

The application of the quick response manufacturing system (QRM) in Sudanese industrial companies and its impact on reducing costs and achieving competitive advantage (For the period 2017-2022) (Analytical study)

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Abstract: The study aimed to shed light on which the quick response manufacturing system (QRM) can be applied in Sudanese industrial companies and its impact on reducing costs and achieving competitive advantage by reducing lead times and deleting activities that do not add value and the consequent reduction in cost and speed in completing production processes and work orders. In general, which leads to gain customers' confidence in the price and quality of products and thus increasing the competitive advantage. The research objective identifies the methods and elements of the quick response manufacturing system which are used to influence cost reduction and achieve a competitive advantage in Sudanese industrial companies. The researcher has used the deductive approach when choosing a problem, the study and the development of scientific hypotheses. In addition to, the statistical analysis that has relied on the field study. The study population and sample consist of a group of accountants, production managers, engineers and technologists. The most important results: By testing the hypotheses of the study, it was found that the value of the (t) test is (23.847) with a degree of freedom of 102 and a significant level (0.000), which indicates a statistically significant relationship between the Sudanese companies' application of the quick response manufacturing system and cost reduction and an increase in competitive advantage by 95%. This means that the Sudanese industrial companies that applied this system during the study period achieved a cost reduction and that the speed of their response by increasing their market share of products leads to attracting new customers, thus achieving a competitive advantage in the local and global markets. The study has recommended that Sudanese industrial companies adopt the quick response manufacturing system as a comprehensive applied strategy that includes an intellectual tendency that seeks to severely and continuously reduce production deadlines and develop scientific competence and skills by urging with industrial company managers' and production managers to participate in conferences and seminars held by professional people related to the quick response manufacturing system.

Keywords: manufacturing / quick response / cost reduction / lead times / competitive advantage / Sudanese industrial companies.

تطبيق نظام التصنيع بالاستجابة السريعة (QRM) في الشركات الصناعية السودانية واثره على خفض التكلفة وتحقيق الميزة التنافسية للفترة من 2017-2021 (دراسة تحليلية)

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المستخلص: هدفت الدراسة الى القاء الضوء على امكانية تطبيق نظام التصنيع بالاستجابة السريعة في الشركات في الصناعة السودانية وتأثيره على خفض التكلفة وتحقيق الميزة التنافسية من خلال تقليص في المهل الزمنية وحذف الأنشطة التي لا تضيف قيمة وما يترتب على ذلك من تخفيض التكلفة والسرعة في انجاز العمليات الإنتاجية وأوامر العمل بشكل عام مما يؤدي إلى كسب ثقة العملاء في سعر وجودة المنتجات وبالتالي زيادة الميزة التنافسية. هدف البحث إلى التعرف على الاساليب والعناصر لنظام التصنيع بالاستجابة السريعة التي تُستخدم للتأثير على خفض التكلفة وتحقيق ميزة تنافسية في الشركات الصناعية السودانية. استخدم الباحث المنهج الاستنباطي عند اختيار مشكلة الدراسة ووضع الفرضيات العلمية بالإضافة إلى التحليل الإحصائي الذي تم الاعتماد عليه في الدراسة الميدانية. تمثل مجتمع وعينة الدراسة مجموعة من المحاسبين ومدراء إنتاج ومهندسين وتقنيين. ومن أهم النتائج ومن أهم النتائج انه باختبار فرضيات الدراسة تبين ان قيمة اختبار (t) هي 23.847 بدرجة حرية 102 و مستوى معنوية 0.000 مما دل على وجود علاقة ذات دلالة احصائية بين تطبيق الشركات السودانية لنظام التصنيع بالاستجابة السريعة وبين خفض التكلفة وزيادة الميزة التنافسية بنسبة 95%. يعنى ذلك أن الشركات الصناعية السودانية التي طبقت هذا النظام خلال فترة الدراسة حققت خفض في التكلفة وأن سرعة استجابتها بزيادة حصتها السوقية من المنتجات يؤدي إلى جذب عملاء جدد مما يحقق لها ميزة تنافسية في الأسواق المحلية والعالمية. اوصت الدراسة الى أن تتبنى الشركات الصناعية السودانية نظام التصنيع بالاستجابة السريعة باعتباره إستراتيجية تطبيقية شاملة تتضمن نزعة فكرية تسعى إلى خفض الشدائد والمستمر للمهل الزمنية في الإنتاج وان تطور الكفاءة العلمية والمهارات من خلال حث مدراء الشركات الصناعية ومدراء الإنتاج على المشاركة في المؤتمرات والندوات التي تعقدها الجهات المهنية ذات العلاقة بنظام التصنيع بالاستجابة السريعة.

الكلمات المفتاحية: التصنيع - الاستجابة السريعة - خفض التكلفة - المهل الزمنية - الميزة التنافسية - الشركات الصناعية السودانية.

Introduction

It contains:

First: the methodological framework of the research

Preamble.

Sudanese industrial companies play a pivotal role in the development of the local economy and the great development in the business environment and the increasing competitive pressures in global markets have imposed on them to bring the fundamental changes in their strategic objectives and production operations so that they can keep pace with the quick change in global markets and achieve competitive advantages as intense competition. The multiplicity of products and services by companies in the global industrial environment has forced them to reconsider their production philosophy and try to adopt parallel production systems that enable them to own the factors of success by generating values in their products in response to the desire of their customers by reducing costs and increasing the level of quality, taking into account continuous improvement and focus on innovation to enhance their competitive position, so in order to remain in a competitive market, these companies have to adopt lean manufacturing systems, and one of these systems is Quick Response manufacturing), which is a system that consists of a series of principles and tools that focus on reducing waste in the time needed for the manufacturing process. And for all other company operations, it has been designed. This approach was introduced by (Rajan Suri in 1988), so that the goal was to respond quickly to customer needs by strictly reducing waiting time in all stages of manufacturing, other processes ,delivery and adopting production policies in small sizes, high mixes and tailored to order, which leads to the arrival of products to customers in a shorter time. It also improves the quality of operations within companies in addition to lowering the cost required for its operations as a whole. (Enge, 2018, pp38-40 & Siong).

study problem:

The major challenges as a result of technological progress, developments and increased competition among international companies have led Sudanese industrial companies to face many problems that limit their competitiveness, such as low share in local and global markets, low level of profitability, prolongation of production and delivery period to customers, which leads to increase production costs and the subsequent decline. The level of product quality and the failure to meet the needs of customers, so these companies must implement one of the modern manufacturing systems that can enhance their competitive position. The QRM system is one of the most important of these systems through which they can achieve their goals of growth and progress. However, Sudanese industrial companies still need a long time to adopt this system, which is a philosophy that focuses on reducing lead times as one of the differentiating factors in obtaining a competitive advantage and deleting activities that do not add value and the consequent reduction in cost and speed in completing production processes and

work orders in general which leads to gain customers confidence in the price And the quality of the products and from here the problem of the study arose as the researcher seeks to study and analyze the possibility of applying the quick response manufacturing system and its impact on reducing costs and achieving a competitive advantage.in Sudanese industrial .

