

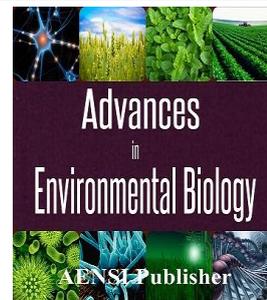


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A Survey of the Factors Affecting Intention of Information System use in Disaster Management in Tehran

¹Reza Eslami Dolatabadi, ²Zadolah Fathi and ³Sara Maleki

¹MA of administrative management, information system, Islamic Azad University, Tehran Markaz branch, Iran

²PHD of accounting, Assistant professor, Islamic Azad University, Tehran Markaz branch, Iran

³MA of administrative management, Financial department, Islamic Azad University, Tehran Markaz branch, Iran

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ABSTRACT

One of important feature of our country is various instability and disasters. This research examines the theory of information systems success in the context of disaster management in organizations. Past researches, shows that information quality and system quality are major factors in disaster management success in organization. This research examines the role of variables such information accessibility, response timelines, relevance to task, expected group value, perceived task support and user satisfaction on intention to use system information. Sample was collected from 237 experts of disaster management sections in Tehran Municipal, Red crescent and Police. Structural equation modeling and confirmatory factor analysis was used to analysis data collected. result show that all variables have positive and significant coefficient whit information system intention to use.

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INTRODUCTION

According to the statistics, Iran has the rank 10 in the world and rank four in Asia in terms of disasters. In various regions of our country, different unexpected events occur including earthquake, flood, land sliding, avalanche and other unexpected events as traffic accidents, plane crash and etc. The longest contemporary historical war was imposed on our country. More than 90% of the area of Iran is exposed to above average danger in terms of earthquake and great earthquakes occur in various regions of Iran each 10 years and this makes people sad. The neighboring countries have the same condition and after waging war in these areas, many people migrate to our borders. All the above factors beside the increasing urban population, growth of various industries, high climatic changes and epidemic new diseases indicate the importance of crisis management [2].

2-Statement of Problem:

The term “crisis management” in recent years is coined vs. “classic management” of organizations. Crisis management is a set of skills or research process being applied in abnormal risks or hard conditions.

In other words, crisis management is the set of advanced plans and methods to prevent and control crises.

Our history is full of the cases in which exact and timely information had changed a set of events in environment [6].

About two decades, the application of communication and decision making support systems regarding crisis management has received much attention from the researchers.

Recently, researchers emphasize on decision making support systems and information propagation in various crisis management aspects. The main reason of this emphasis is evaluation of various reports of various crises as the efficiency and effectiveness of responding the crises are reduced due to information shortage. For example, in September 11, the firefighters were not aware of the location of polices. A common problem is that despite the existence of information in organization, the data analysis and access to them at appropriate time is not possible for appropriate people.

Corresponding Author: Reza Eslami Dolatabadi, MA of administrative management, information system, Islamic Azad University, Tehran Markaz branch, Iran

Responding the crisis including natural crises (e.g. Earthquake and etc.) or unnatural (e.g. Terroristic attacks, etc.) is a complex process and creates an unreliable environment with high mental pressure for involved people. This defines the need to information during crisis. In other words, crisis management is information-based activity. Although people involved in crisis should cope up with information shortage or incomplete information, some of them can manage and use information and other avoid using information for various reasons.

This study determines the role of information systems during crisis management in crisis management units of Tehran Municipality, security force and Red Crescent of Tehran.

The main question of the study is determining effective factors on using information systems during urban crises in Tehran.

The questions of the study include as follows:

- 1- What is the influence of information accessibility on expected group value?
- 2- What is the influence of information accessibility on perceived usefulness?
- 3- What is the influence of information timeliness on expected group value?
- 4- What is the influence of information timeliness on perceived usefulness?
- 5- What is the influence of information relevance on perceived usefulness?
- 6- What is the influence of perceived usefulness on expected group value?
- 7- What is the influence of expected group value on users' satisfaction?
- 8- What is the influence of expected group value on intention to use systems?
- 9- What is the influence of perceived usefulness on users' satisfaction?
- 10- What is the influence of perceived usefulness on intention to use systems?
- 11- What is the influence of users' satisfaction on intention to use systems?

