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Presenting an effective proposed model on the accounting system of environmental management in petrochemical and metal industries in Iran with a mixed approach

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Abstract

In recent years, the companies and factories active in our country have caused a lot of damage to the environment due to their unfavorable performance in the field of environmental management, which has caused very serious problems for the environment. Still, the evidence shows the different mechanisms of the environmental management accounting system. Does not exist. Therefore, the purpose of this research was based on the proposed model effective on the environmental management accounting system in petrochemical and metal industries in Iran with a mixed approach. This research is applied in terms of purpose and qualitative, which was analyzed. In the first stage, the qualitative method and semi-structured interviews were used to identify the model's components. In the qualitative part, 15 university experts were selected in a targeted way. To analyze the data of the qualitative section, the thematic analysis method was used using the Maxqiuda 2022 software. The results of the qualitative part showed that 63 primary concepts, 10 subcategories, and one main category were identified. Environmental marketing includes all activities designed to produce and facilitate exchanges intended to satisfy human needs or desires so that by satisfying these needs and desires, the least harmful impact on the natural environment will occur.

Keywords: accounting system, environmental management, petrochemical and metal industries
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1 Introduction

The reflection of environmental issues at the world level, due to events such as nuclear explosions, leakage of chemical substances and carbon dioxide and other harmful substances to the environment, parallel to the growth and development of the population and the economy of countries, has increased significantly, especially in the last two decades. These events have increased the collective concern of the people of the world about major issues such as global warming and the destruction of natural resources and habitats [28]. Unfortunately, especially in recent years, the companies and factories active in our country have caused a lot of damage to the environment due to unfavorable performance in the field of environmental management, which has caused very serious problems for the environment [33]. Therefore, in recent years, the situation of environmental pollution and destruction in our country has increased.

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Therefore, company managers should be aware of the harmful consequences and environmental risks caused by the activities of their companies and factories, because in addition to the above issues, many environmental costs can also be reduced by using better decision-making, better management accounting and design. Again, production processes and products greatly reduced or eliminated their harmful effects [38]. Therefore, more correct and efficient management of environmental costs can also improve the environmental performance of the company and bring considerable benefits to society [2]. Environmental management systems indicate the proper integration of environmental policies with environmental goals and objectives and provide an organizational structure in the use of methods and resources for the implementation of environmental policies [13]. The environmental management system, in addition to improving environmental performance, will directly have a positive effect on financial performance as well (Tam Le et al. [37]; Nazaripour and Nasiri [29]; and Ilbeigi et al. [13]). In fact, for example, the optimal and controlled consumption of natural resources, on the one hand, will improve environmental performance and advance towards sustainable development; And on the other hand, by reducing the consumption costs of natural resources such as water, electricity, gas, fuel, various raw materials, etc., it will improve commercial performance and financial profit [8].

Today, in companies, accounting for environmental reporting is facing an important challenge; A challenge that is not only related to playing the traditional role of this discipline in recording and reporting financial information, but also related to playing its role in the field of environmental performance management [2]. A major part of the challenge created for corporate accounting is caused by changing social expectations and growing pressure to improve the organization's environmental performance. Due to social concerns about the environment, organizations are forced to face the fact that they do not have an inherent right to the environment (especially in the use of natural resources), and they must comply with the new social contract that is emerging. Therefore, "environmental accounting," which can help when facing this challenge, is a field of accounting that prepares information on the company's environmental performance and reports to internal and external stakeholders [30]. The environmental management accounting system from the internal aspect of companies helps managers in the correct implementation and efficient management of financial and physical resources, identifying cost reduction opportunities and making better decisions. Also, from the external aspect, this technique provides useful information to stakeholders, such as shareholders, creditors, analysts, and environmental organizations from a financial and environmental point of view [16]. In traditional management accounting systems, all indirect costs of the company, whether environmental or otherwise, were included in the overhead section, so the exact amount of the company's environmental costs remains hidden from the managers, and this issue leads to underestimation. These costs and the failure to achieve their real growth and related decisions, but the environmental management accounting system using the balance of material circulation and determining the hidden costs of the environment, reveals a considerable part of the internal costs to the managers. It is important to make decisions for investment projects and correct pricing of products [33].

