are registered in the register of ICT companies of the Republic of Kazakhstan. The number of ICT specialists at the end of 2018

amounted to 34.3 thousand people, which is 7.8% less than in 2017 (37.2 thousand people).

Based on the provided statistical analysis, 3 variables were identified in the table 4. The analyzed period included four years from 2016-2020 due to limited data. The number of ICT specialists decreased gradually during considered period. However, the difference in the end of the period made up more than half and was only 1289(totals) of ICT specialists. On the contrary, the number of organizations using Cloud services made up only 413(totals) in 2016, and in the end of the period 11884(totals). The share of SME in GDP in 2016 was 26.8%, increased gradually overall for almost 4% and reached 30.5% in 2020.

Table 4 – Variables

No	Variables	Year				
		2016	2017	2018	2019	2020
1	Number of organizations with ICT specialists (totals)	2 740	2 390	1 905	1 597	1 289
2	Number of organizations using Cloud services over the Internet (totals)	413	5 862	8 648	11 577	11 884
3	Share of small and medium enterprises in GDP (%)	26.8 (%)	26.8 (%)	28.4 (%)	29,5 (%)	30,5(%)

Note - Compiled based on data from source [20].

Due to the sample size was only 5, Spearman correlation coefficient was run based on the identified variables in the table 5. Spearman's correlation was provided to identify the correlation between the variables. High degree of negative correlation is observed between Share of SME in GDP and Organizations with ICT Specialists -,975. Whereas there is strong positive correlation

between two variables Share of SME in GDP and Organizations using iCloud services,975.

The aim of the research was to identify if chosen independent variables have impact on SMEs development in the course of business digitalization. Therefore, negative correlation between Share of SME in GDP and Organizations with ICT Specialists is regarded as significant (we ignore negative correlation).

Table 5 – Coefficient correlation

			Share_SME_ GDP	Org_ICT_ Spec	Org_Cloud_serv
<i>Spearman's rho</i>	<i>Share_SME_ GDP</i>	<i>Correlationcoefficient</i>	1,000	-,975**	,975**
		<i>Sig. (2-tailed)</i>	.	,005	,005
		<i>N</i>	5	5	5
	<i>Org_ICT_ Spec</i>	<i>Correlationcoefficient</i>	-,975**	1,000	-1,000**
		<i>Sig. (2-tailed)</i>	,005	.	.
		<i>N</i>	5	5	5
	<i>Org_Cloud_ serv</i>	<i>Correlationcoefficient</i>	,975**	-1,000**	1,000
		<i>Sig. (2-tailed)</i>	,005	.	.
		<i>N</i>	5	5	5
**. Correlation is significant at the 0,01 level (2-tailed).					

For provision of the analysis of the chosen variables, regression analysis was conducted. The R-square, in the table 6, demonstrates that 98% of SME share in GDP is explained by the used variables in the model. That is if to take the independent variables (Organizations using Cloud service, Organizations with ICT Specialists) as a

set of factors, they account for 98% of the SME share increase in GDP.

The ANOVA analysis in the table 4, shows that the significance level is less than 0.05 (p <, 05). The F value indicates high difference between two variables. Therefore, the model can be accepted as significant

Table 6 – Model Summary

Model	R	R- square	Adjusted-R Square	Std.Error of the Estimate
1	,994 ^a	,988	,975	,2585
a. Predictors: (constant), Organizations using_Cloud_service, Organizations with_ICT_Specialists				
b. Dependent variable: Share of SME in_GDP				

Table 7 - ANOVA

Model		SumofSquares	df.	MeanSquare	F	Sig.
1	<i>Regression</i>	10,606	2	5,303	79,339	,012 ^b
	<i>Residual</i>	,134	2	,067		
	<i>Total</i>	10,740	4			
a. Dependent variable: Share of SME in_GDP						
b. Predictors: (constant), Organizations using_Cloud_service, Organizations with_ICT_Specialists						

The table 8 demonstrates regression coefficients for the independent variables Organizations using Cloud service and Organizations with ICT Specialists. The regression coefficient for the first predictor - Organizations using Cloudservice, is insignificant (Sig. P=,131) as the P-value is higher than the significance level. For the second predictor, Organizations with ICT Specialists (Sig. P=,030), P-value is less than the significance level. Consequently, the predictor Organizations using Cloudservice P-value is statistically significant.