Crisis is an event occurred naturally or by human being as suddenly or increasingly and crisis management is the set of actions to mitigate the crisis impact before, during and after disaster. Crisis is a stage in which uncertainty about the estimation of condition and its important solutions and disaster control and its impact can be reduced. Crisis management is a cycle in time and the goal is saving the life and property and etc. and as preparation for the next crisis is very important, a pre-defined model is required for integration and flow of information, organizing, decision making, planning and coordination. The lack of this model creates complex problems during crisis. For example, one of the major conditions after event is the shortage of information and uncertainty of their accuracy. The efforts for better preparation and prevention of events are one of the priorities of relief authorities and its executives. Thus, comprehensive and reviews information about human and economic effects is required. Planners, policy makers and authorities in relief affairs need accurate, quick and uniform information. During crisis, effective reaction indicates providing the map of disaster, preparations, creation and development of operational plans and plans to protect the life, property and environment. We can not eradicate natural disasters but we can mitigate disasters and their impact by timely awareness and establishment of a good alarming system against the disasters by technology. In some cases, people involved in crisis management are not inclined to information systems and they can not use these systems well. Thus, finding effective factors on intention to use information systems by people will be important in crisis management.

3-Review of literature:

About 60% of Iran is in earthquake-stricken areas. Thus, the major damages in Iran are dedicated to earthquake. In the past 1000 years, averagely each 10 years, a big earthquake has occurred with great property and life losses and more than 450 people were died in this disaster. According to some informal references, the past century in Iran dedicated rank 4th in the world with 89 earthquakes and 130 thousands losses. About 20% of losses are dedicated to flood and the existing statistics show that only during 1952 to 2010, more than 3830 destructive floods had occurred in Iran.

Extensive climate and various weather conditions in Iran created natural disasters ranging flood to hurricane. The great part of Iran plateau is located on earthquake belt. As our country is located in Middle East, political crises, war or migration are observed more than other countries in the world.

One of the sources of industrial crises in the world is special industrial regions with high density of operational units. Some regions including Mahshahr and Asaluyeh have the same features in Iran. The industrial progresses of Iran in recent years and namely investment in oil, gas and petrochemical industry caused that these crises called industrial crises are occurred more. Today, industrial events and crises of natural events threat the life and health of people seriously. Based on experience, any society coping up with these events and observing the safety principles before disaster and training people is not astonished by the events and life and property damages are reduced considerably and much security can be provided for the society members [13].

3-1 Crisis classification:

Authors have presented various classifications of different crises and some of them include:

a. Crises classification in terms of abrupt or Cumulative:

Some of crises are created suddenly and have abrupt impacts on internal and external environment of organization. These crises are called abrupt crises. Cumulative crises start from crisis issues and are enhanced over time and then are continued to threshold level. Six key features can be used to compare the Cumulative and abrupt crises. Abrupt crises are appear rapidly, having low predictability, being obvious with a quick specific event, occurring at a fixed time and are based on the lack of compliance of organization with one or few environmental aspects. However, cumulative crises are emerge gradually and cumulatively, having high predictability, ambiguous, they start from a threshold level and their gradual occurrence is increased over time and are created based on lack of compliance of organization with several environmental aspects.

B) Classification of crisis in organizations based on their origin:

1-The crises created in the organization: These crises are problems of production, communication, defect in hardware or software defect, problems of major projects of organization, financial management, internal conflict between labor force and management. In these crises, employees or managers are blamed but the lack of understanding, communication or coordination create these crises. Internal organization crises are expected crises and employees are aware of them but they don't prevent it for some reasons.

2-The external organizational crises: These crises affect organization form outside and despite internal organizational crises suddenly destroy the organization. A good example of this type of crisis is manipulation of products, sabotage and abusing computer and computer network of organization.

3-The crises based on the relation of organizations with governments: Most of commercial and business contexts are based on governmental, local, national or international institutions. For example, a company loses its market due to the fact that goods importing country regulate new criteria or the manufacturing organizations are encountered with cheap goods controlling domestic goods market despite the regulations to avoid this outcome. If these governments don't have prevention policy of these events or ignore the protection of domestic manufacturing organizations, they are encountered with crisis rapidly.

4-The crises created based on the nature of people in critical conditions: For many years, authors have considered psychological aspects of crisis. Their studies showed that by increasing mental pressure, one's abilities are reduced in decision making. The mental pressure of this type of crisis causes that the decision maker loses his attitude in critical condition and can not perceive the basis aspects of situation and take decisions creating newcritical condition.

5-The crises created by the role of government organizations and volunteer brokers against the crises of human being acts:

The fifth type of crises is based on the role of organizations, volunteer authorities and state authorities coping with crises of people behavior and deeds.

The research deals with organizational and behavioral reactions to crisis and prevention or restriction systems or investigates other studies regarding crises with transnational messages.

c. The classification of crises from internal, external, technical-economic or organizational-social aspects.

Mitraf divides organizational crises into internal external, technical or economic in a classification

Table 1: Classification of Mitraf of crises from internal or external, technical –economic or organizational-social aspects.