Environmental management accounting as a support mechanism for managing environmental performance has attracted increasing interest and attention in many countries of the world, both in the field of research and in the field of implementation and practice. But in our country, Iran, this field of accounting has remained untouched, and even its theoretical concepts have not been fully discussed [28]. The review of the internal research done in this field shows that most of the researches are on identifying EMA methods or barriers or indicators for choosing EMA methods such as the article by Alamshah [2] and Ramezani [33] or its relationship with financial and economic variables such as the study of Najafi [28], Keshavarz [18], Nazaripour and Nasiri [29], Ilbeigi et al. [13], Heydarpour and Qarani [11] and Pourzmani and Mashaikhi Fard [32]. However, there are not many studies that have provided an effective proposed model for the environmental management system. Since today's world has caused an increase in pollution, environmental problems and concerns of countries regarding the environment. With the increase of environmental concerns from consumers, governments and different communities around the world and manufacturing companies are seeking to develop environmentally friendly programs such as environmental management systems, green product development, green brands and green technology. These concerns were extended to various industries to the extent that nowadays one of the important factors in the activities of companies, from the supply of raw materials to the production process of a new product in the factory and the issues that arise during the use of the product by the consumer, It is environmental considerations [3]. Several factors affect environmental performance; among these factors, the environmental management system can be mentioned [34]. It seems that in recent years, the behavior of domestic consumers has shown a significant tendency towards environmental consumption considerations. Now, people have realized the importance of protecting natural resources and green space and using environmentally friendly products more than ever. As a result, the new generation of consumers will definitely place more value on green options in their purchasing decisions in the future. And this requires the awareness of companies about the environmental concerns of consumers, among which the petrochemical and metals industry is very important [22].

The fact is that currently, paying attention to the environmental issues and warnings of the petrochemical and

metals industry for business managers does not have a special place among their business goals and priorities, and managers are more concerned about profitability, gaining more market share, and saving. They have costs and issues like this. But it must be said that not paying attention to consumers' attitudes and priorities in the long term can cause irreparable losses to the company and even endanger its survival. Therefore, it is necessary, considering the growing increase of green attitudes in different sections of the society, that managers should also increase their level of awareness in these issues and formulate and implement practical solutions for it in the petrochemical and metals industry. On the other hand, the petrochemical industry, like many industries that use harmful chemicals in their production process, faces many green considerations. There have been no detailed studies on the harms of products such as artificial stones and their chemical compounds, and consumers have concerns about the degradability of these products in nature. The issue of protecting the environment is considered a necessary and moral issue, and damage to it has adverse consequences for people and organizations. Among a wide range of measures to preserve the environment, the environmental movement that has emerged in the last decade around the world has made consumers rethink the products they buy. Consumers can contribute significantly to the protection of the environment by purchasing products that cause less damage to the environment. Therefore, the main problem of the present research is to design and present an effective model for the accounting system of environmental management in the petrochemical and metal industries in the country by combining quantitative and qualitative methods. Therefore, the main question of the current research is: What is the model of the environmental management accounting system in the petrochemical and metal industries?

2 Theoretical foundations of research

2.1 Accounting system

In the era of globalization and rapid advancement of technology, the accounting system is considered as the most important capital of organizations. The accounting system is a set of skills, knowledge, and general characteristics of people in the organization, and it can indicate the capacity of doing work today and the potential of work tomorrow [12]. To use and manage the accounting system optimally in organizations, from the first quarter of the 20th century, the field of personnel affairs was transformed into human resources management [10]. The accounting system and management knowledge have emerged as important and competitive assets of the organization today, and human resource managers who are aware of the importance of human resources will be able to create a competitive advantage for the future of the organization. This change in position has caused more attention to the value of human resources for the development of strategic roles for accounting systems [5]. The management accounting system is the most important pillar of management, and in recent years, it has attracted the attention of many human resource management researchers. Green human resource management is an activity that seeks to optimize the use and preservation of scarce environmental resources [21]. The background of the research shows that the traditional functions of the management accounting system have reached a low level of employee involvement in collaborative and supportive processes, in which employees have the right opportunity to improve their skills, knowledge and attitude in the era of increasing awareness in the field of environmental management and sustainable development. Resources: green human resource management focuses on the company's environmental management practices, in which human resource management acts as a platform for connecting human resource management practices to the company's environmental management activities [36]. Therefore, the management accounting system is a vital area of business management [5].

