The Impact of leadership Style and organization culture on employee readiness to change with mediating role of employee commitment to energy management An empirical study on petrochemical secto in Egypt

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Abstract

This research investigates the leadership style and organization culture on employee readiness to change with mediating role of employee commitment to energy management in petrochemical sector in Egypt. The objectives of this research are: to recognize the effect of leaderships style on employees' commitment to energy management; to identify the effect of the organization culture on employees' commitment to energy management; to assess the effect of employees' commitment to energy management on their readiness to change, using structural equation modeling. The research uses a quantitative approach; an administrated questionnaire is used to gather the required data to test the developed hypotheses, analyzing the data through structural equation model (SEM) using AMOS software version 25. Results of this study show: there is a significant direct effect between leadership style and employee readiness to change; there is a significant direct effect between organizational culture and employee readiness to change; there is a significant direct effect between leadership style and employee commitment to energy management; there is a significant direct effect between organizational culture and employee commitment to energy; there is a significant direct effect between employee commitment to energy management and employee readiness to change. The study found that the results of the mediation effect indicate that there is partial mediation effect of the employee commitment to energy management between the relationship of leadership style, organizational culture and employee readiness to change.

Key words: culture, energy commitment, leadership, petrochemical sector, readiness to change

Introduction

Current researches show that global energy system needs to change. The Covid-19 crisis and the Russian Ukrainian war has demonstrated the weaknesses of the existing energy system, and exposed the consequences of energy poverty experienced by billions of people worldwide. Over the next decade, every aspect of national energy systems will be affected by changes in climate, energy policy and shifts in energy supply and demand. [1]. Energy management as a support function in industrial companies has developed considerably within the last twenty years [2]. In spite of the increasing activity in regard to energy management in business practice, so far there is no consistent understanding of energy management in academic literature [3]. It is more about change management than engineering.

The concept of energy management in literature have been categorized into four main clusters: energy use, strategic perspective, inclusion of managerial aspects, and relevance of people. Research show that people can make or break an energy program. Gaining the cooperation of key people at different levels within the organization is an important factor for successful implementation of the action plan in many organizations [4]. To date, there is a clear gap of knowledge in identifying the most key factors for employee commitment to energy management and its direct and indirect effects on employees' readiness for change.It is widely known that the petrochemicals industry main growth factors are the result of operational and financial improvements, including optimizing asset utilization, improving yields, running efficient operations [5]. Hence, it is argued that, energy management enable petrochemicals organizations to enhance its results [4].

The Petrochemical sector is one of the Egyptian petroleum sectors, which contribute to the Egyptian economy with almost 3% of the country 's GDP. The Egyptian petrochemicals sector is starting its energy management journey that is aligned with petroleum sector digital transformation plan to achieve Egyptian 2030 strategy [6], [7]. Accordingly, this research seeks to investigate the impact of leadership style and organization culture on employees' commitment to energy management.The empirical insights that emerges is to aid scholars and practitioners to grasp the realization of how to effectively move employees to work towards the current change and commit to the supporting practices of energy management. In order to achieve this aim, several objectives are needed to be attained. Therefore, this study contains five research objectives that is are as follows: (RO1) to investigate the effect of leaderships style on employees' commitment to energy management; (RO2) to test the effect of the organization culture on employees' commitment to energy management; (RO3) to examine the effect of leadership style on employee readiness to change; (RO4) to assess the effect of organizational culture on employees' readiness to change; (RO5) to investigate the effect of employees' commitment to energy management on Employees' readiness to change.

The remaining sections in this paper reviews the literature review, illustrates the research design used to collect and analyze the necessary data, displays and clarifies the quantitative research results, the hypotheses testing through structure equation modeling (SEM), and the research conclusion and discussions.

Literature Review

Leadership Style and organizational culture is considered as the independent variables, Employees' commitment is considered as the mediator variable, and Employees' readiness to change is considered as the dependent variable.

Leadership Style

A popular theory in leadership is the *Trait Leadership Theory*. In this theory, [8] show that there is no perfect leadership model that can be implemented in an organization that would lead to high productivity or to the success of a specific vision [9]. [10] argues that what differentiate effective leaders from others is their ability to continuously assess the unique circumstances and to strategically behave in accordance. There is no universal definition of leadership because leadership is complex, and is different in different contexts [9]. key aspect of this process is to understand the benefits and limitations of the different leadership styles in relation to the ever-changing business environment [11]. In the contemporary market, there are many different styles in leadership. Nevertheless, the all emerged from the three basic styles.

