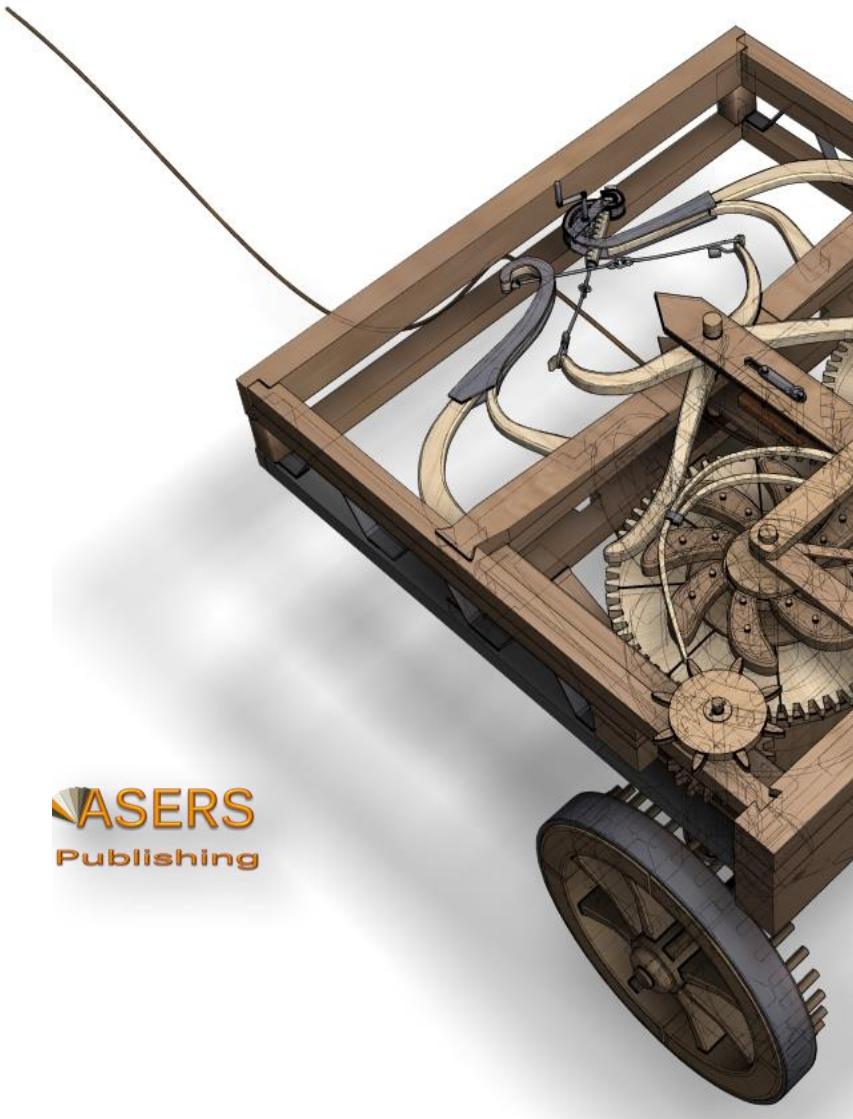
Theoretical and Practical Research in Economic Fields



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Theoretical and Practical Research in Economic Fields

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The Impact of the Pandemic on the Economic Development about Small and Medium Sized Businesses

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Abstract: The article substantiates the use of a systems approach to the processes about business model switching in small businesses, as this approach was not previously demanded before the pandemic. In this regard, it is concluded that the study of strategic shifts made by small businesses in different segments of the economy is an important new stage in the development of the systems approach.
This paper proposes adapting the matrix approach to distinguish crisis states for small businesses according to the properties of their business models: divergent to crisis; crisis-resistant; adaptive; temporarily limited; externally supported; true bankruptcy.
A standardized decision-making procedure for digitalization has been developed, and the challenges that small businesses need to address when choosing a digitalization scenario as the minimum necessary sequence of actions, each element of which is necessary to realize the digital transition, have been identified.
Keywords: pandemic; COVID-19; matrix; small and medium businesses; crisis; economics management.
JEL Classification: E21; E25; E27; E16; E44; E64; E65; F13.

Introduction

The world is unlikely to emerge from the COVID-19 crisis unscathed. The consequences of this crisis are likely to be nothing like what the world has seen so far, given the strength and speed with which the coronavirus has spread everywhere. Under these circumstances, businesses, especially small businesses, should consider possible forms of predicting the economic impact of the pandemic.

The first effects of the pandemic were a sharp drop in both aggregate demand and supply. The widespread closures of businesses to combat the pandemic led to a decline in aggregate supply, while the decline in consumption and investment led to a decline in demand. The search for forms of forecasting relies on selecting a model and approach in general that will predict the effects of the pandemic on small businesses. A common small business problem is that some small business owners are at risk of going out of business because of a failure to prepare for a crisis. Particular problems are that a number of entrepreneurs lack adequate crisis management strategies to survive unexpected constraints on operations.

Traditionally, all institutions related to business support have focused on crisis prevention rather than on providing crisis response strategies. Raising small business owners' awareness of the economic risks associated with the lack of crisis management strategies is a starting point for improving business practices.

Let us agree that uncertainty persists for a long time, and the full impact of a pandemic on business will not be definitively determined until after it is over[1].

Therefore, the first conclusion that is not in demand today is the requirement to study the dynamics in studies of the effects pandemic on small business: each new advance of the crisis must be accompanied by active studies of economic dynamics, and the findings must be accompanied by fairly private revisions and adjustments as a consequence of the findings.

It is intuitively obvious that the crisis not only forces many organizations to fight for survival, but also to look for alternative strategic paths. While, on the one hand, the pandemic posed enormous challenges to small businesses, on the other hand, it also required a new search, giving businesses the opportunity to identify new models that will allow them to survive the crisis. In general, the systemic crisis management model includes a crisis management model, crisis management planning, contingency planning, and business continuity planning, which enhances the survival of small businesses[2].

In connection with the above, the authors hypothesize that businesses need to form the ability to switch business models within a single enterprise (or group) without liquidation (in any form) within the framework of systemic views.

Such a "switch", according to the authors, can be justified only within the framework of the system approach, ensuring sustainable development in times of crisis (Fig.1). As part of the idea of implementing the "switch" two possibilities, based on different theoretical foundations, should be considered:

- crisis management theory,
- the theory of crisis intervention.

Figure 1. Crisis management stages

Figure 2. Crisis intervention models to help maximize mental stability during a crisis

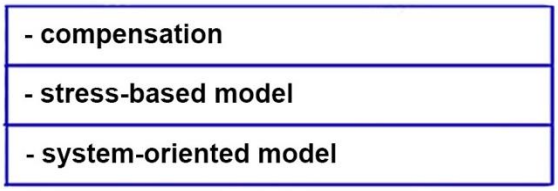
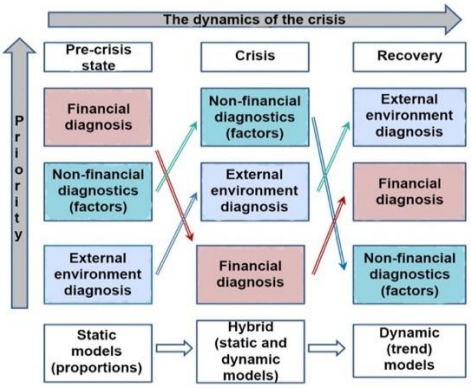


Figure 3. Matrix for the application of different SME diagnostic models during different periods of crisis



[1] Seetharaman P. Business models shifts: Impact of Covid-19 // International Journal of Information Management, 2020, vol. 54, no. 102173.

