Survey of the Relation between Organizational Structure and Informational Overload in Case Study: Payame Noor University

Roya Arjmand Kermani
Department of Psychology, Payame Noor University, PO BOX 19395-3697 Tehran, IRAN

Abstract

Increasing mass information is one of uppermost puzzles for managers who forced to confront with them. On one hand there is also deficient correct information. They may find it difficult to determine which information constitutes corporations' strategic sources and lead to assets. But that is the question, what a proper solution is. Partly related to design and performance of management information systems. Another part of the solution can be found in design and establishment of appropriate organizational structure and management of organizational information sources. This research surveys the link between organizational structure and informational overload in PNU of Iran. Robbins Theory was the basis in assessment of organizational structure made. Three dimensions to organizational structure: centralization, formalization, complexity, with some indicators for each one, has been evaluated by the theory. This research which by purpose, method, nature of the subject and specified directions is applied, is kind of correlational research (concordance or relational). Moreover data collecting has been done through survey and questionnaires that are in common use for evaluation. Population universe was 217 in people included managers and experts of the PNU. Reliability of the questionnaires applying Retest technique, the indicator of reliability coefficient which is kind of co relational coefficient, distinguished by SPSS. This research has one major and 3 minor hypothesis. Final analysis of data verified the result: the 1st hypo (centralization) with 0.95 confidence level and the 2nd hypo (formalization) with 0.99 confidence levels. But the 3rd hypo (complexity) rejected. The major hypo (organizational structure) has been verified with 0.99. It is mentioned that the most impact on changes of informational overload variable caused by changes of formalization variable.

Keywords: Organizational structure, centralization, formalization, complexity, informational overload.

Introduction

We live in the information era, scientific and technical progress has put an incredible amount of pressure on modern societies. The information produced in the world is so much that makes us face with "information explosion", "information pollution" and "overgrowth of information". Today, because of the incredible rise in the existing information mass, information management is known as a very complex concept. All persons, in any position they are, deal with information and try to manage it in some ways[1]. In the 1980s and 1990s we experienced the acceleration of the companies to get rid of the bureaucracy derived from organizational hierarchy which was getting worse by the process of transmitting written information. Now, this structure has generally become much more even and the new structures have less levels between the top and the bottom of the hierarchy. We can say by experience that in hierarchical structures, the inappropriate management strategies causes overload of the information. On the other hand, free and less hierarchical structures decrease the rate of overload[1]. The organizational structure clarifies that how should we allocate the organizational responsibilities like who should give reports and who should receive them; and also what are the interactive patterns that should be held. We define "structure" as one of the components of organization which consists of complexity,

formalization and centralization. Complexity indicated the inter-organizational separation limits. It also refers to specialization, division of labor, and the amount of levels in the organizational hierarchy. The limitation that an organization considers for directing its employees to behave toward rules, instructions and procedures is called formalization. Centralization refers to the department which is the center of decision making authority. In this information era, the value of information is getting more and more obvious everyday and the more we focus on it the more information we produce and try at the same time to make it more exact and comprehensive. This can be the key to organizational success, but also can make some problems. The information should include as less details as possible. The existence of any extra word means more processing, more analysis and taking more space and so will result in taking much more useless decisions. To stay and improve in the business market, all of us need information. But at the same time, too much information can confuse us and eventually lead to the individual employee's and the organization's failure. Information overload happens at a time that the amount of received information precedes our ability of effective and meaningful processing. The information overload may be a result of organizational factors like organizational structure (centralization, formalization, complexity)[1]. In this present research we are about to study the effect of the three factors of:

organizational centralizing, organizational formalization and organizational complexity on information overload by using Robin's model. So this research will study the relation between information overload and organizational structure with its three components (complexity, formalization and centralization) in the Payame Noor University. The organization requires a clear and codified structure to function efficiently, effectively and optimally. Organizational structure is an adherent of missions, targets, plans, history of activities, division of tasks and the methods of management's decision making and the information and connections they need. For proper decision making and planning and also to have supervision on doing tasks and activities management needs to have information and special connections. We can see the important role of information through vast contexts of vital human activities. As the activity of companies and organizations have expanded a lot, the access to exact and correct information to use for management's decision making is becoming a very vital and essential need. With the increase in the amount of information in different organizational levels and the importance of proper decision making in a limited time, it is more obvious nowadays that the managers need more updated information. Formalization, complexity and the degree of centralization are some components of an organizational structure which should necessarily be compatible with the information management method.