Autocratic Leader

An autocratic leadership style, is a style where the leader retains all the power and makes all the decisions without allowing employees to provide their input or ideas. They are, therefore, task oriented and not relationship orientated [9]. Autocratic leaders have been critiqued over the years. Some of the reasons include it being a major contributor towards larger numbers of absenteeism; nonetheless, this leadership style can be beneficial in certain scenarios [11]. However, the rigid approach of that style tends to oppress creativity and enthusiasm and it could be argued that this style is not favorable specially during the change activities implementation for the reason that it does not support individuality and subjective inputs from employees [10]. On the other hand [12] show that a round 25% of the investigated case studies have a successful change efforts despite the existence of autocratic leaders leading the change which doesn't support the widely held assumption.

Democratic Leader

Research show that organizations that want to adapt changes easily need the help of the employees in brainstorming together for the right course of action [12]. The process of consultation, seek others' input about achieving an objective and are open to developing a plan together to achieve the objective known as participative management and empowering employees [8]. In a study of the success factors related to the organizational change, [12] find that democratic leadership is the predominant style of leadership mentioned and is twice as prevalent as the autocratic or a laissez-faire/ style of leadership.

Laissez-Faire Leader

Many scholars describe Laissez-faire leadership as the opposite *of* authoritarian leadership in many ways. A laissez faire leader tolerates followers to have complete freedom in making decisions that concern their work and how it is to be completed. Researches illustrate that this style of leadership, also known as the hands-off style, is not preferable when an organization seeks to implement change. Laissez-faire entail Low-directive–low-supportive behavior - provide little or no direction and support - let employees make their own decisions [13]. Laissez-faire leaders demonstrate limited participation in vital organizational matters [12].

Organizational Culture

According to [16], organization's culture is : what allows the entity to either accept or resist change. Those organizations that have resistance to change is due to environmental pressures and uncertainty. Thus, to promote and allow change, an organizational learning process needs to take place which pushes the organization beyond its currently held understandings of itself and its ways of dealing both with its internal and external reality. The

assessment of organizational culture is an important step for creating change readiness [14]. Characteristics of organizational culture can lead to the failure of a change activities even before it starts [15]. Several researchers studied the influence of organizational culture on change readiness and implementation. [19] research illustrates that organizations with bureaucratic, top-down hierarchies and rigid managerial paradigms are classified as having un-adaptive cultures, that are resistant to change, which can result in under performance. The research indicates that a desirable culture is one that embraces change and has a focus on utilizing the intellectual capital that exists within an organization. There is a move towards more de-centralized structures that devolves power down the hierarchy and empowers the members of staff. This culture fosters creativity, innovation and learning, which allows for it to adapt to the changes in the external operating environment. changers emerges as people within organizations learn how to accept and deal with uncertainties [16]. Hence, organizational culture can help organizations adapt to external environments with rapid and appropriate responses.

Employees' Commitment to Energy Management

[22] state that employees' commitment to change is "*a force (mind-set) that binds an individual to a course of action deemed necessary for the successful implementation of change initiative*". Organizational change typically requires leadership motivation towards the change, and ongoing support from employees; and their commitment to change fundamentally alters their change-related behaviors, thus promoting organizational change effectiveness [23]. Employees' commitment to change has been identified as a vital antecedent of success or fail in organizational change efforts [25]. Despite its presumed importance, however, little attention has been paid to the triggers of commitment within a change context [25]. Research show that people can make or break an energy program. Gaining the support and cooperation of key people at different levels within the organization is an important factor for successful implementation of the action plan in many organizations [4]. Therefore, employees need to be committed in order   for organizations triumph in the energy management system. Reaching energy goals frequently depends on the awareness, commitment, and capability of the people who will implement the action plan [4].