[2] Braun B. Preparedness, crisis management and policy change: The Euro area at the critical juncture of 2008-2013 // The British Journal of Politics & International Relations, 2015, vol. 17, pp. 419-441.

A system-oriented model can help identify social factors to predict people's reactions. Entrepreneurs can use compensation, stress-oriented, and systems-oriented models to establish a discernible onset of a crisis, figure out whether the crisis is situational or developmental, understand the perceptions of the people involved, minimize future vulnerabilities, and determine a time frame for response (Fig.2).

Such learning must consider internal factors: business boundaries, communications, processes, goals and values that change during a crisis as well (Fig 3.).

1. Research Methodology

The economy is considered from the position of system solutions as a set of socio-economic systems, *i.e.*, isolated in time and space relatively stable and holistic parts of the surrounding world, which are distinguished by the observer by spatial or functional features. Such a vision allows us to establish the possibility of identifying sustainable parts of the economy during a crisis in unity with the problematic ones and propose an algorithm based on structural shifts to increase the survival of small business.

However, from 2003 to 2013, developing crisis strategies for small business owners was not a priority, which led to significant losses when the pandemic struck. Without crisis management strategies in small firms, the risk of significant financial loss or business closure is higher when an external shock manifest itself.

A systematic approach to enhancing survivability in crisis situations manifests itself in the following:

- exploring one's own capabilities to examine the impact of standardized processes and practices in small businesses;
- exploring renewal opportunities to change or create processes, products, or services to increase the likelihood of survival;
- partnering to survive an operational crisis by providing expanded control over products, information, and cash, moving between suppliers, manufacturers, and retailers to customers;
- understanding the added value of small businesses to minimize risk when providing technology services.

An important role in crisis management during a pandemic is to understand the need for systemic (system-forming) resources. For example, platforms became such a resource in commerce, while, say, in tourism, restaurant business, hotel business such resources have not been established (despite an attempt to identify them - ring flights, cruise ship ring routes, delivery of ready-made lunches and dinners, including serving, provision of rooms and services by hotels for remote work). Confirming the hypothesis put forward about the need to create conditions for switching business models, it should be understood that system resources must have substitutability and replenish ability, and in this case in the pandemic there were few examples where system resources could be replenished, *i.e.*, the entire economic system worked for consumption, waiting for the end, not for replenishment. The only resource that was being replenished was the digital environment - everything related to data and its processing. And it was digital solutions that made it possible to put forward the thesis of switching business models instead of bankrupting enterprises. Information on auditing, organizational structure, team design, and training capabilities will undoubtedly be needed for such a switch.

2. Analysis

In strategic analysis, since the 60s of the last century, such tools as matrices have been widely developed to systematize management information. Widely known are the matrices BCG, GE, SWOT, SNW and many others. Matrices in management are a two-scale systematization, which makes it possible to distinguish certain quadrants on a graph, united by two properties. Attempts to make three-dimensional matrices (*i.e.*, consisting of cubes rather than quadrants) are known in the literature, but they have not become widespread due to perceptual complexity. Table 1 presents one of the successful classifications of matrix tools, which the authors supplemented with comments on the applicability of these matrices in small business, based on the universality and possibility to take into account the features of small business.

Table 1. Matrix toolkit in small business operations

№	Level	Matrix name	Description	Eligibility for small businesses
1	Vision of the organisation	SWOT matrix	Analysis of the company's strengths, opportunities and threats	YES
2		MCC matrix	Analysis of the relevance of the company's mission to its core capabilities	YES
3		Matrix of the economic development vector of a company	Analysis of static data	Limited
4	Market	BCG Matrix	Analysis of growth rates and market share	Limited
5		GE Matrix	Analysis of comparative market attractiveness and competitiveness	No
6		ADL Matrix	Industry life cycle and relative market position analysis	YES
7		Hofer/Schendel matrix	Analysis of industry position among competitors and stage of market development	YES
8		Ansoff Matrix ("market-product")	Market and product strategy analysis	YES
9		Porter matrix (five competitive forces)	Strategic business opportunities	Limited
10		Market elasticity matrix of competitive response	Analysis of firm action on product competitiveness factors depending on elasticity of priority competitor's product response	YES
11		Product grouping matrix	Product grouping analysis	No
12		Impact Uncertainty Matrix	Exposure and non-exposure analysis when entering a new market	Yes
13	**Industry**	Cooper matrix	Industry attractiveness and business strength analysis	Limited
14		Shell/DPM Matrix	Analysis of attractiveness of resource-intensive industry as a function of competitiveness	Yes
15		Matrix of strategies for businesses in decline	Analysis of competitive advantage in the industry environment	Yes
16		Matrix of the main forms of alliances	Industry environment alliance analysis	No
17	**Target segment**	Matrix of competitive position improvements	Analysis of market differentiation and penetration	Limited
18		Matrix "Relative Cost Efficiency Differential"	Analysis of differentiation and relative cost efficiency	Limited
19		Matrix "Productivity-Innovation/ Differentiation	Innovation / differentiation and productivity analysis	Limited
20	**Quality**	Price/Quality Matrix	Product positioning in terms of quality and price	Yes
21		Quality-Resource Intensity Matrix	Analysis of quality versus capacity	Yes
22	**Marketing**	Matrix for brand family expansion strategy	Analysis of distinctive advantage and market segmentation	Limited

23		Awareness - attitude towards the product brand" matrix	Analysis of the relationship between gross profit margin and sales response	Yes
24		Matrix of marketing channels	Analysis of the correlation between the rate of market development and the value added by the channel	Yes
25		Matrix "Contact - level of service adaptation	Analysis of the relationship between the level of customisation of services and the degree of customer contact	Yes
26		Marketing Diagnostic Matrix	Analysis of strategy implementation dependency	Limited
27	Management	Matrix of modes of strategic management	Analysis of dependency of strategy and planning impact	No
28		Matrix of the strategic management model	Analysis of dependency of management model on the type of change	No
29		Hersey-Blanchard matrix	Analysis of situational leadership model	Yes
30		Matrix "Ohio University Leadership Style Dimensionality Combinations"	Analyzing combinations of leadership style dimensions	Limited
31		Management grid matrix	Analysis of leadership types	Limited
32	Personnel	Change-Resistance Matrix	Analyzing the relationship and resilience to change within the organization	Limited
33		Matrix of Payment Influence on Group Relationships	Analyzing the relationship between group relations and pay differentials	Yes
34		Matrix of types of inclusion of the worker in the group	Analysis of the relationship between attitudes to organisational values and attitudes to organisational norms	Yes
35		Core Business Skills Matrix	Market and core business capability analysis	Yes
36		Job Importance Matrix	Job Importance Dependency Analysis	Limited
37		Matrix of existing formal systems of performance criteria	Analysis of existing formal quality performance criteria systems	Limited
38		Matrix of performance management results	Analysis of performance management results	Limited
39		Blake-Moughton Matrix	Analysis of job performance as a function of the number of people and the number of tasks	Yes
40		Mac-Donald Matrix	Performance analysis	Limited

Source: compiled by the author, based on Matrix Methods of Strategic Analysis/Classification and Implementation.

