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### Researching Relationship Between Performance Improving and Unlimited Improvement in Libyan Industrial Companies

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#### ABSTRACT

Unlimited improvement is one of the most advanced and important tools that based on incremental and progressive improvements in production. The research aims to identify the relationship between the use of unlimited improvement and performance in the Libyan industrial companies. The study community consists of the financial management accountant, the director of marketing department, the managers of the quality control offices and the general managers of all the Libyan industrial companies operating in the central and western regions according to the industrial guide for the industry and minerals sector (2017). Within the scope of the research, 24 items were used in the questionnaire where personality characteristics were asked. This research produced a literature review and survey of unlimited improvement and the performance improvement in the Libyan industrial companies. the finding shows a statistically significant positive relationship between improving performance and unlimited performance in Libyan Industrial Companies.

Keywords: Unlimited improvement, performance improvement, Industrial companies.

Jel code: M11

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#### Libya Sanayi Şirketlerinde Sınırsız İyileşme ve Performans İyileştirme İlişkisi Araştırması

#### Özet

Sınırsız iyileşme, üretimde ileri düzeyde gelişme üzerine kurulu en önemli iyileşme araçlarından biridir. Araştırma, Libya Sanayi şirketlerinde sınırsız iyileştirme ve performans kullanımı arasındaki ilişkiyi tanımlamayı amaçlamaktadır. Çalışma topluluğu, sanayi rehberi (2017) içinde yer alan finans yönetimi muhasebecisi, pazarlama departmanı Müdürü, kalite kontrol ofislerinin yöneticileri ve orta ve Batı bölgelerinde faaliyet gösteren tüm Libya Sanayi şirketlerinin genel yöneticileri, endüstri ve mineraller sektöründen oluşmaktadır. Araştırma kapsamında, kişilik özelliklerinin sorulduğu iki ölçekte 24 ifade kullanılmıştır. Bu araştırma kapsamında, Libya Sanayi şirketlerinde sınırsız iyileştirme ve performans iyileştirmeçalışması yapılmış ve Libya Sanayi Şirketlerinde sınırsız performans arasında anlamlı bir ilişki tespit edilmiştir.

Anahtar kelimeler: Sınırsız iyileşme, performans iyileştirme, sanayi şirketleri

#### 1. Introduction

Organizations in the current era face many challenges posed by globalization, successive scientific and technological developments, increased global competition and constant change in consumer behavior. All these challenges have led organizations to adopt the principles, principles and tools of TQM as a means of sustaining and sustaining their competitiveness and improving the level of services and products they offer to local and global markets. Unlimited improvement is one of the most important TQM tools used to perform operations improvement of FAO's activities and operations, through the improvement and development of the organization's current performance. Unlimited improvement is an administrative philosophy that aims at continuously developing processes and activities related to machines, materials, individuals and methods of production. The philosophy of unlimited improvement is one of the pillars of TQM methodology that needs to be supported by senior management and encouraged through appropriate material and moral incentives. It is the responsibility of management to provide the requirements for the success of unlimited improvement efforts. The adoption of the concept of unlimited improvement in industrial companies is one of the strategies that aims to provide high quality outputs that have a competitive advantage to cope with obstacles in the market.

That can be achieved through the introducing of continuous development in management, activities and processes, providing an innovative environment



and suitable infrastructure as well as modern means and the use of ICT in production and customer service as it contributes to improving the interactive relationship between the employee and management of the company and it contributes to strengthening the relationship between the company and customers.

The intensity of the competition between the Libyan industrial companies on the domestic and international markets has been exacerbated by the decline in the performance of some Libyan companies operating in the sector Industry. The problem of research is that many organizations are still afraid to enter the modern world of manufacturing (for reasons of their inability to control markets, pricing decisions, and therefore inability to control costs, as well as traditional ways of reducing costs), which is imperative in the context of intense competition. The impact of this environment on performance improvement is reflected in the recent developments in through which it is possible to improve performance, and reduce them to lead in the limited improvement. Generally, it has been noted that companies in the developed world show great interest in the subject of unlimited improvement. While, on the contrary in the Arab countries, theoretical framing unlimited improvement is not yet complete, and this is reflected in the reality of practice and application. From here, the problem of the study can be formulated in the form of a question as follows:

Is there a statistically significant relationship between unlimited improvement and improving performance in the Libyan industrial companies?

