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BUILDING ORGANIZATIONAL SYSTEM FRAMEWORK MODEL FOR CRISIS MANAGEMENT AND SUSTAINABILITY IN CONSTRUCTION SECTOR OF GEORGIA

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ABSTRACT

The breakout of COVID-19 pandemic is followed by the unexpected and continuous crisis in all fields of activities. Literature is describing the features of challenges of different levels in different segments of economic performance. Georgia's economic development is experiencing inevitable changes, which are not necessarily negative. Crises often lead to changes in the entrepreneurial mindset. The companies start considering new business models for future continuous operations and long-term sustainability. We set studying the current anti-crisis strategies of the construction companies and development of recommended system framework as a research problem. There was considerable doubt whether companies had strategy and plan for handling the crisis beforehand. The article provides some research findings on how companies managed to bring uncertainties and losses to a minimum. The method of interview allowed conducting qualitative analysis of different factors impacting construction projects. The pre-crisis performance, challenges during the crisis, and signs of recovery period are characterized. Study highlights the role of government in maintaining business operations. The results of survey and model for improved resilience is developed and introduced representing recommended set of resources, components of business process for desired outputs and outcomes in the construction business in Georgia.

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Introduction. Since January 30th, 2020 when COVID-19 was declared as global pandemic by the World Health Organization (WHO) exported from People's Republic of China to other countries (WHO, 2020), the outbreak started spreading and threatening globally not only the healthcare system (WHO^a, 2020; Deloitte, 2020), but also business and entrepreneurship activities (Brown, Cowling, 2020; Yue, Cowling, 2020; Korsgaard, et al., 2020; Greene, Rosiello, 2020; Lim, et al, 2020; Ewing Marion Kauffman Foundation, 2020; Fairlie, 2020; Looze, Desai, 2020); agriculture (OECD, 2020; Rediff, 2020); energy (IEA, 2020; IEA^a; Bertram, et al, 2021; Cheshmehzangi, A., 2020); socio-economic systems (WHO^b, 2020; Nicola, et al, 2020; Kumar, Nayar, 2020; Serafini, et al, 2020; Seiful Islam, et al, 2020; Hunter, 2020); The construction industry have been severely affected by the COVID-19 pandemic (Gamil, Alhagar, 2020).

Indeed, impact of the crisis caused by COVID-19 pandemic outbreak reaches all sectors of economics but varies across them. Construction industry is highly vulnerable to the considerable declines in the economy due to its sensitivity to the phases of business cycles. Increased health risks

have drastically downsized the volumes of construction works leading to the suspension in the project schedules. The supply chain was distracted, employees were laid off, and value creating was slowed down thus creating risks to the terms and conditions of the project contracts. On the other hand, construction bears potential to give great stimulus to economic recovery, particularly to its job creation ability. Timely and well-planned recovery measures can provoke sector's improved sustainability. The quality analysis of existing business-related economic risks, the dialogue and cooperation between governments, financial organizations and construction companies can reveal the potential ways and actions for speedy and less painful recovery from the current crisis.

Literature Review. Since the COVID-19 pandemic breakout some studies investigated the consequences on the economy of industries worldwide. Uncertainty still prevails even in current and future economic developments. The negative impact on GDP in 2020 is estimated to range from -4.8% to -9.8% compared to the baseline level, although the government's fiscal countermeasures result in a positive effect of some 2.5% in real GDP (Havrlant, et al, 2020). According to the World Bank report, a baseline global pandemic scenario 'sees gross domestic product fall by 2 percent below the benchmark for the world, 2.5 percent for developing countries, and 1.8 percent for industrial countries' (World Bank, 2020).

PwC describes the hit to engineering and construction (E&C) companies by the ongoing crisis as 'unprecedented', although industry tends to be affected by cyclical downturns. Projects suffer from delays and even cancellation mostly due to the distracted chain of supply; social distancing created unpredicted constrains; financial performance is worsening and debt restructuring shall be considered (PwC, 2020).