Having analyzed the above matrix, we concluded that structurally, the matrix should be presented in two coordinates - the stage of crisis and the state of the small enterprise (3x3), as shown in Figure 4.

Figure 4. 3x3 matrix format for strategy selection in a crisis situation

Stages of crisis/small business condition	Sustainable	Threatened	Close to bankruptcy
Pre-crisis	1	2	3
Acute crisis	4	5	6
Recovery	7	8	9

Accordingly, if after the diagnostics we can place the results of enterprise diagnostics in one of the quadrants, then we should also give some recommendations: what strategies to choose in each quadrant.

However, as it was repeatedly noted in the previous paragraphs of the thesis, small business depends to a large extent on the external environment. This allows us to make an addition in the form of a macroeconomic indicator - the GDP growth rate, dividing the growth rate also into three stages (it should be noted that this is done conditionally for this study, in a practical study this number of stages can be increased or decreased - for example, the fall or growth of GDP).

According to the authors, the study of the dynamics of cash flow makes it possible to establish the presence of problems in a small enterprise.

Undoubtedly, we should not refuse the traditional coefficient analysis either, revealing those coefficient ratios which adequately describe this or that type of activity (Fig. 5), supplemented with the state "no crisis". The adapted vertical part of the matrix during a pandemic is more appropriately presented in the following form (Fig. 6), although consciously assuming the error that it is applicable only to the business whose condition was stable before the crisis. Undoubtedly, if we strive for universality, we can increase the number of gradations by adding the state of small business before the pandemic (Fig. 7).

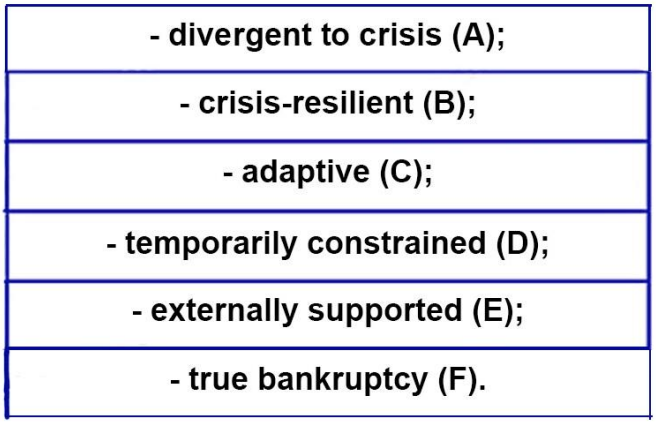
Figure 5. Ratios of coefficients for different crisis stages

Ratio of ratios	Stages of crisis
Return on equity (Net profit / Equity) ≥ 25%	No crisis (0)
Own working capital ratio (Own working capital / Working capital) ≥ 0.2	
Financial leverage (Borrowings / Equity) < 0.7	
Asset turnover (Revenue / Assets) ≥ 25%	
Return on equity (Net income / Equity) ≤ 5% or losses	Pre-crisis (1)
Own working capital ratio (Own working capital / Working capital) ≤ 0.1 or there is no own working capital	
Financial leverage (Borrowed capital / Own capital) ≥ 0.7	
Asset turnover (Revenue / Assets) ≤ 5%	
Return on equity (Net income / Equity) not available due to losses	Acute crisis (2)
Own working capital ratio (Own working capital / Working capital) < 0 or no own working capital	
Financial leverage (Borrowed capital / Equity) ≥ 0.7	
Asset turnover (Revenue / Assets) ≤ 2%	
Return on equity (Net income / Equity) > 0	Recovery (3)
Working capital adequacy ratio (Working capital / Working capital) > 0 and ≤ 0.1	
Financial leverage (Borrowings / Equity) ≥ 0.7	
Asset turnover (Revenue / Assets) ≤ 2%	

Figure 6. Types of small business condition before and after the crisis (pandemic conditions)

State before the external crisis	State during the crisis
Normal, functional	Regular
	Pre-crisis
Presence of problems	Pre-crisis
	Acute crisis
Threat of bankruptcy	Acute crisis
	Liquidation
Recovery	

Figure 7. Number of gradations on the horizontal axis [3]



Divergent to the Crisis. N. Taleb [4] used the concept of anti-fragility specifically for such business models. Such businesses grow returns (sales and profitability) on invested capital. Indeed, certain types of business improve under stress and realize their opportunities more effectively in an external crisis situation. For the current pandemic crisis, Internet commerce, shipping, non-pandemic drug manufacturers, Internet services, computer games, etc. proved to be anti-fragile. A number of business opportunities that had been criticized as difficult and unproductive turned out to be important after the onset. These opportunities turned out to include overstocking in warehouses, technological leadership, availability of alternative suppliers in global supply network, the presence of several channels to consumers, etc. Examples of the seemingly obvious divergent behavior, but did not take advantage of this opportunity, was the small private medical business, especially in the second wave of the pandemic.

Accordingly, the assignment of small businesses to this category can be carried out either only during the crisis as a fact, or by modeling threats and assessing the dynamics of the business model. It should be noted that this gradation does not stem entirely from the entrepreneur's internal decisions, but largely depends on the favorable environment and the business' choice of this environment before the crisis.

Crisis-resistant. Such models can be described as being able to remain in working order (without changing the business model) during external crisis problems in time of crisis. Such small enterprises include enterprises of food industry, housing and utilities sector. As a rule, in such situations the volume of sales changes (both in the direction of growth and decline), but the interaction itself remains unchanged. Among the "growing" areas we can include information technology (for example, the record revenue growth of Zoom, which provides video conferencing services), the sales volume of which is unlikely to grow during the recovery phase, logistics, for which the growth of the volume of supply, caused more problems than a significant increase in profitability.

Cab services have experienced a drop in sales, but by expanding functional solutions (delivery), most aggregators manage to maintain their business model.

Various stress tests could be recommended to assess the resilience of such businesses, allowing to assess the margin of resilience and the limits within which the business should not spend resources to change the business model.

Adaptable to crises. A number of businesses needed to adapt their business models. Adaptation may have involved switching to remote services, replacing sales of goods with services (for example, instead of selling a self-test, a service to administer the test and receive the results), reducing the product line, and changing the way services and production are provided due to viral safety and quarantine requirements. Such businesses include government services, education, production of protective equipment (production of masks, production of nitrile gloves). Adaptation of such business models turns out to be expensive and intensive, but the results of such adaptation lead to the possibility of faster recovery and growth of operational efficiency in the post-pandemic period, which, incidentally, was demonstrated by the recovery period after the first wave.

Temporarily limited. The choice between trying to maintain operations in a pandemic or temporarily suspending them with the intention of resuming a crisis is one of the most difficult. The decision to close is made under the pressure of external circumstances. These types of businesses find themselves in the most difficult

[3] Ritter T., Pedersen C.L. Analyzing the impact of the coronavirus crisis on business models // Industrial Marketing Management, 2020, vol. 88, pp. 214-224.
[4] Taleb N.N. Antifragility How to Profit from Chaos. M.: KoLibri, Azbuka-Atticus, 2014.

situation, especially if economic conditions are recovering on a "W" rather than a "V" basis. The second wave of the crisis can significantly reduce the resources of small businesses, not allowing a second recovery. Such types should include the tourist segment, the hotel sector, the theater arts, in part fitness clubs and similar activities. But the suspension also occurred in manufacturing: cars, home appliances, etc. The key argument for such businesses is the statement that it is better to suspend a business than to bring a business to bankruptcy and start a new one while trying to maintain operations. Given that the second wave is accompanied by an investment boom, it is advisable to invest the freed funds during the second wave. The argument against is uncertainty - no one can predict when the pandemic will end and the number of waves.