#### 2. Theoretical Framework

Unlimited improvement is one of the most advanced and important technologies that based on incremental and progressive improvements in production. These improvements are reflected in reduced costs and improved product quality. Thus, unlimited improvement can be defined as "the active pursuit of performance development and quality improvement in order to maximize the benefit achieved by the consumer and reduce the costs to a minimum without compromising quality. Thus, unlimited improvement aims at reducing costs rather than controlling them in order to reduce them in the short term, Product lifecycle in order to satisfy consumers' desires, satisfy their ambitions, achieve a competitive advantage for the organization and thereby increase their market share (Basile, 2001, 109). The improvement is also defined as "gradual improvement through small improvement activities rather



than large activities. These improvements are achieved through innovation or substantial investment in techniques, and improvement is a goal that is the responsibility of senior management, executive management and all activities (Hilton, 1999, 220).

It is clear that organizations have recognized the importance of unlimited improvement to achieve their objectives, because it is based on an activity that does not stop in search for ways to reduce costs, reduce waste, improve quality and raise the efficiency of activities that produce value from the point of view of the consumer (Beauty, 2000, 32). In addition, the principles which unlimited improvement is based on, as follows: (earning, 2004, 12).

\*Improvement is not an end. It is continuous as long as the Organization is in existence.

\*Unlimited optimization is a comprehensive process.

\*The improvement process needs the efforts of all those who work in the organization.

\*No lack of errors means no need for improvement.

Participation and teamwork because improvement is a collective responsibility.

Exploit time to differentiate from competitor.

Unlimited improvement based on available technological means.

The goal of unlimited improvement technology is to achieve complete perfection through continuous improvement in production processes, which requires great efforts to reach this goal, because achieving a strategic objective is to achieve a competitive advantage by reducing cost, improving quality and customer satisfaction. Thus, the goal of unlimited improvement is a moving goal through: (gain, 2004, 13)

\*Satisfying customers 'needs is a mobile goal by constantly improving specifications as per customers' needs.

\*Constant reduction of costs to maintain competitive advantage and is also a moving goal by adopting a policy of production free of defects and damage.

The organizations' possibility of progress may only be achieved if these pursue continuous performance. Therefore, it represents one of the main objectives at the level of the organizations' management. Many of the studies approach



only the organizational performance (Koning, 2004). But, for instance 98% of the subjects of a study consisting in executive managers of average and big companies have stated that improved performance of the employees would lead to an increased performance of the company. Numerous studies and statistical indicators (Campbell et al, 1998; Chen and Kuo, 2004) demonstrates that the success and competitiveness of organizations depend largely on the professional performance of employees, the ways to improve it should become a pressing and permanent concern, in a competitive market. Current concerns and organizational practice did not reach sufficiently convincing results in this area, recognizing the need for new searches and involvement of additional forces to identify as acceptable solutions. In addition, Romania studies (or their results) on strategies to improve employee performance are limited or are not sufficiently comprehensive. Over time, management staff was asked, what are methods to improve the performance of work for their employees are more appropriate. We consider the issue of motivation as essential to human activity, for understanding and explaining behavior. In general, especially those within organizations and therefore we cannot talk about strategies to improve performance without implicitly bring into question the

Concept of Motivation, Studies (lelics, 2001: 151) show that many managers believe that addressing behavior in terms of motivation is particularly difficult, while the problems that arise can take the following form: "how to persuade employees to do what you want?" or "how can you be sure that employees will be working without direct and constant control?". Performance improvement is a form of organizational development focused on increasing outputs and improving efficiency for a particular process or procedure. Performance improvement can occur at different levels including the employee level, team level, the division or unit level and the organization as a whole.

Quality control is a common form of performance improvement as a means to ensure consistency of output and consistency of performance analysis. The Seven Basic Tools of Quality are used to measure quality and make improvements. Performance improvement can range from a formal, rigid process conducted at timely intervals to a continuous, software-driven, realtime system that continuously looks at ways efficiency and output can be increased. Performance improvement can be seen as a subset of performance management.



### 3. Aim of Research

The research aims to identify the relationship between the use of unlimited improvement and performance in the Libyan industrial companies. The importance of research is to highlight the role that unlimited improvement can play in improving processes and products. The importance of this research is to clarify the importance of the relationship between unlimited improvement and performance improvement in the Libyan industrial companies. Provided the opportunity for leaders and managers in industrial companies to understand this relationship.