The need for industry members to address both short-term and long-term business challenges has emerged from the ongoing crisis. This includes but is not limited to project-specific responses and solutions considering a new reality in global and local environment (Holland & Knight, 2020). The biggest challenge is that the scale of appropriateness of changes still cannot be defined, metrics are not established and outcomes cannot be predetermined.

Many international organizations throughout the world seek ways to help construction businesses with recommendations for recovery. As an example, European Construction Industry Federation (FIEC) describes the measures being established to help construction companies and workers get through the current crisis (FIEC, 2020). European International Contractors (EIC) predicted impacts of COVID-19 crisis as 'detrimental'. Pandemic affects both key cost components of construction projects - material and labor – and creates threats to the active projects, as well as financial liquidity and entire organizational frameworks of the businesses (EIC, 2020).

Recovery strategies are proposed by both academic studies and practitioners (Sweeney, et al, 2020; Black, 2020).

Georgia's economic stand as a result of COVID-19. At the very outset of pandemic, a joint statement on the impact of the coronavirus on the construction sector was issued by trade organizations of the British construction industry and members of the Civil Construction Association. The statement expressed fears that in addition to the tourism sector, the construction sector would also be significantly affected, the negative impact of COVID-19 on the construction sector is inevitable and it will affect different levels of the industry (Construction, 2020).

Enterprises involved in various economic activities have been hurt to varying degrees. According to Geostat, in 2019, the largest shares of GDP by activity are held by wholesale and retail trade; repair of motor vehicles and motorcycles (4.4 percent), and real estate activities (11.5 percent), manufacturing (10.1 percent), Construction (8.6 percent)¹, agriculture, forestry and fishing (7.2 percent), public administration and defense; compulsory social security (6.8 percent), transportation and storage (6.5 percent), financial and insurance activities (5.4 percent) (National Statistics Office of Georgia, 2020). Such structure of GDP has made Georgia's economy vulnerable, as these sectors have been most affected by the pandemic crisis (EMC, 2020). The construction industry had a large decline (-24.5 Percent). Restrictions imposed for this sector from 31 March to 29 May, 2020 slowed down functioning of the construction companies, leading to severely negative impacts.

According to the research conducted by Galt & Taggart, at the end of March 2020, construction along with production and transportation remained areas without considerable

¹ projections for 2020 indicated that construction would contribute to 13.4 per cent of global GDP (Global Construction Perspectives & Oxford Economics, 2015)

restrictions. However, due to the slowed activities in construction business, global demand for iron was already reduced by that time. In general, private investments fall sharply during the crises. The growth of government infrastructure projects is important for the economy as a whole, as well as for construction companies and their employees (Galt & Taggart, 2020).

Deterioration of construction schedules will then take years to recover. Employment and import of construction materials are endangered. In 2008, employment in construction fell by 28 percent and it took 3 years for the activity to increase again. In 2009 imports of construction materials decreased by 29 percent. Galt & Taggart views construction as an area in which the negative effects of the crisis will not be immediate, rather it will have delayed consequences.

The negative consequences of the pandemic crisis were also analyzed by PwC. According to the survey, 65% of the companies state declining demand as the main problem. However, "the biggest challenge for enterprises in the construction and ICT sectors was the change in the GEL exchange rate and late payments from customers" (PwC, 2020). 50% of the construction sector has suspended business activities or reduced production volumes. In March-April 2020, revenues were almost halved compared to the same period of previous year, which confirms the views of Galt & Taggart. Construction companies lay off around 10% of their employees. This area is also proved to be the most challenging for predicting future revenues.

