IMPROVING SAFETY PERFORMANCE BY UNDERSTANDING RELATIONSHIP BETWEEN MANAGEMENT PRACTICES AND LEADERSHIP BEHAVIOR IN THE OIL AND GAS INDUSTRY IN IRAQ:

A PROPOSED MODEL

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Abstract-As the world continues its voyage towards modernization it faces tremendous challenges of the 21st century. The rapid growth in the industry globally has raised concern on safety and health issues at the workplace. As a result more occupational accidents and injuries at workplace make headline news all over the globe. The aim of this paper is to review related empirical literatures and highlight the need to investigate safety performance with respect to the oil and gas industry in Iraq. This paper discusses the role of two main organizational factors that may have an impact on safety performance in the oil and gas industry. They are management practices and leadership style. Toward the end of the paper, a conceptual model depicting the relationships between management practices and leadership behavior, and safety performance will be offered.

Key words-Management Practices; Leadership Behavior; Safety Performance; Oil and Gas; Iraq

I. INTEREDUCTION

World continues its voyage towards modernization, it faces tremendous challenges of the 21st century. The rapid growth in the industry globally has raised concern on safety and health issues at the workplace, as more and more occupational accidents and injuries are becoming headline of news globally. Safety at work is a difficult and complex phenomenon, and the subject of safety performance across the industries is hard and demanding to achieve. It needs a lot of measures and policies to be applied on the ground. Additionally, safety performance is very complicated and sensitive concern of the organization to deal with, as it's the matter lives of people and resources, who involved in the project towards success [1]. However, occupational accidents are rising, as due to lack of attention given to safety performance, safety procedures and improvement of methods to prevent accidents and injuries [2].

On the other hand, occupational accidents occur are either due to lack of knowledge, training, lack of supervision, and lack of rules implementation. In addition, a human error leads to negligence, carelessness of workers, recklessness of workers and lack of monitoring and controlling. All these factors have influence on safety performance or lead to the weakening safety performance and the high rate of accidents [3].in addition, Occupational accident is defined as an occurrence arising from the course of work which results in non-fatal or fatal injury [4].

One industry that is likely to face occupational accidents is the oil and gas industry. According to Mearns and Yule (2009), the oil and gas industry all over the world is a high risk industry due to the nature of the industry and the difficult working conditions involved [5]. Similarly, Kane (2010) indicates that the oil and gas industry is one of the industries that has a very high risk factor and has high workplace fatalities and injuries [6]. Iraq, an oil rich country, is also not spared from occupational/industrial accidents. Based on a personal communication with CEO for Iraqi oil ministry, in 2009 the oil and gas sector recorded 322 accidents that include 34 fatal work injuries and 334 non-fatal work injuries. The term fatal injuries mean those deaths, which resulted from traumatic injury or other external causes that occurred on the workplace [7].

While non-fatal injuries refer to those injuries which lead to physical or emotional damages. These injuries can be controlled by medical aid within a certain time period and these injuries do not lead to death [8].

Oil and gas industry of any economy is one of the main sources of revenue and it highly contributes to the economic performance [9].Oil and gas export helps a country to earn a huge amount of foreign exchange, which in turn helps it to build its infrastructure. As mentioned earlier the oil and gas industry is considered it one of the most important industries in Iraq because it contributes 90% to government revenues and 74% to gross domestic product (GDP), and it offers tremendous employment opportunities for Iraqi people [10]. In comparison with other industries, the agricultural sector employs 35,296 people and the manufacturing sector 63,667 people [9], the oil and gas industry has the highest

number of employees of 79900 [11]. With the highest number of employees in the oil and gas industry it is reported that comparatively there is a number of accidents and injuries rate on the site [12].

According to the Iraqi Congress Report (2008), the oil and gas accidents were said to be caused by insufficient tools, poor technology, poor organizational management, lack of precautions, lack of adequate services, employee misbehavior towards safety regulation and inadequate training [13]. But according to Al-Moumen, (2009), given the fact that the entire infrastructure has been damaged due to global sanctions imposed on Iraq and the American invasion of Iraq in 2003, oil and gas accidents seem to be inevitable [14]. Whilst such external factors are largely true, the safety issue in the oil and gas industry in Iraq is very important because of Iraq's dependence on oil production and exports. In addition, Iraq possesses more than 115 billion barrels (bbl) of proven oil reserves. Therefore, it ranks second in oil inventories worldwide after Saudi Arabia [15], [16], [17]. But Iraqi former Oil Minister, Thamer Ghadban, said in August 2004 that Iraq's oil is a much of 214 billion barrels, placing Iraq in the first place in the world in oil reserves [9].