The following sub-questions are derived from the main question

- 1- What is the possibility of applying the QRM system in Sudanese industrial companies
- 2- What is the impact of the application of the QRM system on reducing costs in Sudanese industrial companies?
- 3- What is the impact of the application of the QRM system on achieving competitive advantage in Sudanese industrial companies?

study Importance

- 1- Scientific importance: The study derives its scientific importance from the importance of the subject of the study, as:
 - A. Global interest in reducing production costs by adopting modern industrial systems and methods whose benefits are reflected on industrial companies
 - B. The need for Sudanese industrial companies to understand the theoretical concepts and practical practices of the quick response manufacturing system and its role in reducing costs and achieving a competitive advantage.
 - C. The research is a modest attempt to raise the level of performance of Sudanese industrial companies that strive to apply the concepts of quality, continuous improvement, and lower cost by introducing them to the response manufacturing system, which includes these concepts.
- 2- Practical significant:
 - A. The quick response manufacturing system is considered one of the relatively recent topics in the industrial and academic field in Sudan, and subjecting it to the analytical study gives its importance within the scientific framework of contemporary accounting methods.
 - B. Explanation of the role that the application of the quick response manufacturing system can play among the advantages, the most important of which is reducing costs, reducing waiting times, and high quality of products that help achieving a competitive advantage for Sudanese industrial companies, which will help them entering the global competition market. The research attempts to review all aspects of the system and the impact of its application in Sudanese industrial companies.

The objectives of the study:

- 1- Identifying the level of interest of Sudanese industrial companies in achieving a competitive advantage through their adoption of the quick response manufacturing system.

- 2- Contributing through this research to improve the performance of Sudanese industrial companies and motivating them to adopt and apply the methods of the quick response manufacturing system.
- 3- Shedding a light on the methods and elements of the quick response manufacturing system that are used to influence cost reduction and achieve a competitive advantage in Sudanese industrial companies.
- 4- Shed a light on previous studies that dealt with the subject of the quick response manufacturing system and its results.

The hypotheses of the study:

Based on the research problem and its objectives, the following main hypothesis is tested:

The application of the quick response manufacturing system affects the cost reduction and the achievement of a competitive advantage in Sudanese industrial companies including the following division:

- 1- The first sub-hypothesis: There is a correlation between the application of the quick response manufacturing system, cost reduction and increasing competitiveness in Sudanese industrial companies.
- 2- Second sub-hypothesis: There is a significant effect of the application of the quick response manufacturing system on cost reduction in Sudanese industrial companies
- 3- The third sub-hypothesis: There is a significant effect of the application of the quick response manufacturing system on achieving competitive advantage in Sudanese industrial companies.

study Methodology:

To achieve the research objectives, the following approaches will be used:

- The inductive approach: by extrapolating, collecting and analyzing the results of accounting studies in the field of research and testing research hypotheses
- The deductive approach: which depends on logical thinking in defining the problem and deriving logical hypotheses

Literature review: To review previous studies

Statistical and descriptive analytical method: to study the case and analyze hypotheses

study Structure.

Methodological framework for research and previous studies

Theoretical framework

Applied study

Findings and Recommendations

Bibliographies

Second: previous studies

We discuss the previous studies, which are as follows:-

1- Study (Agha et al. 2012)

Entitled (The Impact of Core Competence on Competitive Advantage and Organizational Performance)

The study dealt with basic competence as a concept that represents the set of knowledge that distinguishes a company and provides it with a strategy that achieves a competitive advantage over others in highly competitive markets. The aim of the study is to investigate the relationship between core competency, competitive advantage and organizational performance. Core competency was measured through three dimensions: shared vision, cooperation and empowerment. Methodology of the study The proposed model was selected in the Paints Company in the United Arab Emirates. The results confirm that although core competency has a strong and positive impact on competitive advantage and organizational performance, the study also confirmed the existence of an impact of competitive advantage on organizational performance. This confirms the varying importance of the dimensions of core competency on competitive advantage and organizational performance.

The researcher believes that this study focused on the basic efficiency through its dimensions and its impact on competitive advantage. While the current study dealt with the impact of the application of the quick response manufacturing system and what it can achieve from a competitive advantage in Sudanese industrial companies.

2- Study (Al-Saati, Hadi, Karam 2016 AD)

Entitled: (Quick Response Manufacturing (QRM) and its impact on operational scheduling, an applied research at the General Company for Vegetable Oil Industry (Al-Farabi Factory in Iraq)

The study dealt with one of the methods that may contribute to improving the productivity of the General Company for Oil Industry / Al-Farabi Factory in Iraq. The problem was that, not taking the deadlines in production and not following the scheduling in its operations. And the delay in the delivery of products led management attention to the use of quick response manufacturing, which aims to control energy, inventory and time wastage and increase the efficiency of operations. The methodology of the study has relied on a questionnaire in collecting the research sample data. One of the most important results is that the factory suffers from not following scientific methods in scheduling operational processes, and that the use of the quick response manufacturing system plays an important and influential role, especially that there is a positive correlation between the QRM system and the scheduling of operational processes, and the time limits were reduced by 50% and the utilization rate was achieved. The production capacity is 71%.

The researcher states that this study deals with the impact of quick response manufacturing on operational process scheduling and therefore agreed with the current study in the existence of a relationship between the quick response manufacturing system and operational process scheduling, but

what distinguishes the current study is its treatment of the impact of the application of this system on cost reduction in order to achieve a competitive advantage in industrial companies

3- Study (Taher et al., 2017)

Entitled (Manufacturing with quick response and its role in reducing costs - a case study in the International Graphics Company for Home and Office Furniture - Iraq)

The study has dealt with the role of the quick response manufacturing system in reducing costs for the global international fees company for home and office furniture - Iraq)

The problem of the study was: What is the contribution made by manufacturing by quick response in the field of reducing lead times and deleting all redundant activities that do not add value and focusing on those that add value and the consequent reduction in costs. The activities that do not add value, starting from the customer's entry into the company until the delivery of the product. The study methodology was based on a case study of the International Graphics International Company for Home and Office Furniture - Iraq.