Key issues for employers and employees to consider. The government of Georgia has elaborated support plan for the construction and development sector.¹ This sector is one of the fastest growing segments of the economy, comprising 9% of a direct and indirect share of the GDP. It employees 101.4 thousand people (7.8 percent of all employed; as of 2019), almost similar to the fact, that before pandemic, construction sector accounted for around 7.7 percent of global employment (ILO, 2020). The development sector in Georgia is characterized by high transmission effects on other sectors of the economy. According to the financial sources, volume of the portfolio of bank loans issued to the sector is 1.2 billion GEL, and the portfolio of bank loans secured by residential real estate - almost 8 billion GEL. In total, the portfolio of loans and mortgages issued to the sector amounted to 9.2 billion GEL (18% of GDP). Expectedly, pandemic resulted in the reduced economic activity, deteriorated economic growth forecasts, purchasing power of the existing and potential customers has decreased and led to a significant decline in the sector's pre-sales; risks of completion of construction projects significantly increased; sales reduced; and credit risks amplified. The risks of significant fluctuations in real estate prices have increased. As a logical result, there may be the risks of significant worsening of the banking portfolio. Moreover, impressive size of this portfolio may serve a systemic threat to the financial sector.

COVID-19 has an impact on employers and contractors involved in construction projects in many ways. At the grassroots level it can lead to a) delays in the completion of projects, and/or b) increased costs for these projects. The following are examples:

The requirement of social distancing cannot affect only the number of employees (which a contractor may have at the facility at any given time), but also limit the number of employees that the contractor takes to and from the facility. In addition, new regulations and requirements were implemented for increased health and safety testing (worker testing, temperature testing, and constant cleaning and sanitation of facilities). Clearly, these requirements significantly increase both the cost and time of a project completion.

Immediate measures taken by Georgian government to lessen the negative consequences of the unexpected crisis.

Government of Georgia accurately analyzed the above potential threats related to delays and cancellation of construction projects as a result of uncertainty and declined purchasing power of consumers and in close cooperation with the National Bank and the private sector, has developed measures to support the construction and development sector. Those measures intend to stimulate demand for residential real estate and, on the other hand, provide access to finance during the crisis.

The measures were detailed and considered all involved parties. In particular:

- The state planned to subsidize some level of the nominal interest rate specified in the mortgage agreement. The amount of the subsidy was to be reduced by the state based on the reduced refinancing rate. The subsidy is supposed to last for 5 years after signing the contract and will be terminated during this period if the refinancing rate is set at less than 5%.

¹ Government of Georgia, 2020. Report on the actions taken by the Government of Georgia against covid-19

- State guarantee will be enacted on the mortgage loan portfolio for the mortgage loan issued in the period of 01/06/2020 - 01/01/2021.

- One-time purchase of residential real estate by the state in the period of 01/06/2020 - 01/01/2021. The procurement will be carried out by auction. The state will use the purchased property as part of a program to provide housing for IDPs.

- Development of a scheme of state guarantee for the completion of the residential real estate project (under which 77 special state programs will be managed).

This is the way how state will insure the risks of completion of current construction projects (Government of Georgia, 2020).

The results of this special anti-crisis plan could not be evaluated in the simulation analysis, as the main beneficiaries of the program are development companies. It is also not feasible to assess its impact on the household level using existing information arrays. In general, government measures provide some benefits for those employed in this sector and whose effectiveness can be assessed at the household level, as their degree of addressability is quite high (Kakulia, et al., 2020).

Organizational Readiness for Anti-Crisis Measures.

Methodology of the study.

Crisis management is one direction of general management of the organization. Crisis management is designed by the organization for overcoming the crisis. It has crucial importance for construction companies because timeliness of the project management almost completely depends on creating such an environment where potential hindering factors are forecasted well ahead and activity measures for bringing threats to the minimum are pre-planned. Methods of crisis management are considered efficient if construction works continue even during the crisis. Based on the findings in both practical activities and academic works in the field of construction, we developed the questionnaire, conducted survey through in-person communication as well as electronic means (in case if interviewee desired to be anonymous), collected data and analyzed it. The content of the questionnaire was intended to help in construction of the organizational system framework model for sustainable development of construction companies. The managers of the five departments were targeted; most important factors (out of nine) for continuous business operations were to be selected; survey has three parts: pre-crisis, crisis, and recovery from crisis.