Research Theoretical Framework: The theoretical frameworks for this research for measuring the independent variable - the organizational structure- in Payame Noor University is extracted from the theory of Stephen P. Robins. And the theoretical framework for measuring -the dependent variable of overload- is extract from Joseph Ralph and Opler.

The Research Hypothesis: i. There is a meaningful relation between information overload and the organizational structure in the Payame Noor University. ii. There is a meaningful relation between information overload and the organizational centralization in the Payame Noor University. iii. There is a meaningful relation between information overload and the organizational formalization in the Payame Noor University. iv. There is a meaningful relation between information overload and the organizational complexity in the Payame Noor University.

Literature Review: The organizations have a major role in our modern world. The organizations pervasive presence in all of the aspects of our lives makes it inevitable to study and know about them not only as a scientific subject but as an inseparable part of our social lives. It is not easy to know the concept of organization to an extend which is enough to help our managers in not only their personal lives but also in their organizational lives and to equip them with knowledge to lead and control their personnel. Because nowadays both the organizations and the individuals who work in them are really complicated, the network of relations and structures derived from interactions

between these individuals and organizations becomes that much complex and intertwined that we can understand it only by means of theory. The challenge which managers are faced with is that they should be able to understand the organizational structures and patterns and so be able to (successfully) reach the company's objectives. The three components that we apply to make the organizational structure are complexity, formalization and centralization. Although it's common to accept these three components as main and the most important parts of the organizational structure, but it's not universal and pervasive. It contains a range of the most common to the least common in different parts. In addition to including a group of people who work in them, the organizations are also a kind of decision making and information processing systems. The organizations make it easier to gain the objectives through coordinating group work; and decision making and information processing are key factors to this coordinating. Despite all these, the information itself is a scarce source in the company. The advanced information technology, equips the managers with a big mass of data in order to take decisions. We are bombarded with information in today's world. So the scarce source is our ability to process selected set of data. A manager's ability for data processing is limited. If we give the manager more information than her capacity, it will result in information accumulation. To avoid such phenomenon, some parts of the decision making should be given to other people and the centralization of decision making should spread from one single point to all over the organization. This act of spreading or transmitting is called decentralization. To prepare information for making decisions the managers trust their staff. The information is sent from the bottom levels to the top and is first refined by the employees. If the filtration and refining process wouldn't happen, the manager had been bombarded with different information. But this process needs the staff that can interpret and explain the information required by the manager. The second component of organizational structure is formalization. Formalization is a set of rules, methods and written documents which determine the responsibilities, instructions and orders for employees and members of the organization. Complexity refers to the amount of differentiation in an organization. Horizontal differentiation refers to the amount of differentiation between organizational units based on members' positions, nature of their responsibilities and the amount of their achieved education and trainings. Existence of several professions in an organization which all need specialized knowledge and scientific skills makes the organization more complex. The most important factor associated with horizontal differentiation is specialization and internal classifying. Specializing is the accurate grouping of one person's responsibilities. Specializing has two forms. Its most common form is functional specializing in this form; the professions are divided to simple and repetitive categories. Social specializing takes place by hiring people who have skills but can't use them easily[2]. "Ackoff" suggests that most of the managers suffer more from the extra amounts of raw and inappropriate data than lack of the appropriate and useful data, and this means that most of the managers gain too much

information and data and need a lot of time to extract useful data out of this mass.

Ackoff calls this problem- which has in the first place happened because of the extension of information technology especially in recent years- "the information overload". So in order to develop the process of decision making in the organization, we need to reduce the information overload that most of the decision makers are faced with. This practice concludes "filtration" and "condensation". Filtration is a process through which the (raw) data according to its relevance with the desired subject is classified, refined and purified. In other words the required, relevant and necessary data is separated from the irrelevant and unnecessary ones. And condensation is a process through which the (raw) data is cleared from frills, the repeated data is removed and all the received data is compressed and condensed. In this way, a compress and an abstract of the data will be offered to the decision maker (the manager) and prevents "information pollution" so that the manager won't receive extra and unnecessary data neither inadequate, inappropriate nor incomplete ones[3,4].