As a result, the quick response manufacturing system contributes to eliminating or minimizing excess costs by eliminating activities that do not add value to the products. The study recommended the need to pay attention to the internal arrangement of the factory to ensure the efficient flow of materials and parts during the course of operations, because the factory's survival in this state leads to an increase in the accumulation of storage in front of the machines, especially the critical ones, in addition to the need to work with the form proposed by the research and related to the design process of the office distinction because of its A major role in reducing the lead times of the design process.

The researcher sees that this study deals with the role of quick response manufacturing in reducing costs, and has not addressed competitiveness, as the current study deals with. We find that this study is deeper and more comprehensive than the previous study.

4- Study (Talib Muhammad 2019)

Entitled (Reducing production costs as an input to achieve competitive advantage in institutions (a field study for ACRODIV Foundation, Al-Masila Unit (Algeria))

The problem of the study has dealt with the extent to which the reduction of production costs represented in the costs of quality and maintenance in achieving the competitive advantage of industrial enterprises. With regard to the study literature and the descriptive analytical approach with regard to the applied aspect. The study reached results that proved the validity of its hypotheses, including the existence of a medium-significant correlation to reduce quality costs, maintenance costs and competitive advantage in industrial enterprises, the study recommended that Algerian industrial enterprises should try to adopt the concept of a productive maintenance system The comprehensive system, which is a modern system that has proven its success and positive impact on reducing costs.

The researcher states that this study focused on the role and contribution of reducing quality and maintenance costs in achieving a competitive advantage, while the focus in the current study was to verify

the impact of the application of the quick response manufacturing system and its role in reducing all costs of industrial companies, leading to an increase in their competitiveness.

5- Study (Gromova, 2020 entitled

(Quick response manufacturing a promising alternative manufacturing paradigm) Quick response manufacturing is a promising alternative manufacturing model

The problem of the study was that, the Fourth Industrial Revolution and the quick changes, it brought about in technology, price instability and increased competition led Russian companies to produce a wide range of products in small batches in short periods of time, which caused problems with regard to stocks, public expenditures and efficiency in these companies. Several attempts to adopt waste-free product manufacturing systems due to new challenges in the external environment. The aim of the study is to analyze the quick response manufacturing system and link it to the current situation of Russian industrial development. The most important results are that the Fourth Industrial Revolution brought about a major change in the strategies of the Russian industrial companies, which necessitated the transformation of their operating models into new effective models that bring about promising economic development. Quick response can be useful if it is applied by Russian industrial companies due to the advantages related to quick response to customers and product development in less time with quality assurance and low cost. It can be useful if it is applied by Russian industrial companies due to the many advantages related to quick response to customers and product development in less time with quality assurance and low cost.

6- Study (Wanzhu Wang et al, 2021)

Entitled (Application of Nested Ring Cards for Combined Coupled Cells in a Quick Response Manufacturing Framework for Optimal Production Performance)

(Implementation of POLCA Integrated QRM Framework for Optimized Production Performance—A Case Stud). The study dealt with the quick response manufacturing system (QRM) as a relatively new concept that includes all previous methods (on-time production, flexible manufacturing, lean manufacturing, efficient manufacturing), which represents a hybrid push and pull strategy used between cells and a system to control the needs of resources and parts, where the integration of cells with each other is organized in a dynamic manner that preserves the production capacity smoothly, which leads to reducing lead times in producing products in small sizes with high quality and increasing the efficiency of operations. She also explained that this approach (QRM) is a company-wide strategy that seeks to increase productivity by reducing production lead times in all operations, which covers all aspects of manufacturing, design, planning in accordance with the material planning system (MRP) and thus works to transform the company into a system integrated cellular

The study concluded that, the integration of QRM & POLCA systems leads to an improvement in production scheduling and a reduction in lead times, which leads to an increase in profitability.

7- Study (Al-Husseini, Imad, 2021)

Entitled (The Role of Quick Response Manufacturing in Competitive Priorities through Comprehensive Productive Maintenance)

The study dealt with some intellectual and field problems, whose answer aims to clarify the theoretical philosophy, intellectual connotations and applied fields of the variables (manufacturing with quick response, comprehensive productive maintenance, competitive priorities) and sought the importance of the study to provide treatments and proposals for the management of the organization in question, putting them into practice and benefiting from them in order to improve the reality of its performance. The study aimed to show the impact of each of the manufacturing with quick response and its dimensions through the entrance of comprehensive productive maintenance with its dimensions in enhancing competitive priorities and the possibility of its application in the Iraqi environment, specifically in the ready-made garments sector of the State Company for the manufacture of men's clothing in Najaf. The study relied on the analytical test approach to measure the variables of the study. The study concluded that there is a direct significant correlation between the three study variables, with a direct significant correlation between the dimensions of the study variables (manufacturing with quick response, comprehensive productive maintenance, competitive priorities) and also reached the The presence of a clear impact of quick response manufacturing in its dimensions in enhancing competitive priorities directly and indirectly through comprehensive productive maintenance. The study recommended companies to give the philosophy of quick response manufacturing more importance than before as it is the main key to enhancing current and future competitive priorities due to the increasing competitive pressures.

What distinguishes the current study from previous studies is that it complemented the previous ones from previous studies to find out the role that the application of the quick response manufacturing system can play in reducing costs and increasing the competitiveness of industrial companies. It is an analytical study different from the environments in which previous studies were applied. A questionnaire was designed and distributed to A number of managers, production and legalization engineers and accountants in a number of industrial companies in Sudan.

Theoretical framework

First / Quick Response Manufacturing System

The idea of the Quick Response Manufacturing (QRM) system emerged from what the American Association of Garment Manufacturers provided during the eighties with the aim of increasing its profits. Where the idea included the performance of production processes in the way that they result in response to the quick desire of customer operations. The roots of this system were discovered in the time-based competition strategy in the 1980s in Japanese companies and it was used in (TCB) and its principles were

speed in order to obtain a competitive advantage. But the time-based competition strategy can be applied to all business organizations, and the quick response manufacturing system can be applied in industrial companies.

This system represented (QRM) is a technology developed in the United States at the University of Wisconsin Madison, from which principles had been developed that were applicable in production, and in 1992 a center specialized in quick response manufacturing was established by Professor RAJAN. It aims to meet the needs of customers by strictly reducing waiting times in all stages of production and other processes such as design and delivery, which leads to the arrival of products to customers in a shorter time and will improve the quality of operations within companies in addition to reducing costs necessary for production operations. (Suri, Rajan, 1998, pp3-5) This system combines the various parties of the production process (company - individuals - technology) and connects them with customers. This integration is a competitive advantage that provides the company with the ability to respond quickly to changes that occur in the modern manufacturing environment. Frequent changes in product design require faster response times for customers to maintain The ability of competitive companies, as they must have strategies to design new processes for their products, as the global market has become more intense in terms of competition and product quality It has become expected and therefore the main way to enhance competitiveness is to deliver products to customers faster and more diversified. Therefore, many companies that seek to achieve profits and customer satisfaction seek to adopt a production system based on production and quality together and strike a balance between them. Therefore, quick response manufacturing has become one of the The most important contemporary manufacturing systems (Benjamin 2005, p12)

This system is often applied or implemented by two types of companies: (Marian, 2018, p222).