Study is based on qualitative research method. 12 construction companies of different sizes were selected, from which top managers of 5 leading departments (construction operations, sales, finance, communications, IT) participated in the survey. Therefore, sample consisted of 60 interviewees (even distribution of received responses) (Figure 1).

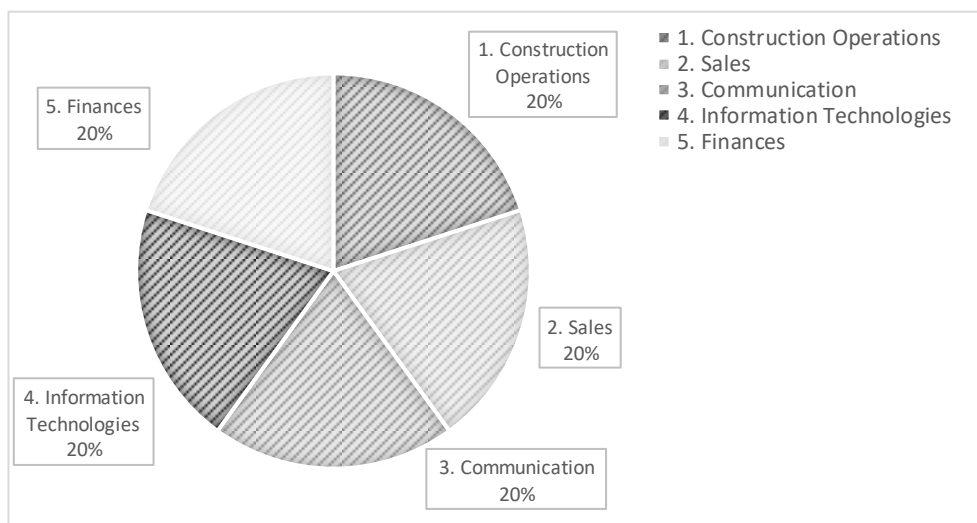


Fig. 1. Distribution of interviewees by departments

Some highlights of the most important survey results are presented below (Figure 2):

- 43.3% indicated financial and organizational factors as most hindering during the crisis and think that these factors slowed down the crisis handling process.