2.2 Environmental management accounting

The available articles show that the environmental management accounting system has progressed from the old way of working, such as low levels of employee involvement, to more collaborative and supportive processes where employees have opportunities to improve their skills, knowledge, and attitudes [36]. In the period of increasing awareness about environmental management and sustainable development of resources, green human resources management refers to the procedures aimed at the environmental impact of companies and its connection with the environmental strategy and green behaviors of employees. We argue that GHRM is correct and complete in sustainable HRM articles and on the company's environmental management practices, where green HRM acts as a platform to relate HRM practices to the company's environmental management activities. Therefore, GHRM reflects the organization's strategic orientation towards environmental protection and requires top management to focus on organizational processes and practices that encourage people to engage in green work behaviors to reduce pollution [31]. In other words, GHRM includes the integration of the organization's environmental management goals in human resource processes, i.e. recruitment and selection, training and development, performance management and evaluation. , reward and recognition [26].

2.3 Environmental performance of the company

Environmental performance is a set of company operations that are synchronized and compatible with the environment, and this performance is mainly through the criteria and scales determined by relevant institutions and agencies, both national and international in size. Reducing the production of pollution (atmospheric emissions, waste and liquid sewage), reducing the consumption of toxic and dangerous substances, reducing water and energy consumption, and reducing the recurrence of environmental accidents are indicators of environmental performance evaluation [19]. The environmental performance index is estimated using 22 indicators that are reflected in several policy categories. These policy categories include the following 10 categories: environmental health, water (its effects on human health), air pollution (its effects on human health), water resources (environmental effects), biodiversity and habitat, Forestry, fisheries, agriculture, climate change and energy [21]. Research has shown that environmental activities are rarely consistent with organizational evaluation criteria. In addition, many companies use traditional scales such as profit, investment return rate, market share, etc., to evaluate themselves about environmental issues. Few companies have realized that being green gives them strategic advantages. Proper positioning starts when what the company offers has a real difference compared to competing companies and thus creates value for customers [22].

3 Research background

In this section, the internal and external backgrounds related to the research are presented in table number 1.

Theoretical framework, industrial managers should be aware that they are environmentally responsible for designing their new products and should design products that have the least amount of pollution and cost for the environment. Therefore, it is necessary to make joint efforts between manufacturers and suppliers to create green systems in accordance with environmental regulations in production. The fate of a product, in terms of the amount of pollution at the end of its life cycle, is one of the issues that can be decided at the stage of design and selection of materials and processes. Environmentalism can be done by organizations through the implementation of various measures. The successful implementation of green human resource management measures can promote the environmental behavior of organizations (Guerci et al [9], Zaid et al [39]) believe that the actions of green recruitment, green training and development, and green performance management of human resources can improve the internal and external actions of environmentalism of organizations. Singh et al. [36], in a study investigated the effect of green innovation on organizational performance through the mediation of green transformation leadership and green human resource management. The findings showed that the actions of green human resource management have a positive and significant effect on green innovation leadership and then on the environmental performance of organizations. In a study, Lee [20] investigated the effect of green human resource management on the environmentally friendly behavior of hotel employees and environmental performance. The findings showed that paying attention to green human resources management measures increases the organizational commitment of employees, their behavior compatible with the environment and sustainable performance. The health care organizations discussed the results of the study showed that the components of green recruitment, green development and training, and green innovation have an effect on the management of sustainable performance on all economic, social and environmental dimensions of organizational sustainability. Jovita et al [17] conducted a research titled investigating the effect of green management measures on organizational effectiveness. The results showed that recycling has a positive and significant effect on reducing costs and pollution. Seman et al [35], in a research, investigated the effect of green management on the environmental performance of organizations through green innovation. The findings showed that green management actions through the formulation of green innovation of organizations have a significant effect on their environmental performance. Mumtaz et al [27], in a study, evaluated the effect of green supply chain management measures on the organizational performance of industries. The results showed that the implementation of green management components in industries will reduce the amount of environmental pollution and their operating costs.