Externally Supported. Businesses are not able to meet the needs of external financing and depend on external support. In turn, external support largely depends on the social orientation of the business. Of course, there is a discussion in society about the choice between direct support of the population and support for businesses that provide necessary services to the population or do not lay off their employees. Governments offer support programs to reduce vulnerability, investors offer financing for their firms, and banks form various payment vacation programs. Like temporarily restricted businesses, the key assumption here is that the business will be successful after the crisis and that external assistance is justified relative to the alternatives (e.g., unemployment, social instability, unavailability of services, crisis, loss of investment, non-repayment of loans, etc.).

True bankruptcy. This type of business ceases to exist during a crisis because the cost of getting the business through the crisis exceeds the possible profitability after the crisis. In these situations, it makes more sense to go out of business. During the crisis the business idea may finally become obsolete after the crisis, or the chosen area may become uninteresting for entrepreneurship (for example, the elimination of small stores after the sale of pre-crisis inventory).

Figure 8. Summary matrix for management decisions in crisis management of small businesses

State before the external crisis	State in times of crisis	GDP fall (Gross Domestic Product)(1) / GDP growth (Gross Domestic Product)(2)					
		Divergent to crisis (A)	Crisis resilient (B)	Adaptive (C)	Temporarily constrained (D)	Externally supported (E)	True bankruptcy(F)
Normal, functional (N)	Regular (N)			1			
	Pre-crisis (P)			2			
Existence of problems (R)	Acute crisis (C)				3		
	Acute crisis second wave (V)				4	5	
Threat of bankruptcy (F)	Liquidation (L)					6	7
	Recovery (W)						

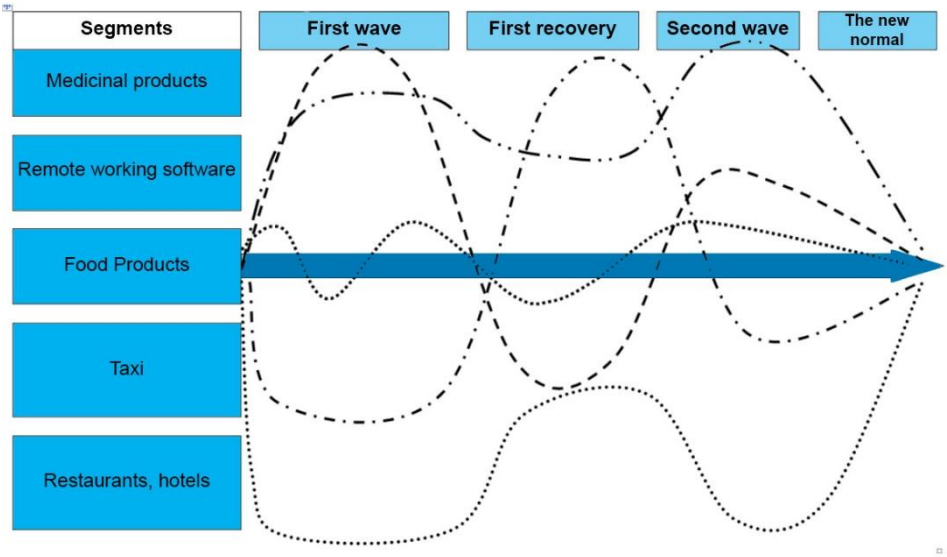
The final vision of the management decision matrix is shown in Fig. 8, which also demonstrates a possible scenario for an adaptive business (1,2,3,4,5,6,7 - results of periodic diagnostics). Possible scenarios and management recommendations will be discussed in the next paragraph.

Figure 9. Choice of actions by pandemic crisis stage

	First wave	First recovery	Second wave	A new normal
Target	Retention of staff, retention of operations	Return of profit	Downsizing	Follow the pre-crisis strategy
Consumers	Preservation of service	Retention of crisis clients	...	...
Value creation	Postpone projects, continue digitalisation	Develop new technologies	Stop innovative projects	Combine digitalisation and pre-crisis strategy
Value proposition	Focus on internal sales	...	Service contracts	Growth of virtual interaction
Opportunit	E-commerce	...	...	Factories of the future

But the selected actions are not enough to form scenarios. To do this, we need to look at the dynamics of the crisis, which is shown in Fig. 10.

Figure 10. Evolution of the crisis by segment



Further we systematize possible actions in scenarios of anti-crisis behavior according to Fig. 9 and in accordance with the assumptions adopted in S. Torgren and T.A. Williams:

1. Postponement of investments.
2. Fire some of the full-time employees.
3. Expect extra pay for work from the government.
4. Reduce payroll costs for full-time employees.
5. Stop paying freelance workers.
6. Reduce any costs.
7. Negotiate contracts already agreed upon.
8. Control stock reduction.
9. Continue revenue-oriented activities.
10. Continue survival-oriented activities.
11. Reduce innovation activities.
12. Attract loans.
13. Ask for deferral of loans.
14. Termination of activity.

Undoubtedly, for practical application, the above list should be specified and detailed, but attention should be paid to the refusal of excessive detailing, which will lead to the impossibility of choosing the scenario. In other words, a certain generalization should also be inherent in the practical formation of a set of actions.

In forming a scenario, it is quite common to give preference to the worst- and best-case scenarios, assembling the final scenario as something in between the two options.

The problem is that, in fact, one tends to see only one scenario and is more likely to choose the option closer to a favorable development of events and reject the worst-case scenario as too bad even to consider.

This approach will lead to the fact that the consideration of scenarios will be shifted in the direction of the optimistic option (more often) or pessimistic (less often). But the future is described not only by one uncertainty, and there is a high probability that there are several such uncertainties. Therefore, the dominant approach in scenario analysis is more effective - the use of a scenario cross, which with the help of two uncertainties forms four variants of events.

But the objection that there are more than two uncertainties is objective, and that such an approach would also have lacunas. Using more than four scenarios raises the possibility of failing to distinguish between different options. Therefore, it is suggested that in order to select the two most important uncertainties, a hierarchy of such uncertainties should be constructed, from which the two most significant uncertainties should be selected. To construct a hierarchy of uncertainties it is possible to use any of the known methods of constructing an objective tree.

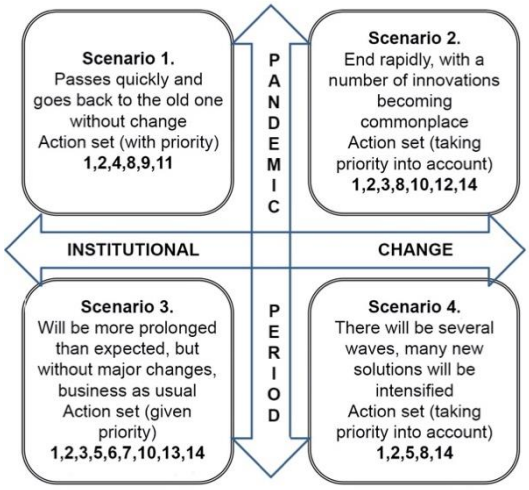
In our case, we chose two uncertainties to construct a scenario cross:

1) how long will the pandemic last? (Fast, within the expected output, or very long with seasonal flare-ups);

2) will changes in business models and state behavior be institutionalized? (Everything will return to its previous conditions, or many changes will become a habitual way of life).