We all need information to survive in the business market and to compete, meanwhile excessive information may make us drown in. If you let yourself inundate in the informational swamp, the organization and yourself will face corruptive consequences. Existence of repetitive and wrong information somehow makes the managers disappointed, and prevents them reaching the useful information. The more useful information exists, the more analysis is required and sometimes the excessive analysis leads in paralysis and hurt the accurate decision making[5]. There are various opinions are expressed by theoreticians with respect to the concept and reasons of informational overload existence, and we briefly express some of them here: a. Herbig and Kramer: The Informational overload is too much amount of the information which is offered within a short time and is difficult to comprehend and solve. The informational overload occurs when the nature of the information is unspecific, vague, new, complicated or compressed[6], b. Josef Ruff: As expected, individuals who have little or no information for processing make weak decisions. When the information amount is increased, the information processing and the decision making quality is increased too. However, the decision maker could have access to more information by determining a specific point rather than by processed the information. Now, the informational overload occurs and the decision making ability is declined and subsequently, the extra information cannot be processed and just interferes the decision making ability[7]. c. Butcher: To give a better understanding of the informational overload, Butcher proposed seven main factors of why managers obtain too much excessive information to be embarrassed: i. They accumulate the information to pretend that they care too much about their responsibility for making better decisions; ii. They receive too much amount of unnecessary information; iii. They search for more information to check the existing information; iv. They need to justify their decisions; v.

They accumulate the information for a likely future utilization; vi. They feel they can provide more security by obtaining more information; vii. They use information as a kind of current capital to avoid being obedient or subordinate to others.
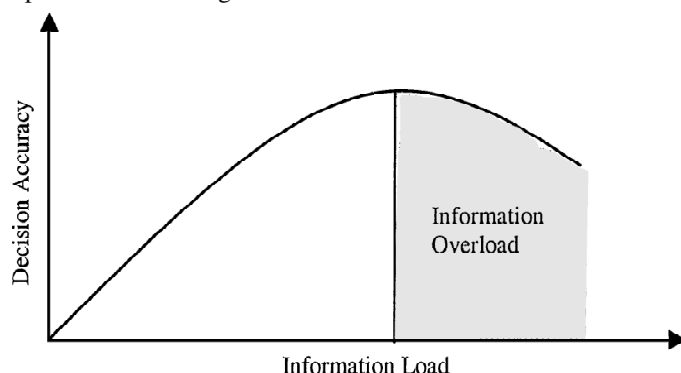

Figure-1
The concept of Informational overloads Capacity

In all of the said cases, in spite of the abundant information, obtaining the relevant useful information from amongst enormous amount of information for daily operations and programming is so difficult. Also, accumulating too much information, so that he/she cannot process it, may result in disorder[8,9].

Stanly and Clipsham: These two theoreticians have defined Stress as a feeling resulted from the increased anxiety for informational overload. The factors of informational overload which cause stress include the physical stresses (Such as: bad air, warm air, night shift working, hard physical works ...), psychological stress (Such as: lack of time, quarrels, social isolation, mandatory group works, lack of ability to discern) and financial conditions (Such as: inadequate fund, occupational instability ...). Informational overload has recently been expressed as a stress making factor[10-13].

Commercial information Commission of Reuters: In an empirical study (The subject countries: Singapore, Hong Kong, Australia, England and United States of America), Reuters defines the informational overload as repetition of events or accidents, and points out the factors that affect the informational overload and the effects resulted from it[14] (figure 2).