Employees' readiness to change

Employees' readiness to change refers to the process by which employees' attitudes are changed in a way that they view the change as necessary and likely to be successful which highly depends on their leaders' support [17]. it is argued that leadership may affect employees' ability to manage change [18]; and ultimately, prepare them to participate effectively in organization change efforts. In conclusion, based on the literature review, a proposed research model as shown in figure 1 is developed to be further tested. This model seeks to evaluate the impact of various leadership styles on employee commitment to energy management and employee readiness to change. In addition, the model seeks to assess organizational culture on employee commitment to energy management and employee readiness to change. Based on the model, five main hypotheses are formulated: (H1) Leadership Style has an effect on Employees' commitment to energy management; (H2) Organizational Culture has an effect on Employees' commitment to energy management; (H3) Leadership Style has an effect on Employees' readiness to change; (H4) Organizational Culture has an effect on Employees' readiness to change; (H5) Employees' commitment to energy management has an effect on Employees' readiness to change.
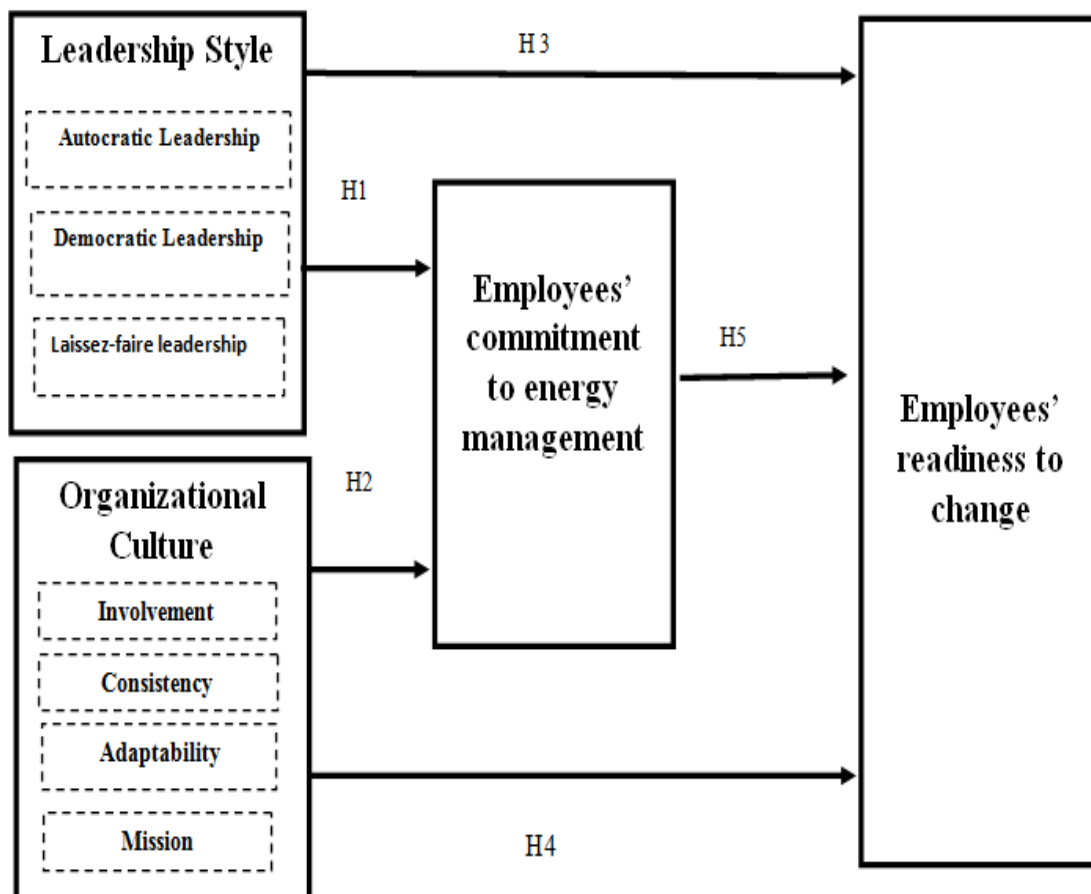
Figure 1- *Conceptual Framework*

Research Methodology

For the purpose of this research, the research population refers to Egyptian employees working in petrochemical sector in Egypt. The research questionnaire was administered to seven hundred (700) respondents, 458 questionnaires representing 65.4% were returned, and 42 questionnaires representing 6% were incomplete or ineligible or refusals and 242 (34.6%%) were not reached. There were 416 acceptable responses, a response rate 59.4%, which is highly adequate for the nature of this study. In this Research Paper, the Amos 25.0 software package was used to perform the structural equation modelling (SEM) to investigate the inter-relationships between the constructs of the hypothesized model. Hypotheses Testing Following a confirmatory factor analysis, the valuation of the structural model through testing of the hypotheses underlying the research model is conducted.