It is necessary to pay attention to the fact that the scenario cross is also not a tool which fixes the logic of events one-step and for the whole period until the end of uncertainty. Obviously, the scenario cross of the first wave differs from the second wave. And the example below (Fig. 11) refers to the scenario cross of the second wave of the epidemic. For example, if the second wave in the scenario cross of the spring period was uncertainty, then already in the fall, the third and fourth waves, as well as seasonal outbreaks become a probabilistic event, which requires reflection within the scenario or scenarios, but not to form an independent scenario.

Figure 11. Scenario cross of a possible presentation for pandemic crisis



Thus, Fig. 11 shows two uncertainties - the first (vertical axis) is the pandemic continuation period (short or long), with the short one during the second wave defined just over a year - spring 2021, the long one was defined over 2 - years - spring 2022 with seasonal outbreaks up to 5 years - until 2025. The pessimism of the latter scenario is due to the speed of vaccine development and the beginning of mass production, as well as information about the mutation of the coronavirus.

The second uncertainty in Figure 11 (horizontal axis) is related to the uncertainty of society's perception of the results of the pandemic, from the fact that everything will return to claims that the world will never be the same. Such changes cannot be determined with the probability of events occurring, as what changes society will accept can only be reasoned at the level of futurism, especially since three other uncertainties are superimposed on the horizontal axis - digitalization and quantum research, globalization and regionalization, ecology and industrial production. Therefore, we retain this particular choice on the axis: the transformation of society and business in a coronavirus story. It should be noted that a possible alternative to this axis is state financial support for small business, but we believe that state financial support is just one of those solutions that may or may not be institutionalized.

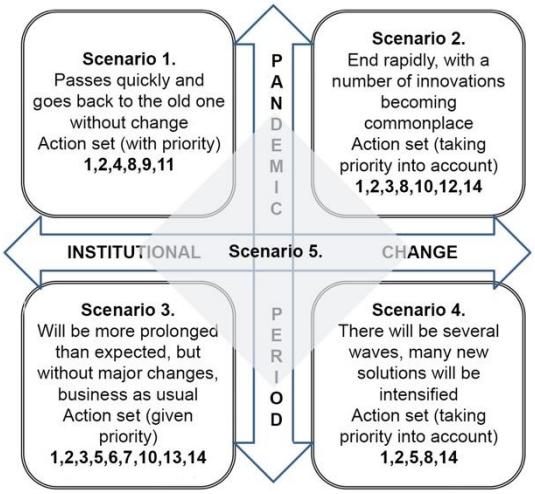
As a result, we can distinguish four segments, each of which will correspond to a scenario. Theoretically, there could be a fifth scenario - at the intersection of the axes, but it is usually not considered, considering it either a compromise or not reflecting the dynamics of the axes (Fig. 12).

Scenario 1 assumes that society will not perceive coronavirus constraints, and, after a fairly short period, the weight of social economic relations will return to the January 2020 period, except for digital solutions, which have simply been accelerated in their development (covariate development). Such a scenario would be in line with the strategy of "concentrating on what is available.

Scenario 2 also assumes a rapid end (at the time of the first wave 2-3 months, at the time of the second wave just over a year) of coronavirus pressure on business but considers that during the crisis there were progressive solutions that should provide new opportunities during the recovery and the formation of a new reality. These innovations are indeed related to progress rather than a consequence of coronavirus constraints, but because they have withstood pandemic testing, the range of resilience of businesses using such solutions is

expanding. Notwithstanding the above, this scenario already assumes decisions to go out of business, to cease operations. Such a scenario would be consistent with a "deferred growth" strategy.

Figure 12. Scenario cross, assuming a fifth scenario



Scenario 3, in fact, focuses on the threat of a lasting pandemic impact, but again counts on the fact that resistance to pandemic change will be built up in society. As a result, the threats will increase for those businesses that are heavily pandemic-oriented. This scenario would be consistent with an "asset reduction" strategy.

Scenario 4, the most pessimistic of the presented scenarios, believes that the duration of the pandemic will be long, that there will be several waves with their own characteristics, that society will endure new relations in almost all spheres, and its result will require significant renewal of many types of business, making the threat of bankruptcy of many small enterprises imminent. Such a scenario would be consistent with a "development or exit" strategy.

Scenario 5 assumes that it will be formed as compensations for deviations from pre-crisis business development, and will try to take into account the realities of each of the scenarios. This is the most complex version of the scenario and can only be formed after the first four scenarios have been worked out. Such a scenario would be consistent with the "increase in market share - growth" strategy.

A set of four (or five) alternative scenarios serves as a simple tool for small business to find a way out of the crisis and successfully interact.

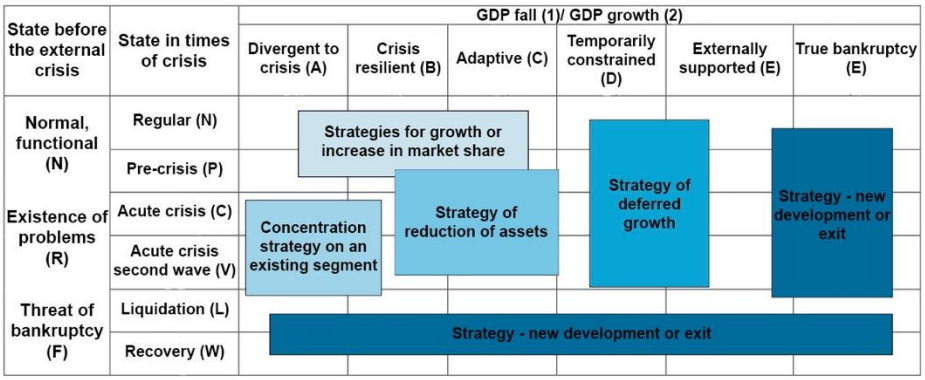
The formation of scenarios and corresponding strategies is aimed at renewing the business in the long term after the crisis, while maintaining control over the current situation, taking into account the requirements of rapid response.

Small enterprises, unfortunately, do not have sufficient resources for strategic development, especially in times of crisis, when it is a question of survival. Therefore, decisions about alternative ways out of the crisis or innovative solutions are quite risky and require time, which is often simply not available.

The strategies shown in Fig. 13 in practical activities require adaptation, and they determine the direction of development rather than specific actions.

The goal of a growth strategy is to maintain sustainability in fast-growing segments of markets. In the initial stages of the pandemic, these segments grew very rapidly, and to keep up requires significant resources and strengthening the position of a particular type of business before the displacement stage (recovery wave) occurs. One of the problems with this strategy is that the resources spent may not ensure a sustainable position (e.g., the development of additional mask manufacturing facilities). The situation is similar to increasing market share. The implementation of this strategy requires large investments: it is necessary to increase sales volume, at least according to the growth rate of the market. Significant increases in market share usually culminate in horizontal mergers (as observed in the first recovery in the restaurant business). In the displacement stage, growth in market share can be achieved through features of the product itself, market segmentation, pricing, improved service or improved distribution efficiency.