<p>2) (External technical-economic crises</p> <ul style="list-style-type: none"> -National, governmental and international crises -Occurrence of natural disasters -Massive destruction of the environment -Deterioration of large systems -Bankruptcy of mother organizations -The emergence of new technologies in the market 	<p>1) (Internal technical-economic crises</p> <ul style="list-style-type: none"> Reduce the amount of goods and services -Occurrence of industrial defects or accidents in the work environment -Deterioration of computers or devices -Failure in Information Systems Management -Financial Bankruptcy -Depreciation of technical and informational sources
<p>(4)Internal organizational-social crises</p> <ul style="list-style-type: none"> -Symbolic generalization -Deliberate destruction of the system by external forces -Gossip and traduce to the organization -Taking organization's managers as a hostage and taking bribe of organization by influential environmental factors -Forgery of products by competitors -Strike, sanctions, killing to obtain illegal privileges 	<p>(3)Internal organizational-social crises</p> <ul style="list-style-type: none"> -Deliberate destruction of computers and devices by staffs -Gossip. Traduce and vulgar jokes in the organization -Bribery by employees for services and products Committing illegal activities

d)Also, Mitraf and Angance in another classification divided crises in terms of nature into seven groups (Mitfaf and Angance, 28).

1. Economic: Labor strike, market crash and reduction of main revenues
2. Information: losing private and confidential information, manipulation of key information
3. Materialistic: Losing equipment and main devices of organization
4. Human resources: losing key staffs
5. Good reputation: Gossip and defamation to organization
6. Behaviors caused by mental illness: Taking hostage and terroristic operation
7. Natural disasters: Earthquake, Fire, flood

3-2 Crisis management cycle:

Crisis management cycle is based on four basic stages:

1-Prevention: Some measurements taken to avoid risks or mitigate its adverse effects.

2-preparedness: Some measurements to increase ability of organization in various stages of crisis management. Preparedness includes data collection, research, planning, creating management structures, training, resources providing, practice and maneuver.

3-Response: It is presenting emergency services after crisis with the aim of protecting the various sources and avoiding extension of damages. Response in unnatural events include the identification of crisis range, finding the causes of crisis, using humanistic, information and physical tools to cop up with crisis. The capabilities of human resources of organization are of great importance in response to crisis.

The following ways are recommended to respond to crisis:

Establishment of pre-alarming system

Continuous analysis of internal and external environment

Dynamic planning

Flexible organization structure

Feedback and its analysis

Organization prosperity

4-Recovery: Returning critical conditions to normal condition by considering all security regulations.

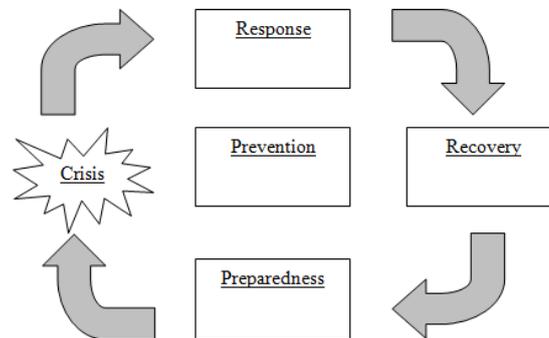


Fig. 1: Crisis management cycle.

4-Study hypotheses:

1. Information accessibility has positive effect on expected group value?
2. Information accessibility has positive effect on perceived usefulness?
3. Information timeliness has positive effect on expected group value?
4. Information timeliness has positive effect on perceived usefulness?
5. Information relevance has positive effect on perceived usefulness?
6. Information usefulness has positive effect on expected group value?
7. Expected group value has positive effect on users' satisfaction?
8. Expected group value has positive effect on intention to use systems?
9. Perceived usefulness has positive effect on users' satisfaction?
10. Perceived usefulness has positive effect on intention to use systems?
11. Users' satisfaction has positive effect on intention to use systems?

5-Methodology:

As the results of the study can be useful for top, middle managers and employees of various crisis management units of organization, this study can be applied in terms of purpose of study.

The present study is quantitative in terms of data collection and is survey in which questionnaire is used. To be sure of the validity of questions, initial test is used and after correcting the errors, the corrected questionnaires can be distributed among the population of main sample.

5-1 Study population and sample:

The study population is including 700 experts of crisis management of Municipality of Tehran, Red Crescent and security force in Tehran city.

Sample selection:

Study sample: Simple random sampling method is used in this study.

All of these samples have at least BA, organizational position as manager, expert among men and women. The sampling is done in Tehran city and these issues are explained in details in descriptive statistics in fourth chapter.

Sample size:

The sample is including a part of people of a population as their attributes are similar with the attributes of population and represent the population. In other words, it should have homogeneity with the society members (Hafeznia, 1998).

The sample size is computed by Cochran's formula as:

$$n = \frac{Nz^2pq}{d^2(N-1) + z^2pq}$$

Where, N is the number of study population, z is normal variable value with confidence interval as 95% in this study, p*q is standard deviation and d is error level as 0.05 in this study.