Results and Findings

Based on the frequency analysis, the respondents in this study were Egyptian employees working in the petrochemical sector in Egypt who came from different socio-demographic background as shown in table 1.

Table 1: *The Respondents Socio-demographic Traits*

Var	Desc	Freq	%	Var	Desc	Freq	%
Age	20 - Less than 3535 - Less than 5050 - Less than 65	18521615	44.551.93.6	Gender	MaleFemale	312104	75.025.0
Education	SchoolCollegePostgraduatOther	12341801	.256.343.3.2	City	CairoAlexDamieOther	9219611711	22.147.128.12.6
Current Job	MainMarktLogistOperatE & IOther	12713301723836	30.53.17.241.39.18.7	Year of Exper	> 1 Y1 - 4 Y5 - 10 Y<10 Y	11194310	.22.622.674.5

Composite reliability (CR) is used to measure the reliability of a construct in the measurement model. CR is a more presenting way of overall reliability and it determines the consistency of the construct itself [19]. The CR of (Democratic = 0.933, Autocratic =0.912, Lassie faire =0.877, Employee commitment to energy management = 0.930, Mission = 0.807, Employee readiness to change = 0.950, Involvement = 0.845, Consistency = 0.829 and Adaptability =0.906). So, it clearly identified that in measurement model all construct have good reliability. The average variances extracted (AVE) should always above 0.50 [19]. That average variances extracted (AVE) of the particular constructs(Democratic=0.735,Autocratic=0.64, Lassie faire =0.589, Employee commitment to energy management=0.690,Mission=0.55,readiness to change =0.706, Involvement=0.584, Consistency= 0.548 and Adaptability=0.616) are more than 0.500. Overall, these measurement results are satisfactory and suggest that it is appropriate to proceed with the evaluation of the structural model. Table 2 illustrates the results of these analyses.

Table 2: *Model Measures*

Variables	Composite Reliability CR	Average Variances ExtractedAVE	Square Root ofAVE	Maximum ReliabilityMaxR(H)
Democratic	0.933	0.735	0.857	0.944
Autocratic	0.912	0.638	0.799	0.937
Lassie faire	0.877	0.589	0.767	0.882
Employee commitment to energy management	0.930	0.690	0.831	0.934
Mission	0.807	0.549	0.741	0.887
Employee readiness to change	0.950	0.706	0.840	0.954
Involvement	0.845	0.584	0.764	0.893
Consistency	0.829	0.548	0.740	0.830
Adaptability	0.906	0.616	0.785	0.910