Figure 13. Matrix of strategies for small businesses during a pandemic



Strategies involve getting as much cash as possible in the process of leaving the business (gradual or rapid) the business, understanding that it is not profitable to try to maintain a weak position in an unattractive market. Even if leaving the business would benefit competitors, it is better to leave that market and focus resources on developing other opportunities, during the recovery period. Such strategies should be employed when the business in question still has some value and is somehow attractive. Unfortunately, the available strategies and scenarios do not answer the question of choosing a new one, which requires further research.

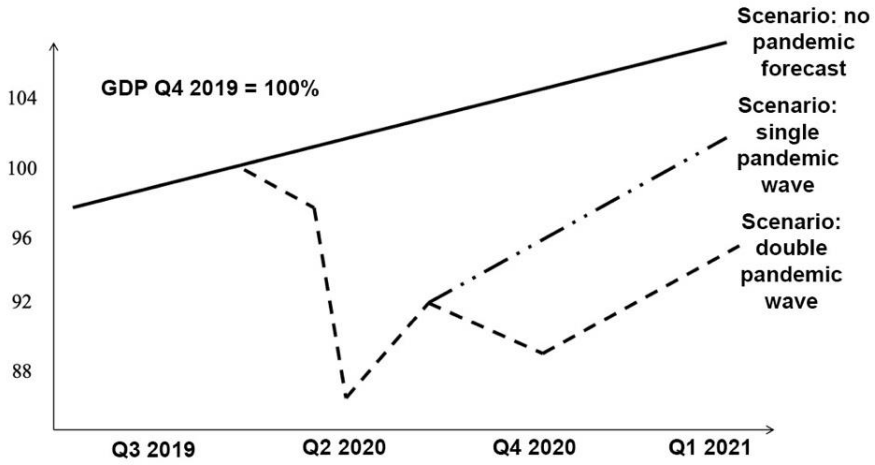
Long-term thinking and scenario development are really difficult in times of crisis. With the help of alternative scenarios and the choice of appropriate strategies with a perspective beyond the long term, entrepreneurs have received support and assistance on how to survive and emerge from the crisis, as well as benefit from the actions applied in times of acute crisis.

Scenarios are usually long-term tools for business development and creating flexibility and sustainability. In this case, we applied the scenario approach to short-term goals as well, to find a way out of a crisis situation. Scenarios are useful tools for innovation and business community anywhere, but in these difficult times, they open the mindset to positive and offensive action instead of defensive, threat-based behavior.

3. Implementing Crisis Management in the Aftermath of a Pandemic as a Shock and Re-Shock to Scarce Business

The pandemic, which continued throughout 2020, had a different impact on the socio-economic level of countries' development, putting negative dynamics of key macroeconomic indicators in front of everyone in approximately the same way. Moreover, like any crisis, the pandemic not only made a certain completed circle in its manifestation of crisis, but also with a new force began to move in a second wave, raising the obvious in this case predictions of a possible third wave and even the uninterrupted first wave, which only strengthened its effect These different positions are based on traditional ideas about the evolution of crises, so further we will not dwell on a specific point of view regarding the order number of the pandemic wave, but focus on the directions of

Figure 13. Forecast of global economic development and recovery in the post-pandemic period, %



But economic recovery takes place between the first and second waves of the pandemic, as noted by analysts at the World Bank, the OECD, and respected international agencies. This recovery can be represented in the shape

of the letter "V" (as opposed to a longer recovery in the shape of the letter "U"), so it is fair to say that the crisis is spontaneous[5], and states have mostly made the right decisions on anti-crisis regulation.

However, considering the fact that, according to the OECD forecasts, the world economy is unlikely to recover to pre-crisis levels before 2022.

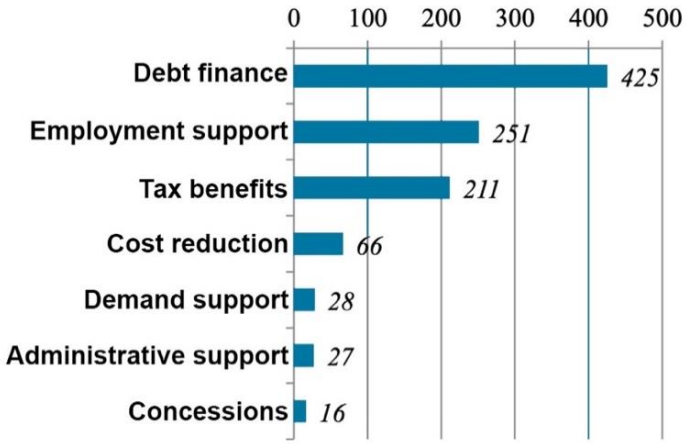
At present researchers unambiguously fix the end of the positive trend of development of the world economy, which lasted during the pre-pandemic period, and depending on the number and pandemic wave amplitudes predict different scenarios for economic recovery in terms of time and effect.

Undoubtedly, the crisis caused by the pandemic is unparalleled in recent history, but its effect on the economy is complex and consists of the interdependent influence of the determinants, which form the characteristics of the impact of the pandemic on the functioning of the economy as a whole and, accordingly, have an impact on small business.

If we go deeper into the determinants of demand, the main effect of the pandemic crisis should be considered a general decline in income and purchasing activity. Therefore, most of the decisions and measures taken by governments of the countries were discussed and taken regarding the so-called "helicopter money", *i.e.*, financing the expenditures of the population when the income fell due to the lockdown - thus a successful attempt to activate economic activity is made. In general, in this aspect, it should be noted that the International Monetary Fund recommends that all countries consider anti-crisis measures (in fact, this is government spending) precisely for the purpose of increasing aggregate demand[6].

In general, the governments of countries, considering the rate of spread of the disease and the negative effects on the economy, decide on some or other measures to support citizens and businesses in the pandemic.

Figure 14. Ranking of types of small business support by number of instruments used, units



In general, some typical, optimal and balanced package of anti-crisis measures (without regard to the economic capabilities of a particular state) to support business includes the following measures:

- state financial and non-financial support to business through the use of monetary and tax mechanisms (limitation - the capacity of the budget and fiscal policy of the state), while full compensation is unacceptable;
- support of employment, payment of wages through the mechanism of subsidizing the minimum wage
- restructuring of part of the fixed and variable costs of business in terms of tax, credit, rent, utility payments;
- issuing direct loans to SMEs through state institutions, providing grants and subsidies to SMEs;
- development of the public procurement system to support the entrepreneurial sector, including through increased participation of small businesses, continued implementation of national development projects and important investment projects aimed at creating conditions for business development;
- introduction, expansion or simplification of credit guarantees to increase the ability of commercial banks to lend to SMEs;
- correct selection of the most affected sectors and development of non-typical measures to facilitate or restore business, considering the problems of organizing sales, increasing employment, and changing business processes

[5] Buklemishev O. Coronavirus crisis and its effects on the economy // Population and Economics, 2020, vol. 4, no. 2, pp. 13-17.

[6] IMF. Economic Policies for the COVID-19. War. URL: https://blogs.imf.org/2020/04/01/economic-policies-for-the-covid-19-war/.