N=700

P=q=0.5

d =0.05

z=1.96

Based on this formula, samples are 248 but finally 237 questionnaires are completed correctly and are considered for the study.

-

Data collection:

Filed method is used for data collection in this study. A questionnaire is applied in field method. The applied questionnaire of the study is provided based on 5-item Likert scale as one of the most common methods or presenting response for close questions. A proposition is given to respondents in Likert scale and they are asked to show their agreement or disagreement.

The questionnaire of Lee *et al.*, is used as the main questionnaire to measure the variables.

- Data analysis method:

After data collection and classification, the data are processed by Spss 18, Lisrel software and the findings are described in various tables. Besides descriptive statistics methods as frequency table, inference statistics methods are used to investigate frequency. Also, to test the main hypotheses, structural equations tests and factor analysis tests are used.

- Structural equations modeling:

Structural equations modeling is a general and strong multi-variate analysis technique of multi-variate regression and it is extension of "general linear model" enabling the researcher to test a set of regression equations at the same time. Structural equation modeling is a comprehensive approach to test the hypotheses regarding observed and latent variables relation called sometimes the covariance structural analysis, causal modeling and Lisrel but the main term is structural equation modeling or SEM.

- Factor analysis:

Factor analysis is a statistical method to classify the observations in small sets and it is one of the highly applied methods in social sciences and statistical researches.

Factor analysis is one of multi-variate analyses establishing a specific relation as assumed model between a set of relevant variables [13]. By this method, the existing correlation model between a set of observed random variables can be explained based on a few latent random variables called factors [13].

Factor analysis includes 5 stages:

Formation of data matrix

Calculation of correlation matrix

Extraction of factors
 Rotation of factors
 Naming the factors
 Validity and reliability

5-3 Conceptual model of study:

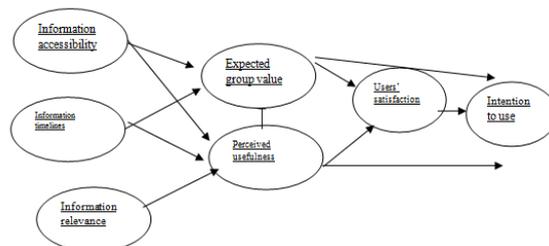


Chart 1: Conceptual model of study.

Lee, J., N. Bharosa, *et al*. [17] "Group value and intention to use—A study of multi-agency disaster management information systems for public safety." *Decision Support Systems* 50(2): 404-414.

5-4 Validity and Reliability of questionnaire:

The validity answers this question that how much measures evaluate the required feature and without awareness of the validity of measure, we can not be sure of the accuracy of data. Thus, validity means whether the measures are the real sizes of the measures features or not, if a questionnaire has not required validity, the results can not be used in a scientific study.

Lawshe developed a highly applied method to evaluate content validity and this methods measures the agreement among the panel list regarding the basic nature of a specific item and it is calculated via the following formula Mirzayi, 2009, 3270.

$$CVR = \frac{(n_e - N/2)}{N/2}$$

CVR=Content validity ratio

n_e = number of panelist indicating "essential".

N = Total number of panelist

To be sure of content and face validity, the followings are performed:

1-Survey of lecturers and calculation of CVR

2-Using previous tested questionnaire in similar researches

This ratio in this study is 0.73 and by considering 10 lecturers is acceptable.

Table 2:The minimum value of CVR for different number of panel list (Lawshe, 1975).

Minimum values	Panel list
0.99	5
0.99	6
0.99	7
0.75	8
0.78	9
0.62	10
0.59	11
0.56	12
0.54	13
0.51	4
0.49	15
0.42	20
0.37	25
0.33	30
0.31	35
0.29	40

Reliability of questionnaire:

Other points are reliability of study as it is one of the technical features of measure. The aim of evaluation of reliability of test is that the results of study have application stability in various places and times and the test

is reliable. It is a reliable study if the measure is reliable and if this study is performed by another person or the researcher at other places and times, the similar results can be achieved. The main measure is questionnaire in the study. The reliability of questionnaire is calculated by Cronbach's alpha method. This method is used to calculate the internal consistency of measure as questionnaire or the tests measuring the various features. To calculate Cronbach's alpha coefficient, at first the variance of scores of each subset of questionnaire questions is calculated by subset and total variance. Then, by the following formula, Cronbach's alpha coefficient is calculated.

$$r_a = \frac{J}{J-1} \left(1 - \frac{\sum s_j^2}{s^2}\right)$$

Where

J=The number of subsets of questions of questionnaire or test

s_j^2 =Variance of subset jth

s^2 =Total variance of questionnaire or test

This method is used to calculate the internal consistency of the tests measuring the various features. The reliability of this study is calculated after performing initial tests with 40 samples by Cronbach's alpha and it is 0.793.