Measurement model Results

The 9 factor was subjected to CFA using the AMOS software. DF was 290 (it should be more than 0), χ^2/DF has a value of 2.500, that is less than 3.0 (it should be less than or equal 3.0). The RMSEA was .056 (it should be less than 0.08). The TLI index was .939 which is very close to 1.0 (a value of 1.0 indicates perfect fit). The CFI was .946. All indices are close to a value of 1.0 in CFA, indicating that the measurement models provide good involvement for the factor structure determined through the CFA.
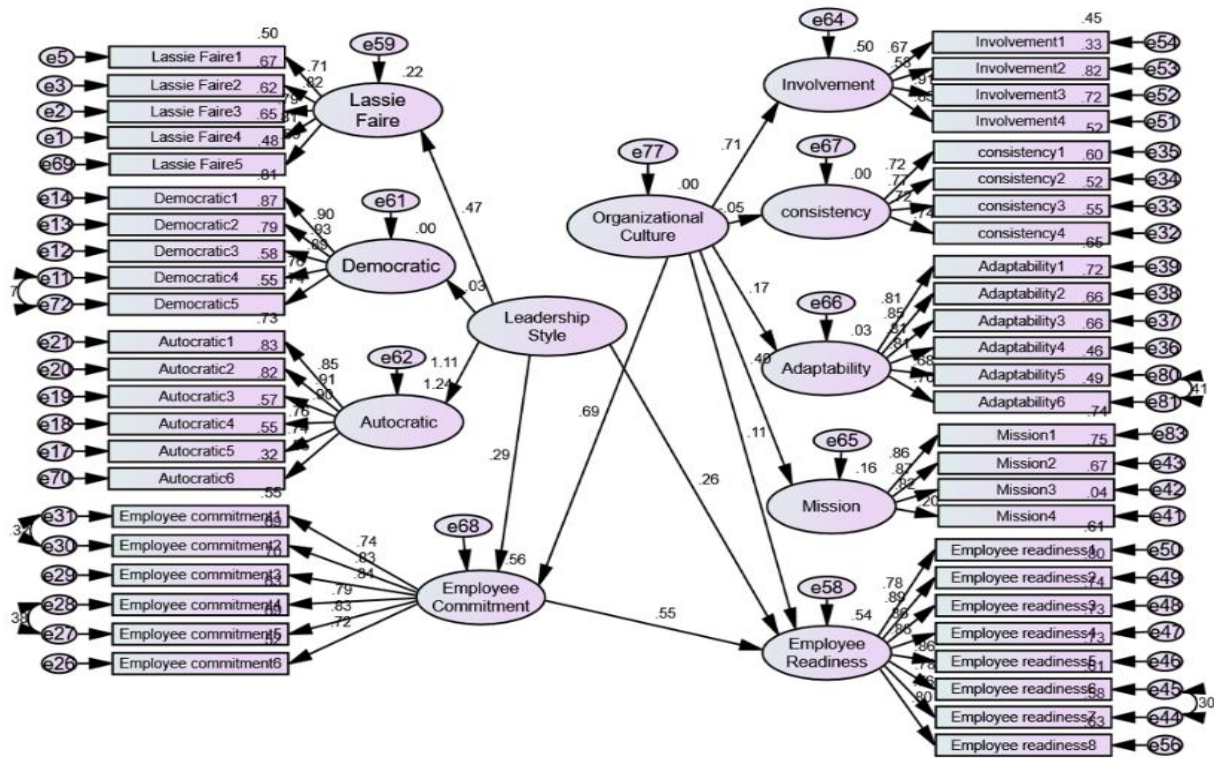
Figure (2) *Structural Model (Final Result)*

Structural model summary

As shown in figure 2, the results of structural model using the AMOS software, shows that DF was 1068(it should be more than 0), χ^2/DF has a value of 2.390, that is less than 3.0 (it should be less than or equal 3.0). The RMSEA was .054 (it should be less than 0.08). The TLI index was .907 which is very close to 1.0 (a value of 1.0 indicates perfect fit). The CFI was .912. All indices are close to a value of 1.0 in CFA, indicating that the measurement models provide good involvement for the factor structure determined through the CFA.

Research Conclusion

This research investigated the leadership style and organization culture on employee readiness to change with mediating role of employee commitment to energy management in petrochemical sector in Egypt. The objectives of this research are: to recognize the effect of leaderships style on employees' commitment to energy management; to identify the effect of the organization culture on employees' commitment to energy management; to assess the effect of employees' commitment to energy management on their readiness to change, using structural equation modeling. The following paragraphs illustrate the results of each objective achieved.

Due to the individual tests of significance of the relationship between the variables. It reveals that, as expected a positive relation between Leadership Style and Employees' commitment to energy management (β = 0.286, CR (Critical Ratio) = 6.044, CR > 1.96, p = 0.000, p<0.05). Therefore, H1: Leadership Style has an effect on Employees' commitment to energy management.) is supported. That result is consistent with [14].

According to the analysis performed testing the relationship between the variables. H2:

Organizational Culture has an effect on Employees' commitment to energy management. (β = 0.688, CR (Critical Ratio) = 22.072, CR > 1.96, p = 0.000, p<0.05). is supported, as it predicts that " There is a positive relation between Organizational Culture and Employees' commitment to energy management. ". That result is consistent with [20]. The result shows that H3: Leadership Style has an effect on Employee readiness to ch ange (β = 0. 260, CR (Critical Ratio) = 6.340, CR > 1.96, p = 0.000, p<0.05). is supported, as it predicts that " There is a positive relation between Leadership Style and Employee readiness to change ". That result is consistent with [18], [21] .