- reduction of administrative barriers and consulting support for business adaptation to the new economic realities.

If we rank the most common anti-crisis measures of support to small businesses in the world as a whole, the leading one is debt financing (Fig. 14, 15).

4. Implementation of Digital and Cognitive Technologies in a Crisis Management Model

Analyzing the conclusions of these authors, we believe that new methods, including digital transformation and new techniques of cognitive management, should be introduced into the practice of anti-crisis survival.

Nevertheless, it should be understood that digital transformation is still not an ideal process, and in its implementation in the activities of the enterprise (including small businesses) it overcomes significant difficulties.

Figure 15. Main challenges in the impact of the digital economy on small businesses

- threats of cyber-attacks. Information not only provides opportunities for communication and credible decision-making, but also creates opportunities for the manipulation of the information consumer
- financial and business risks. The decision to change business processes in favour of digital solutions requires additional costs. In addition, the decisions made may not lead to the expected results, which already entails entrepreneurial risks
- job losses. Digital solutions often lead to a higher risk of employee layoffs
- barriers in the digitalisation of business prevent small businesses from being aware of business support and from being heard and supported

The four main problems stated above in the area of the impact of digitalization on small businesses can be reasonably reduced to two, in the context of this study: 1) financial relationships and 2) a high degree of uncertainty, which is determined by the low (insufficient) level of digital competence of employees engaged in small business.

One of the obstacles to the transformation of the business model (Fig. 16) is the lack of convergent perception of environmental change by managers. However, the COVID-19 pandemic has led almost everyone to believe that dramatic and significant changes have indeed occurred in the business environment, with most researchers confident that these changes will not only occur during the pandemic, but will also persist into the post-pandemic period.

Figure 16. Opportunities for digitalization of different groups of business processes in small businesses

Business process groups	Digital tools (systems, products, software solutions)
Objective №1. Establish closer relationships with suppli ers and customers	
Interaction with suppliers	SCM (Supply Chain Management) systems
Interaction with customers	CRM (Customer Relationships management) systems
Task №2. Increase the level of your own operational efficiency	
Resource management	ERP (Enterprise Resources Planning)
Business process management	BPM (Business Process Management) systems
Analytical component management (data analysis)	Big Data, Data mining, OLAP-cube, cloud computing, Google Analytics, etc.
Providing company's employees with up-to-date technology to effectively execute daily tasks.	Office 365 Google doc, use of CRM system, dashboards to evaluate key metrics
Task №3. Improving the competitiveness of manufactured products	
Product management (control, storage and provision of necessary information)	Marketing activities, including: digital internet marketing tools
PLM (Product Lifecycle Management) and PDM (Product Data Management) systems, digital sensors, GIS-technologies, etc.	Use of google Analytics, Google Adwords tools; SEO and SMM

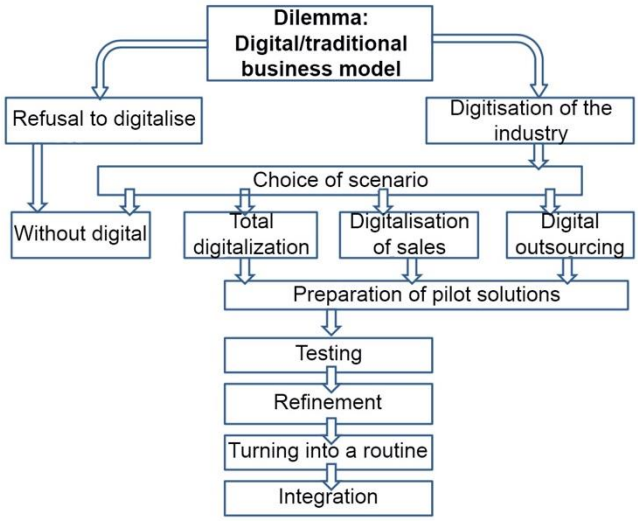
Requirements for speed of change rest on the hope that the long-term impact of pandemic

COVID-19 is still small and the post-pandemic opportunities will be even greater if firms can use digital technology during a pandemic.

Figure 17. Implementation of a four-phase model for digitalization activities for a small enterprise[7]

Phase 1: Experimentation as an understanding of the digitalisation opportunity; development of basic skills; setting up a pilot project; shaping the workspace;
Phase 2. Implementation, as development of the first product/service; resource mobilisation; fundraising; development of a release plan;
Phase 3. Expansion as more cases; release planning; building structure and teams; growth plan;
Phase 4: Optimisation as business practices as the new normal; setting financial targets and outcomes; normalising the data environment.

Figure 18. Decision-making about digitalization and standard stages given the choice of scenario



To meet the challenges of this article, the authors have developed a standardized decision-making procedure for digitalization and proposed recommended steps. This shows the challenges that small businesses need to address when choosing a digitalization scenario as the minimum necessary sequence of actions, each element of which is necessary to implement the digital transition.

Consequently, according to the authors, the sequence of tasks for small businesses to transition to digital solutions in a crisis situation contains:

- clarifying the ways and means of diffusion of digital innovation in the firm and the choice of a strategic scenario of digitalization;
- the search for available knowledge and the organization of training of specialists, including self-learning;
- changing the organizational structure and functions (auxiliary processes) that create the opportunity for subsequent digital projects;
- organizing sales in the digital environment (independently or on the basis of industry or universal integrators);
- managing access to various data sources, platforms, financial technologies and ecosystems, and managing resources;
- building a set of different digital technologies necessary for operations, taking into account their obsolescence and need for updating, as well as testing new available technologies;
- Increasing operational efficiency (in times of crisis, avoiding payment gaps);
- transition to a bespoke organization of activities (precisely in the crisis period), in the recovery period the development of the concept of everything as a service.

Let us further elaborate on these tasks more specifically.

To clarify the ways and means of diffusion of digital innovations in the firm and the choice of a strategic scenario of digitalization. First of all, it is necessary to form a digital vision of your own business in a digital format. The digital image of business does not allow for inviting outside consultants to form it, so to form it, it is necessary

[7] Demarest G., Scott J. Architect's Guide to Implementing a Digital Transformation. Springer, 2016.

to collect data on best practices. Once the vision of the digital future of the business has been established, a strategy for transition to such a state must be developed, based on consideration of the digitalization of functions (all or selected ones). This phase is considered complete when a project team is established to implement pilot solutions.

Search for available knowledge and organize training of specialists, including self-study. The project team must generate a list of available knowledge sources for digital transformation solutions and create a sense of urgency for the entire business for digital solutions. At the same time, an important task of this stage is to organize self-learning to reduce the time it takes to obtain digital solutions. Despite the common recommendation to bring in external specialists, the crisis requirements of rapid digital results require the use of internal resources.

Change the organizational structure and functions (supporting processes) that create the opportunity for subsequent digital projects. It is necessary to conduct a functional analysis of business processes, to consider the introduction of new functions in order to catch up with emerging digital technologies in business. This should exclude the creation of functions on the principles of "it should be" or "will be needed in the future", which will lead to unnecessary costs. The organizational structure should be changed (adjusted) according to the new set of functions. If the number of personnel is small, this part of the reform should be performed by the owner himself.

