

## Information Technology Project-based Organizations and Employee Satisfaction: A Case Study of Iran

<sup>1</sup>Akram Hadizadeh Moghadam and <sup>2</sup>Seyyed Sabahedin Vajdi Dastgerdi

<sup>1</sup>Faculty of Management and Accounting Department, Shahid Beheshti University, Tehran, Iran

<sup>2</sup>School of Management and Accounting Department, Shahid Beheshti University, Tehran, Iran

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**Abstract:** This paper's main focus is on the employee satisfaction as one the most sought after subjects in today's IT project-based organizations. It provides an empirical examination of the relationship between job satisfaction and the degree of dependence on IT tools to complete job tasks. 210 questionnaires were distributed among respondents to study this relationship based on the model of 4 constructs to measure the effects of "computing environment", "organization environment" and "job characteristics" on "job satisfaction" by applying structural equation modelling. The results strongly support the extended model and conclude with implications for practitioners and recommendations for future researches.

**Key words:** Information Technology • Computing Environment • Job Characteristic • Organization Environment • Job Satisfaction

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### INTRODUCTION

Information technology (IT) has been increasingly developed in recent years in organizations. In Iran such as other developing countries, the growth of IT as a new technology has been in high speed. Despite the ever more pervasive presence of technology in the workplace, there have been few empirical studies regarding the effect of using computer on job satisfaction. For many employees, their daily activity is now highly dependent on the use of computers. For example, high levels of computer use are considered as a feature of those who have come to be labelled as "knowledge employees", namely those employees whose main tasks involve the collection, manipulation, interpretation and communication of information. Indeed, for many employees, most information regarding the organization (e.g., contact information, policies and procedures, employee benefits, mails, messages etc.) is available only electronically. on the other hand, Organizational researchers have long been interested in studying job satisfaction due to its relationships with job performance and/or organizational commitment [1,2]. More importantly, employed individuals spend most of their time doing their jobs. As a result, their feelings about their jobs are likely to affect their lives in general [3]. The literature review in this study supported

the view by indicating a positive relationship between job and life satisfaction, for example it can be supposed that job satisfaction affects one's positive mood after working. In turn, job satisfaction is important for personal well-being and organizational effectiveness [4]. By considering the reviewed issues and created computer environment in organizations and its effect on job satisfaction and ultimately life quality, we decided to develop a model for measuring the effect of IT and computer environment on job satisfaction, other organization and job dimensions such as organizational environment and job characteristic.

### MATERIALS AND METHODS

Job satisfaction has been widely researched both in terms of its determinants and its predictive power. Researchers have noted that job satisfaction is directly related to employee turnover/retention rates [5], [6] and absenteeism [7] and indirectly to job performance and productivity although the findings for productivity have been somewhat contradictory. Research has been conducted with the general population of workers as well as within specific job types such as bank tellers [8], health care workers [9], information systems workers [10,11], factory workers [12] and managers and professionals [13,14].

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**Corresponding Author:** Dr Akram Hadizadeh Moghadam, Department of Management and Accounting, Shahid Beheshti University, Ewin, Tehran, Iran, Tel: (+9821) 22422415, +982122431843, +989121075653, Fax: (+9821) 22170599, +98218897312, +982122431843, E-mail: Hadizadeh6@gmail.com.

**Job Satisfaction and its Concept:** Locke's [15] classic definition of job satisfaction has been widely cited in the literature. Locke defines job satisfaction as “a pleasurable or positive emotional state resulting from an appraisal of one's job or job experiences”. Similarly, Hackman and Oldham [16] provide an implicit definition of job satisfaction as one's affective reactions to his/her job in their Job Characteristics Model. Both definitions indicate that job satisfaction is one's “emotional reactions” to one's job.

Pointing out inconsistent treatments of job satisfaction as affect and attitude in the literature, Weiss [17] argued that affect and attitude are not the same things. He further argued that the three constructs of an evaluative judgment regarding jobs, affective experiences at work and beliefs about jobs need to be distinguished. To Weiss, job satisfaction is not an affective reaction, but rather an attitude that is an evaluative judgment involving objects. Based on his argument, Weiss defined job satisfaction as “a positive (or negative) evaluative judgment one makes about one's job or job situation”. Some researchers tend to agree with Weiss's distinction between affect and attitude in defining job satisfaction [18], [19]. In particular, Ilies and Judge [18] acknowledged Weiss's argument and remarked that job satisfaction is an attitudinal concept reflecting one's evaluation about one's job, as well as an emotional reaction to it.