6- Study findings:

Inference statistics:

This part of statistics estimates and tests the hypotheses regarding population parameters based on sample. The inferences of the sample can not be definite and these inferences are probable and we should consider the basics of probability theory. Indeed, the final goal of inference statistics is estimation of population features. Various analyses are used to analyze the study data and statistical inference. At first, to support, confirmatory factor analysis is used and finally correlation test is used to investigate the study variables condition.

The investigation of the normality of variables distribution:

Normality of residuals of regression model is one of the regression assumptions indicating the validity of regression tests. In this study, normality of dependent variable distribution is evaluated by Kolomogrov-Smirnov test. As normality of dependent variables leads to normality of model residuals (difference of estimated values from real values). Thus, it is required the normality of dependent variable is controlled before estimation of parameters.

H0=The data follow normal distribution for dependent variable.

H1= The data don't follow normal distribution for dependent variable.

Number of variables	Significance value	Kolomogrov-Smirnov test
237	0.637	1.34

Based on the results, $0.05 < 0.637$, H0 is not rejected and the data have normal distribution.

KMO index and Bartlett test:

For factor analysis, at first we should be sure we can use the existing data for analysis. By this test, we can be sure of the adequacy of sampling. This range is in zero to 1. If the index value is about 1, the required data are suitable for factor analysis, otherwise factor analysis results are not suitable for required data [13].

In this study, to be sure of the suitability of data as the matrix of correlations as basis of analysis is not zero in population, Bartlett Test (t) is used. By Bartlett Test, we can be sure of the adequacy of sampling. If KMO is less than 0.5, the data are not good for factor analysis and if it is ranging 0.5 to 0.69, we can perform factor analysis and if it is bigger than 0.7, the existing correlations in data are good for factor analysis.

The following shows the result of the calculations in this study.

Table 3: Adequacy of sampling (KMO).

Sample adequacy size		0.822
Bartlett's Test of Sphericity	Maximum Chi-square	702619
	Df	236
	Significance value	.000

Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity Sig. in factor analysis by SPSS are 0.822, 0.000, respectively.

Confirmatory factor analysis of study variables:

This section deals with the results of confirmatory factor analysis of each of study variables by LISREL software as separately for each variable. It is worth to mention that to reduce the variables and considering them as latent variable, the factor load is higher than 0.5 [13]. In Confirmatory factor analysis, the researcher know which question dedicates to which dimension. In confirmatory factor analysis, there is conceptual model for each of concepts or study variables.

Regarding the investigation of each of the models, the basic question is as whether these measurement models are suitable? Are the study data in line with the conceptual model or not?

Generally, there are two types of indices to test the model fitness. 1- Good indices, 2-Bad indices.

The good indices as AGFI, GFI, NFI and etc and the higher their value, the better. The proposed value for such indices is 0.9. The bad indices include χ^2/df and RMSEA and the lower their value, the better the fitting. χ^2/df value is 3 and RMSEA limit is 0.08.

To respond the question of model fitting, the goodness and bad indices should be investigated (χ^2/df , RMSEA, AGFI, GFI, NFI and CFI).

General model fitting tests:

As different tests are called fitting indexes can compare, develop and evolve continually but there is no public agreement regarding an optimal test. The result is that various papers presented various indices and famous writing of SEM programs as Amos, EQS and Lisrel give great numbers of fitting indices. These indices are classified by various methods and one of the major types is classification as absolute, relative and adjusted. Some of the indices are classified as:

Goodness of fit index (GFI):

This index evaluates the relative value of variances and covariance as common via model. The GFI changes range 0, 1. GFI should be equal or higher than 0.9.

Adjusted Goodness of Fit Index (AGFI):

Another fitting index is AGFI or adjusted value of GFI for degree of freedom. This is equal to mean of squares instead of sum of squares in denominator and numerator (GFI-1). This index is ranging 0, 1. GFI, AGFI indices are proposed by Jöreskog and Sörbom (1989) and don't depend upon sample size.

RMSEA index (Root Mean Square Error of Approximation):

This index is Root Mean Square Error of Approximation. RMSEA index is 0.5 or less for good models.

NFI and CFI index:

NFI index is also called *Bentler* and Bennett and is acceptable for values higher than 0.9 and it indicates model fitting. CFI index is acceptable higher than 0.9 and it indicates model fitting. This index evaluates improvement via comparing an independent model in which there is no relation between variables with the required proposed model.

Chi-square index (χ^2): It indicates Chi-square value for model. Indeed, this index shows the difference of model and data and is a criterion for bad nature of model. It is better this index is interpreted by considering degree of freedom (Schumacker & Lomax, 2004). The result of calculations of model fitting is summarized:

The values for model fitting indices show that all models to determine and fit have good condition. The results of actor loads of each of measurement variables are summarized in the following Table.