Organization of sales in the digital environment (independently or on the basis of industry or universal integrators). First of all, a selective implementation of digital technologies must be carried out: individual tasks, services, payments, etc. The next step is to redesign sales channels, combining these solutions with possible digital promotion in market segments. When selecting products or services for random testing, prioritize products/services suitable for digital marketing, which is established by analyzing best practices (and taking into account the region).

Managing access and necessary resources. In the digital economy, consumers are becoming the main resource, so it is necessary to understand exactly where customer data will be stored and who will have access to it. In addition, the simplification of sales processes leads to the possibility of the growth of spontaneous purchases that do not require complex actions or complex choices for the consumer, as very often the digital shopper is deterred by non-standard procedures. Great opportunities are contained in collaborations with partners that also promote small business sales, so affiliate networks become a powerful tool for digital promotion. Such solutions should also involve: building a portfolio of different digital and financial technologies; implementing your own online commerce platforms, engaging digital analytics data, and engaging consumers through social media.

Growth of operational efficiency (in the crisis period - avoiding gaps in payments). In order to achieve operational efficiency during the crisis, functional business models should be abandoned as much as possible and reoriented exclusively to product business models, including final services. The development of partnerships should be preserved only in promising value chains, taking into account the growth at the stage of economic recovery. A special place in this block is occupied by mastering new skills that lead to productivity growth.

The transition to a bespoke organization of activities (precisely in the crisis period), in the period of recovery the development of the concept of everything as a service. Fulfillment of large individual orders from industrial enterprises or state customer will provide financial stability. Therefore, the search for orders from a large customer becomes one of the tools for redesigning business processes, but it should be understood that such opportunities are limited. An important role here is played by sales managers in such segments, which allows to formulate ideas from partners, expanding the product portfolio. Thus, because of the increasing amount of customization of end products, it is advisable to use digital twins, developing a scalable solution for the use of resources, when the replacement of costly physical testing by the use of digital technology is everywhere, which makes this study practical significance.

Conclusion

Analysis of examples interconnectedness environmental indicators and threats to small businesses demonstrates that a holistic view of the situation, rather than individual private solutions, must be formed to adapt models of anti-crisis behavior. In general, to overcome uncertainty there is no possibility to make a single optimal choice, and multivariant strategies with the possibility of least-cost switching becomes a necessity - this justifies the relevance of this study.

The study highlighted a set of uncertainties affecting small businesses in the current pandemic (resource availability (including anti-globalization sentiment and actions); short-term needs and timing (including the uncertainty of ending the pandemic or establishing a new reality); lessons learned (or lack thereof in shaping the

new reality); patterns of competition (including the dominance of technology leaders); communication and digitalization (quality of communication and digital transition); and groups of factors, with:

- oil price shock factors;
- targeted government regulation and support;
- digital transformation, including ecosystem uptake;
- changing patterns of consumption of goods and services created by small businesses.

An important conclusion of the study is that the crisis implies a dual understanding: it can be a global crisis, which affects all aspects of economic development, and it can be a private local crisis, which concerns a specific organization. If for large companies these different meanings can be considered independently, then for small business they quite often coincide: a general crisis and a local crisis, and further we consider those manifestations of the general crisis which created (or can create) problems for small business.

Given the analysis of factors affecting small businesses, the definition crisis management for small businesses should be supplemented by a reference to the external environment, as small businesses, do not have the ability to form their own crisis management, sustainability potential and largely depend on the environment.

The authors proposed to adapt the matrix approach to distinguish crisis states for small businesses according to the properties of their business models: divergent to crisis; crisis-resistant; adaptive; temporarily limited; externally supported; true bankruptcy.

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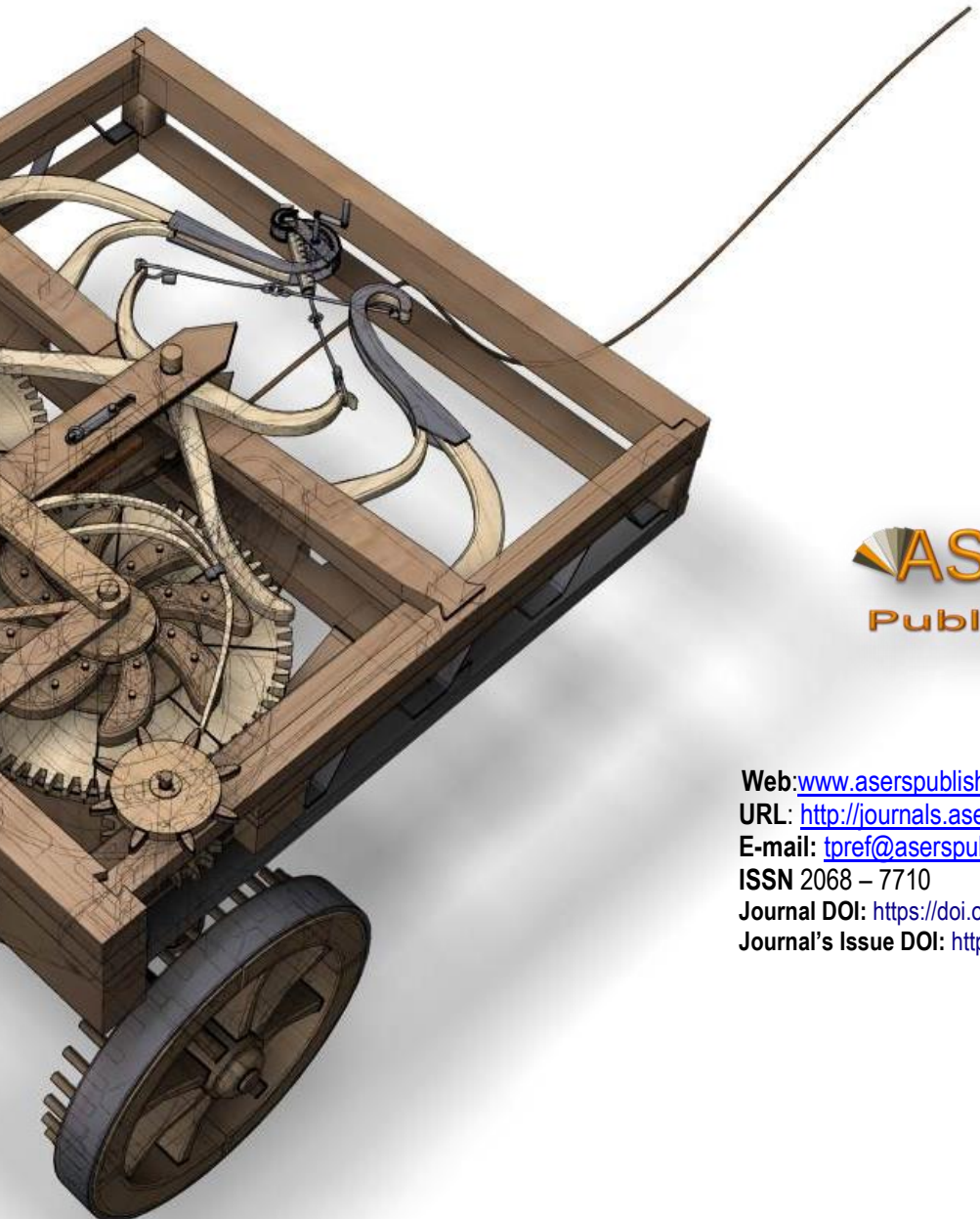

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