### **Variables Affecting Job Satisfaction**

**Demographic Variables:** Demographic and socioeconomic variables Studies have shown inconsistent results concerning the relationships between most background variables and job satisfaction, except for gender. Most reviewed studies consistently find no relationship between gender and job satisfaction of either IT personnel [20], [21], [22]. Some researchers found that the older employees were more satisfied with their jobs than the younger individuals [21]. Other researchers found that age was not a factor [23], [24], [25], [26].

Metle's [27] literature review provides evidence of inconsistent findings between educational level and job satisfaction. In fact, Kuo and Chen [21] found no relationship between education and the job satisfaction of IT personnel in Taiwan. Women have been found to report significantly higher job satisfaction than men [28], [29], although this gender gap appears to be narrowing [30]. Some researchers have noted that older workers tend to have a higher level of job satisfaction, although a number of studies have shown that the age variable might

be more a proxy for experience [31], [32], [33]. Older workers also tend to be situated in higher level positions which might be more fulfilling than the less exciting entry-level positions of those just entering the work force.

**Organization Environment:** Barak and Levin [34] discussed a number of studies that conveyed the relationship between acceptance by the organization and job satisfaction. They also presented evidence of a negative relationship between a perceived lack of fit between employees and others in the organization and job satisfaction. In organizations that had the environment of sense of cohesion, life and job satisfaction was higher than organizations didn't have this environment [35].

One of the other variables for organization environment is job autonomy. According to Hackman and Oldham [16], job autonomy is one of the key sources of job satisfaction. Other researchers have also reported a positive relationship between these two variables [2], [36]. Higher job satisfaction has been linked with employees who are able to exercise autonomy [8] and with those who have a higher level of job involvement [37]. Based on [38] several organizational practices are considered important to maintaining job satisfaction. For example, programs and measures provided by the organization to enhance worker's skill and job knowledge might enhance employee job satisfaction, what Herzberg would define as ‘hygiene’ primarily because such organizational practices provide the bridge to the formulation of intrinsic elements connected to the job. Workers who are able to enhance their skills and to increase their job knowledge through programs and measures provided by their organizations are more satisfied with their job than those who are not provided these opportunities. Danziger and Dunkle [38] identified four organizational practices which might enhance the overall assessment of job satisfaction as it relates to computer-using workers, they are: skill development, work autonomy, work influence and information-rich environment.

**Job Characteristic:** The job characteristics model [16] applied in job design research provides a framework for understanding the extent to which individuals perceive their jobs to be motivating and satisfying by focusing on job characteristics. The model suggests that five job dimensions task variety, task significance, task identity, autonomy and feedback influence three critical psychological states knowledge, experienced meaningfulness and experienced responsibility.

These states, in turn, influence a number of personal and work outcomes including internal work motivation, general job satisfaction, growth satisfaction, lower absenteeism, lower turnover and work effectiveness [39]. The literature is replete with empirical support of the positive link between job characteristics and behavioural outcomes [40], [41], [42]. Researchers argue that the positive effects of job characteristics on job incumbents may not be homogeneous [43]. Employees who identify with the organizational goals, value their organizational membership and intend to work hard to achieve the overall organizational mission will perceive the job characteristics of autonomy, variety, task identity and feedback as highly motivational and stimulating to their task performance [44]. Danziger and Dunkle [38] identified four indicators of job characteristics are used in the analysis. Similar to organizational practices and procedures, they focus on indicators which they believe are reflective of jobs in which computers are necessary for the completion of job tasks. These four indicators are: Degree of information intensity, Computer use, Continuous learning and Job stress.