## 4. Scope of Research and Methodology

This research will focus on the relationship between unlimited improvement and performance improvement of Libyan industrial companies. The theoretical part is well formed, which includes some general concepts of unlimited management optimization and performance improvement. In this way, concepts are based on the relationship between limited improvement management and improved performance. The experimental study is the second part of the research, which is limited to the Libyan companies (industrial sector) in the western and central region of the country, because the researcher has knowledge of the industry and language market, making it easy for survey companies and collect data. (Küçük, 2016), stated that sample mass determination very sampling should be performed within systematic steps. The commonly known sampling process consists of five steps which are:

\*Definition of the main mass,

\*Sample frame,

\*Determination of sample size,

\*Determination of sampling method

\*Selection of sample.

The basic type of probability sample is the random sample in which every item in the relevant world has an equal opportunity of being selected. The study community consists of the financial management accountant, the industrial staff and engineers, the managers of the quality control offices and the general managers of all Libyan industrial companies operating in the central and western regions according to the industrial industry manual. The mineral

sector (2017) is the number of 50 companies with about 5000 terminals, a random sample of about 360 employees was selected according to the schedule reported as mentioned (Küçük, 2016). In this case, a sample of the total number reached 211 is determined according to what he stated (Küçük, 2016).

The research relies on the use of inductive and deductive methodology, and both approaches are considered. In an integrated approach, the inductive approach starts from the molecules to reach accredited colleges. The first is the observation of the phenomenon, to development of scientific hypotheses, and then the final stage of the curriculum. The extrapolation is a test of hypotheses, relying on the methodological deductive Stages. Note the phenomenon under study, where the researcher will extrapolate and review studies scientific research and periodicals related to research, which will help to form a scientific background for different aspects of research.

The development of scientific hypotheses was development of scientific hypotheses for research in light of the framework and the necessary data were identified through interviews with the company's officials, and the survey list was drawn up, and testing hypotheses. The hypotheses will be tested using statistical programs to reach search results and validation test to achieve and evaluate the research objectives, and to determine the possibility dissemination of research results to the study population. Data collection is the systematic approach to gathering and measuring information from a variety of sources to get a complete and accurate picture of an area of interest. Data collection enables a person or organization to answer relevant questions, evaluate outcomes and make predictions about future probabilities and trends. Data were obtained to achieve the objectives of the study based on two sources of data collection Secondary source.

#### 5. The Research Model

Figure 1 shows the pictorial positions of the research framework. The research framework illustrates the relationship between the relationship between unlimited improvement and performance improvement.

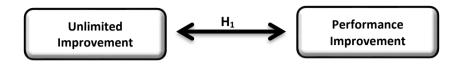


Figure 1. The proposed conceptual framework of the study concluded from the above literature review.

### 6. Research Hypotheses

To answer the research problem, the research was based on the following hypotheses

H1: There is a statistically significant relationship between unlimited improvement and performance improvement in Libyan Industrial Companies.

### 7. Data Analysis

The study community consists of the financial management accountant, the director of marketing department, the managers of the quality control offices and the general managers of all the Libyan industrial companies operating in the central and western regions according to the industrial guide for the industry and minerals sector (2017). The study sample was selected by financial accountants, quality controllers, general managers and industrial engineers, which the researcher can access in light of the difficult security situation experienced by the State of Libya. According to the personal knowledge of the researcher of some of the companies that make up the study society, the researcher used the method of direct communication by hand when possible when distributing questionnaires to industrial companies in order to avoid their loss.

# Table 1. The statistics related to performance improvement factors andexplanatory factor analysis that reveal the factor loadings.