All factor loads or observed variables are significant and we can say the results of confirmatory factor analysis show the good fitting of model.

Table 4: The results of model fitting.

Result	Obtained values	Allowable value	Indices
Good fitting	2.48	$\chi^2/df < 3$	Chi-square / df
Good fitting	0.06	$0.05 < < 0.08$	RMSEA
Good fitting	0.92	Above 0.9	GFI
Good fitting	0.91	Above 0.9	AGFI
Good fitting	0.90	Above 0.9	CFI
Good fitting	.96	Above 0.9	NFI
Good fitting	0.95	Above 0.9	NNFI

Content and discrimination validity (AVE):

To determine validity of questionnaire, content validity and discrimination validity is used to determine average variance extracted (AVE). This coefficient indicates which percent of construct variance is under the influence of variables. The various researchers determined above 0.5 for suitability of this index. To determine

the reliability, Cronbach’s alpha coefficient is calculated by collecting pre-test questionnaires and it is above 0.7 as acceptable. Based on the problems of Cronbach’s alpha method as there is similar value for all questions of a construct, composite reliability is used in this study and the coefficients are shown in the following Table. The constructs their CR value is above 0.6, have acceptable reliability and the closer this value to 1, the higher its reliability.

Table 5: The results of confirmatory factor analysis (CFA) including factor loads.

1	Construct
	Accessibility
0.80*	B8
0.90*	B9
.77*	B10
	Timely response
0.73*	C11
.79*	C 12
0.90*	C 13
	Relevance
0.79*	D14
.70*	D15
.69*	D16
	Perceived group value
.73*	E17
0.91*	E18
.76*	E19
	Perceived usefulness
0.50*	A7
.55*	A8
0.84*	
	Satisfaction
0.82*	F20
0.87*	f 21
0.76*	f 22
	Intention to use
0.69*	Q23
0.75*	Q24
0.72*	Q25
.73*	Q26

**P<0.01, *P<0.05

Table 6: The results of validity and reliability analysis of the studied constructs with indicators.

Cronbach’s alpha reliability coefficient	Composite reliability coefficient(CR)	Average variance extracted (AVE)	Studied hidden attributes
0.76	0.62	0.59	Accessibility
0.74	0.75	0.63	Response
0.73	0.79	0.64	Relevance
0.76	0.66	.51	Perceived group value
0.79	0.63	0.54	Perceived usefulness
.74	0.60	0.63	Satisfaction
0.70	.72	0.61	Intention to use

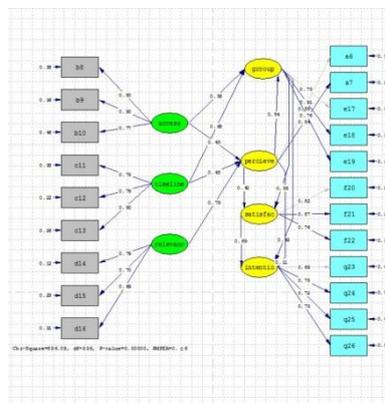


Chart 2: The model in estimation of coefficients.

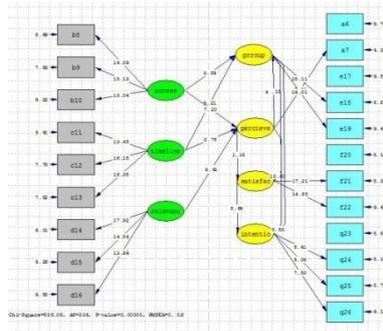


Chart 3: The model in significance of coefficients.

The results of confirmatory factor analysis show that all factor loads of constructs are significant and play significant role in measuring the required construct and the constructs have required validity. Based on the model in standard coefficient, we can say which variable plays important role in measuring each construct. Based on the model in standard coefficients, the variable plays important role in measuring the required construct that has high standardized coefficient.

Responding the study hypotheses by structural equations:

Hypothesis 1: Information accessibility has positive effect on expected group value.

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.58$, $t\text{-value}= 3.59$, $\text{Sig}<0.05$), it can be said there is no reason to reject the relation between these two variables and these two variables have direct and significant relation at confidence interval 95% and by increasing each of two variables, another one is increased.

Hypothesis 2- Information accessibility has positive effect on perceived usefulness.

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.45$, $t\text{-value}= 7.20$, $\text{Sig}<0.05$), it can be said there is no reason to reject the relation between these two variables and these two variables have direct and significant relation at confidence interval 95% and by increasing each of two variables, another one is increased.

Hypothesis 3: Information timeliness has positive effect on expected group value.

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.68$, $t\text{-value}= 9.21$, $\text{Sig}<0.05$), it can be said there is no reason to reject the relation between these two variables and these two variables have linear relation and there is a positive and significant relation between information timeliness and expected group value at confidence interval 95% .