M. Eppler and J. Mengis: From their point of view, managers may be thankful to the information obtained through management information system, however, the complain a lot about the excessive information (Informational overload) available today. It's interesting to note that when the excessive and too much information is supplied, the managers imagine that they cannot obtain all the information they require for their work. The irresolvable issue is that the managers receive too much information but do not obey the correct type. These two theoreticians suggest that the solution for the informational overload should be expressed on five extensive subjects. Personal factors, informational characters, process and work parameters, organizational designing and utilizing the informational technology[15,16].
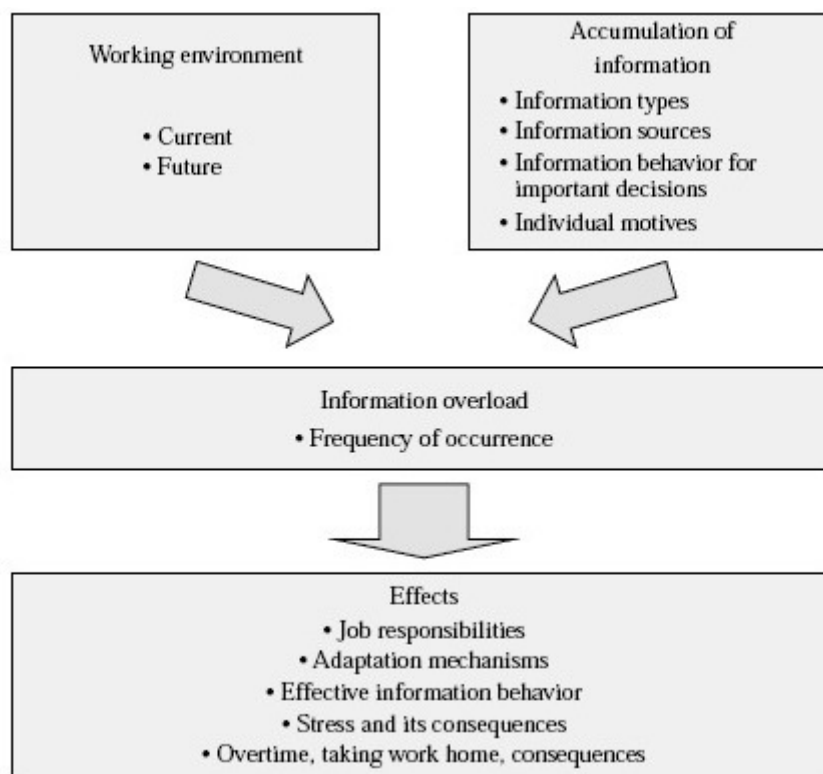
Figure-2
Elements and structure of the empirical study

Research Methodology

This present research is focuses on nature and the applied method is correlational, and the process of gathering data from the statistical population is through survey. And according to objective is considered practical. The statistical population of this research is 217. To gather data from them and in order to test the adjusted hypothesis, a questionnaire is used that has been adjusted according to variables of this research and the process of bringing them into practice based on "Parasuraman Et al" 's theory. The questionnaire of research is formed of two categories of questions. The first category is adjusted to determine the characteristics of statistical population like education, work experience, age, sex, and the second category is to test research hypothesis. The applied scale in the questionnaire is Likert Scale, this Likert is a five-itemed one (very little, little, average, a lot, too much). In the present research, the formal or symbolic validity was used to determine the validity of data gathering instruments. For this purpose, a primary questionnaire was given to some professors and experts so that they can comment on the questionnaire and see if the given questions can measure the desired qualities or not. Afterwards their comments were considered in the questionnaire and required changes were made. Although the present questionnaire is based on SERVQUAL instrument and so is considered a standard one the only difference between this and the original questionnaire is the five-itemed scale instead of the seven-itemed one. For final checking of the questionnaire the

test-retest method was used. For this purpose, the measuring instrument (the questionnaire) was given to the members of the statistical population two times (with at least two weeks interruption) and the correlation of 35 members' answers was counted in both two times. The output gained from SPSS software by means of Pearson correlation coefficient- which its results indicate a high correlation between the two groups- is given in the table below.

Table-1
Test-retesting for final examination of research variables
Using Pearson correlation coefficient

Variable	Pearson Correlation Coefficient
Organizational Centralization	0.841
Organizational Formalization	0.981
Organizational complexity	0.918
Information Overload	0.807

After testing the validity of the questionnaire, deductive and descriptive methods were used to analyze the gathered data. For this purpose distribution tables and the calculated percent of answer to each question were used. And column charts were used to show the statistical data in a coherent way. At the analytical level, to test hypothesis 1 to 3, after gathering data, first the Kolmogorov-Smirnov test was taken to test the normality of the data. And because gained data follows the normal distribution, the Pearson test (Pearson correlation coefficient) to find out the degree of correlation between the two

variables. A simple linear and multi variable regression test was also used to determine and predict the dependent variable which is calculated based on the independent variable.