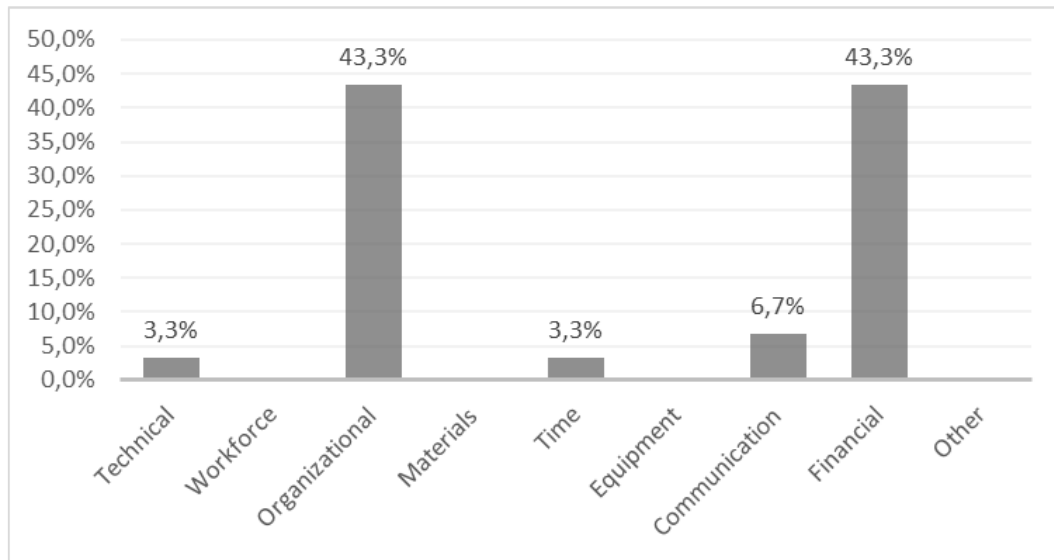


Fig. 2. Important factors for continuous construction operations

Interestingly, survey showed that workforce, materials and equipment were not presenting the considerable challenge. This is due to government’s decision to support construction and construction materials organizations with regulation ensuring uninterrupted operations.

Survey results are systematized in the following Table1, which provides responses to the survey questions and are presented in percentages.

Table 1. Responses to the survey questions by categories and sub-categories

Survey Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	2	3	4	5	6
I. In the pre-crisis period:					
1. Management had already set general directions for the development	46.7%	26.7%	0	3.3%	23.3%
2. The strategy was addressing important priorities	40%	36.7%	0	10%	13.3%
3. Organizational directions were focused on potential threats and challenges	16.7%	36.7%	3.3%	13.3%	30%
4. There were almost no ad-hoc decisions and statements	10%	40%	3.3%	20%	26.7
II. Impact of crisis caused by COVID-19 pandemic on the activities of the organizations					
1. Operations stopped due to ongoing crisis	Presented Below (in Figure 3)				
2. What is the impact of crisis on your activities? (presented in charts below)	Presented Below (in Figure 4)				
III. Attention to important issues					
1. Challenges during the last one year	Presented below (in Figure 5)				
2. The directions set after the crisis are consistent and rational	16.7%	43.3%	10%	13.3%	16.7%
3. The contracts were not delayed and were not terminated	20%	30%	10%	20%	20%
4. Materials supply was not delayed and did not stop	10%	30%	16.7%	20%	23.3%
5. The budget is in line with the threats posed by the current crisis	16.7%	36.7%	20%	6.7%	20%
6. State regulation of the construction sector is timely and adequate	10%	30%	23.3%	23.3%	13.3%
7. What changes do you expect in the current 2021?	Presented below (in Figure 6)				

Continuation of table 1

	1	2	3	4	5	6
IV. The contribution of individual departments in overcoming the crisis						
1. IT dep. was able to successfully transfer administrative staff to remote work in a timely manner (technical support)	56.7%	23.3%	13.3%	3.3%	3.3%	
2. Labor safety rules have been changed to protect against the spread of the virus	73.3%	23.3%	0	3.3%	0	
3. Internal and external communications worked effectively	26.7%	50%	6.7%	3.3%	13.3%	
4. The Operations dep. was able to coordinate activities with other deps.	13.3%	56.7%	3.3%	13.3%	13.3%	
5. Sales have successfully changed the strategy, leading to increased sales	16.7%	33.3%	10%	20%	20%	
6. Due to limited financial resources, the projects were not delayed or closed	20%	30%	10%	20%	20%	

Survey analysis showed results by periods.

Almost half of the interviewees (46.7%) are confident that management was following the predetermined plan of activities and directions in the pre-crisis period. During the same period, organization’s strategy was clearly depicting the priorities; and pre-determined directions were corresponding to the proper responses to potential threats and challenges (contingency planning); also, almost half of them think that management was practicing ad-hoc decisions and statements (i.e, unplanned and unexpected decisions prevailed).

Impact of crisis on the activities of the organizations: 50% of respondents stated that their organizations continue operations; 13.3% states that their organizations temporarily stopped activities, but now are back to normal; 10% specified that the operations were stopped due to regulations, while 16.7% responded that they stopped operations completely and forever (Figure 3).

