J. Appl. Environ. Biol. Sci., 4(3)353-361, 2014

ISSN: 2090-4274
Journal of Applied Environmental and Biological Sciences
www.textroad.com

The Impact of Human resources management Practices on the Acquisition, Creation and Production of Knowledge in the Supply Chain of the Automotive Industry

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ABSTRACT

One of the most important resources in any organization is its human resources. The main purpose of this paper is to study the effect of human resources management practices on creation, acquisition, and production of knowledge in the automotive supply chain of Iran. In this study, first, the key indicators for each dimension of research in a literature review were identified. Then all indicators were adapted, amended, and finally approved by three industry experts and three university professors. As a result, two questions and five hypotheses are presented. This study was conducted in a survey format (with a questionnaire), and the investigation was a casual-effect study. The research was done in the supply chains of Iran Khodro and Saipa. 52 experts were involved in this research. The selection of respondents was judgmental. Criteria for the selection of experts were amount of experience and education. Research findings showed that the most important human resources management practices are job design and planning, job security, and training and skills development. The strongest indicators for the creation, acquisition, and production of knowledge in the automotive supply chain of Iran included the following:
convening various groups to discuss ideas with the aim of creating innovation in product and the production process; active participation in industrial sciences research associations; the study of the results of ongoing scientific research related to best industry standards; the identification of patterns, and the recruitment and retaining of qualified and knowledge-based employees in every field. Path analysis also showed that the greatest impacts of human resources management practices are on the most important indicator of creation, acquisition, and production of knowledge.

KEY WORDS: *Human resources management, knowledge Creation, Supply Chain, Automotive Industry.*

1. INTRODUCTION

At present, accelerating changes in science and technology have increased so that many thinkers believe that the pace of innovation in technologically advanced products and knowledge creation and its development exceed the rate of human learning. Even if trustee organizations use all the strategies, time, and human capital available to learn, it may still be impossible for them to overcome this speed. Knowledge, in the long run, is considered a key resource for organizations, and effective management of this knowledge is also necessary for success. In addition, according to Nonaka and Takeuchi (1995), successful companies are those who continually discover and create new knowledge to solve new and unfamiliar problems, develop this knowledge purposefully, systematically, and in a way that is tailored to specific strategic goals in all layers and sections of the organization, and seek to change new knowledge into new technology and new products.

Hence, with regard to the great importance of knowledge management in organizations, researchers went on to work on one of the key elements of knowledge management; that is human resources management. Several researchers have identified human resources management practices as a key factor in knowledge management[1], but in their own research, they have not conclusively investigated the importance and impact of human resource practices on knowledge creation. Most research on knowledge creation is organizational, and no specific research on indicators of knowledge creation in the supply chain has been observed. The innovative aspects of research can be the collection of the most important human resource practices for knowledge creation in the supply chain and quantitative and analytic investigation of human resources management practices for the acquisition, creation, and production of knowledge in the supply chain of the automotive industry.

In the following report, we will first review previous research. In the third section, the research methodology will be presented in detail. The fourth section is devoted to the presentation of research findings, and in the fifth section, conclusions and suggestions will be offered.

[1]Booz Allen and Hamilton (2001), Mertins et al. (2003), Holsapple and Singh (2001), Gupta and Govindarajan (2000), Lai and Chu (2001), Lehner and Hass (2010), Leonard-Barton (1995),Van der Spek and Spijkervet (1997),Chen and Huang (2009), Theriou and Chatzoglou (2009), Ooi et al. (2009), Grimshaw and Miozzo (2009),Banavides-Espinosa and Roig-Dobon (2011

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2. Background

According to the main goal of this study, the research literature was divided into three parts of supply chain, human resources management practices, and knowledge acquisition, creation, and production.

1-2- Supply Chain

In today's economy, competing is not so much company against other company, but the chains that go on competing with each other [24]. Some reasons, such as the complexity of the business world, economic developments, intense competition, new technology, and rapidly changing customer needs, have made organizations use some advantages like rapid information flow, group decision-making, better coordination with partners, and a holistic approach. The existence of these developments can be seen in the discussion of the supply chain. The main objective of companies in the supply chain is described as "achieving maximum value" [9].