4 Research methodology

This research, which has a developmental goal, was conducted with a qualitative approach and using thematic analysis method. The theme analysis method, which is also known by other titles such as thematic analysis and thematic analysis, is one of the common methods of content analysis and a method for analyzing qualitative data from interviews, which provides the basic skills needed for many other qualitative analyzes. Common methods in theme analysis include format, matrix themes, theme network themes, and comparative analysis, in this research, the theme network analysis method was used. In the theme network developed by Atride Stirling, the themes are systematized

Table 1: internal and external background of the research

Findings	Title	Researcher (year)
Green human resource management practices have an effect on employees' environmental behaviors and environmental values moderate the relationship between green education and development on employees' pro-environmental behavior and the relationship between green performance management on employees' pro-environmental behavior, but on the relationship Choosing green employment does not have a moderating role on pro-environmental behavior of employees. Also, service culture has only moderated the relationship between green hiring and pro-environmental behavior of employees and has not had a moderating effect on other relationships.	Investigating the effect of green human resources management on the environmentalist behavior of employees, taking into account the moderating role of individual green values and service culture.	Farrokhi et al [7]
There is a positive and significant relationship between environmental accounting and management accounting procedures and the design of management accounting systems.	Investigating the relationship between environmental accounting and management accounting systems design in Iran Railway Company	Najafi [28]
Environmental management accounting has been a useful and important tool in providing information to achieve superior environmental performance in companies.	Examining the effects of environmental strategy, environmental uncertainty and senior management commitment on environmental performance, considering the role of environmental management accounting	Keshavarz [18]
There is a positive and significant relationship between the environmental management system and financial performance, and the supplier replacement cost has a negative and significant effect and the intensity of competition has a positive and significant effect on the relationship between environmental management systems and financial performance. Also, replacement cost and intensity of competition have a positive and significant effect on the relationship between environmental management system and financial performance.	Examining the relationship between environmental management systems and financial performance with an emphasis on market factors	Nazaripour, Mohammad and Nasiri [29]
1- The low priority of accounting for environmental costs, 2- Resistance to changing traditional methods, 3- Efficiency or considerations of costs and benefits, 4- Limitation of resources and expert staff, and 5- The difficulty of collecting and allocating environmental costs are factors that affect the process Deciding whether or not to use environmental management accounting methods.	Investigating the effective factors in not using environmental management accounting methods (EMA) in polluting companies in Bushehr province	Ramezani [33]
So far, there have not been many studies in the field of presenting the implementation model of the environmental management system based on management accounting, and there is a noticeable research gap in this field.	Systematic analysis of environmental management systems in the structural equation model based on management accounting	Johnstone [16]
Environmental management accounting (EMA) directly affects innovation in product manufacturing and indirectly affects innovation through management accounting techniques.	Investigating the role of environmental management accounting on innovation based on management accounting in companies	Fabricia et al [6]
The social dimension of corporate accounting social responsibility may not foster collaborative innovation in developing countries, which is contrary to the findings in developed countries. In addition, both direct and indirect government support can increase the positive effect of the environmental dimension of corporate social responsibility on collaborative innovation, while indirectly it can also enhance the positive effect of corporate governance on collaborative innovation.	Examining Corporate Social Responsibility Accounting and Collaborative Innovation: The Role of Government Support	Ji & Miao [15]
Responsible innovation mediates the relationship between corporate social responsibility, environmental management and competitive advantage of small and medium enterprises.	Investigating the impact of corporate social responsibility towards stakeholders and environmental management on responsible innovation and competitive advantage	Bell, Hoque [4]

based on a certain process and in the form of basic, organizing and comprehensive themes. The stages of theme analysis research are as follows:

The first step: research design, thematic analysis

This step includes choosing the topic, research, stating the problem, stating the goals and research questions, choosing the research plan, determining the territory, society and statistical sample. As mentioned earlier, the current

research was conducted with the aim of identifying the factors of the environmental management accounting system and providing a comprehensive model of these components based on the identified factors and aims to answer the following questions:

1- What are the components and factors of environmental management accounting system?

2- What is the design of the environmental management accounting system model?

The statistical population of this research included all professors of the faculty of accounting and senior managers and experienced workers of the petrochemical and metal industries, which was carried out by targeted sampling with the snowball method. The main criterion for entering the research was having a doctorate education and specialized knowledge in the field of public administration, having work experience and research activity in the relevant field, which were selected purposefully and according to the information obtained from the previous cases. Demographic characteristics of experts in table no. 1 is given.

5 Research findings

In this research, the views of 15 experts were used. The characteristics of the participants are presented in Table 2.

Table 2: Demographic characteristics of the interviewees

The amount of work experience	organization level	education	gender	Age
More than 10 years	science Committee	PHD	Female	43
More than 10 years	science Committee	PHD	Female	39
5-10 years	science Committee	PHD	Female	40
More than 10 years	science Committee	PHD	Female	44
5-10 years	science Committee	PHD	Man	36
More than 10 years	science Committee	PHD	Man	54
More than 10 years	science Committee	PHD	Man	45
More than 10 years	science Committee	PHD	Man	36
5-10 years	science Committee	PHD	Man	57
The amount of work experience	science Committee	PHD	Man	47
More than 10 years	science Committee	PHD	Man	37
More than 10 years	science Committee	PHD	Man	56
5-10 years	science Committee	PHD	Man	37
More than 10 years	science Committee	PHD	Man	47
5-10 years	science Committee	PHD	Man	51

Second step: data collection

In this research, data was collected through semi-structured interviews with 15 experts. The interviews continued until theoretical saturation was reached. Theoretical saturation means that the sampling continues until the similarity of the given answers leads to repetition of the answers and there are no new data in them.

Table 3: Verbal evidence from the interviews for initial coding

Detected codes	Verbal evidence
Expertise in your field	Knowledge and skills in the specialized and technical field of the unit under the manager
Specialized training	holding educational courses
	Training in a specialized field
Correct and quick decision making	Collecting information for decision making
	Speed of action in decision making and execution

Third step: data analysis

In this stage, after implementing the interviews and completing them with the notes taken during the interview sessions, the researcher carefully and repeatedly studies the text of the interviews and identifies independent ideas in the form of basic themes and assigns a code to each of them to identify basic themes, themes The organizer and the comprehensive are drawn by the abstraction of the network of themes. The network of themes shows the relationships between the themes in a non-linear way. In this network, there is no hierarchy between the themes, and the emphasis

is on the dependence and connection between the components of the network. After drawing the network of themes, the network is It is reviewed and analyzed. Of course, the researcher should keep in mind that the theme network is a tool of analysis and not the analysis itself. After drawing the network of themes satisfactorily, the researcher again refers to the original text and interprets it with the help of the network [1].

Fourth step: Presenting the results of research report preparation and evaluation

In this research, the method of agreement between two coders was used to ensure the reliability of the research. In this way, in addition to the researcher who did the initial coding, another researcher was also separately paid for the coding of the findings. To calculate the level of agreement, the Kappa coefficient was used in SPSS software, and its value was 0.75, which indicates acceptable reliability. Also, to ensure the validity of the research, in addition to applying the researcher's sensitivity strategy in the research process, the findings were provided to three academic experts and were approved by them.