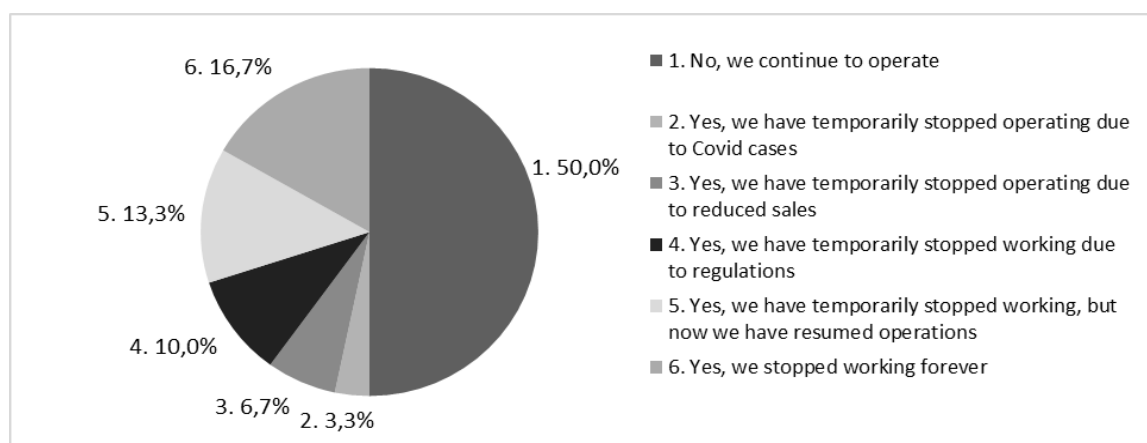


Fig. 3. Operations Stopped Due to Ongoing Crisis

Impact of crisis on revenues, sales and employment is presented in the Figure 4 below.

The majority of respondents stated that sales and therefore revenues declined by 10% to 25% during the crisis period. 37% informed that they have not downsized their staff; 33% informed that they laid off 10% to 25% of employees and 20% stated that they had to reduce their staff by 50% or more.

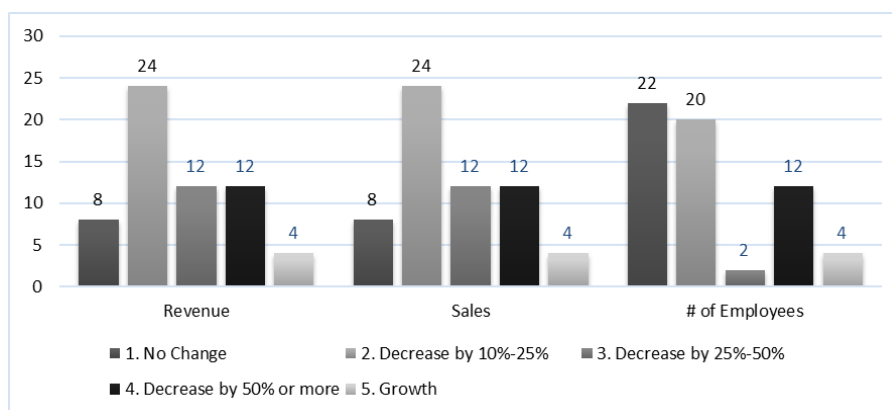


Fig. 4. Impact of Crisis on Activities

Attention to important issues - the question about challenges during the last one year consisted of materials, workers, financial flows from the banks, and financial flows from the customers. Survey results are presented in the Figure 5 below.

The main challenging factor appeared to be the lack of financial resources from both banks (providing loans) and customers (sales revenues) (34 and 40 responses accordingly). Supply of materials (28 responses) and lack of labor force (14 responses) follow as other significant risks.