The supply chain can be considered to include all stages directly or indirectly involved in meeting customer requirements [9] and ranges from final customers to initial suppliers. In this chain, three streams, informational, physical, and monetary, are moving [39]. The main goal of the supply chain can be considered to be achieving maximum value for the customer [9]. In pursuing this objective, a market-driven set of goals (such as increasing productivity, reducing inventory, profits for all stakeholders, etc.) and financial objectives (such as return on assets, profit margin, etc.) will be presented [31].

2-2 Human resources management Practices

Human resources management refers to the policies, practices, and systems that influence the behavior, attitudes, and performance of individuals. Its effective management has a significant impact on organizational performance and competitive advantage and includes practices such as identifying the needs of human resources, recruitment, selection, training, encouragement, and performance evaluation of employee relations as well as attending employees, their health, safety, and fair judgments regarding them [41].

In their study, Gernigeret al. (2002) aimed to identify the best practices in human resources management at the international level. They considered measures such as employment, job satisfaction, training and development of employees, evaluating employees, payments, and communications as the most important measures in human resources management. Regarding the importance of human resources in the implementation of knowledge management in the value chain, Sooliman and Spooner (2000) suggested a series of strategies for knowledge management, the bases of which are human resources management and its activities. The strategies for that are: creating proportion and harmony between knowledge management and business directions, recognizing the benefits of knowledge management measures, selecting an appropriate program of knowledge management, implementing an appropriate and empowered technologies strategy, creating a supportive environment for knowledge management applications, team building for knowledge management, and creating leadership for knowledge management.

Moffett et al. (2003) in their research on the application of knowledge management referred to the set of measures of knowledge management, some of which are related to human resources management. These human actions are: participation and understanding staff, staff training, performance measurement, job enrichment, team work, job security, and creating motivation and value for employees. Yahya and Goh (2002) sought to examine human resource practices with knowledge management processes. They considered four important measures for human resources management, namely, education, decision-making (designing work, working conditions, work routine tasks, distribution and capital), performance evaluation, and the methods of compensation and encouragement. They noticed that, from the perspective of human development, they should focus on gaining quality, creativity, leadership, and problem solving skills; from the perspective of compensation for services, they should seek to improve group functionality, knowledge sharing and innovative thinking; and in terms of evaluation, they should consider to assess knowledge management practices of employees and input for guiding management actions. Dia Koulakiset al. (2004) addressed the positive relationship of human resource practices (such as education, encouraging new ideas, and knowledge sharing, and encouraging employees) and observed that the factors most strongly impacted were the two processes of knowledge creation and knowledge sharing. Egbu (2004) also addressed strengthening communication and cooperation, job security, and motivating and valuing employees in the human resource system. Regarding the key role of human resources as a source of knowledge in organizations, Perez and Pablos (2003) identified investment in human resources as a factor to increase an enterprise’s sustainable competitive strength. Janev and Vranes (2005) divided human resources management practices in the knowledge management environment into three categories: official-administrative, organizational, and development and gaining of staff. The first category includes the management of employee records, payroll, and employing, and the second category includes ratings, setting the workspace, forming and planning team work, and preparing the human resources management information system. The third category includes staff training and development and employee performance evaluations. Chew and Chan (2008) also identified the most important human resource practices as fair compensation, selection, training, fair performance evaluation, employee assistance programs, occupational safety, rewards and incentives, and teaching proper behavior. Yang and colleagues (2008) only considered the positive effect of education on knowledge and skills among farmers to deal with the plague. Chen and Huang (2009) in their study also investigated the relationship between human resources management practices and innovation performance in organizations in terms of the mediating role of knowledge management. They