**Computing Environment:** There has been some research on workplace automation which has pointed to increases in job stress when such systems ‘crash’ or are so complex that it is difficult to pinpoint problems and correct them quickly [45], [46]. At base, high emphasis on automation coupled with an unstable, unreliable computing environment resulting in high uncertainty could lead to lower levels of job satisfaction. Danziger and Dunkle [38] for measuring the computing environment use three

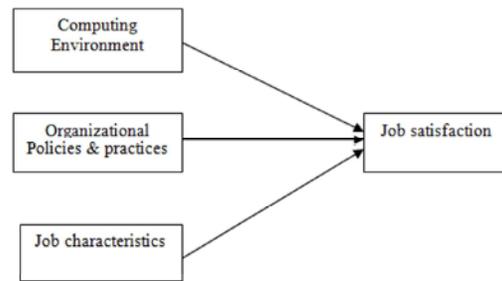


Fig. 1: Initiative model

question that are: business independency to computer, changes in software and availability of computer in organization.

**Research Model and Hypotheses:** For doing this research we must were finding the model related to Information Technology and Job Satisfaction, so we begin to search and found the model that shown in figure 1 in the Danziger and Dunkle [38], this model involves four variable that are "Computing Environment", "Organizational Policies and practices", "Job characteristics" and "Job satisfaction". This model became a base for our research.

We developed this model with change of variables. We change latent and observer variables. We change the model from this simple and the non prioritize form to the structural equation model with three types of variable, independent variable that is "Computing Environment", mediator variables that are "organization environment" and "job characteristic", and in the end of model we can see dependent variable that is " Job satisfaction". This model is shown in figure 2.

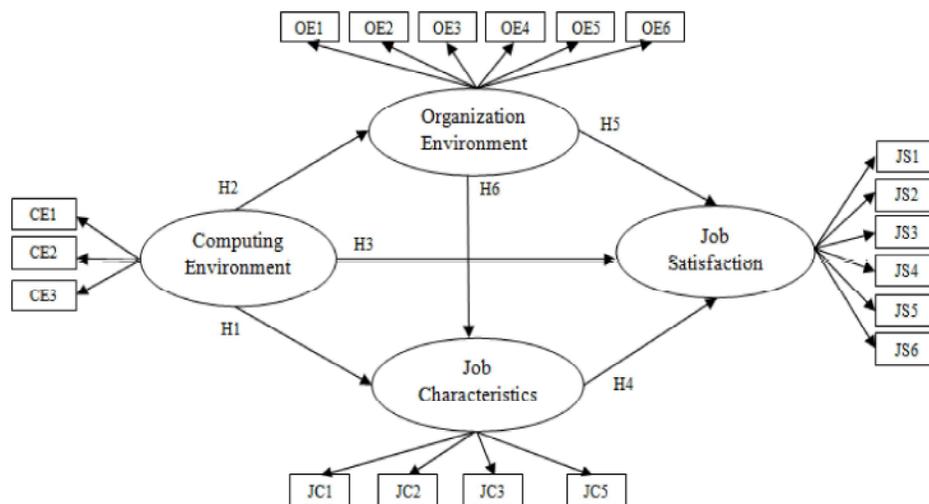


Fig. 2: Developed and conceptual model

Table 1: Profiles of the respondents

variables	Frequency	Percentage
<b>Gender</b>		
Female	64	30.5
Male	146	69.5
Total	210	100
<b>Age</b>		
20-25	84	40
26-40	102	48.6
41-60	12	5.7
Over 60	12	5.7
Total	210	100
<b>Occupation</b>		
Self-employed	2	1
Governmental job	32	15.2
Private company's job	176	83.8
Total	210	100
<b>Education</b>		
High school degree	69	32.9
University degree	101	48.1
Master or doctorate degree	40	19
Total	210	100
<b>Internet Usage (hours) per week</b>		
1-2	9	4.3
2-4	14	6.7
4-6	59	28.1
Over 6	128	61
Total	210	100

Based on conceptual model (Figure 2) as you can see, here are our hypotheses:

- H1: computing environment has a positive impact on the job characteristic.
- H2: computing environment has a positive impact on the organization environment.
- H3: computing environment has a positive impact on the job satisfaction.
- H4: job characteristic has a positive impact on the job satisfaction.
- H5: organization environment has a positive impact on the job satisfaction.
- H6: organization environment has a positive impact on the job characteristic.