Performance Improvement	Factor Load	Core value	Variance Exp Rate (%)	Cronbach Alfa	Average	KMO value
Q7 In the development of the company's strategic plan, performance indicators are taken into account in financial, customer service, renewal, training and product development.	.803	5.211	43.426	,881	3.99	,893
Q1 The management of the production company is careful with minimal time and resources.	.744				3.85	
Q8 The management of the company is interested in measuring the indicators related to product development through continuous training and education of employees.	.710				3.96	
Q3 The Company's management shall consider the activities required to produce the cost of the product	.702				3.95	
Q12 The company's management prepares a working paper for functional analysis of different parts of the product.	.700				3.88	
Q4 The management of the company is keen to qualify a production team capable of understanding the impact of the production process on the cost.	.689				3.86	
Q6 Company management uses specific methods to determine how best to use its resources.	.640				3.99	
Q5 The company's management is keen to reduce costs in the early stages of product development.	.639				3.78	
Q9 The management of the company has the ability to overcome the problems that can be exposed to achieve the desired goal.	.590				3.89	
Q1 0 The company's management uses many cost management techniques to improve performance, control and reduce costs	.588				3.87	
Q11 The company's management is keen on production to meet customer demand in terms of quality, quantity and time.	.541				4.14	
Q2 The success of the company's management in reducing the cost of the commodity contributes to improving its competitive position and thus maximizing profitability	.497				4.21	



The researcher also used the training department in other companies to distribute the rest of the forms. The researcher gave sufficient time to answer questionnaires. The period ranged between the distribution of the forms and their collection around 15 days. The number of collected forms reached 220, of which 211 were valid for analysis of the 360 forms, or about 58.6% of the number of distributed forms.

Within the scope of the research, 6 items were used in the questionnaire where personality characteristics were asked. In the questionnaire where performance improving were included a scale of 10 items and unlimited improvement questions were included a scale of 16 items. Descriptive factor analysis was conducted in order to determine the integrative relationship among performance improving and unlimited improvement in additional to scale factors were related to relevant factors. Factor analysis provides grouping of measures, measuring the validity of factor loads, values, and measures in the form of appropriate analytical results. The Caronbach's Alpha model was used when reliability analysis was performed. A value between 0 and 1 this coefficient is called the Alpha coefficient. Depending on The Caronbach's Alpha, 1.00> 0.80 scale is highly reliable (Küçük, 2016).

The statistics related to performance improvement factors and explanatory factor analysis that reveal the factor loadings represented by participants who are surveyed are shown in Table 1. A principal components factor analysis was conducted on the 12 items. The Kaiser–Meyer–Olkin measure verified the sampling adequacy for the analysis, KMO = .893. An initial analysis was run to obtain eigenvalues for each factor in the data. Two factors had eigenvalue over Kaiser's criterion of one but the scree plot was clear and showed inflexions that would justify retaining only one factor that explained 43.426% of the variance. Table 1 shows factor loadings after rotation. The items that cluster on this factor suggest that performance improvement scale can be represented by one factor only (Küçük, 2016).

According to this test as the value of ( $\alpha$ ) of the correct one indicated that the homogeneity and then credibility, and conversely the closer the value of ( $\alpha$ ) from zero indicated that the lack of homogeneity and this leads to the lack of credibility. Below Table shows reliability analysis for performance improvement scale, which had reliability, Cronbach's  $\alpha$  = 0.881. The Cronbach's Alpha, which showed reliability in the test, was found to be 0.881. As a result, the scales seem to be quite reliable. So,the scale is reliable and valid, cientific



research and analysis, which indicates homogeneity and increase credibility (Küçük, 2016).

The statistics related to unlimited improvement factors and explanatory factor analysis that reveal the factor loadings represented by participants who are surveyed are shown in Table 2.

	Factor	Core	Variance	Cronbach Alfa	Average	кмо
Unlimited Improvement Q24 Unlimited recovery	Load	value	Exp R (%)			value
(improvement of whole process, application, person, machine	.778		52.471	,917	3.91	
Q23 Managers can be changed to improve performance	.770	6.297			3.93	
Q19 Posts can be changed to improve performance	.760				4.08	
Q20 Tools, methods and processes can be changed to improve performance	.751				4.04	
Q18 Personal rights can be changed to improve performance	.744				3.77	
Q13. All managers are included in the optimization process	.736				3.83	,928
Q21 The functions of Organization units can be changed to improve performance	.713				3.90	
Q17 Working hours can be changed to improve performance	.708				3.84	
Q16. All suppliers are included in the optimization process	.705				3.82	
Q15 .The organizational structure as a whole is included in the improvement	.702				3.99	
Q22 Suppliers can be changed to improve performance	.681				4.02	
Q14 All managers are involved in training	.632				3.86	