Hypothesis 4: Information timeliness has positive effect on perceived usefulness.

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.48$, $t\text{-value}= 2.78$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between information timeliness and perceived usefulness at confidence interval 95% .

Hypothesis5: Information relevance has positive effect on perceived usefulness.

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.79$, $t\text{-value}= 9.41$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between relevance and perceived usefulness at confidence interval 95% .

Hypothesis 6:Information usefulness has positive effect on expected group value.

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.54$, $t\text{-value}= 4.12$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between expected group value and perceived usefulness at confidence interval 95% .

Hypothesis 7-Expected group value has positive effect on users' satisfaction.

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.58$, $t\text{-value}= 7.93$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between expected group value and perceived users satisfaction at confidence interval 95% .

Hypothesis 8: Expected group value has positive effect on intention to use systems.

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.48$, $t\text{-value}= 8.83$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between expected group value and intention to use at confidence interval 95% .

Hypothesis 9:Perceived usefulness has positive effect on users' satisfaction.

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.58$, $t\text{-value}= 7.93$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between perceived usefulness and user satisfaction at confidence interval 95% .

Hypothesis 10: Perceived usefulness has positive effect on intention to use systems.

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.54$, $t\text{-value}=13.60$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between expected group value and users satisfaction at confidence interval 95% .

Hypothesis 11: Users' satisfaction has positive effect on intention to use systems.

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.69$, $t\text{-value}=8.33$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between users satisfaction and intention to use at confidence interval 95% .

7-Discussion and Conclusion:

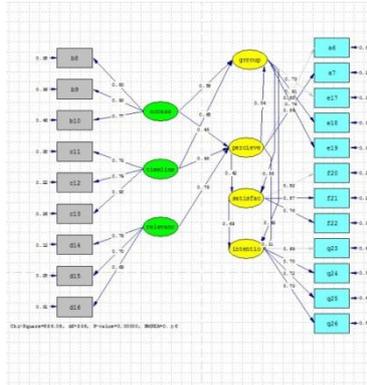


Chart 4: The general final model in standard coefficients.

Conclusion based on hypotheses:

Hypothesis 1: Information accessibility has positive effect on expected group value:

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.58$, $t\text{-value}=3.59$, $\text{Sig}<0.05$), it can be said there is no reason to reject the relation between these two variables and these two variables have direct and significant relation at confidence interval 95% and by increasing each of two variables, another one is increased.

By improved accessibility, an information system user can see what others do. This helps the users to adapt their works with a big image and increase the chance of finding a response to the questions of other people knowledge. Thus, accessibility when great number of organizations participates in a participative performance has positive effect on both individual and group performance level.

This conclusion is in line with the results of the study of Aruoy, Setork, Lina and Van Born, Nahapit and Gushal and are not in line with the results of the study of Lina and Pil and Metz Narneo.

Hypothesis 2- Information accessibility has positive effect on perceived usefulness:

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.45$, $t\text{-value}=7.20$, $\text{Sig}<0.05$), it can be said there is no reason to reject the relation between these two variables and these two variables have direct and significant relation at confidence interval 95% and by increasing each of two variables, another one is increased. Only the information can not eliminate the problem and in case of lack of good access of user to it can be equal to the lack of information and doesn't help in doing the duties of user. The results of the study are in line with the study of.

Hypothesis 3: Information timeliness has positive effect on expected group value:

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.68$, $t\text{-value}=9.21$, $\text{Sig}<0.05$), it can be said there is no reason to reject the relation between these two variables and these two variables have linear relation and there is a positive and significant relation between information timeliness and expected group value at confidence interval 95% .This result is in line with the result of the study of Lee *et al.*, Coefficient 0.68 shows that users know timeliness as one of the important factors improving group capacity for crisis management. Expected group value is the value the users expect to achieve in group activity.

Hypothesis 4: Information timeliness has positive effect on perceived usefulness:

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.48$, $t\text{-value}=2.78$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between information timeliness and perceived usefulness at confidence interval 95% .Indeed, timely information to users causes that their perception to system applications is positive. In addition,

the information that is not extracted timely are not good can lead to unsuitable reaction of user to existing conditions.

This result is in line with the results of Daus and Crasul 2004.

Hypothesis 5: Information relevance has positive effect on perceived usefulness:

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.79$, $t\text{-value}= 9.41$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between relevance and perceived usefulness at confidence interval 95% . Great volume of information in case of needing information not only eliminates problem but also it decreases the decision making in work and it negates the type of attitude to information system and these results are consistent with the result of Lee *et al*

Hypothesis 6: Information usefulness has positive effect on expected group value:

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.54$, $t\text{-value}= 4.12$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between expected group value and perceived usefulness at confidence interval 95% . This hypothesis shows that the higher the perception of people of using system, the higher the required group value. The results are in line with the study of Meloyl *et al* ., and Nilson *et al* .,

Hypothesis 7-Expected group value has positive effect on users' satisfaction:

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.58$, $t\text{-value}= 7.93$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between expected group value and perceived users satisfaction at confidence interval 95% . By increasing expected group value, the users satisfaction is increased. The users consider information systems an effective factor in increasing group output. The result of this study is in line with the results of Daice cresol, 2004, Maklin and Delon, 2003.