found that knowledge management capacities have a mediating role in the effective and positive relationship between human resources management and organizational innovation. They considered the method of services compensation, performance evaluation, staffing, and organizational participation to be the most important knowledge management practices in teaching. Theriou and Chatzoglou (2009) also referred to the positive and meaningful relationship of the best practices of human resources management, knowledge management, organizational learning, organizational capabilities, and organizational performance. They identify the most important measures for human resources management as employee job security, selective hiring, using teams and decentralization, compensation, incentives, training, internal communication and participation in the organization, designing careers and employment opportunities within the organization, job description, occupational health and safety, and integrating different levels of organizational issues in punishment and reward. Ooiet al. (2009) also referred to the positive relationship of the concept of human resource practices (performance appraisal, selection and recruitment process, and encouragement system) accompanied by comprehensive quality management practices on knowledge management processes. Ghorbanizadeh and Khaleghinia (2010) also considered the significant interaction between tacit knowledge transfer and staff empowerment. Grimshaw and Miozzo(2009) expressed the belief that the traditional practices of human resources and human resource practices in an environment of knowledge differ from each other. They put recruitment, development of job skills, and employee job security as their research indices. Moreover, other researchers also introduced the role of human resources in terms of the subject of knowledge transfer .They have defined specific roles for each management level. The role of operational managers in knowledge transfer is to define skills based on experiences and seek to mobilize tacit knowledge to explicit knowledge in the form of technology. Middle managers are an interface between senior managers and employees and have direct participation in implementing the processes. They considered for them the key roles of leader, interface, spokesperson, and information distributor. Senior managers also sought to integrate human resources, caring for the dynamics of interpersonal communication, team building, and the distribution process to guide the work of the partnership and knowledge transfer in the business environment [5].

With regard to the reviews, the set of selection criteria for human resource practices are described in Table 1.

Table 1: Human resources management practices

Practice	references
Selective hiring and recruitment	41; 17; 45; 8; 25; 15; 40; 11; 6
Training and developing skills	17; 45; 6; 48; 8; 25; 11; 47; 36; 15; 41
Evaluating employees' performance	40; 6; 8; 25; 47; 11; 36; 15; 41
Creating job security	36; 12; 8; 17
Payment, reward and compensation system	15; 47; 25; 8; 6; 45; 40
Job security and health	41; 45
Creating and planning work teams	36; 25; 45
Designing and planning jobs	36;47; 25;45

Question1*: What are the major Practices in Human Resources Management for the acquisition, creation, and production of knowledge in the supply chain?*

3-2- Acquisition, creation and production of knowledge in the supply chain

The creation and production of knowledge refers to the development or creation of knowledge resources by organizations while operating across borders and organizational duty. It requires the ability to generate new applications from existing knowledge and to exploit potential new skills which have not been discovered [32]. Nonaka's model of knowledge creation can best describe this stage to a four-stage model. This process can be considered a kind of improved usage of existing knowledge and producing new knowledge that will include knowledge related to organizational goals and perspectives of the organization, employees, and the sharing and rotating experiences of employees [27]. Sedera and Gable(2010) believe that the creation and production stages of knowledge are essentially related to the planning and implementation stages of the lifecycle of organizational systems. They also see the creation and acquisition of knowledge as something that requires more specialty than the application of knowledge.

For the creation of knowledge in logistics, Fugate et al. (2009) introduced the survey indicators of customers: observing common websites to better understand customer needs, participating in sales activities , helping customers solve their problems, working in partnership with service department staff in order to be familiar with their work, viewing facilities and tools of leaders in the industry, observing suppliers to learn about various aspects of their work, attending communities of network (e.g. schools of management and economics, research groups, industry associations, etc.), and studying government reports and legal groups. For this process, Hult et al. (2004) introduced variables, such as regularly and periodically identifying customer needs, assessing the quality of chain products and services annually, and evaluating the impact of changes in the supply chain. Liao and Wu (2009) also introduced other measures, including procedures for obtaining knowledge of customers, processes for acquiring knowledge from suppliers, receiving feedback from the projects, trading partners to exchange business, receiving information about products in the industry, acquiring knowledge of competitors in the industry, pattern performance evaluation, and determining teams to identify the best practices. Massa and

Testa (2009), in their study about the relationship between knowledge management approaches and organizational competitive advantage for the creation and acquisition of knowledge, introduced measures that include: market research and market survey, implementing research and development practices, the study of consumer consent, using knowledge of customers and suppliers, market-bases based on information from the industry and consumers, sensitivity about the information related to market changes, partnership with international clients, offering ideas by employees, recruitment and retention of skilled and trained technical individuals, respecting the attitudes and beliefs of individuals with the aim of encouraging them to upgrade their skills, creating an open culture in the workplace, creating culturally appropriate conditions for the introduction of knowledge management, and spending time studying commercial and scientific journals. Chen and Huang (2009) identified such variables as gaining knowledge of customers and business partners as a requisite for the acquisition and creation of knowledge. Goldoni and Oliviera (2010) considered indicators such as number of discussion groups on innovations in product and process and valid contribution for organizational/Intranet repositories for knowledge creation processes. DanaeeFard and Selseleh (2010) also introduced indicators for knowledge creation processes such as passion for the promotion of knowledge of individuals, financial benefits for acquiring more knowledge, the tendency of people to use continuous learning and use of learning opportunities, staff training systems, knowledge of the companies of their experts in various fields, organization to attract and retain knowledge-centered staff, consent of knowledgeable individuals regarding human resource policies, employees' personal investment in learning, encouragement of senior managers from staffs to gain knowledge.