Table 4: a selection of open coding on the text of the interviews

Basic open coding	**The text of the interview**	**interviewee**
Internal environmental management and environmental management accounting system have progressed from the old way of working such as low level of employee involvement towards more collaborative and supportive processes where employees get opportunities to improve their skills, knowledge and attitudes.	Every system in computer-based information systems is like a living organism: it is born, grows, reaches maturity, declines and finally dies. This transformation process is called the system life cycle and includes the following steps: planning, analysis, design, implementation, and application.	(2)
Green purchasing and green management is a new management approach to develop the capabilities of the organization (leadership, policy and strategy, organizational partners, organizational resources and processes) to achieve sustainable success (economic results, social results and environmental results). to become industrial excellence by naturalizing the behaviors and functions of the organization along with learning, creativity and innovation.	The life cycle of a system requires passing through standard stages, each of which requires management activities. The system may become less useful and effective due to technical or other errors or noncompliance with the changing environment. It is also possible when the new system is planned. Defects will increase. The final stage of the life cycle of a system is its replacement. The life span of each of these stages is different in the systems. Those employees get opportunities to improve their skills, knowledge and attitudes	(4)
Collaboration between client environment and system analyst work is not system analysis. System analysis is the examination of the existing system to design a new system or find a deficiency	Nowadays, most of the systems are designed in computer form and the growth of computer and information and communication technologies is high. The life cycle of computer systems is relatively short. The basic principle of system analysis and design is to recognize the need of a system to revise or replace it, and the second principle is hierarchy, priority and readiness to replace the previous system.	(7)

The fifth step begins when there is a satisfactory picture of the themes. In this stage, the researcher presents, defines, and revises the main themes for analysis, and it is determined which aspect of the data each main theme contains. At this stage, after going back and forth among the categories, the researchers finally reached 63 primary concepts, 10 subcategories, and one main theme. Table 5 shows the final codes extracted from the qualitative section.

Based on the findings of the qualitative section consisting of 63 primary concepts, 10 subcategories, and 1 main category, the primary research model is formed as follows. In the following, in order to fit the model obtained from the qualitative part and analyze the existing conditions with the desired conditions, quantitative techniques, including structural equation modeling and inferential tests, are used.

6 Conclusion

The present study, which is a qualitative method for presenting the model of environmental management accounting system in petrochemical and metal industries in Iran, this model includes 63 primary concepts, 10 sub-categories, and one main theme was identified. The management reporting system is an extensive information source at the organization level, which is used by managers at all levels and in all fields of activity. decision-making, the management reporting system is important in the division of information systems because of the reports it provides to support the decisions of managers, this system provides different reports to managers, although the reports of these systems In the beginning of the 70s, it was structured, but today, with the advancement of programming knowledge and the design of report generation software, users can design and receive various types of reports from the system. The financial system of an organization, regardless of whether it is big or small, has a significant impact on its healthy growth and