Hypothesis 8: Expected group value has positive effect on intention to use systems:

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.48$, $t\text{-value}= 8.83$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between expected group value and intention to use at confidence interval 95% . The higher the expected value, the higher the inclination of users to use these systems. Lee *et al* ., 2011 and Dais Crasol, 2004 had the same results.

Hypothesis 9: Perceived usefulness has positive effect on users' satisfaction:

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.58$, $t\text{-value}= 7.93$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between perceived usefulness and user satisfaction at confidence interval 95% . The user can feel the help of system to the duties. The result is in line with the results of the study of Hanson, 2013 and Lee.

Hypothesis 10: Perceived usefulness has positive effect on intention to use systems:

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.54$, $t\text{-value}= 13.60$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between expected group value and users satisfaction at confidence interval 95% .The results are in line with the results of the study of Godo 1995.

Hypothesis 11: Users' satisfaction has positive effect on intention to use systems:

Based on positive and significant correlation coefficient at confidence interval 95% ($\beta=0.69$, $t\text{-value}= 8.33$, $\text{Sig}<0.05$), it can be said there is a linear relation between these two variables and there is a positive and significant relation between users satisfaction and intention to use at confidence interval 95% . By increasing the satisfaction, the users can use these systems more. The result of this study is in line with the results of the study of [5].

Recommendations based on hypotheses:

Based on the model in standard coefficients, we can say which variable plays important role in measuring each construction. Based on model in standard coefficients, the variable with high share in measuring the construct has high standardized coefficient. The factor load can indicate correlation of index with the relevant factor and the more the load of an index, the higher we should dedicate for weight.

The recommendations of accessibility:

Based on factor loads, accessibility to information with coefficient 0.58 is correlated with expected group value. Among the questions of accessibility, (information systems of my work place give exact information) with coefficient 0.90 as high coefficient and it is the most important item. Thus, update and full information are most important factors in accessibility.

Also, the factor load of accessibility relation with perceived application is 0.45 as is less than factor load of accessibility relation with expected group value. Thus, we should have high expectation in accessibility regarding expected group value.

Recommendations of information timeliness:

Load factor of relationship between information timeliness and expected group value is 0.68 and the factor load of relationship between information timeliness and perceived usefulness is 0.48. Thus, information timeliness has high effect on expected group value. Among the relevant items (information systems of my work place in critical conditions without delay, disconnection or disturbance of required information can be presented) with coefficient 0.90 has the highest influence. Thus, the lack of delay and disturbance regarding information for system is vital.

Recommendations of relevance:

Regarding relevance, only its relation with perceived usefulness is investigated with coefficient 0.79 and is higher than accessibility and timeliness. Among the relevant items (the information the information systems of my work place presents is relevant fully with my needs for decision making or measurements in crisis) with coefficient 0.56 with high influence compared to other items. Thus, usefulness should be considered to meet the required need.

Recommendations of expected group value:

Information timeliness plays important role than determining the changes in expected group value. Among the items (information systems of my work place in critical condition increases the easy group work) with coefficient 0.91 and highest load. Thus, effectiveness is the most important factor in creating expected group value that should be determined accurately.

The recommendations of perceived usefulness:

Information relevance with coefficient 0.79 has the highest factor load to influence perceived application. Among these items (existing information systems can take uniform information of all the sectors in crisis management to do the duties of each sector during crisis) with coefficient 0.84 has the highest impact.

Recommendations of satisfaction:

Expected group value with coefficient 0.58 has the highest factor load to influence user satisfaction. Among the relevant questions (information of information systems of my work place under crisis conditions have expected efficiency and are useful) with 0.87 has the highest impact. Thus, usefulness has the highest importance in providing satisfaction.

Recommendations of intention to use:

User satisfaction with coefficient 0.69 has the highest impact on intention to use of users of systems. Also, the item (I think under critical conditions, only we can take action based on the information obtained of information systems) with coefficient 0.75 has the highest impact on intention to use of systems and it shows that information systems play important role in crisis management.

Research recommendations for further studies:

- 1- Extension of study scope in more organizations with bigger study population.
- 2- The investigation of the role of substructures in development of communication systems in crisis management.
- 3- The role of organizations and non-profit factors in development of crisis management information systems.
- 4- Investigation of other models of the role of information systems in crisis management.

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