**Instrument:** A survey instrument consisted of 19 items was developed to measure four constructs of the model. To ensure the content validity of the scales, the items selected must represent the concept about which generalizations are to be made. Therefore, items selected for the constructs were mainly adapted from prior studies to ensure content validity. Validated items from the prior research were used to examine the theoretical constructs

of the model, for Job satisfaction measures of Weiss [46], for Organization environment and Job characteristic of Danziger and Dunkle [38] and for Computing environment of Danziger and Dunkle [38] and our practices, were used. In appendix A the questionnaire is shown. A five-point Likert scale was used to measure respondent's agreement or disagreement from (1) "strongly disagree" to (5) "strongly agree".

**Participants and Data Collection:** A questionnaire method was employed for the survey. Respondents were employed in government and private IT Company. The data collected over three month from November 2008 to January 2009. The questionnaires distributed either in hard-copy format or via Email. A total of 250 questionnaires were distributed, of which 210 were collected. Various minimum sample sizes for the Structural Equation Modelling approach have been recommended, if we consider Bollen's [47] suggestion of a minimum sample size of 100, the sample size of 210 in this study, is considered adequate. Of the 210 respondents 69.5 percent were male and the majorities (88.6 percent) were between 20 and 40 years of age. Most (67 percent) had obtained college degrees, while the rest (33 percent) had completed high school, also most (89 percent) had used computer more than four hours. Table 1 shows the complete profile of respondents.

## RESULTS AND DISCUSSION

**Measurement Model:** A confirmatory factor analysis using LISREL 8.54 was conducted to test the measurement model. Eight common model-fit measures were used to assess the model's overall goodness of fit: the ratio of  $\chi^2$  to degrees-of-freedom (df), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normalized fit index (NFI), non-normalized fit index (NNFI), Incremental Fit Index (IFI), Comparative Fit Index (CFI) and Root Mean Squared Error of Approximation (RMSEA). As shown in Table 2, all the model-fit indices exceeded their respective common acceptance levels suggested by previous research, thus demonstrating that the measurement model exhibited a fairly good fit with the data collected.

**Validity and Reliability:** We evaluated construct validity through Principal Component Analysis (PCA). The results of the PCA for each of the constructs are shown in Table 3. As the loadings of items on the construct exceed 0.4, it is verified that the items measured show sufficient validity.

Table 2: Model fitness

Fit indices	Recommended value	Measurement model	Structural model
$\chi^2 / df$	= 3.00	2.64	2.64
Adjusted Goodness of Fit Index (AGFI)	= 0.80	0.85	0.84
Root Mean Squared Error of Approximation (RMSEA)	= 0.1	0.07	0.07
Normed Fit Index (NFI)	= 0.9	0.95	0.94
Non-Normed Fit Index (NNFI)	= 0.9	0.94	0.94
Comparative Fit Index (CFI)	= 0.9	0.97	0.97
Incremental Fit Index (IFI)	= 0.9	0.95	0.95
Goodness of Fit Index (GFI)	= 0.9	0.90	0.90

Table 3: Results of principal component analysis

Component	Job Characteristic	Organization Environment	Computing Environment	Job Satisfaction
JC1	.690	.515	.061	.247
JC2	.710	.274	.118	.314
JC3	.703	.331	.084	.340
JC4	.665	.133	.177	.265
OE1	.228	.653	.134	.266
OE2	.233	.657	.302	.273
OE3	.324	.823	.353	.311
OE4	.321	.785	.001	.237
OE5	.014	.801	.217	.429
OE6	.330	.804	.043	.425
CE1	.112	.438	.623	.166
CE2	.343	.299	.862	.186
CE3	.150	.151	-.858	.178
JS1	.421	.328	.144	.865
JS2	.425	.237	0.92	.852
JS3	.429	.311	.211	.829
JS4	.359	.217	.234	.814
JS5	.446	.143	.299	.783
JS6	.265	.272	.217	.883
Cronbach's $\alpha$	.741	.843	.708	.802
Eigenvalue	5.61	2.67	1.75	1.52
Cum. Variance explained (%)	19.11	35.57	49.86	60.85

For reliability Analysis, Cronbach's  $\alpha$  for each of the 4 factors is shown in Table 3 and as it is vivid, it is greater than 0.7 for each factor and for all of the factors Cronbach's  $\alpha$  became 0.9 that this result show the reliability of model is high. Eagenvalues (Table 3) were examined to decide the number of factors to extract. An Eagenvalue greater than 1 was used as a criterion to determine the number of factors.