Generally speaking, an occupational accident in Iraqi oil and gas sector has an enigmatic direct impact on production [13].The Iraqi Congress Report states that Iraq is currently working with a production capacity of 45% in the oil sector and bears the costs as a result of the ongoing incidents in the production of oil and gas. The big question raised by scholars and experts alike is whether the Iraqi government and the oil and gas companies are capable in managing efficient and effective work place safety in order to reduce occupational accidents [14], [18], [19].

This study is base on the management perspective to investigate the safety performance. The reason because safety related issues in Iraqi oil and gas industry, has the high rate of occupational accidents which is due to many reasons; mainly the failure of these occupational accidents and injuries is management negligence, which is explained in term of human errors, overload, and lack of development of management capacity building in addressing occupational accidents [14]. Additionally, the main focus of this study is to explain the management perspective in addressing these occupational accidents, with maintaining or improving Iraqi oil and gas industry's safety performance. In addition, this study is designed to study the relationship between management practices, leadership behavior on safety performance in Iraqi oil and gas industry.

II. LITERATURE REVIEW

A. Factors Affecting Safety Performance

There are many factors which can affect the safety performance as the safety at work is a complex phenomenon, and the subject of safety performance in the oil and gas industry is even more complicated to understand. Given below are the many factors which could affect the safety performance. These factors are human factors, behavioral factors, economic factors, psychological factors,

organizational factors individual and social factor and environmental factors, which are discussed below.

1) Human factors

Human factor is important sub dimension to explain human involvement towards safety behavior and its nature how human deals in with life. The workplace safety can be improved the workers need to give importance to safety measure and related issues. It is a combine effort to recognize and then feel the responsibility to improve the safety conditions. When dealing with large number of worker in oil and gas industry, it is not a professional approach to completely rely on management staff to direct the workers to safety, as at that time, time is a critical factor to negotiate [20]. On the other hand, human factor deals in with the discipline, which refers to human operations, and work environments so that they match capabilities, limitation and needs base on human behavior [21]. When the organization and job factors, and human and individual characteristics which influences behavior at occupation in a manner that can help the occupational safety and workers health [22], [23].

2) Behavioral factors

The behavioral factor of safety refers to employee motivation and performance improvement through behavior constrains. Behavior factors base on safety provide more focus on effort of behavior rather than results such as accidents recorded. The behavior base safety refers to the behaviors which lead to reduction of risk behaviors and as a result reduce accidents and injuries. As discussed by Krause and Russell (1994), reported that the workers who have riskier behavior are commonly present in most injury situations where people are case accidents and injuries [24]. When the accident or injury is recorded which is related to behavior occurs, it is highly likely that the similar attitude has not caused injury when previously experienced. Behavior based safety involvement are workers more emphasis on group observation of workers performing regular work. If safety oriented programs are encouraged works can change their behavior and mold their attitude to act safely [25], [26], [27].

3) Economic Factors

Apart from the human cost of suffering an accident, the economic effect can be devastating. As a research conducted in UK found that every £1 of an accident cost, that an insurance company has to pay out, could cost the contractor between £5 to £50 in indirect costs. These indirect costs will range from product and material, to legal costs [28].Other hand it is found the 370 million lost working days due to incapacity at work and over 15 million days are lost due to occupational accidents and injuries [29], [30].However, the economic factors are very important and have high contribution on safety performance. The economic factors deals in term of monetary values which are associated with safety such as, hazard pay. Compensation base on the accident is very important. In most of the cases money can never compensate the life of any worker who lost his life but can only temporarily relief the pain of one who had losses one. The economic factor depends on the organizational polices and may vary from company to company. Therefore

there is a difference procedure for payment to individual in term of overtime, bonus or profit sharing, which likewise motivate worker or encourage the workers operational duties within the organization. The economic factor can also improve the occupational safety by providing appropriate equipment and other relevant safety prevention tools [31].

