

Proposing a Model for Identifying and Ranking Key Indices in Crisis Management

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ABSTRACT

Crisis management operations enable organizations to overcome some of the crises on their path and manage others in an efficient way. It also enables organizations to learn rapidly and thoroughly. The present paper is an attempt to identify the factors in crisis management and proposes a model of crisis management at Karafarin Insurance Company. The study was carried out as an applied work in terms of objectives and a survey-descriptive in terms of methods. The study population consisted of managers and staff at Karafarin Insurance Company in Arak City (Iran) (n=80). The sample group was selected through a census approach. Based on field studies and interviews, the factors in crisis management were determined. Data analysis was done in SPSS and AMOS. The results showed that the marketing index had the highest mean rank, while the organization life stage had the lowest mean rank. At the conclusion of the discussion, recommendations for improving organizational performance are provided.

1. Introduction

Crisis management (CM) is a technical term in management and refers to a set of activities, remedies, and instructions followed by an organization to handle challenges and crises. Its purpose is to control or decrease the pace of events and control or solve crises. In general, CM means steering the course of events purposefully toward a controllable path and bringing things to normal as fast as possible [1]. Despite risk management that is aimed at managing probable risks and finding the best solution to avoid them, CM includes facing threats before, during, and after their occurrence [2].

CM can be used to have better control or management of the situation in many cases such as natural disasters (e.g. flood, earthquake, and fire outbreak) or political and economic crises

(war, famine, and so on) [3]. In addition, at smaller scales, CM can help small and large businesses to handle business crises and go through the hard conditions with minimum losses and damages. After a successful CM, businesses can return to their normal business process [4].

Using an efficient CM, many companies, organs, organizations, and enterprises have managed to return to their glory days one step before bankruptcy and dissolution [5]. Having a crisis-oriented attitude entails the ability to think about worst case scenarios and bring up countless solutions. Since in many cases, the first solution is not feasible, trial and error is the normal practice. There is a need for caution and to have a plan to deal with probable threats. Organizations and individuals need to have a plan to respond fast in urgent situations and keep an adequate level of readiness through practicing and maneuvering [6].

Today, thanks to technological advances, many natural and man-made crises are predictable and even preventable. Knowing the whereabouts and probable time of crisis incidence and by

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preparing trained human forces and equipment, it is possible to prevent crises or alleviate the negative effects on national health, economy, and security infrastructures [7].

The term crisis is borrowed from medicine by sociology and economy. In medicine, a critical situation is when an organism is at risk or its function is disrupted. Some believe that it is also a critical situation when a society or an organization loses its normal order and steps into chaos [8].

Crises are part of the business environment and it is not possible to remove all crises an organization might deal with. CM operation enables an organization to overcome some of the crises and manage the others in an efficient way and develop the tools to learn fast the thorough from crises [9].

2. Problem statement

We live in a century of fast changes. This makes facing crises and controlling them an essential necessity. Crisis in a society or organization is a situation in which the control over processes and individuals is minimized and naturally leads to concerns and spontaneous decision making. Unfortunately, Iran is one of the countries with the highest death tolls due to natural crises [10].

Organizational crises create situations where the normal work process and activities are disrupted temporarily or permanently. A crisis is a situation that disrupts the main system or parts of it and threatens the stability of the system [11].

CM enables an organization to remove some probable crises and manage the rest in an efficient manner. It is an essential tool for complete and rapid learning from crisis [12].

CM conveys implicitly that organizations experience short periods of stability and peace between crises. Therefore, while admitting that no organization can accurately predict the future and plan in advance, they still need to develop the readiness to face many known and unknown threats. This readiness is possible only through learning from others' experiences, sharing one's experiences, learning from those experiences, and implementing those learnings [13]. Clearly, making right and timely decisions plays a key role in the future of any organization [14].

There are a variety of mathematical and statistical techniques to assess the variables of a phenomenon, which can be used for an efficient and right management of the variables [15]. Therefore, the present paper is an attempt to identify the factors in a crisis in organization through a case study in Arak City, Iran (Karafarin Insurance Co.). The study uses statistical methods to answer "what are the factors in crisis management in an organization?" and "what is the extent of effects of these factors?"

2.1. Necessity of study

CM is a necessity for all organizations, organs, public/private bodies and at a larger scale for municipalities and national organizations [16]. Crises and disasters naturally create unwanted situations beyond control. Still, with an efficient CM, systems can control the extent of crises, damages, and death toll [17]. CM has been a popular topic over the past years and highly emphasized by researchers and managers [18]. Crises are an element of the business environment and removing all crises that threaten an organization is not possible [19].