1. Companies that manufacture highly engineered products and adopt small batch production policies.
2. Companies with production processes for different products with a significantly changing demand for each of these products, provided that the management of companies must understand the manufacturing systems in them, especially those that affect production and delivery times, while the QRM system covers all areas of (purchasing Shipping, financing, human resources).

Quick Response Manufacturing System Concept (Nelfiyanti& Zuki,2020,p1)

Quick response manufacturing is difficult to define because of its holistic nature, and it requires the organization to move from the traditional perspective of batch manufacturing to flow manufacturing in which production is according to customer demand (pull system). It also includes several concepts such as total quality management, timing to market, cost based Cellular activity and manufacturing, but the main strategy is to increase the overall flexibility and the organization's ability to respond (Mohamed Taher et al., 2017, p. 3). There are multiple views of researchers in the field of the concept of quick

response manufacturing that can be summarized as the best ways that can be used to reduce waste (waste).) and improving performance in manufacturing industries (Nelfiyanti & Zuki, 2020, p1).

Quick Response Manufacturing (QRM) has been defined as a comprehensive implementation strategy that includes an intellectual tendency that seeks to drastically and continuously reduce lead times in the detailed activities of management in manufacturing methods and analysis techniques and a sequential step-by-step methodology to reach the desired reduction in lead times. (Al-Atrushi, Al-Abadi, 2006, p. 55).

Rajan suri sees that QRM is a system built on the principles of specific production system (JIT) and lean manufacturing and continuous improvement in reducing waste and striving to reduce waiting times throughout the production process to improve quality, reduce cost and eliminate activities that do not add value. (Rajan, suri) ,2003,p11).

The researcher defines it as the best entrance to the application of the philosophy of broad bequest through the value chain, as responding to the desires of customers and quickly begins with a reaction to a series of procedures that begin by reducing the time of product development and then the time of its production. The quick. (Emboava,&others,2017,p415).

The external field: It looks at what the customer or customers perceive with the company, as the system fulfills the quick needs of customers through the quick design and manufacture of products according to the required specifications and their delivery as quickly as possible. Internal field: The system is seen by focusing on reducing lead times for all production and other processes in the company, improving quality, reducing cost and inventory, to achieve quick response and achieve a competitive advantage(Cheng,Kuan,2018,p38).

The thought of the manufacturing system in response is based on an institutional thought that includes mechanisms and techniques that contribute to making activities in companies easy and streamlined, and they are represented in:- (Al-Saati, Karam, 2016, p. 228)

1. Quality at the source.
2. Production by a unit-to-unit system instead of the quantitative production system.
3. Optimizing the work site.
4. Improving the work climate (labor and employee relations) and applying the multi-skill team work system.
5. Comprehensive productive maintenance
6. Using advanced technologies to ensure the accuracy of the handling of materials, components and the complete product
7. Production planning with a cell system, which consists of groups of similar and dissimilar equipment to produce a specific part or group of parts.

The main objectives of the quick response manufacturing system are as follows: (Al-Saati, Karam, 2016, p. 229)

- A. Reaching the loss ratio to zero in all production functions such as malfunctions, number of defective product, delay time and inventory in all stages of supply, equipment accidents, personnel effort.
- B. Reducing supply time and speed of response to customer requests, increasing productivity, improving quality and maximizing profitability
- C. Maximizing the existing competitive ability of the enterprise and striving to build new competitive capabilities.

The importance of quick response manufacturing

The quick response manufacturing system derives its importance from being based on the basic principles based on:

1. the power of time:

Industrial companies with traditional production systems focus on cost management measures and strategies, which results in highly specialized labor and hierarchical management structures. The quick response manufacturing system illustrates the negative effects of these systems on lead times and financial costs. secrets generated by it. (Center of quick response manufacturing, 2018), meaning that the quick response manufacturing system is a comprehensive strategy that reaches beyond production processes to include office work, supply chain or supply. Therefore, this system suggests that focusing on the organization level will lead to reducing lead times, which leads to improvements in cost, product quality, customer response, and then the management level.

2. Organizational Structure (Manney Dave2020,pp1-3).

Companies in the environment of traditional systems are not designed by design for time management. The organizational structure and accounting systems in it depend on the management of production volume and cost, and its characteristics are the accumulated response time and the presence of specialized departments, which in turn represent great barriers to the application of the quick response manufacturing system, which is concerned with reducing the accumulated time for response and completely rethinking the organization Production process facilities - Raw materials processing - Organizing office work in all its forms by adopting the cellular system with high mix - low value - on-demand environments on products that are designed and directed directly to a segment of the market.

3. Dynamic System.

The QRM system also uses two dynamic principles represented in the formation of work teams within the company's departments and the removal of barriers between functions to form office cells with a quick response that achieves a significant reduction in the lead times for all work in the form of closed chain multifunctional loops (cost estimation, pricing, processing production orders) and includes Work teams responsible for a group of products with engineering specifications.

4. Regulatory Implementation or Enterprise-wide application

The QRM system gives great importance to the on-time delivery in all departments of the company, which is the main measure of performance in it. The organizational changes aim to reduce lead times, supported by performance measures based on indicators that measure production activities before and after application. The percentage of reduction as a result of the application of this system. In the sense that the quick response manufacturing system (QRM) applies the management system on the basis of time in all parts of the company, including office work, production control - planning - resources - new products and presented to consumers. In addition, the researcher believes that the cell-based manufacturing system, training managers to use time-based strategies, linking business strategies to functional strategies, focusing on implementation and sustaining changes that reduce the lead time also represent my principles and foundations for the quick response manufacturing system (QRM).

Second: Cost Reduction

Industrial companies suffer from intense competition and the accompanying technological developments, production systems, short product life cycles, and increased interest in meeting customers' desires with regard to quality and price. Cost management and planning. As most of them cannot impose appropriate selling prices in light of intense competition and the presence of the multiple opportunities for customers must pay more attention to cost reduction in order to achieve a competitive advantage that enables them to increase their profitability. (Mohammed Taher et al. 2017, p. 23) Reducing the cost represents the process that is based on certain strategies with the aim of achieving the total cost figure in a monetary scale and the purpose is to reduce cost Relative i.e. with regard to production within a specific level and specific in quantity and quality. The researcher believes that the measure of the success of any project in the process of reducing costs is the amount of decrease in the cost of a unit of product by raising production efficiency, which means an increase in the number of production units. There are several systems to reduce costs, including a cost system Quality which controls costs while maintaining product quality.