**Structural Model:** A similar set of fit indices was used to examine the structural model (see Table 2). Comparison of all fit indices with their corresponding recommended values provided evidence of a good model fit ( $\chi^2 / df=2.64$ , GFI=0.9, AGFI=0.84, NFI=0.94, NNFI=.94, CFI=0.97, RMSEA=0.07). Thus, we could proceed to examine the path coefficients of the structural model. Properties of the causal paths, including standardized path coefficients, t-values and variance explained for each equation in the hypothesized model are presented in Figure 3.

As expected, hypotheses  $H_3$ ,  $H_4$  and  $H_5$  were supported, in that computing environment, organization environment and job characteristic all had a significant positive effect on job satisfaction. Altogether, they accounted for 62 percent of the variance in job satisfaction with computing environment ( $\beta=0.24$ ) contributing more to satisfaction than organization environment ( $\beta =0.18$ ) and equal with job characteristic ( $\beta=0.24$ ). In addition, hypotheses  $H_1$  and  $H_2$  were also supported. Computing environment had a positive effect on both organization environment ( $\beta =0.16$ ) and job characteristic ( $\beta =0.63$ ). The total effect of computing environment on job satisfaction was 0.45 ( $0.24+0.16*0.18+0.63*0.24+0.16*0.71*0.24$ ). Also hypothesis  $H_6$  was supported. Organization environment had a positive effect on job characteristic ( $\beta =0.63$ ). The total effect of organization environment on job satisfaction was 0.35 ( $0.18+0.71*0.24$ ). Direct and indirect effect of all constructs show in Table 4.

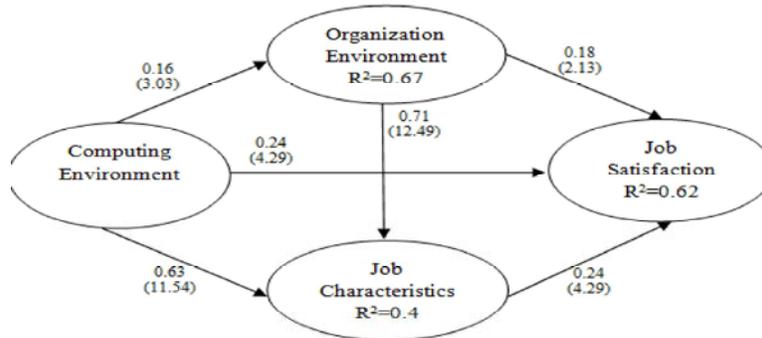


Fig. 3: Result model

Table 4: Direct and indirect effects

	OE		JC		JS	
	Direct Effect	Indirect Effect	Direct Effect	Indirect Effect	Direct Effect	Indirect Effect
CE	0.16	--	0.63	0.117	0.24	0.21
OE	--	--	0.71	--	0.18	0.17
JC	--	--	--	--	0.24	--
R <sup>2</sup>	0.67		0.4		0.62	

### DISCUSSION

This study focused on the extended job satisfaction model to illustrate the process by which computing environment influence job satisfaction. Most empirical studies of job satisfaction have examined relatively simple employee satisfaction. It is not clear whether the constructs and relationships embodied in this model would be equally applicable to more complex organization. This study is a pioneering effort in applying new model to the newly emerging context of IT project-based organizations, which have become available and popular only recently. Using this new model as a theoretical framework, this study introduced “computing environment” as a new factor to reflect the effect of computer concerns in the satisfaction of new organizations and examined the effect of organization environment and job characteristic on the job satisfaction. The findings of this study strongly support the appropriateness of using this model to understand the satisfaction of employees in IT project-based organizations. Significant effects of computing environment, organization environment and job characteristics on job satisfaction were observed, with computing environment exerting a stronger influence than both organization environment and job characteristics. In reality we also found the new variable (“computing environment”) to have a stronger influence on job satisfaction than the traditional variables (“job