3. Literature review

Cheetsazet al. (2015) conducted a study titled "analyzing the effects of knowledge sharing infrastructures on enhancing the quality of CM operation through organizational learning." Their results showed that the factor loads of strategy, culture, structure and information technology on knowledge and sharing infrastructure was 0.824, 0.842, 0.867, and 0.828 respectively. In addition, the effect of knowledge sharing on organizational learning and CM was 8% and 24% respectively. The effect of organizational learning on CM was equal to 58%. The results of t-test in the structural model indicated a significant relationship between organizational learning and CM [20].

AghaHosseiniAshkaavandi (2015) performed a study titled "identifying and prioritizing strategic future planning, Cm, and human resources agility in Isfahan Blood Transfusion Org." They used Delphi and analytical hierarchy process (AHP) methods and showed that the term "strategic future studies" was widely employed to describe processes and activities that help direct future plans of a company. Their study population consisted of managers, officials, and experts from Isfahan Blood Transfusion Org. and three other disaster-prone provinces in Iran. The participants had at least 10 years of work experience (n=160). They showed that, based on Delphi methods, there were five elements in strategic futuristic capabilities, five elements in agility of human resources, and six elements in CM. These elements also contained sub-elements, which were prioritized and weighted using AHP [21].

HedayatiShahidani and Pinkfetsov Roman (2014) carried out a study titled "Russian and the USA behavior models in regional crisis management; case study: Syrian Crisis." International arena has shown that superpowers try to achieve a stable power structure at international level within a multi-aspect structure amidst cooperation and competition among each other. This phenomenon emerged after the Syria Crisis in 2011. The main specifications of such relationships are concepts like motivation, harnessing, avoidance, reaching agreement, and crisis settlement. They tried to investigate these concepts based on Jorge Modelski's crisis management model. Their main question was the main strategy of Russia and USA in the Syria Crisis. They showed that these two superpowers managed the crisis through mutual interactions along with taking into account their other international interests. Through this, they returned to the competition and cooperation model of the Cold War Era [22].

Mohebbi et al. (2014) conducted a study titled "choosing the right strategy to preserve organizational capitals in crisis management using a combined approach of AHP and SWOT ." Their results showed that an adaptive approach was the best approach of CM. A joint response approach to crises was adopted as an adaptive approach where, along with solving internal weaknesses, available external opportunities were seized. While planning for normal activities, many organizations lack systematic management for urgent situations. Organizations need specific objectives and strategies to face crises. By defining these goals and strategies for urgent situations, many ambiguities are resolved and an efficient leadership is implemented. Their findings indicated that similar to normal situations, organizations need to set their objectives and strategies for critical situations. Such strategies must be developed through structured methods and updated continuously [23].

In their study on organizational CM, Zhang and Wang (2016) categorized management factors into internal and external categories. They argued that the internal organizational factors included managers' belief and attitude, performance of managers, management and organizing, human resources, marketing, and financial factors. The external factors included changes in competition, technological advances, environmental changes, the mass media, and customers [24].

Jafari et al. (2022) conducted a study evaluating the performance of various units of the Shazand Oil Refinery (SOR) using Data Envelopment Analysis (DEA). In this article, in addition to quantitative data, qualitative data were also utilized in assessing the decision-making units. Furthermore, the Anderson-Petersen (AP) model was employed for ranking the efficient units [25].

4. Methods

Research method is a set of rules, tools, and reliable and systematic methods to examine facts, discover the unknowns, and achieve solutions. The present study was carried out as an applied work from the objective viewpoint. As for method, the study was a descriptive-survey work with a study population consisting of managers, staff, and agents in Karafarin Insurance Company – Arak City (n=80). The participants were selected through a census method and data gathering was done through library and field studies. A questionnaire with 25 items was the main data gathering tool (Table 1).

Table 1. Elements of the questionnaire

Variable	Items
Managers' belief and attitude	1-2
Managers' performance	3-7
Management and organizing	8-9
Human resources	10-11
Marketing	12-14
Financial factors	15-17
Inefficient information gathering	18-19
Record and experience of organization	20-21
Organization life stage	22-23
Concentration level	24-25

4.1. Validity of the questionnaire

There are a variety of methods to measure validity of a questionnaire and content validity is one of them. Content validity is used to examine the elements constituting a tool so that it

depends on the items in a tool. The items in a questionnaire are valid when they represent specific skills and characteristics that researchers intend to measure, content validity is confirmed. To have content validity, the questions of a questionnaire must represent different parts of the content under the study. Therefore, content validity represents the structural specifications of a measurement tool that are added to the tool in the process of developing the tool [26]. To examine content validity, experts and university professors were consulted and asked for their opinions about the tool.