The impact of quick response manufacturing (QRM) on supply chains and cost reduction

Companies face challenges in order to supply their requirements and the needs of customers in a timely manner. Therefore, it is necessary to find stable supply chains for the flow of production materials, which is of value in order to improve the performance and quality of products. Supply chains represent a connected network of individuals, businesses, resources, activities, and technologies involved in the manufacture and sale of a product or service. It begins with the delivery of raw materials from the supplier to the manufacturer and ends with the delivery of the final product or service to the final consumer. That is, they are the steps taken by organizations to deliver the product or service from its original state to the final customer. Companies periodically develop supply chains according to time, cost and quality standards. Since competition has become more complex, there must be appropriate supply chains in the

presence of a response manufacturing system. Al-Sariya, which seeks to improve quality and reduce costs by reducing lead times in all supply chain activities, which leads to a decrease in the performance of production processes, fewer errors, fewer customer complaints due to late delivery, and achieves customer satisfaction, which is one of the driving forces behind the use of this system, which is the quick response to its requirements. which can achieve a competitive advantage for the company by offering its products at prices that suit them. All of this leads to a reduction in production costs in the company as a whole. QRM eliminates all activities that do not add value and focus on those that add value, which helps companies eliminate excess costs while improving product quality and respond quickly to customers or clients. It also helps managers shift to ground-based thinking. Cost to time-based thinking makes reducing lead times the standard of organizational success. Companies will be able when they use QRM (Murry Marrian 2018, p223)

- a. Achieving a reduction in the operating times of production processes up to 95%, a reduction in the cost of its products by 30%, an improvement in the on-time delivery performance by more than 60%, a reduction in waste and losses, and a return of operations by 85%.
- b. Achieving annual savings: the efficiency in manufacturing processes leads to meeting the needs of customers with flexibility and faster delivery on time.
- c. Optimizing the company's supply chain so that it can get what customers want and when they want it.
- d. Reducing costs and waste and increasing the level of service to customers.

Third, Competitive Advantage

The concept of competitive advantage (capacity) captured the attention of management in business organizations in the middle of this century, where (Porter) introduced the concept of competitive strategies for business organizations, and competitiveness represents the critical strategic element that presents a fundamental opportunity for the organization to achieve continuous profitability compared to its competitors. And researchers in giving the concept of competitive advantage, some of them focused on the component of value and some of them focused on time with an emphasis on the need for competitiveness to create value for the organization to be felt by customers. And theories have developed that help explain the concept of competitiveness, including the theory of market-based supply (MBV). And the Resource-Based Supply Theory (RBV). Where the market theory clarifies that the main determinants of companies' performance are the attention to industry and external market factors, as it defines the strategic position of the company through how it performs similar activities to other companies, but in different ways. Either resource theory clarifies that the internal environment of companies and their use of resources efficiently are considered a driver of competitiveness as it is more important and is considered one of the internal factors towards developing what has been obtained A lot of strategic resources (Wang Hui,2014,p34)

The researcher states, the resources are not enough to achieve an advantage or competitive ability over other companies, as companies need optimal use through the use of modern technology and techniques. Achieving superiority over competitors in the market, and this comes through developing distinctive capabilities that lead to achieving a competitive advantage in organizations, where production processes are required to focus on what must be done in the best way. Companies that have resources and capabilities that exceed those of competition and have approved strategies in the use of these resources With high efficiency, it can create what is called competitiveness. Competitiveness is meaningful if it is linked to features that the market evaluates according to the needs of customers and their awareness of the existence of constant differences in the important qualities between the company's products and services and those of its competitors, which are represented in the variables that affect customers (Sabah Agha & other, 2016, p2).

- A. Market purchase criteria/product features/delivery.
- B. Perceptions of the product or service, its benefits, and its availability.
- C. Product or service quality, price and after-sales services.

Competitive advantage, is defined as the skill, technique, or distinguished resource that allows the organization to produce values and benefits for customers that exceed what it provides to them.(Malkawi, Gharbia, 2015, p. 73)

The researcher states, it is the ability to distinguish the organization over competitors in quality-price-time of delivery of products or provision of services before or after sales, innovation and the ability to quickly and effectively change. Competitive advantage or ability is defined as the value provided by a business that motivates its customers or end consumers to buy its products or services instead of its competitors. It is the ability to design, produce or market products and services that are superior to those products by competitors, taking into account price and qualities (Navikaite, 2015, p143 & (Varanavicius, Navikaite), indicates that the advantage or competitive ability occurs when the organization obtains development medals that allow it to outperform its counterparts in the market, in addition to the organization's adoption of business strategies, which is a prerequisite for obtaining Market differentiation The basic elements of business strategies in the presented market are the value chain that meets the needs of heterogeneous customers that add increased value to the products and the value chain can include a sub-group represented in the following (Nafikaite, Varanavicius 2015.p151,)

- A. Marketing and sales: which represent the activities associated with the purchase of products by customers, including the selection of advertising channels - promotion - pricing - wholesale management
- B. Service: It includes all activities that maintain the value of the product - customer support - repair services - training – promotion
- C. Human Resource Management: Activities related to recruitment, development, retention and compensation of employees and managers

- D. The company's infrastructure: includes the Planning Department, the General Department of Legal Affairs, Accounting and Finance, and the Quality Department.

The researcher states The market analysis identifies the needs that can achieve exploitation to reach a competitive advantage for each part of the market and translate this advantage into desirable capabilities for each job allocation in the company and then proceed to implement it.