4) Psychological Factors

The worker psychological is the significant factor to contribute safety performance noted by Crocker, (1995), found that the worker psychological very complicated and it depends as he added that "workers will work more safely with a supervisor who is seen as someone who respects their workers and their contribution, and who is stimulated by a distinct company policy on safety [28]. Because they see that their supervisor regards safety equally important as production. They can also expect operatives to react positively, when they work safely. [32].

Base on the study conducted by Sawacha, Naoum & Fong, (1999), concluded that psychological factor have found to have a significant relationship with safety performance [30]. Operatives who showed concern for personal safety had a better safety record than those who neglected safety in the course of their work. Furthermore the author cited that "operative's expectation of their supervisor's safety attitude was relatively high and they see their superintendent's attitude towards safety as being a major source of influence upon their behavior on site". [30].

5) Organizational Factors

The term organizational factor under the context of safety performance is explained as those factors that could cause accidental condition. Base on the past empirical studies we have found to make a relationship between the organizational factors and workers safety behavior [33], [34], and safety out comes such as injuries, incidents, and accidents [35], [36], [37], [38].

Additionally there are other organization factors which are found to be useful predictor of organizational safety [39].Base on the past studies on organizational factors have examined those factors which can preventing future accidents. On the other hand, organizational factors can be influenced by external factors such as economic, socio-technical environment and national culture [40].

Therefore, organizational factors in different geographical location may vary in term of producing differential effects on safety performance. In the recent era of globalization, production industries is facilitating their industry programs of overseas subsidiaries should effectively consider organizational characteristic difference and their influence mechanisms in different countries for safety performance. On the other hand, research attempts to compare cross-cultural differences of organizational factors on safety performance, and identifies unconventional behavior from those differences. [36], [41].This study will be finding the effect of organizational factor on safety performance and it will also find the casual relationships between organizational factors and safety performance.

On the other hand, the effectiveness of organizational factors on safety is important to understand as how the industry functions. The management of organizational set its goals and develops its strategies according to its mission and objectives. The organizational also keep updating and response to requirements imposed by the changing environment. The corporate management makes policies to determine strategic goals and the means to achieve these goals toward the betterment of their workers. In the same setting middle level management formulate the operational procedures to provide tactical policy action guidelines [42]. Accordingly the line manager gives its feed back to execute policies and procedures, which give directives to the frontline workers, and supervise the work process to ensure safe and reliable operation within the safe and reliable environment [36], [43].

The organization factor includes organizational climate, individuals attribute meaning, and work environment value to features of the work value [36].The organizational factor deals in with the safety behavior of effective organization in order to control and manage safety behavior. Organizations must participate in the exercise to manage safety in order to achieve high values of safety performance. The term in the context of organization has been defined as the ability of the organization to tackle risks so as to avoid accidents and injuries. The success rate of safety performance can be improved by identifying management and organizational factors [44].

6) Individual level factors

The individual level is combination of three factors which are integrated together that are: safety self efficacy, safety awareness, and safety behavior. Employee belief which is their practice competence and may affect employee perceived safety control, a mediator role between safety climate and self reported injuries is denoted as self efficacy [45].

However, safety awareness reflects risk factor which incurred at the workplace. The safety behavior is represented as to employee risk-taking behavior and compliance to safety rules and procedures. Base on the discussion by Neal and Griffin (2002), found that organizational factors (such as supportive leadership and conscientiousness) may influence safety behavior, when evaluated through compliance and participation [46].

7) Individual and Social Factor

The Individual and social factors are the aspect of risk which depends on the motivation to encounter risk, or avoid risk altogether, and it is one of the influential determent of safety which is related to behavior [47]. Risk can be perceived base on the influenced by some biased and other factors that influence behavior options. The term bias is explained as a process of influence that tends to produce results that systematically varies from reality [48].

The risk which deals with the safe and unsafe practices depends on the cognitive biases associated with safety and for the workers who are facing risk, bias in the perception of risk which occur in a rational but this assessment of risk is unrealistic, in a result causing more higher level of risk [47], and higher levels of accidents and injuries casing death. Cognitive biases included melioration bias, rare event bias and optimism bias. The other factors that can influence the behavioral choices can include the cost factor of the safe

behaviors and the unbalance between the demands for safety and the demands for performance. Melioration bias is the capability of individual to assign more weigh to short term results, and to underestimate the potential for the occurrence of any uncertain event [49], [50].