According to the model, there are only two predictors. Therefore Variance Inflation Factor (higher than 10) and Tolerance (less than 0,1) for both repressors are identical. As tolerance is less than 0,1 it shows that there is high level of Multicollinearity, thus is makes the model insignificant. VIF higher than 10 also states that there must be more than two regressors in this model.

Table 8 – Coefficients

Model	Unstandardized coefficients		Standardized coefficients	T	Sig. Tolerance	Collinearity Statistics	
	B	Std.Error	Beta			Tolerance	VIF
1	(Constant)	39,840	2,472		16,114	,004	
	Organizations with ICT Specialists	-,005	,001	-1,702	-5,609	,030	,068
	Organizations using Cloud service	,000	,000	-,754	-2,484	,131	,068

a. Dependent variable: Share of SME in GDP

From the table 9, the Collinearity Diagnoses, shows the eigenvalue of Organizations with ICT Specialists is high. Therefore, dimensions with high eigenvalue make significant contribution. Whereas, the second predictor (Organizations using Cloud service eigenvalue = ,000) does not make any significant contribution. At the same time the condition index for the predictor Organizations

with ICT Specialists is less than 15 (Condition index >15 shows multicollinearity). Condition index for Organizations with ICT Specialists is high, more than 30 (Condition index >30 shows high multicollinearity). The variance proportion shows high collinearity for the predictor Organizations with ICT Specialists. As there are to variance proportions above 0,9.

Table 9– Collinearity Diagnostics

Model	Dimensions	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Organizations with ICT Specialists	Organizations using Cloud service
1	1	2,716	1,000	,00	,00	,00
	2	,282	3,103	,00	,01	,03
	3	,001	44,936	1,00	,99	,96

a. Dependent variable: Share of SME in GDP

The provided analysis demonstrated that the independent variable Organizations with ICT Specialists makes high contribution to the SME development and profitability. All the rest variables used in the analysis, as well as excluded ones, showed insignificant contribution to the increase of SME share in GDP. Thus, our hypothesis that staff qualification in ICT is much more significant than such indicators as internet access, usage of digital tools etc. in the sustainable development of digital economy is proved.

Conclusion

Theoretical significance of the article is definition of main indicators of digital economy development in the context of COVID-19 in Kazakhstan. Accordingly, the practical implication of this study could be done through improvement of existing model of digitalization provision in the Republic of Kazakhstan.

Current research considered most common indicators of digitalization. Among them, there were defined two main factors, which have greater impact of the development of SME in the context of digital economy. However, Lack of ICT specialists has much greater negative impact on the management of businesses, therefore the second indicators as the usage of digitalization tools as iClouds etc., has insignificant impact. These two factors depend on each other. Due to the lack of specialists in ICT or personnel with appropriate ICT skills, the adoption of digital tools by SME is insufficient. Provided statistical analysis shows that in Kazakhstan there are few ICT specialists, which makes employing qualified ICT staff expensive. In the result, SME are left behind the adoption and usage of digital tools. Therefore application of digital artefacts as social networks or websites, platforms are the most popular among large, medium and small enterprises.

Government program “Digital Kazakhstan 2017-2020” was developed before the COVID-19. Consequently, it did not predict such conditions and rapid digitalization of all sectors of economy simultaneously. Therefore, the steps prescribed by the program were insufficient during pandemic, as many SMEs had to stop their functioning. Previously, introduction and application of digital tools were of higher priority in the implementation of “Digital Kazakhstan 2017-2020”. Today, much attention is directed at the training of current personnel and the program of training new specialists at higher educational institutions. Therefore educational programs of ICT specialists training, delivery of ICT subject in not specialist classes needs fundamental reconsideration.

According to the provided analysis of the indicators, it must be taken in to account, that plain

internet access or ICT tools usage does not make great contribution to the development of digital skills. Therefore, educational institutions must be equipped in accordance with the training programs, thus to be of higher quality and standards.

The coronavirus pandemic has given a powerful impetus to the massive adoption of digital technology in everyday life. It is evident that changes this trend will bring to the socio-economic system will be unparalleled.

Continuing social exclusion measures in much of the world have forced much of the world’s trade in goods and services to go online. In the near future, the world is expected to further explosive growth in the capitalization of online service providers amid falling positions of companies in the commodity industries. The consumption structure will change fundamentally. Much of the work and education will also go into the distance format.

On the one hand, these changes will make human life even more convenient. The wide horizons of human development will offer opportunities to provide oneself with the necessary necessities without leaving home, to use robotics to perform several “non-prestigious” or dangerous tasks. In order to obtain the necessary information about the main socio-economic trends, in the format of open data for the treatment of diseases and countering their spread with using remote communication technologies, the use of artificial intelligence and big data analysis.