This potential is represented in four dimensions: (Nur Aldeen,Jameel,2011 pp. 1-39)

- a. Cost: Low prices can increase the demand for products and services, but on the other hand, they reduce the profit margin if the product or service is not produced at a low cost and for the purpose of being competitive. Operations managers are required to work on reducing the cost of raw materials, wages and expenses through Design a system to reduce the cost per unit of a product or service.
- b. Quality means the overall features and characteristics of the offered good or service that match its ability to meet the desired or implicit needs. Quality includes: - quality of design, quality of production and quality of performance
- c. Delivery includes three aspects: - The speed of delivery, which is measured by the amount of time between the date of receiving the customer's request and the date of its response. This time is usually called the agreed waiting period, expressing this as the percentage of orders delivered to customers at the specified times.
- d. Speed in development, measured by the amount of time required to develop, design and produce a new product
- e. Flexibility The ability of the company to respond to continuous changes in the environment, population, production processes and production quantity

The role of the quick response manufacturing system in enhancing competitive advantage:

Industrial companies are always faced with the need to achieve customer satisfaction by providing products that meet his needs, expectations and desires in line with the changes in global markets, which are witnessing acceleration in growth and progress, and providing a product with specifications that helps to have more than a competitive advantage that gives him a greater market share. The manufacturing system works with quick response. QRM) to keep the company on the importance of being prepared and leading its innovations and making it acquire and retain customers. The application of this system can lead to achieving a competitive advantage through: - (Al-Mamouri, Al-Khalidi, 2017, pp. 121-124)

- A. Adopting the continuous improvement approach that leads to maintaining the competitive advantage through the design of a customized product by customers. Therefore, companies must seek to increase attention to quality because it is the basis of customer confidence. Producing a

product according to specifications leads to a greater reduction in inspection and testing work and defective cost, thus reducing The costs of internal and external failure

- B. Saving costs by reducing waste (cancelling activities that do not add value) and thus reducing production times, which allows meeting customers' desires and achieves their satisfaction.
- C. Reducing production and delivery times to achieve better quality and new features in the product
- D. The ability of companies to plan, design, manufacture and market their products at a lower cost than their competitors helps to sell these products at a lower price.
- E. Reducing the delivery time of the order to customers
- F. Flexibility in production processes and adherence to schedules
- G. To adopt technological techniques, high competencies, effective expansion methods, and price policies that would enable it to increase its market share.

Field Study:

In the field study, the researcher deals with a description method and procedures that he has followed in carrying out the study, including a description of the study population and its sample, the method of preparing its tool, the procedures are taken to ensure its validity and reliability, the method used to implement it, and the statistical treatments under which the data were analyzed and results were extracted. The descriptive analytical method was used to measure the study variables and they were tested using statistical methods, including regression analysis, mean and standard deviation.

Study Population And Sample

The study population means the total set of elements that the researcher seeks to generalize the results related to the problem of study. The study population consists of, accountants, executive directors, heads of departments and technicians in Sudanese industrial companies: where the researcher distributed (130) questionnaires to the targeted and (103) responded completely, as they returned the questionnaires after filling them with all the required information, i.e. a percentage of approximately (85%) of the target audience. In order to get as accurate results as possible, the researcher was keen on the diversity of the study sample in terms of including the following:

- Individuals of various educational qualifications (Bachelor, Higher Diploma, Master, Ph.D., others).
- Individuals of different age groups (less than 30 years old, 30-40 years old, 40-50 years old, 50 years old and over).
- Individuals from different disciplines (accounting, management, economics, finance, others).
- Individuals of different years of experience (less than 5-10 years, 11-15 years, 16-20 years, 21 years and over)

- Individuals from different job positions (general manager, financial manager, technical technician, chief accountant, etc.)

The following is a detailed description of the study sample members according to the above variables (respondents' characteristics).

SectionFirst: Table (1): Frequencies and percentages of demographic characteristics of the participants (n = 103).

Item (S)	N	%	Total
Gender:			
Male	80	77.7%	103
Female	23	22.3%	(100%)
Experiences			
1 - less than 5 years	28	27.2%	103
From 6 – less than 10 years	19	18.4%	
From 10 – less than 15 years	18	17.5%	(100%)
From 15 – less than 20 years	20	19.4%	
From 20 years to above	18	17.5%	
Education level:			
Bachelor	54	52.4%	103
Post graduate diploma	8	7.8%	
Doctorate	37	35.9%	(100%)
Other	4	3.9%	
Job:			
General Manager	10	9.7	103
Technician	5	5%	
Accountant	16	15.5%	(100%)
Chief of Accounts	10	9.7	
Financial Manager	3	2.9%	
Other	59	57.2%	
Specialty:			
Accountancy	52	50.5%	103
Management	17	16.5%	
Economy	2	1.9%	(100%)
Finance	10	9.7%	
Other.	22	21.4%	

*Source: Prepared by the researcher from the 2021 field study

Table No. (1): shows that the majority of respondents (80%) are males, with a bachelor's degree (52.4%), a doctorate degree (35.9%), and (45.6%) with less than 10 years of experience. Accounting (50.5%) of the subscribers, and (61.2%) of them worked in other departments.

The second section: the arithmetic mean and standard deviation of the first hypothesis questions:

Ranking	General Direction	Standard Deviation	Median	The statement
6	Agree	0.96	1.83	1- Changing the traditional intellectual tendency of managers and workers in Sudanese industrial companies leads to the successful implementation of the quick response manufacturing system.
1	Strongly Agree	0.403	1.19	2- Building an integrated relationship with suppliers for industrial companies inside and outside Sudan, which helps in achieving a quick response to customer needs of or products.
5	Agree	0.834	1.81	3- Exploitation of the physical and human energy of Sudanese industrial companies is consistent with the principles of the quick response manufacturing system.
3	Strongly Agree	0.795	1.77	4- Industrial companies that apply the quick response manufacturing system achieve a reduction in cost and price, which will enable them to have a competitive ability in the markets.
2	Strongly Agree	0.758	1.60	5- The application of the quick response manufacturing system in light of the modern manufacturing environment has become a necessity to reduce production costs in Sudanese industrial companies.
8	Agree	0.966	2	6- The application of quick response industrialization requires technological investments, which negatively affects the decision to implement it in some Sudanese industrial companies.
4	Agree	1.047	1.80	7- Motivating workers to continue designing, planning and producing products in small sizes that leads to achieve the goals of the manufacturing system in quick response.
7	Agree	0.7979	1.85	8- The application of the quick response manufacturing system leads to an increase in the profitability of Sudanese industrial companies by reducing costs, improving quality and achieving competitive advantage.
Strongly Agree			1.83	The axis as a whole.

*Source: Prepared by the researcher from the field study 2022.

It is evident from Table No. (2) that:

1. The average value of the answers of the study sample members to the first question was (1.83) and the standard deviation was (.96), and this value means that the majority of the sample members agreed that changing the intellectual tendency of managers in Sudanese companies leads to the success of the application of the quick response manufacturing system.