8) Environmental Factors

The environmental factors are categorized into two main methods in which the environment has deal in with to improve the safety performance. These two categories are mainly the engineering and the behavioral intervention. The engineering factors emphasis on reducing and reducing physical hazards within the environment, while behavioral factors base on environment deals with the behaviors of the workers so that the hazardous environment can be improved through interaction [41], [51], [52].

However the safety engineering which involves environmental factors deals in term of devices such as mechanical guards, personal protective equipment, and ergonomically designed tools and equipment. Safety engineering has found to be successful tools to decrease hazards [51]. They further argued that the engineering factor has major three problems. First, that it has extremely extensive and labor intensive, in order to find all the expected hazardous conditions in the occupational environment. Secondly, it may foster unsafe reliance on artificial safety controls and thirdly, the workers when ignore safety device [41].

B. Management practices on safety performance

Management practices are aimed to prevent occupational accidents at work, which is an approach to control the workplace accidents [53]. In essence, some authors have established about management practices, According to Ali, Abdullah & Subramaniam (2009), stated that management practices are an important factor of an organization's and it plays an effective role in reducing workplace injuries [54].

A study conducted by Geldart et al, (2010), on organizational practices, workplace health and safety on 312 workers in Canadian manufacturing firms [55]. The study found administrative policies; practices and attitudes have a direct positive impact on safety in the workplace. In addition, Injuries are low on the administrators and workers skilled or highly experienced in working. And official policies and practices such as encouraging workers to meet the requirements of safety, issuing a reward, motivation, and participation in the decision have a positive relationship in the rate of injury in the workplace. Department's cooperation with the workers through the Health and Safety Commission is a prominent role in the nappy to make workplaces free from injuries.

The extract of the definition of management practice is to share the common beliefs and values that safety is at preference. The effectiveness of the safety depends on how it can be achieved when there is a proper management of the interaction between people and technology. However, occupational accidents in the workplace do occur when there is no proper integration between the people who are tends to be safe and unsafe behavior as per their feedback. The most import motivational factors for the worker is to create a safety culture in recognition to their attitudes and behaviors of employees are critical to workers attitude and their behavior at work [54].

According to the European Process Safety Center (1994) Basic safety management include important elements such as politics, organization, management practices, procedures, monitoring and auditing. As discussed by Vredenburgh, (2002), that there are many management practices which are appreciate to create safety culture [56]. These management practices are rewards, training, and management commitment. Base on the past literature the practitioners have found that these dimensions are key component to improve safety performance. These management practices are discussed below:

1) Training

Training plays most contributing role in explaining management practices to improve safety performance. As per argued by Ali, et al,(2009), that employees take decisions base on safety concerns, these decision are not being practice by the whole organization as these precautions are form employees rather than management. There is comparatively less impact on the over employees as the safety code of rules and regulation are not been enforced by the management. Their findings also suggest that the ineffectiveness of safety training may not help to reduce the occupational accidents and injuries [54].

On the other hand, the safety training is very useful as it provides the means for making accidents more predictable. The two categories between those who get hurt and who not get hurt can be recognize as hazards and hazardous actions and understand the consequences. In order to improve the quality of safety and health for all employees, organizations should implement a systematic, comprehensive safety program and health training program for new employees. To improve the awareness to these hazards and it will help provide orientation to new employees in safety and health quality systems [57].

Training helps to reduce and retain hazards it improves to tackle the safety issues [58]. Employee training and occupational safety depends on the level of risk, which is incurred and warnings and cautiously plays significant role to prevent from those hazards [59]. As discussed by Vredenburgh and Cohen (1995) found that the level of perceived danger increased compliance to warnings and instructions; therefore, it is critical that entire employees are well trained to identify and react against the hazards associated with their workplace [60]. With the help of training programmers the organization can do the goal setting and goal-achievement, innovation and change, and improve technical and professional skills. With the help of training the organization can prevent from accidents and injuries as it inform their employees about adherence to safety rules and procedures, and at the same time detecting training needs, developing changes in work procedures and revising work goals, in order to make the work place more safe [53].