#### Table 2. Factor analysis for unlimited improvement scale.

This result shows the goodness of being above 0.60. Kaiser-Meyer-Olkin measure of sampling adequacy is within acceptable limits (p <0.000). A

principal components factor analysis was conducted on the 12 items. The Kaiser–Meyer–Olkin measure verified the sampling adequacy for the analysis, KMO = 0.928. An initial analysis was run to obtain eigenvalues for each factor. One factor had eigenvalue over Kaiser's criterion, and the scree plot was clear and showed inflexions that would justify retaining only one factor that explained 52.471% of the variance. Table 3 shows factor loadings after rotation. The items that cluster on this factor suggest that unlimited improvement scale can be represented by one factor only (Kücük, 2016). In this test the value of  $(\alpha)$  of the correct one indicated that the homogeneity and then credibility, and conversely the closer the value of ( $\alpha$ ) from zero indicated that the lack of homogeneity and this leads to the lack of credibility. Table below shows reliability analysis for unlimited improvement scale. This scale had high reliability, Cronbach's  $\alpha = 0.917$ . The Cronbach's Alpha, which showed reliability in the test, was found to be 0.917. As a result, the scales seem to be guite reliable. So, that your scale is reliable and valid, scientific research and analysis which indicates homogeneity and increase credibility (Küçük, 2016: 227-232).

The correlation analysis of relationship unlimited improvement, and performance improvement has been analyzed. The major statistical measure of the relationship is the correlation coefficient, where the correlation analysis is primarily concerned with finding out whether a relationship exists and within determining its magnitude and direction (Saunders, 2011). In order to know the most contributory of this relationship between the variables, the multiple regression was conducted. (Hair, Anderson, Tatham, & Black, 1998; Saunders, 2011; U. Sekaran, & Bougie, R., 2016), they described the multiple regressions as a statistical technique to predict the variance in a single dependent variable caused by the effect of more than one independent variable. In other words, correlation indicates to the existence of the relationship between the variables. In the study, the correlation between relationship unlimited improvement, and performance improvement is analyzed by Pearson correlation analysis, as shown in Table 11.3. Pearson Correlation analysis is used to measure the level of linear relationships of two continuous variables. In other words, it investigates the meaningful relationship between two variables (Kalaycı, 2010). Pearson Correlation has been used to test the relationships between variables in the study.



		1	2
Performance	Pearson	1	. 0.670**
Improvement	Correlation		
Unlimited	Pearson	. 0.670**	1
Improvement	Correlation		

Table 3. Correlation Analysis.

There is a statistically significant positive correlation between unlimited improvement and performance improvement with  $0.670^{**}$  (Küçük, 2016). In this case, there is a statistically significant relationship between unlimited improvement and performance improvement. Therefore, H<sub>1</sub> hypothesis is accepted.

### 8. Discussion

The main purpose of this study was to relationship between unlimited improving and performance Improving of the Libyan industrial companies. In the study Pearson Correlation Analysis revealed a relationship between unlimited improving and performance Improving a statistically significant and positive relationship was found. In the study Pearson Correlation Analysis revealed relationship between unlimited improvement and performance improvement was investigated by Pearson Correlation Analysis using SPSS software. Which, represented in research by H1. The finding shows that there is a statistically significant positive correlation between unlimited improvement and performance improvement. This results spotting the light on the important of understanding the unlimited improvement and performance improvement in field of business and industry, as well as the connection and relationship between them. Research sample shows high awareness in their opinion about these issues. Finding provide to us with evidence of positive relationship between unlimited improvement and performance improvement, which confirm and agree with some international studies such as (BENSHINA, 2018; Bond, 1999). The results of the fourth hypothesis were a relationship between unlimited improvement and performance improvement.