4.2. Reliability of the questionnaire

Reliability refers to the extent to which a measurement process is free of any systematic or random error [27]. An imperative requirement for a test is to have a tool to predict and measure the variable under study which is reliable and consistent. That is, the results of different measurements must be comparative. Therefore, reliability is a measure of consistency of the results of a test. Reliability is the consistency of a tool or data gathering method over time. There are different methods to measure reliability of a tool, and one of the most important of them is Cronbach's alpha, which was used in this study using the following formula [28]:

$$\tau_a = \frac{N}{N-1} \left(1 - \frac{\sum_{i=1}^N S_i^2}{S^2} \right) \quad (1)$$

Where τ_a is the reliability index, N is the number of items, S_i^2 is the variance of answers to i^{th} item, and S^2 is the variable of all items in the questionnaire.

The output of SPSS for Cronbach's alpha is listed in Table 2.

Table 2. Cronbach's alpha

Variable	Reliability	Output
Managers' belief and attitude	0.796	Confirmed
Managers' performance	0.759	Confirmed
Management and organizing	0.731	Confirmed
Human resources	0.748	Confirmed
Marketing	0.781	Confirmed
Financial factors	0.769	Confirmed
Inefficient information gathering	0.760	Confirmed
Record and experience of organization	0.732	Confirmed
Organization life stage	0.712	Confirmed
Concentration level	0.788	Confirmed
Total	0.760	Confirmed

5. Data analysis

The following are the steps taken for data analysis:

- Analyzing descriptive statistics (mean, mid, max, min, and frequencies) (AMOS);
- Testing normal distribution of the data using Kolmogorov-Smirnov test (SPSS);
- Testing existence and or the extent of a variable in the study population using t-test (SPSS);
- Ranking the measures based on Friedman’s test (SPSS).

5.1. Confirmatory factor analysis

The main purpose of confirmatory factor analysis (CFA) is to determine the capability of a factor model using a set of observed data. That is, CFA tries to answer if the number of factors and variables loaded on these factors are consistent with what is given by the theoretical model. The correlation between observed variables and the factors is called factor load, which is -1 to 1 range. The closer the value to 1, the higher the correlation between the factor and variable. Researchers adopt different cut-off values for accepting a factor load, which is in 0.5 to 0.7 range [29].

Therefore, based on a literature review of factor load and cut-off values and consulting with experts and university professors, 0.7 was taken as the cut-off point for factor loads. CFA was performed in AMOS and the items with a factor load higher than 0.7 were extracted for further analyses. The results are presented in Figure 1 and Table 3; clearly only six indices have a factor load higher than 0.7.

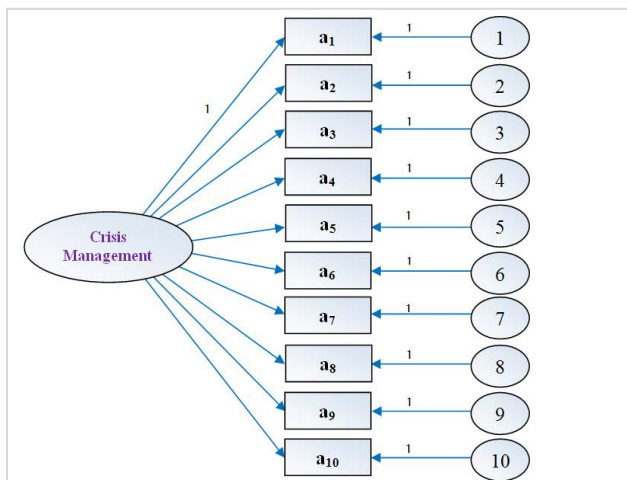


Figure 1. Factor diagram of the variables

Table 3. Factor load of indices

Title	Index	Factor load
a ₁	Managers’ belief and attitude	0.723
a ₂	Managers’ performance	0.692
a ₃	Management and organizing	0.768
a ₄	Human resources	0.509
a ₅	Marketing	0.703
a ₆	Financial factors	0.783
a ₇	Inefficient information gathering	0.567
a ₈	Record and experience of organization	0.719
a ₉	Organization life stage	0.798
a ₁₀	Concentration level	0.619

5.2. Kolmogorov-Smirnov (KS) test

5.2. Kolmogorov-Smirnov (KS) test

To test normal distribution of the depended variables under study, KS test was used

H_0 : Variable Y has a normal distribution.