Regarding the reviews, the set of factors are selected as indicators of these processes are listed in Table 2.

Table 2: Indicators of acquiring, creating and producing knowledge

Indicators	references
Continuous engagement with all domestic and international clients in their assessment	14; 23; 33; 34; 7
Continued participation with partners in ongoing assessment of changes in the chain members	14; 23; 33; 34
Sensitivity to market changes and ongoing assessment of conducted developments among existing competitors in the industry.	14; 33; 34
Attendance in industrial circles, scientific – research, and continuous investigation of scientific research results related to industry to identify the best standards and templates	14; 33; 34
Existence of different groups to discuss ideas with the goal of innovation in product and producing process	34; 16; 10
Creating decision-making opportunities by training systems to upgrade and update skills of individuals	34; 10
Attract and retain knowledge-centered and qualified employees in all areas of knowledge	34; 7; 10

Question2: What are the main indicators of acquisition, creation and production in the supply chain?

3. RESEARCH METHODOLOGY

This study's purpose was practical. It included qualitative variables considered as descriptive categories, and was done as a survey. The instrument used in this study was a questionnaire based on the Likert quintuple range, and the scope of the research included the set of producing companies, suppliers, and after-sale service providers (in the first layers of the supply chain) in Iran's automotive industry.

- **Research Variables and Hypothesis**

In this study, the indexes of knowledge creation can be introduced as dependent variables and measures of human resources as independent variables. Therefore, regarding the main objective of the study, the main research hypothesis can be stated as follows:

Human resources management practices have a significant effect on acquisition, creation, and production in the supply chain.

As a result, the secondary research hypotheses are:

Hypothesis 1: *Human resources management practices have a significant impact on the continued participation index of all national and international customers for their assessment in the supply chain.*

Hypothesis 2*: Human resources management practices have a significant impact on the continued participation index with partner companies to assess ongoing changes in members of the supply chain.*

Hypothesis 3*: Human resources management practices have a significant impact on indicators sensitive to market changes and developments in ongoing assessment conducted among competitors in the industry's supply chain.*

Hypothesis 4*: Human resources management practices have a significant effect on the presence in industrial circles, scientific–research, and ongoing study of results which are consistent with the industry to identify the best standards and models in the supply chain.*

Hypothesis 5*: Human resources management practices have a significant effect on the index of the presence of different discussion groups to talk about ideas for the purpose of product and process innovation in the supply chain.*

Hypothesis 6*: Human resources management practices have a significant influence on the index of creating decision-making opportunities to upgrade and update individuals' skills in the supply chain.*

Hypothesis 7*: Human resources management practices have a significant impact on attraction and retention of knowledge-centered and specialist employees in each domain in the supply chain.*

- **Population and Sample**

Since the unit of analysis of this research is the automobile industry supply chain, the population comprised active enterprises in the automotive supply chain and included related experts within organizations in which the research is done. Experts and specialists, who constitute the study population in this sector, were selected from among people with at least three years' experience in the field of management studies and having at least one of the following criteria:

A) A university degree (BA or higher) in the field of industrial, economics, or management.

B) Reports or research papers in the field of knowledge management, supply chain management, or supply chain performance evaluation.

C) Their administrative activity in their organization is related to the supply chain, human resources, or knowledge management.

The sample in this section was selected from among the companies in the supply chain of the two large companies of Iran Khodro and Saipa. The main reasons for this selection were that these two valid automotive companies hold the largest share of Iran's automobile market and the experience of these two companies is more than other companies in this industry [3][49].Therefore, the sampling of relevant experts was investigated related to the research subject in these two companies. Since the subject of this investigation is one of the new and fresh issues raised in the industry and the number of desirable, relevant respondents is limited, samples were selected in a judged and targeted manner. We tried to specify the number of respondents based on the response to the Lysrel software, in addition to the criteria outlined in the population. 60 experts were selected for this survey.