characteristics” and “organization environment”) in the context of IT project-based organizations. Given that the working in the IT project-based organizations is completely complex and that the target user group consists of a large number of employee that most of them had high knowledge in using computer, the findings of this study suggest that in order to satisfy more employee in IT project-based organizations, it is not going to be enough to make the good organization environment. It is of paramount importance to consider IT project-based organizations with availability of computer and with non disruptions of software and network for the employees. In addition, the IT project-based organizations authorities need to concern themselves less with directly influencing job satisfaction. As suggested by our model, these internal processes will result if the belief formation is appropriately managed. Thus, management attention might be more fruitfully focused on the “development” of infrastructures and employee ability in using computer. Especially, the IT project-based organizations authorities should employ training and promotion approaches to develop the employees' beliefs of computing environment, organization environment and job characteristics in the organization, which in turn will influence the satisfaction of job.

Our results provide evidence of the significant effects of the computing environment variable on satisfaction through job characteristics and organization environment. Consistent with our hypothesis, employees

who have higher computer knowledge and haven't problem in using computer are likely to have more positive approach to organization environment and job satisfaction about the job satisfaction.

These findings also support prior research that has found a significant direct relationship between computing environment and job satisfaction [45], [46], [38] and extend its generalizability to IT project-based organizations. While computing environment had a positive effect on organization environment and job characteristics, its total effect on job satisfaction is positive. Hence, management in the IT project-based organizations can increase the job satisfaction through computing environment and the two mediating model variables, organization environment and job characteristics. In order to improve the computing environment, the organization authorities can organize training courses on various computer applications to increase the familiarity of employees with computing technologies. Even if these courses are not directly related to the improvement of organization itself, they will still help the employees to have better sight of organization environment and job characteristics about the organization in general. Compared with previous research we also found same findings that job characteristics have influence on job satisfaction [39]. Based on [38] several organizational practices are considered important to maintaining job satisfaction that this is a same with our finding about organization environment, we found that organization environment has most positive effect on satisfaction with its direct effect and also indirect effect through job characteristics.

## **CONCLUSION**

This research was in response to the call for employee satisfaction research in IT project-based organizations. Utilizing the extended model as a theoretical framework, computing environment, was proposed to have significant influence on the job satisfaction through organization environment and job characteristics. The contributions of this study to job satisfaction research are twofold. First, it successfully applied this extended model in a new information context (i.e. IT project-based organizations) that is quite different from prior studies. Computing environment, organization environment and job characteristics were found to be significant antecedents of the job satisfaction in IT project-based organizations. Second, the computing environment variable was found to be an important

determinant of organization environment and job characteristics of the IT project-based organization.

The findings of this study have implications for improving job satisfaction in IT project-based organizations. Considering the millions of dollars that have been invested in organizations worldwide for job satisfaction, it is of paramount importance to ensure that employees will actually satisfy with their job. In order to achieve this goal, attention must be given to designing good computing and organization environment and also we need organizations with best job characteristics. The IT project-based organizations authorities need to develop the beliefs computing environment, job characteristics and organization environment of the employees regarding job satisfaction in IT project-based organizations. They can do so by organizing computer training courses to increase the general computing environment of the employees. Employees with higher computing environment are more satisfy to their organizations.

This empirical study has several limitations. First, the discussed findings and their implications are obtained from one single study that examined particular organizations and targeted a specific user group in Iran. Thus, we need to exercise caution when generalizing our findings and discussion to other organizations or groups. Second, the relatively low R-square reported by the current research represents another limitation. Hence, there may be a need to search for additional variables that will improve our ability to predict job satisfaction more accurately. For example, variables related to social factors similar to subjective norm and demographic variables [20], [21], [22], such as are being used in other researches of job satisfaction might be added to our model. Some other individual differences, such as age, level of education, computer experience and computer anxiety need to be investigated in the future. Prior research has found computer anxiety to be a construct quite distinct from computing environment. Future research can also examine whether training on the job, such as computer training, have any influence on the satisfaction in organizations. Third, the use of self-report scales to measure study variables suggests the possibility of a common method bias for some of the results. Future research should employ both objective and subjective measures and examine the correspondence (or lack thereof) between them. Finally, this study was conducted with a snapshot research approach. Additional research efforts are needed to evaluate the validity of the investigated models and our findings. Longitudinal evidence might enhance our

understanding of the causality and the interrelationships between variables that are important to the job satisfaction in organizations by employees.

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