This is consistent with the study of (Küçük, 2011), Which showed TQM and six sigmas have been considered as typical quality improvement strategies, lean thinking and the TOC as productivity improvement strategies within the organization devices. It is noted that the quality standards, such as ISO13485:2003 emphasis unlimited improvement, when compared with the general ISO9001 standards, suggesting that unlimited improvement can be



problematic in the context of regulatory processes (O. Küçük et al., 2015). The results have been shown in comparing the applications of the strategies discussed, two distinct emphases are observed. One focuses on a discrete process approach using structured programmers, while the other focuses on creating an organizational culture that directs the efforts of employees. In this regard, six sigmas and the TOC are largely process focused, while TQM and lean thinking are largely culturally focused. It is noted that this categorization is a somewhat simplified view of how these strategies are implemented in real world situations it's the ethos of the strategies can be clearly seen. When choosing to implement a strategy for unlimited improvement, leadership is critical to success. The situational leadership model has been adapted and can be used to indicate whether a cultural or process focused approach might be more appropriate in different situations (Francisco & Boake, 2003). This approach considers how "empowered" a workforce, and how the expertise is distributed within an organization in order to determine what style of leadership is most appropriate. Therefore, which unlimited improvement strategies might work better. It is suggested that organizations where the expertise is centralized, where a more directive leadership is used will find process focused strategies easier to implement. Moreover, organizations where expertise is distributed and leadership is more supportive will find cultural strategies more appropriate (O. Kücük, 2012). A review of the organization's development level and the preferred leadership style of management will help the organization to choose a strategy that requires a minimum from the current state of the organization on to the path of unlimited improvement. Research indicates that, whereas larger companies within the medical devices sector do apply unlimited improvement methods, many of the small and medium size company.

This is consistent with study of (Jose Nicolas, 2014), which said that, now is the time to place behind us the old adversarial approach to managing industrial work. It is time to develop better and more direct relationships with our owners/customers, to initiate more teamwork at the jobsite, and to produce better quality work. Such goals demand that unlimited improvement process be established within the company in order to provide quality management. Meeting owner/customer requirements (providing customer satisfaction) is a primary objective of quality management, and contractors who are the suppliers of construction services must address owner/customer requirements

if they are to succeed. The construction industry exists to provide a service to its owners/customers who are becoming more demanding and are seeking higher quality, better value, and lower costs. These owner/customer requirements mirror the economic pressures, which they face in their own businesses. Implementing total quality management / unlimited improvement in managing everyday construction activities is relevant to all those who participate contribute to the construction process. Unlimited Improvement is a process used by the companies around the world as a strategy to satisfy the highly demanding market. In unlimited Improvement exists a wide variety of tools and methodologies to improve the production processes and exist a vastly literature about it. But in the literature reviewed made so far, there is little information about unlimited Improvement strategy. (Jose Nicolas, 2014) explained in his study the Learning School (LS) for strategy, which analyzed and related with unlimited Improvement. The study finding shown that it fit in some of their characteristics, where some of the most important characteristics that unlimited Improvement and the Learning School LS have been:

- \*The need of a continuous learning process over time.
- \*Everybody in the organization must be participant.
- \*Ideas could come from anyone in the organization.
- \*Keep looking for new opportunities.
- \*Empower the people to do experiments.

With these findings, a strategy frame can be design for unlimited Improvement using the LS and have a clearer way to create it. The results of the study showed that unlimited improvement process should have performance measures associated to all the organizations' processes, and this is not usual, at least in industrial companies. (Formento et,al, 2013 ) explained that approximately one in three large companies have a continuous improvement program with very effective results. This means that they have developed high standards and are thus benchmarks for other companies, even though they still need to develop further themselves. Companies with continuous



improvement processes very effective, in 100% of cases, meet all these components. In contrast, none of the companies with poor results meets all prominent components.

#### 9. Conclusions

This study taken its importance from title itself. Where, the study title was the relationship between unlimited improving and performance improving of the Libyan industrial companies. This research aims to review the literature of unlimited improvement and the performance improvement in the Libyan industrial companies. Also, highlight the relationship between variables and performance improvement in the framework of alternative strategies based on previous literature. In addition, this research attempts to explore unlimited improving and its relation with performance improvement. The research used a structured questionnaire to survey a different sample unit from the entire investigation study. This data collection tool included a symbolic and systematic question on research issues. All survey data was studied and investigated using SPSS software, then evaluated by discussion. This research concluded some conclusions

The shows the principles of unlimited improving and within the business and industry organizations and its role in improving performance. Spotlight on the concepts and unlimited improving and its role in improving and measuring performance. Highlight the potential of the relationship of unlimited improving and organizational performance. also Give a detailed explanation about ideas related to the concept of performance and searching about ways of measuring it. Finally, the finding shows a statistically significant positive relationship between improving performance and unlimited performance in Libyan Industrial Companies.

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