- **Research validity and reliability**

To examine the validity of the model to assess the adequacy and accuracy of the components of the research, the literature review was used. Then, amendments related to the criteria mentioned in the literature based on prevalence in research literature were introduced. Finally, three professors of industrial management and three persons with expertise in the industry and more than five years' experience were selected. The construct validity (which can be obtained through confirmatory factor analysis in LISREL software) was used. In this study, the Cronbach's alpha coefficient and composite reliability methods were used to assess reliability. If reliability coefficients were greater than 0.7, the test had acceptable reliability.

- **Data collection and analysis**

To analyze the data and answer the research questions and hypotheses, descriptive and inferential statistical tools of factor analysis, path analysis, and evaluation of the model were used. Statistical analysis using two software, SPSS (version 18) and LISREL (version 8.54), was performed.

4. Findings

According to the demographic information procured from 60 expert representatives, 52 completed questionnaires were obtained (response rate: 86.66%). 46% of respondents had a graduate education, and 90% of them also had over 5 years of experience in the automotive supply chain.

- **Confirmatory factor analysis and answers to research questions**

Factor analysis offers a base to create a new set of variables which reduces the characteristics and nature of the main variables into a smaller number of variables [26]. By substituting the new variables, the problems associated with large numbers of variables and the dependencies between them can be substantially reduced [13].In this study, the aim of using factor analysis was to reduce the dimensions of the research components in order to identify factors that are more important. Before the factor analysis, however, the KMO test should be performed to ensure adequate sampling. In this paper, for greater certainty, 0.6 instead of 0.5 was considered [20].As seen in Table 3, we found the research indicators that were approved. Reliability was calculated separately for each dimension, and since they were all over 0.7, the reliability of the survey was confirmed. The adequacy of sampling was also approved.

Table 3 - Analysis of the structure of multidimensional analytical research

Dimensions	Components	Factor Loading	Approval or rejection of components	t-value	Construct reliability	Cronbach's Alfa	KMO
The acquisition, creation and production of knowledge	Continuous engagement with all domestic and international clients in their assessment	0.7	approved	-	0.865	0.865	0.804
	Continued participation with partners in ongoing assessment of changes in the chain members	0.64	approved	4.19			
	Sensitivity to market changes and ongoing assessment of conducted developments among existing competitors in the industry.	0.7	approved	4.54			
	Attendance in industrial circles, scientific–research, and continuous investigation of scientific research results related to industry to identify the best standards and templates	0.73	approved	4.76			
	Existence of different groups to discuss ideas with the goal of innovation in product and producing process	0.79	approved	5.11			
	Creating decision-making opportunities by training systems to upgrade and update skills of individuals	0.54	approved	3.55			
	Attract and retain knowledge-centered and qualified employees in all areas of knowledge	0.73	approved	4.77			
Human resources management practices	Selective recruitment	0.41	approved	2.84	0.847	0.841	0.766
	Training and developing skills	0.68	approved	5.22			
	Evaluating the employees' performance	0.66	approved	5.06			
	Creating job security	0.73	approved	5.80			
	Payment, reward and compensation system	0.66	approved	5.07			
	Job security and health	0.52	approved	3.81			
	Creating and planning work teams	0.67	approved	5.15			
	Designing and planning jobs	0.76	approved	6.08			

Desirable rate: $X^2/df<=4$ [22]; RMSEA<=0.06[22]; GFI & AGFI& CFI>=0.9[1,4]

Factor loadings above 0.4 were desirable. [1]
For multidimensional structure research model: X2/df=1.13 RMSEA=0.052 GFI=0.91 AGF=0.9 CFI: 0.97

As evident in the above table, we determined which of the indicators in each dimension is of the greatest importance and have been approved. Those with the highest factor loading are of greater importance, Also, according to various indicators, the model with the desired value is appropriate, and it can be concluded that defined relationships between the variables in the auto industry are a good fit. Thus the validity of research is approved.

- **Path analysis and hypotheses investigation**

The path analysis was used to evaluate and confirm the existence of a causal connection between the variables and the evaluation hypotheses. Using this technique, the impact of human actions on indicators of business processes, the creation

and production of knowledge, were indicated. Table 4 shows the effects of the independent and dependent variables of the research.