The current COVID-19 crisis will herald one of the largest political and socioeconomic reforms in modern history. Digital technologies will play a leading role here, and almost no country in the world will be left on the sidelines.

Limitation of this study was lack of information. Another obstacle is that pure statistics does not give deep information about present day difficulties of SMEs conditioned to COVID-19. In order to provide a deeper analysis a survey or interview is recommended.

References

1. Eller R., Alford P., Kallmünzer A. Peters M. (2020) Antecedents, consequences, and challenges of small and medium-sized enterprise digitalization. *Journal of Business Research.* 112.. 119-127.
2. Godwin M., Mehmet K., Justus H. (2020) Digitalization and economic growth: A comparative analysis of Sub-Saharan Africa and OECD economies. *Telecommunications Policy.* 2020. 44.
3. KPMG: Impact of COVID-19 on the key economic sectors of Kazakhstan [Electronic resource]. – Mode of access: <https://home.kpmg/kz/ru/home/insights/2020/05/covid-key-economy-sectors.html>

(Retrieved from 01.08.2021)

4. Erkan, T.E., Rouyendegh, B.D. (2012). ERP business productivity evaluation by using multi-criteria decision making among end users in Turkish manufacturing Industry. 2nd World conference on Information Technology (WCIT-2011) AWER Procedia, 1, 245-249.
5. Strategy for Denmark's Growth. (2018). [Electronic resource]. – Mode of access: https://eng.em.dk/media/10566/digital-growth-strategy-report_uk_web-2.pdf (Retrieved from 25.06.2021)
6. Vial G. (2019) Understanding digital transformation: A review and a research agenda // The Journal of Strategic Information Systems, 28(2), 118–144.
7. Sebastian I., Ross J., Beath C., Mocker M., Moloney K., Fonstad N. (2017) How big old companies navigate digital transformation. MIS Quarterly. (2020), 16(3), 197–213.
8. Guo, H., Yang, Z., Huang, R., & Guo, A. (2020). The digitalization and public crisis responses of small and medium enterprises: Implications from a COVID-19 survey. Frontiers of Business Research in China, 14(1), 1-25.
9. Michaelidou N., Siamagka N. T., Christodoulides G. (2011) Usage, barriers and measurement of social media marketing: An exploratory investigation of small and medium B2B brands // Industrial Marketing Management (2020), 40(7), 1153–1159.
10. Peltier J. W., Schibrowsky J. A., Zhao Y. (2009). Understanding the antecedents to the adoption of crm technology by small retailers: Entrepreneurs vs owner-managers. International Small Business Journal, 307–336.
11. Eryeşil, K. (2021). Digital Leadership, Leadership Paradigm of the Digital Age: A Conceptual Framework. Equinox Journal of Economics Business and Political Studies, 8(1), 98-112.
12. Pan C. L., Lin J., Wang Y., Zhou Z., Mo Y. (2020) Bibliometric analysis of digitization business economy. Web of Conferences, 214, 3–16.
13. Şchiopu R. (2020) Proceedings of the 14th International Conference on Business Excellence. 385-397.
14. Acciarini, C., Borelli, F., Capo, F., Cappa, F., Sarrocco, C. (2021). Can digitalization favour the emergence of innovative and sustainable business models? A qualitative exploration in the automotive sector. Journal of Strategy and Management, 30(8), 143-1160.
15. Priyono, A., Moin, A., Putri, V. N. A. O. (2020). Identifying digital transformation paths in the business model of smes during the covid-19 pandemic // Journal of Open Innovation: Technology, Market, and Complexity, 6(4), 1–22.
16. Fletcher, G., Griffiths, M. (2020) Digital transformation during a lockdown. International journal of information management, 55.
17. Fitriyari, F. (2020) How do Small and Medium Enterprise (SME) survive the COVID-19 outbreak? Jurnal Inovasi Ekonomi, 5(02), 53–62.
18. Kane G., Palmer D., Phillips A. N., Kiron D., Buckley, N. (2015) Strategy, not technology, drives digital transformation. MIT Sloan Management Review, 6.
19. Nambisana S., Wright M., Feldman M. (2019) The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. Research Policy, 48(8).
20. Ministry of National Economy of the Republic of Kazakhstan Committee on Statistics Kazakhstan [Electronic resource]. – Mode of access: <https://stat.gov.kz/> (Retrieved from 10.07.2021)

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