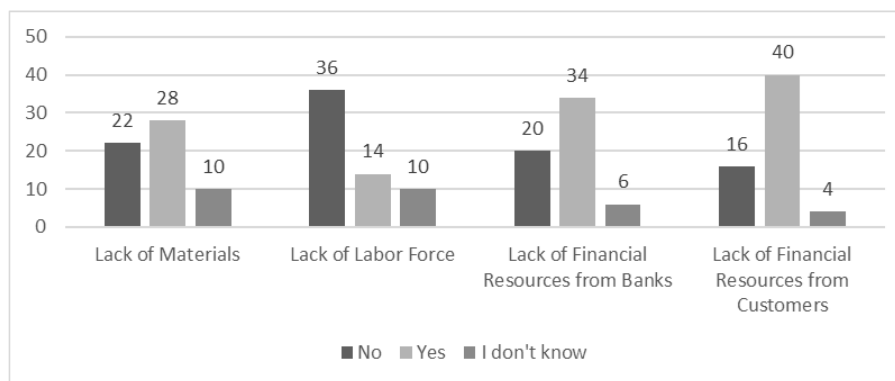


Fig. 5. Challenges During the previous Year

Only 16.7% strongly agree and 43.3% agree that after emerging the crisis sufficient anti-crisis directions are set and organization’s actions are sequential and logical.

As for expectations for FY 2021, 40 respondents are optimistic about the increase of revenues and 44 are hoping to increase sales; only 26 interviewees are hopeful that expanded operations will require hiring more employees.



Fig. 6. Expected Changes in 2021

Notably, majority of respondents think that IT department successfully managed the process of quick shift to perform duties online; internal and external communications worked well.

Only third part of respondents sees the coordination of construction operations department with other departments as well-managed; same percentage thinks that the sales department improved strategy for increased volume of sales.

Organizational system framework model for sustainable development.

Conducted survey helped consolidate activities under the crisis life cycle. Revealed challenges before and during the crisis and planned recovery process provoked interest to develop one model with all appropriate areas of organizational activities. Further research provided information about existed theoretical findings and practices on different ways of unified approach to the development of overarching model of the organizations for efficient crisis management.

A common mistake in the process of developing resilient system for the organization is to look at individual elements of the organization in isolation from each other. Due to the erratic measures aiming either at improvement of strategy development, or operations, or improvements in communication, or adjustments in compensation system, or hiring criteria review or any other stand-alone sets of activities may not bring the organization to its desired results and success. In this case, the organization often lacks a systemic framework that shows leaders, other internal and external stakeholders the organization as a whole. Only agreed upon unified vision helps all interested parties avoid major challenges and threats and save the organization in times of both expected and unexpected crises.

A model of organizational system framework should include and reflect the key variables that affect an organization's performance, most desirably the leaders need to see measurable outcomes as part of the model.

Crisis management can be efficient if it covers various aspects, such as economic, political and legal-regulatory decisions. Organization's readiness for solving issues (before they turn into problems and then – crisis) depends on how flexibly it also addresses other aspects, such as social, technological, educational, cultural, psychological-ethical, environmental, technical, organizational, and managerial aspects.

We understand model as a system of rules of the game, as a set of guidelines and directions according to which crisis management should be best used for future continuous and sustainable development.

After carefully examining the existing models, the analysis of the study object was decided at the level of the constituent organizations of the construction sector, taking into account their micro- and macro-environment. The analysis was carried out with the help of a construction and development crisis management model and a recommendation system developed specifically for this purpose.

For a comprehensive analysis of the crisis life cycle, the cycle must be analyzed collectively, based on a system of criteria.