Table 5: Dimensions and components identified from the qualitative section

Abundance	Basic concepts	Sub component	Main article
10	Commitment of senior managers from green supply chain management in petrochemical and metal industries.	Internal environmental management	
13	Middle managers' support for green supply chain management in petrochemical and metal industries.		
11	Mutual functional cooperation to improve the environment in petrochemical and metal industries.		
9	Comprehensive quality environmental management in petrochemical and metal industries.		
7	Compliance with the environment and audit activities in petrochemical and metal industries.		
8	Creating an environmental management system in petrochemical and metal industries.		
6	The petrochemical and metal industries provide design specifications to suppliers that include environmental requirements for purchased goods.		
7	Procurement and maintenance of environmental management system products from suppliers		
9	Accredited environmental management system such as ISO 14001	Green shopping	Environmental management accounting system
11	Products purchased from suppliers have green features such as recyclable or reusable items.		
12	Products purchased from suppliers must not contain environmentally undesirable items such as lead or other hazardous or toxic substances.		
14	In the petrochemical and metal industries, it evaluates suppliers based on specific environmental criteria.		
9	It evaluates the environmental aspects of the second-tier suppliers.		
12	The petrochemical and metal industries ensure that suppliers meet its environmental targets.		
14	Cooperates with customers in the field of environmentally friendly design.	Customer environmental cooperation	
9	Collaborates with customers for cleaner production.		
7	Cooperates with customers for green packaging.		
6	Collaborate with customers to use less energy when transporting product. has it		
9	Adoption of third party procurement.		
11	Cooperates with customers to return product.		
4	Collaborates with customers for reverse logistics relationships.		
6	Collects customers' used goods for recycling, reclamation or reuse.	Reversible logistics	
8	Collects used packages from customer for reuse or recycling.		
9	It returns the products of petrochemical and metal industries to suppliers for recycling, material preservation or re-production.		
13	Packaging in the petrochemical and metal industries is returned to suppliers for reuse or recycling.		
7	Returns products from consumers for safe refills.		
6	environmental function	Reducing the emission of air pollution.	
9	Reduces sewage pollution.		
10	Reduces solid waste disposal.		
12	Reducing the consumption of dangerous, harmful or toxic substances.		
10	Improving the environmental status of organizations.		
9	Reducing consumption of materials and resources (such as water, electricity, gas and gasoline).		
9	Reducing energy consumption.		
8	Improving compliance with environmental regulations.		
12	The health of employees and the community has improved.		
14	Promotion of reuse and recycling of raw materials.		
11	Avoid fines for violating environmental regulations.		
9	Improving efficiency in the use of resources.		
7	Reducing environmental costs.		
5	"Green image" is improved.		
4	Improving relationships with customers and suppliers.		
8	We use the green employer badge to attract green employees.	Developing green skills	
8	Our company hires employees who have green awareness.		
7	We develop educational programs in the field of environmental management to increase employees' environmental awareness, skills and expertise.		
6	We have green knowledge management (the connection of environmental education and behavioral knowledge with the aim of developing preventive solutions).		
9	Petrochemical and metal industries set green goals and responsibilities for managers and employees.	Green	
11	Petrochemical and metal industries managers set goals to achieve the environmental results found in the evaluations.		

13	Instead of giving prepaid cards to buy green products, we provide green benefits (transportation/travel).	motivation	
4	Petrochemical and metal industries consider rewards based on recognition of environmental management for employees (public recognition, awards, paid holidays, leave, gift certificates).		
9	Petrochemical and metal industries have a clear vision to guide the performance of employees in the field of environmental management.	Green intervention	
8	A number of formal or informal communication channels serve to spread green culture in petrochemical and metal industries.		
6	Petrochemical and metal industries offer practical activities to employees in the field of participation in environmental management. (For example: newsletters, proposals, problem solving groups, low carbon champions and green movement teams)		
5	The total direct and indirect emissions of poisons have decreased.	Environmental results	Environmental management accounting system
7	The volume of recycled items has increased.		
9	The number of environmentally friendly products/services has increased.		
8	The market share in the petrochemical and metal industries has grown over the last three years.	Performance of environmental management accounting system	
9	The brand of petrochemical and metal industries has been recognized compared to competitors during the last three years.		
9	The image of petrochemical and metal industries compared to competitors has improved over the past three years.		
10	Average sales in petrochemical and metal industries have grown over the last three years.		
6	The average amount of possession of property in the petrochemical and metal industries has grown over the last three years.		
5	The level of customer satisfaction compared to competitors has grown over the past three years.		
7	The level of employee satisfaction compared to competitors has grown over the past three years.		
7	The revenue per unit in the petrochemical and metal industries has grown over the last three years.		