2) Reward

Rewards and incentives motivate the employees to prevent form hazards on the workplace. The employee motivation depends on how they behave is a manner that

lead to desired consequences. Employees need to move according to the cultural norms in order to have the desirable outcome. Rewards culture is learned through behaviors and consequences. As discussed by Thompson and Luthans (1990), found that organizational culture take place in an atmosphere where there are numerous reinforcements and reinforcing agents, changing an organization engages to identify the various reinforcing gents in order to determine their effects on the change process [61].

On the other hand the rewards or safety base incentive program reinforces the reporting of accidents or any unsafe act that leads to an accident. The rewards or incentives programs must be a set of package which runs parallel to safety education and training. The organizational structure must include the prevention of accidents, not punishment after any accident take place [62].

However, informational feed back or self recording, social factor such as praise recognition, and tangible reinforces such as trading stamps, cash bonuses, are some on the important way how the employees can be motivated [63].

As discussed by Cabrera, Fernaud & D´ıaz, (2007); Bentley, Haslam (2001), that there are motivational patterns which organizations use in term of applying intrinsic rewards, related to job content, and extrinsic rewards, connected with economic rewards and social recognition. [53].

3) Management commitment

The management practices concerning the safety culture including management commitment help organizations to create safety culture. As discussed by Zohar (1980); Arboleda at all, (2003); Choudhry,Fang&Ahmed, (2008), found that management's commitment to safety is a vital factor influencing the success of an organization's safety programs [64], [65], [66].At the extent to which management give values to safety measures expressed in its way to give importance to the risk. These safety measures are undertaken to motivate employees to remain committed to perform a job is a safe manner. The individual employees who concern with safety as well as management's expressed concern for safety. Commitment and safety concerns are integrated so that the employees should support the management or the administrators, to achieve it safety base success (67).

C. Leadership behavior on safety performance

Leadership behavior is an important factor in achieving safety performance in organizations [68]. As discussed by Künzle, Kolbe & Grote (2010), that the leadership behavior is one of the reasons for success of safety performance in organization [69]. On the other hand, Yang, et al, (2010), stated that leadership can improving safety performance through formulation of a clear message of what must be done in the future [70]. In addition, leadership behavior is important for good safety performance through employee's awareness of the program of the safety activities of the organization [71].

Organization leadership can help the followers to achieve organizational vision, mission, objectives and goals. On the other hand it provides optimal safety performance in contrast with safety culture [68]. Leadership behavior is an important variable to influence safety performance. As discussed by (Wu, Chen, & Li, 2008; Yang, et al, 2010), that leadership behavior together with safety culture are both important factors to influence safety performance [70], [72]. These two variables cannot be ignored if the organization is willing to improve the safety performance. The factors of leadership behavior is already been tested in the past studies and found that industries such as air traffic industry, the nuclear power industry, and the manufacturing industry but very few research has been done on leadership behavior in combination with safety performance in the oil and gas industry [70].

The term senior leadership is defined as a top level monitoring and controlling which refer to as "senior" leadership [73], [74], [75].On the other hand ''Executive'' leadership (Barnard, 1938; Carlson, 1951), and ''Strategic'' leadership [76]. These are the few terms which have been used in numerous studies and these terms are efficiently interchangeable [77].

Base on the previous studies have found that occupational leadership has been fully influenced on safety performance, and the past studies suggest that the leadership models such as transformational and transactional leadership behavior in managers and supervisors [78], [79], [80].

As discussed by Bass and Avolio (1997), that transformational leadership behavior is a set of values that, are based on individual interaction, resulting in better exchange quality and greater concern for welfare [81]. On the other, hand transactional leader behaviors deals in with monitoring and rewarding whereas transformational leader behaviors are directed towards inspiring and genuinely motivating the workforce to improve the occupational safety performance [75].

Transformation leadership deals in with safety performance or behavior because effective transformational leaders appreciate employees to subscribe to team and organizational goals on the priority to immediate personal gain [68]. Similar study has been undertaken by Barling et al. (2002), found that transformational leadership of supervisors to be positively related to employee safety behavior [78] .However, the perceptions of transformational leadership were comparatively important as to determine the self reported behavior of work can be recorded. There are some past studies, which have examined the relationship between safety and leadership. These studies have focused on the supervisory level and very less study have examined the impact of role or more senior level managers on workers safety behaviors. Only Reid et al, (2008), have focused on importance of managers and supervisors safety leadership skills [78]. In fact, form the past studies of [77], [82], [83], [84], [85],have found that there are many studies which examine the relationship between the leadership style, but very few studies have examine the relationship between leadership behavior and safety performance to help the management practices to improve the occupational safety performance [77], [82], [83], [84], [85], [86].