Statistical data analyzing method: Pearson correlation was used to test hypothesis at deductive level:

Table- 2
Testing the correlation coefficient of hypothesis 1 to 3 of research

Hypothesis	Significance Level	Pearson correlation coefficient
Hypothesis 1	0.040	-0.239
Hypothesis 2	0.000	-0.482
Hypothesis 3	0.295	0.123

Results and Discussion

In the table 2, the correlation coefficient between the centralization variable and information overload in the first hypothesis is assumed "P= -0.239", and whereas the significance level of that test is "p-value = 0.040", it can be claimed that the above-mentioned correlation coefficient is meaningful and valid with 5 percents of calculation error or calculation confidence level of 95 percents. And the correlation coefficient between the formalization variable and information overload is assumed "P = -0.482", and whereas the significance level of that test is "p – value = 0.000", it can be claimed that the above-mentioned correlation coefficient is meaningful and valid with 1 percent of calculation error or calculation confidence level of 99 percents. And finally the correlation coefficient between the complexity variable and information overload is assumed "P = -0.123", and whereas the significance level of that test is "p – value = 0.295", it can be surely claimed that, according to gained information, there is no meaningful relation between complexity and information overload in the Payame Noor University.

In the tables 3 and 4 below, according to coefficient of determination R^2 which equals the rate of mentioned changes of the dependent variable X divided to the total changes. It can be said that in the hypothesis 1 about 6 percents of changes of the dependent variable (Y), can be justified according to changes in the independent variable (x_1), this amount in the hypothesis 2

can be 23 percents of changes of dependent variable (Y), according to changes of the independent variable (X_2). And in the hypothesis 3 because the amount of significance is more than significance level of 0.01 and 0.05, it can be claimed that according to the gained information there is no meaningful relation between complexity and information overload. Therefore the mathematical relation between organizational centralization and information overload will be "$Y = 49.644 – 0.172x_1$". So it can be said that one unit increase in the organizational centralization variable will cause 0.172 decreases in the information overload variable. With mentioning the algebra symbol of correlation coefficient we can say the relation between these two variables is linear and negative. Also the mathematical relation between organizational formalization and information overload will be "$Y = 56.199 – 0.513x_2$". So it can be said that one unit increase in the organizational formalization variable will cause 0.172 unit decrease in the information overload variable. With mentioning the algebra symbol of correlation coefficient we can say the relation between these two variables is linear and negative. In testing the main hypothesis of research with mentioning table No.3 whereas the significance level of this test is "*p- = 0.000 value*", so the H_0 assumption is failed with calculation confidence level of 99 percents. So it can be said that according to gained information, there is a meaningful relation between organizational structure (centralization, formalization, complexity) and information overload in the Payame Noor University. In addition, according to coefficient of determination R_2 in the above-mentioned regression model- which equals the rate of mentioned changes by the independent variable X divided to the total amount of changes- it can be said that about 25 percents of changes of the dependent variable (Y) can be justified according to changes in the independent variable(X). It should be said that the most effective changes of independent variable (Y), can be justified by changes in the independent variable (X_2).

Conclusion

So it can be concluded that in the mentioned regression model, the independent variables (X_1) and (X_3) have had the least effects on changes of the dependent variable (Y).

Table -3
Analysis Of Variance Related to the Regression Model of the Information Overload Variable

Hypothesis	The significance level	Coefficient of determination	The adjusted coefficient of determination	Standard error	F
Hypothesis 1	0.4	0.057	0.044	4.6176	4.355
Hypothesis 2	0	0.232	0.221	4.16681	21.77
Hypothesis 3	0.295	0.015	0.002	4.7189	1.112
The main Hypothesis	0	0.248	0.216	4.18185	7.699

Table- 4
Coefficients of Parameters Related to the Variable Information Overload

The title of the variable	Latitude of origin	Line Gradient	Calculated t
Organizational Centralization	49.644	-0.172	-2.087
Organizational Formalization	56.199	-0.513	-4.666
Organizational Complexity	41.367	0.146	1.054

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