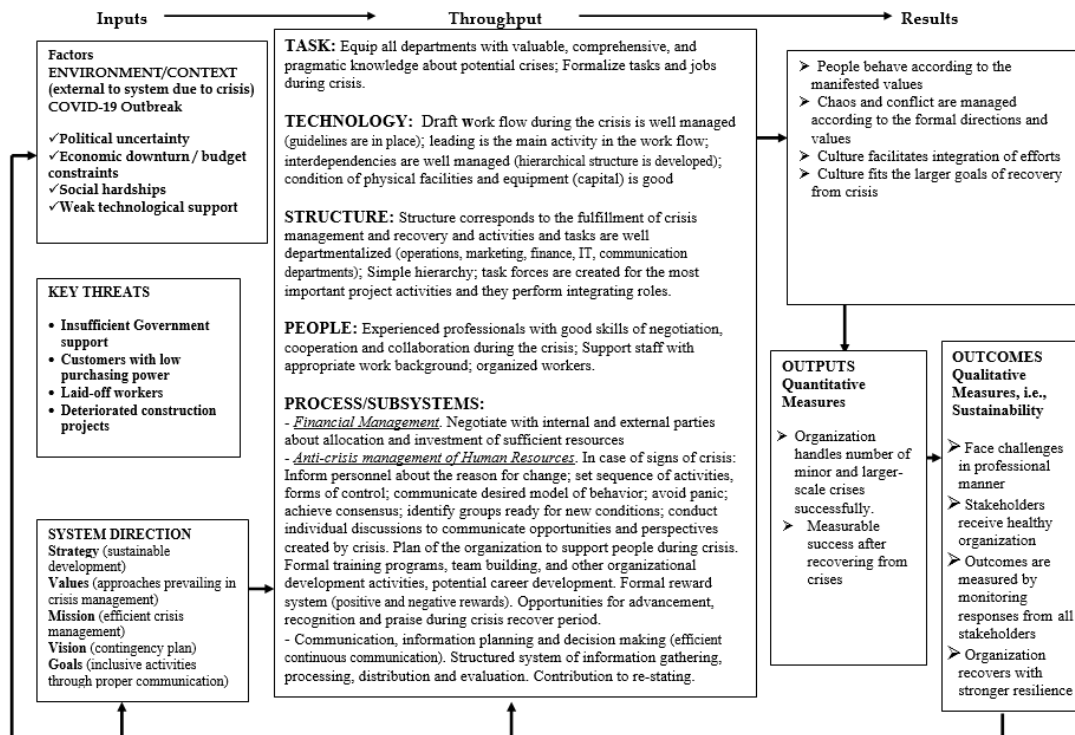


Fig. 7. Organizational System Framework Supporting to Efficient Crisis Management

This framework can be recommended for the construction projects for better resilience to potential crises.

Discussion. There was considerable doubt that organizations were lacking the clear strategy and contingency plan for unpredictable cases. Crisis caused by COVID-19 is unexpected and unprecedented in its scale. Interviews with managers of five departments of 12 construction companies proved the hypothesis that they were unprepared for the challenges emerged after the beginning of 2020. Strategies either did not exist or were outdated; contingency plans were last discussed long ago; in most cases, interdepartmental and external communications were not well established; and outcomes of the system organization were not focused on the crisis management.

Results. The selected method justified itself, because it revealed the most significant factors influencing the resilience of organizations during the crisis. Interview respondents indicated financial (due to the declined purchasing ability of the population, and additional barriers created by banks for getting loans) and communication factors as the most challenging during the crisis.

Strategy design, of even leading construction companies, does not always provide sufficient and appropriate directions for developing plans for rapid response to the crisis; ad-hoc decisions and statements prevail. Some construction projects interrupted and then re-started operations, some were not able to continue business at all.

As a result, based on the research all weaknesses of organizational system were concentrated, structured, and the model is elaborated as a project roadmap for crisis management.

Conclusions. The research follows initial methodology – reviews literature on crisis circumstances; provides information on the role of construction in the economic structure of Georgia; discusses key issues for consideration of employers and employees in the sector; introduces immediate measures taken by Georgian government to lessen the negative consequences of the unexpected crisis; studies and analyses organizational readiness of the construction companies during the ongoing crisis; and introduces Organizational System Framework Model for sustainable development of construction companies. The model is developed with the goal to accumulate all potential external and internal resources, lead the business processes based on the clear interdepartmental communication, cooperation and collaboration, thus creating the efficient organizational culture which, in turn, will bring the organization to desirable and measurable outputs and long-term sustainability as an outcome.

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