2. The average value of the answers of the study sample members to the second question was (1.19) and the standard deviation was (0.403), and this value means that the majority of the sample members strongly agreed that building an integrated relationship with suppliers for industrial companies inside and outside Sudan helps in achieving a quick response to customers' needs for products.
3. The average value of the answers of the study sample members to the third question (1.81) and the standard deviation (0.834), and this value means that the majority of the sample members agreed that the exploitation of material and human energy in Sudanese industrial companies is consistent with the principles of the quick response manufacturing system.
4. The average value of the answers of the study sample members to the fourth question was (1.77) and the standard deviation was (0.795), and this value means that the majority of the sample members agreed strongly that industrial companies that apply the quick response manufacturing system achieve a reduction in cost and price, which achieves them the ability to Competitive in the markets.
5. The average value of the answers of the study sample members to the fifth question (1.60) and the standard deviation (0.758), and this value means that the majority of the sample members strongly agreed that the application of the quick response manufacturing system in light of the modern manufacturing environment has become an absolute necessity to reduce production costs in industrial companies Sudanese.
6. The average value of the answers of the study sample members to the sixth question (2) and the standard deviation (0.966), and this value means that the majority of the sample members agreed that the application of quick response manufacturing needs technological investments, which negatively affects the decision to apply it to some Sudanese industrial companies.
7. The average value of the answers of the study sample members to the seventh question (1.80) and the standard deviation (1.047), and this value means that the majority of the sample members agreed strongly that motivating workers to continue designing, planning and producing products in small sizes leads to achieving the goals of the manufacturing system quick response.
8. The average value of the answers of the study sample members to the eighth question (1.85) and the standard deviation (0.7979) and this value means that the majority of the sample members agreed that the application of the quick response manufacturing system leads to an increase in the profitability of Sudanese industrial companies by reducing costs, improving quality and achieving competitive advantage.

The arithmetic mean and standard deviation of the second hypothesis questions:

Descriptive Statistics

The rank	General Direction	Deviation	Median	The statement
7	Agree	0.902	1.99	1--The quick response manufacturing system is the most important conversion system for small batch production, which affects the cost reduction.
1	Strongly Agree	0.885	1.38	2- Time is the most important factor in adopting the philosophy of quick response manufacturing system.
8	Agree	0.939	2.04	3- The application of the Sudanese industrial companies to the quick response manufacturing system leads to the removal of activities that do not add value
4	Agree	0.860	1.82	4- The application of quick response manufacturing achieves the reduction of waste and thus affects the cost reduction.
6	Agree	0.936	1.92	5- Reducing waiting times for all operations within the industrial company, leading to cost reduction and quick response to customers.
5	Agree	0.971	1.91	6- The application of the quick response manufacturing system reduces inventory costs and shipping costs.
3	Strongly Agree	0.868	1.76	7- The application of the quick response manufacturing system achieves continuous improvement by detecting waste sites in the activities and operations of other industrial companies.
2	Strongly Agree	0.806	1.63	8- The quick response manufacturing system represents a strategy to reduce the total cost, which leads to improving the operational performance of Sudanese industrial companies
Agree			1.93	The axis as a whole

*Source: Prepared by the researcher from the field study 2022

1. The average value of the answers of the study sample members to the first question (1.99) and the standard deviation (0.902), and this value means that the majority of the sample members agreed that the quick response manufacturing system represents the most important transformation systems for production in small batches, which affects the cost reduction.
2. The average value of the answers of the study sample members to the second question (1.38) and the standard deviation (0.885), and this value means that the majority of the sample members agreed strongly that time is the important factor in adopting the philosophy of the quick response manufacturing system.
3. The average value of the answers of the study sample members to the third question (2.04) and the standard deviation (0.939), and this value means that the majority of the sample members agreed that the Sudanese industrial companies' application of the quick response manufacturing system to remove activities that do not add value.
4. The average value of the answers of the study sample members to the fourth question (1.82) and the standard deviation (0.860), and this value means that the majority of the sample members

agreed that the application of quick response manufacturing reduces the damage and thus affects the cost reduction.

5. The average value of the answers of the study sample members to the fifth question (1.92) and the standard deviation (0.936), and this value means that the majority of the sample members agreed that reducing waiting times for all operations within the industrial company leads to cost reduction and quick response to customers.
6. The average value of the answers of the study sample members to the sixth question (1.91) and the standard deviation (0.971), and this value means that the majority of the sample members agreed that the application of the quick response manufacturing system reduced inventory costs and shipping costs.
7. The average value of the answers of the study sample members to the seventh question (1.76) and the standard deviation (0.868), and this value means that the majority of the sample members strongly agreed that the application of the quick response manufacturing system is continuous improvement by detecting waste sites in the activities and operations of other industrial companies.
8. The average value of the answers of the study sample members to the eighth question (1.63) and the standard deviation (0.806), and this value means that the majority of the sample members strongly agreed that the quick response manufacturing system represents a strategy to reduce the total cost, which leads to improving the operational performance of Sudanese industrial companies.

The arithmetic mean and standard deviation of the third hypothesis questions

Descriptive Statistics.

The Rank	General Direction	The Deviation	The Median	The Statement
7	Strongly Agree	0.807	1.73	1- The application of the quick response manufacturing system leads to improve product quality and achieve customer satisfaction, which contributes to create a competitive ability for the company.
3	Strongly Agree	0.689	1.68	2- The companies that implement the quick response manufacturing system achieve a competitive advantage.
5	Strongly Agree	0.780	1.69	3- The quick response of companies by increasing their market share of various products leads to attracting new customers and achieving a competitive advantage.
1	Strongly Agree	0.526	1.38	4- Companies deliver their products faster, which enhances their competitiveness in the competitive markets.
4	Strongly Agree	0.744	1.68	5- The quick response manufacturing system is concerned with changes that affect customers as product attributes, delivery and purchase criteria.

The Rank	General Direction	The Deviation	The Median	The Statement
2	Strongly Agree	0.632	1.50	6- The application of the quick response manufacturing system leads to an increase in the value of the product to customers by reducing the cost of presenting it to the market, which achieves competitive advantages for Sudanese industrial companies.
6	Strongly Agree	0.873	1.69	7- Reducing the production and delivery times of products according to the quick manufacturing system that meets the desire of customers and achieves their satisfaction.
Strongly Agree			1.66	The axis as a whole.