As discussed by Künzle, Kolbe, & Grote, (2010), leadership has a vital importance in term of organization stability and it is also becoming increasingly recognized as

important for occupational safety [69].The development on leadership behavior and safety performance is in line with other high-hazard in the industries such as airlines or energy, construction, and manufacturing sectors where a culture of safety is very usual and where the whole system of organization and culture, including team behavior and leadership, is designed to improve safety performance [68], [69], [87].

On other hand ,Yukl, (2006), discussed that effectiveness of a leader depend on the critical care teams member take or the level of care which appears to be strongly contingent on the particular situation, which is also explain by many theories explain leadership effectiveness as a function of situational moderator variables [88]. The basis assumption is that there is no predefined or best way of leading, the reason because a particular behavior may be successful in one scenario but it will be ineffective in other circumstances. Base on some studies found that situational variables in at the work place, such as extremely standardized circumstances team members, make directive leader behavior unnecessary [89], [90], [91],[92]. Therefore, it is recommended that leaders of critical care teams view the given circumstances deeply and adapt the direction or change their leadership behavior accordingly to improve the safety performance.

The literature review suggests that there is an importance of leadership behavior for the improvement of safety performance. Organizations must alter their managerial practice in accordance with the objective to improve the safety performance. Leadership can be a significant variable to improve the safety performance by implementing a future strategy to improve the safety performance. This can be done by encouraging workers of their team and make the environment for the workers to participation in safety oriented programs and activities

III. PROPOSED FRAMEWORK

The frame work of this study has proposed management practices and leadership behavior as independent variables and safety performance as dependent variable. The reason for integrating management practices with safety performance, is as it supports human factors in control of human error, and achieve to maximum standard of safety, it appears the role of management practices that are also an important factor in achieving the safety performance [90], [91]. In addition, Cox, Jones & Rycraft, 2004), found that, human factors and management practices if work in one direction in organization can achieve better safety performance. These safety performances can influence the behavior of workers to prevent accidents [26].
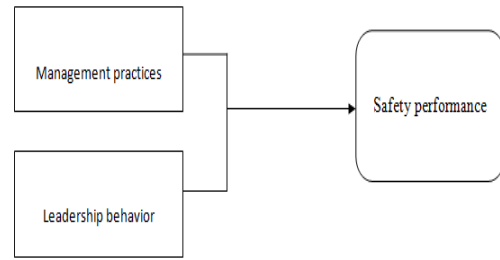

Figure 1. Proposed Framework

IV. CONCLUSION

The main objective of this paper was to review the related empirical literatures and highlight the need to investigate safety performance with respect to oil and gas industry in Iraq. Base of the past literature it is concluded that there is a influence of organizational factors on the work place safety performance in the Iraqi oil and gas industry. In contrast with past literature (Vredenburgh, 2002; Ali, et.al, 2009,), discussing that managerial practices has the similar view towards, safety performance and work place injuries, as there is a significant linear relationship between the managerial practices and work place injuries [54], [56]. On the other hand the dimension of managerial practices such as training, reward, management commitment seems to be the factors which can help to prevent work place injuries.

The second variable which is use as an independent variable is defining work place leadership style influence on safety performance. Base on the past literature, [70], [71], [93], explaining the influence of leadership style on workplace safety performance, has found to have a positive significant relationship between leadership style and work place safety performance. These studies suggest improving safety performance by providing a well-managed system that includes the consideration of leadership style, work place training and a feedback or reporting system for any injuries happened on the work place. Literature base on work place safety performance [3], [26], [53], [93],found that, human factors and management practices if work in one direction in organization can achieve better safety Performance. These safety performances can influence the behavior of workers to prevent work place injuries. However, management practices in this study have investigated the nature of occupational injuries at work, which is an approach to control and prevent the workplace injuries. If proper procedures and knowledge for safety is provided to the workers the human error can be reduced and work place injuries can be controlled [94].

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