Table4. Investigation of research hypothesis

Research hypothesis	Effect rate	Standard error	t-Value	Approval or rejection of hypothesis
Main research hypothesis: the human resource practices have significant effect on acquisition, creation and production in supply chain.	0.66	0.17	3.85	approved
Effects of human resource practices on continuous engagement with all domestic and international clients in their assessment in supply chain of automotive industry.	0.46	0.12	3.85	approved
Effects of human resource practices on continued participation with partners in ongoing assessment of changes in the chain members in supply chain of automotive industry.	0.35	0.11	3.34	approved
Effects of human resource practices on sensitivity to market changes and ongoing assessment of conducted developments among existing competitors in the industry in supply chain of automotive industry.	0.49	0.13	3.85	approved
Effects of human resource practices on attendance in industrial circles, scientific–research, and continuous investigation of scientific research results related to industry to identify the best standards and templates in supply chain of automotive industry.	0.54	0.12	4.43	approved
Effects of human resource practices on existence of different groups to discuss ideas with the goal of innovation in product and producing process in supply chain of automotive industry.	0.63	0.13	4.47	approved
Effects of human resource practices on creating decision-making opportunities by training systems to upgrade and update skills of individuals in supply chain of automotive industry.	0.30	0.09	3.43	approved
Effects of human resource practices on attracting and retaining knowledge-centered and qualified employees in all areas of knowledge in supply chain of automotive industry.	0.54	0.12	4.37	approved

According to the results, the analysis of the entire research hypothesis was confirmed, and it can be stated that there is a significant and effective relationship between human resource practices and indicators of acquisition, creation, and production of knowledge. The impact of human resource practices on each of the indicators of acquisition, creation, and product knowledge in the supply chain has also been discussed.

5. DISCUSSION AND CONCLUSION

The findings revealed that most human resources management practices for the acquisition, creation, and production of knowledge are, respectively, designing and planning professions (with a factor loading of 0.76), creation of job security (with a factor loading of 0.73), and training and development of skills(with a factor loading of 0.68). Among the indicators of acquisition, creation, and production of knowledge in the supply chain, the indicators of various groups to discuss ideas for creating innovation in product and process (with a factor loading of 0.79), attending industrial and scientific-research assemblies, and ongoing study of scientific research results related to industry to identify the best standards and templates (with a factor loading of 0.73), and to attract and retain knowledge workers and experts in the field (with a factor loading of 0.73) are the most important. Results of the analysis also revealed that the greatest impact human resources management practices is on selected and superior indicators of the process of acquisition, creation, and production of knowledge.

According to the findings, it can be concluded that a dynamic process for the acquisition, creation, and production of knowledge requires purposeful and standard planning of occupations among partner companies in the chain to provide job security for individuals to present free and innovative ideas without any fear or threat,and continuous training of new knowledge related to the job.

Superior indicators in the processes of acquisition, creation, and production of knowledge also make an obvious case to show that the creation of dynamic knowledge in the chain requires the creation of group meetings and discussions among peer companies. In this way they would be able to distribute the new knowledge gained to the other members in the chain. Partners' participation in industrial and scientific communities linked in a dynamic process of knowledge acquisition, creation, and production is known to be effective.

Partners must therefore be constantly aware of their duty to actively participate in the industrial and scientific communities of choice of professionals and knowledgeable individuals. Acquiring their knowledge and experience and cooperating with them in the chain are among the factors that can have a significant impact on human resources management practices.

Since purposeful human resources management practices are among the factors by which the professionals and experts can be absorbed, partners in the supply chain, according to a rational process, should identify specialists and experts in the automotive industry and cooperate with them via different elements of human motivation.

With the development of this study, future researchers can investigate other institutional factors in the acquisition, creation, and production of knowledge in the supply chain. Furthermore, they can compare the effect of these factors until

these organizations can become partners in the supply chain for the acquisition, creation, and production and become much more actively and dynamically knowledge-assisted.

The main limitation of the study can be the insufficient or even misunderstanding of knowledge management, especially the topic of knowledge management in the supply chain, which at the same time assigns a lot of research work to the researchers to better explain and complete the research questionnaires by respondents.

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