H_1 : Variable y does not have a normal distribution.

Table 4. KS test results

Variable	KS	Df	Sig
CM factors	0.092	80	0.53

Taking into account the KS test results (P-value>0.05), H_0 (normal distribution of data) was supported.

5.3. T-student test

To compare the extracted indices with average value (3), one sample t-test was used. Parametric tests for a group are used to compare the mean scores of a specimen with the theoretical mean. The theoretical and assumed means is a standard and reasonably expected value. That is, to compare the mean of a variable in the study with a specified mean, one sample t-test is a reasonable choice (Table 5).

Table 5. T-student test results

Factor	Mean	Means difference	t-value	Sig
a ₁	3.1059	0.1059	10.68	0.293
a ₃	3.0470	0.0470	7.37	0.112
a ₅	3.1153	0.1153	11.56	0.302
a ₆	3.0720	0.0720	9.87	0.193
a ₈	3.0966	0.0966	10.19	0.230
a ₉	3.3875	0.3875	17.64	0.432

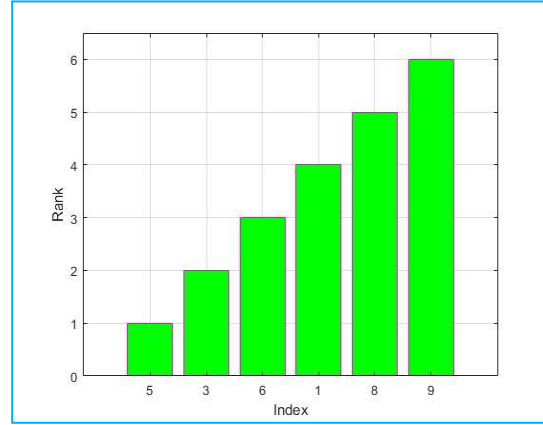


Figure 2. Final rank of the indicators

As listed, all the extracted indices have a mean value higher than the standard mean for the population (3) and the differences are significant at significance level of 0.05.

5.4. Friedman test

Friedman test is a non-parametric test and equivalent to repeated measures ANOVA (intra group). It is used to compare mean ranks among k groups. The H0 hypothesis supported identical mean ranks among the groups. The difference between repeated measures ANOVA (intra group) and Friedman test is that the former repeatedly measures a specimen in different modes; while in the latter, the specimens assigned a score to several specific modes (objects or individuals or so on). Both these tests assign values to variables based on specimens, while ANOVA measures a specimen repeatedly, and Friedman reports the scores given by one specimen. To rank the indices, Friedman test was used (Table 6).

Table 6. Final priority of indices

Variable	Index	Mean rank
Marketing	a ₅	3.92
Management and organizing	a ₃	3.78
Financial factors	a ₆	3.59
Managers' belief and attitude	a ₁	3.53
Record and experience	a ₈	3.23
Life stage of organization	a ₉	2.97

As listed, the marketing index has the highest score and organization life stage has the lowest mean rank. Figure 2 shows the final rank of the indicators.

6. Discussion

Considering the Figure 2 and the information listed in Table 6, it can be stated that the managers of the Karafarin Insurance Company intended to improve their performance and ensure the organization's sustainability. It is advisable to first adopt policies in the insurance market at Arak City level. Then, they should focus on improving the management structure and organization across all sections of the organization. Subsequently, they should address optimal control of financial factors, reduction of unnecessary costs, and attention to the financial satisfaction of insured individuals. Additionally, managers must reevaluate their opinions and create new perspectives so that, in addition to focusing on organizational interests, attention can also be given to customer interests and satisfaction. Using the experiences of their predecessors can significantly impact the organization's future successes, and managers should pay more attention to this factor. If these factors are properly and optimally managed, the organization's lifespan may increase, which is a crucial and fundamental point.

7. Conclusion

Crises induce notable effects on society. Thanks to technological advances, many natural and non-natural disasters are now predictable and preventable in some cases. With estimates of the location and time of a crisis and preparing human resources, equipment, and adequate readiness, disasters can be avoided or the destructive effects on health, economy, and national security can be controlled. Clearly, achieving these goals is not possible without identifying and prioritizing factors in crisis. The factors in CM were identified and a model of CM was proposed for Karafarin Insurance Company. The results indicated that marketing had the highest rank and organization life stage had the lowest rank.

For future researchers, it is recommended to rank critical indicators in the insurance industry using fuzzy and gray techniques and ultimately compare the obtained results with each other.

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