The result shows that H4: Organizational Culture has an effect on Employees' readiness to change of petrochemical sector in Egypt. is supported as the result shows that (β = 0.107, CR (Critical Ratio) = 2.976, CR > 1.96, p = 0.003, p<0.05), as it predicts that " There is a positive relation between Organizational Culture and Employees' readiness to change ". That result is consistent with [17], [21].The result shows that H5: Employees' commitment to energy management has an effect on Employees' readiness to change. (β = 0.549, CR (Critical Ratio) = 17.834, CR > 1.96, p = 0.007, p<0.05). is supported, as it predicts that " There is a positive relation between Employees' commitment to energy management and Employees' readiness to change". That result is consistent with [21], [22].

In conclusion, leadership style and organization culture have significant effect of employee commitment to energy management when studied in the Egyptian petrochemical sector. Accordingly, it was found that leadership style and organization culture have significant relation with the employee readiness to change. Moreover, the study found that there is a partial mediating effect for the employee commitment to energy management on the relation between leadership style and organization culture and employee readiness to change.

Research Discussion

This paper explored the direct and indirect effects of leadership style and organization culture on the employee readiness for change. The outcomes of this study are supported by existing research. For example, the results of first Hypothesis (Leadership Style has an effect on Employees' commitment to energy management) match with [12] who indicate that democratic leadership style influences employee commitment to change, where Laissez-faire leaders demonstrate limited participation in vital organizational matters and incline to procrastinate their response to critical change. At the same study 25% of the investigated case studies do not support the widely held assumption that a more autocratic style of leadership in times of change is partly responsible for the lack of success of change programs. Results align with [9] who states that autocratic leaders are not preferable to handle energy management system since they are task oriented and not relationship orientated so they significantly and directly guide the employees to the decisions made. Where he claims that democratic leadership is the predominant style of leadership mentioned and is twice as prevalent as the other style of leadership.

The result of the second hypothesis (Organizational Culture has an effect on Employees' commitment to energy management) match with [23] in which organizational culture plays an important role of moderating the relationship between leadership style and normative commitment to change. Firm must take in to consideration that organizational culture takes a time to be developed so the sooner a company respond, the more quickly it will   be in a position to implement successful energy management program.

The results of the third hypothesis (Leadership Style has an effect on Employee readiness to change) matched with [21] which indicates that Authoritarian leadership style is negatively related to employees' readiness to change , while both Democratic and Laissez-faire leadership style are positively related to readiness to change. The results of the fourth hypothesis (Organization culture has an effect on Employee readiness to change) matched with [21] which assure that Individuals are not passive recipients of change uncertainty and ambiguity. Quite the opposite, they dynamically react to what is happening in their work environment. The results of the fifth hypothesis (Employees' commitment to energy management has an effect on Employees' readiness to change) matched with [22] study which showed higher change readiness among employees with greater commitment, and, as predicted, the commitment was more strongly related to change readiness when the target of one's commitment had greater change advocacy.

Limitations and future directions

This study faced several limitations when conducting the research. First, because this study was cross-sectional, it is not possible to investigate the nature of cause-and-effect connections between the variables. Future study should therefore focus on the requirement for a longitudinal strategy. Second, as a method of data collection, the questionnaire also had its limitations and could not examine all the information in detail. The answers in the questionnaire were based on the employee's perception and did not take into account deeper explanations and reasons for choosing the selected answers. Additionally, few papers have empirically investigated the elements presented in this paper, so not all factors could be compared with previous research to reach relevant conclusions. These limitations also represent recommendations and guidelines for future studies. Third, because this study's sample was limited to one nation (Egypt) and the petrochemical sector, it is important to proceed with caution when interpreting the results. Despite the fact that the research context is extremely specialized, it is thought that the conclusions apply to various fields and nations. Fourth, a convenience sample approach was used to gather information from respondents over a predetermined period of time, which led to a limitation. The range of respondents who might participate was restricted by the short time window for data collecting. Because responses are acquired based on respondents' accessibility and may not give a representative sample, the convenience sampling approach used to gather responses may have also limited the range of respondents who would participate.

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