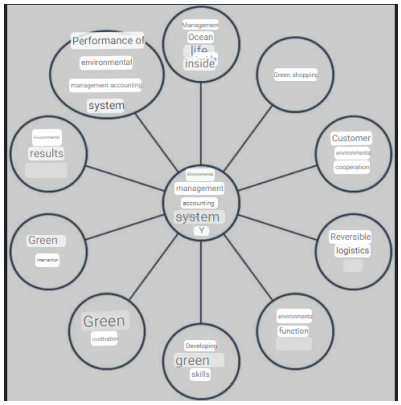

Figure 1: The initial conceptual model extracted from the qualitative section

survival. Due to the increasing complexity of financial activities, the need to use computer-based information systems with the flow of data related to a published, centralized or discrete network from different departments and subbranches is strongly felt. Therefore, the use of a suitable mechanism for data processing to analyze speed and output is considered a necessity for decision makers to make effective and scientific decisions. Data organization provides the required information as a suitable and effective tool for making decisions in leading transactions. It should be noted that about 80% of the total number of computers in the world are used to organize organizational information systems. Setting goals, strategic planning, and presenting business plans and their implementation, it helps the highest management authority. The quality of financial reporting of a system causes a better prediction of the company's future cash flows for investors and other users of financial statements, and it is clear that the legislators And investors agree to have a high-quality financial reporting system because the prevailing belief is that the quality of financial reporting directly affects capital markets. Lower system reporting quality leads to instability and ultimately leads to higher information risk. The financial reporting quality of the system has a direct effect on the company's liquidity, and the choice of financial reporting quality level has a significant relationship with the number of shareholders, sales growth and capitalism. Undoubtedly, the quality of system information has always been one of the favorite subjects of users, standard compilers, legislative assemblies, and researchers because it maintains and strengthens the

position of the accounting information system in the capital markets and reduces agency costs between managers, shareholders, financiers, and other third parties. Whether the quality of information in the company's system is higher, the problem of over-investment is less, because improving the quality of accounting information can increase the company's competitiveness in the industry, and with the growth of the company's industry, the company can also take advantage of the opportunities in that industry. The quality of the information system increases the trust of investors and creditors, and the company aligned with the industry can maintain its share in various markets, including the commodity market and the capital market, and achieve growth aligned with the industry. In the era of globalization and rapid advancement of technology, the accounting system is considered as the most important capital of organizations. The accounting system is a set of skills, knowledge and general characteristics of people in the organization, and it can show the capacity of doing work today and the potential of work tomorrow. To use and manage the accounting system optimally in organizations, from the first quarter of the 20th century, the field of personnel affairs was transformed as human resources management. The accounting system and management knowledge have emerged as important and competitive assets of the organization today, and human resource managers who are aware of the importance of human resources will be able to create a competitive advantage for the future of the organization. This change in position has caused more attention to the value of human resources for the development of strategic roles for accounting systems. The management accounting system is the most important pillar of management, and in recent years, it has attracted the attention of many human resource management researchers. Green human resource management is an activity that seeks to optimize the use and preservation of scarce environmental resources. The traditional functions of the management accounting system have reached a low level of employee involvement in collaborative and supportive processes, in which employees do not have the right opportunity to improve their skills, knowledge, and attitude. In the era of increasing awareness in the field of environmental management and sustainable development of resources, green human resource management focuses on the company's environmental management practices, in which human resource management serves as a platform for connecting human resource management actions to the company's environmental management activities. It works. Therefore, the management accounting system is a vital field of business management. The purpose of this research is to present a proposed model effective on the environmental management accounting system in the petrochemical and metal industries of Iran.

7 Suggestions

- Active participation in learning and performance activities
- Creation of learning networks to achieve continuous learning of work activities
- Providing the possibility of sharing knowledge and reserves for all the beneficiaries of the organization
- Providing the possibility of multiple trainings for the development of people to carry out tasks outside their limited occupational sphere (providing the possibility of fulfilling the career cycle)
- Design and implementation of team activities and workshops
- Acceleration and development of communication channels in the organization of intranet development and internal communication networks for employees
- Socializing new employees in the organization
- Supporting, developing, and showing the art of the organization and its values for employees inside the organization and people outside the organization
- Creating organizational museums and conveying favorable ideas to the minds of employees and clients, creating and developing a succession planning process to cultivate new leaders in the organization and a strong relationship between performance management and green job description as a solution for implementing green performance management from management, according to which organizations carry out activities that have a positive effect on society.

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