*Source: Prepared by the researcher from the field study 2022

1. The average value of the answers of the study sample members to the first question was (1.73) and the standard deviation was (0.807), and this value means that the majority of the sample members agreed strongly that the application of the quick response manufacturing system leads to improving product quality and achieving customer satisfaction, which contributes to creating the ability to Competitiveness of the company.
2. The average value of the answers of the study sample members to the second question (1.68) and the standard deviation (0.689), and this value means that the majority of the sample members strongly agreed that companies that apply the quick response manufacturing system achieve a competitive advantage.
3. The average value of the answers of the study sample members to the third question (1.69) and the standard deviation (0.780), and this value means that the majority of the sample members strongly agreed that the speed of response of companies by increasing their market share of diverse products leads to attracting new customers and achieving a competitive advantage for them.
4. The average value of the answers of the study sample members to the fourth question (1.38) and the standard deviation (0.526), and this value means that the majority of the sample members strongly agreed that companies deliver their products faster that enhances their competitiveness in competitive markets.
5. The average value of the answers of the study sample members to the fifth question (1.68) and the standard deviation (0.744), and this value means that the majority of the sample members strongly agreed that the quick response manufacturing system is concerned with the variables that affect customers as product attributes, delivery and purchase criteria.
6. The average value of the answers of the study sample members to the sixth question (1.50) and the standard deviation (0.632), and this value means that the majority of the sample members strongly agreed that the application of the quick response manufacturing system leads to an increase in the value of the product to customers by reducing the cost of submitting it to the market, which achieves competitive advantages for companies Sudanese industrial.

7. The average value of the answers of the study sample members to the seventh question (1.69) and the standard deviation (0.873), and this value means that the majority of the sample members agreed strongly that reducing production and delivery times for products according to the quick manufacturing system meets the desire of customers and achieves their satisfaction.

The first hypothesis: There is a statistically significant effect between the application of the quick response manufacturing system, reducing costs, and increasing the competitive advantage in industrial companies.

Table No. (2) shows the (t-test) to verify the validity of the first hypothesis:

morale Standard	degrees of freedom	test value (t)	the sample	hypothetical mean	standard deviation	Arithmetic mean	
**0.000	102	23.847	103	3	0.778	1.83	The first axis

***Source: Prepared by the researcher from the field study 2022 AD**

**** Significance at 0.01 . level of significance**

***Significant at the 0.05 . level of significance**

The above table shows that the value of the t-test is 23.847 with a degree of freedom of 102 and a level of significance of 0.000 which is less than the level of significance of 0.05. We cannot accept the null hypothesis that says that there is no statistically significant effect between the application of the quick response manufacturing system and cost reduction and increase Competitive advantage in industrial companies and from here we can say that the researcher is 95% confident that there is a statistically significant effect between the application of the quick response manufacturing system, reducing costs and increasing the competitive advantage in industrial companies.

The second hypothesis: There is a significant effect of the application of a quick response system on cost reduction in Sudanese industrial companies.

Table No. (3) shows the (t-test) to verify the validity of the second hypothesis:

morale Standard	degrees of freedom	test value (t)	the sample	hypothetical mean	standard deviation	Arithmetic mean	
0.000**	102	22.624	103	3	0.864	1.93	The first axis

***Source: Prepared by the researcher from the field study 2022**

**** Significance at 0.01 . level of significance**

***Significant at the 0.05 . level of significance**

The above table shows that the value of the t-test is 25.624 with a degree of freedom of 102 and a level of significance of 0.000 which is less than the level of significance of 0.05. We cannot accept the null hypothesis that there is no significant effect of applying a quick response system on cost reduction in Sudanese industrial companies and that Here we can say that the researcher is 95% confident that there is a significant effect of applying a quick response system on reducing costs in Sudanese industrial companies.

The third hypothesis: There is a significant effect of the application of the quick response manufacturing system on achieving competitive advantage in Sudanese industrial companies.

Table No. (4) shows the (t-test) to verify the validity of the first hypothesis.

morale Standard	degrees of freedom	test value (t)	the sample	hypothetical mean	standard deviation	Arithmetic mean	
0.000**	102	25.633	103	3	0.656	1.66	The first axis

*Source: Prepared by the researcher from the field study 2022

** Significance at 0.01 . level of significance

*Significant at the 0.05 . level of significance

The above table shows that the value of the t-test is 25,633 with a degree of freedom of 102 and a level of significance of 0.000 which is less than the level of significance of 0.05. We cannot accept the null hypothesis that there is no significant effect of the application of the quick response manufacturing system on achieving competitive advantage in companies From here, we can say that the researcher is 95% confident that there is a significant effect of applying the quick response manufacturing system on achieving competitive advantage in Sudanese industrial companies.

The Conclusion: it includes findings, recommendations and references

First: The Results

1. The first hypothesis proved that the value of the (t) test is(23.847)with a degree of freedom of (102) and a significant level of (0.000), which is less than a significant level of (0.05), meaning that there is a statistically significant effect between the application of the rapid response manufacturing system and cost reduction and increased competitive advantage in industrial companies by (95%)
2. The study proved that there is a significant effect of applying the rapid response system on cost reduction in Sudanese industrial companies. The second hypothesis has proven that there is a significant effect of applying the rapid response manufacturing system on cost reduction in Sudanese industrial companies, as the value of the (t) test is(25.624) with a degree of freedom of (102)and a significance level of 0.000, which is less than the significance level of (0.05)and by (95%.)The industrial companies that applied the rapid response manufacturing system achieve a cost reduction and that the companies' response speed by increasing their market share of the products leads to attracting new customers, thus achieving a competitive ability in the markets.
3. The value of the (t) test is (25.633)with a degree of freedom of(102) and a significance level of(0.000), which is less than the significance level of(0.05)on it. The researcher is (95%) confident that there is a significant effect of applying the rapid response manufacturing system on achieving competitive advantage in Sudanese industrial companies

4. QRM helps managers shift from cost-based thinking to time-based thinking, making the process of reducing lead times the criterion of organizational success. Because time is the important factor in adopting the QRM philosophy.
5. The QRM system meets the quick needs of customers through the quick design and manufacture of products according to the required specifications and delivery as quickly as possible. The QRM system represents the best entrances to the application of the philosophy of wide recommendation, through the value chain, as responding to the desires of customers and quickly It begins by reacting a series of actions that begins with reducing the time of product development and then the time of its production.

Second: Recommendations

- 1- Urging the Sudanese industrial companies to study the experiences of other companies that have succeeded in applying the quick response manufacturing system and to benefit from its results that are commensurate with their manufacturing environment.
- 2- That industrial companies adopt the quick response manufacturing system as a comprehensive application strategy that includes an intellectual tendency that seeks to severely and continuously reduce lead times, which is reflected in the decline in quality.
- 3- That industrial companies adopt the concept of competitiveness as a strategic element that provides essential opportunities to help them achieve continuous profitability.
- 4- Updating the rules of ethical conduct for industrial companies in line with developments in the profession.
- 5- Developing a quick response manufacturing system in economic units for the purpose of enhancing commitments.
- 6- The necessity of developing scientific competence and skills by urging industrial company managers and production managers to participate in conferences and seminars held by professional bodies related to the quick response manufacturing system.

Bibliographies

First: Arabic References:

- حسين نور الدين، و رياض جميل، (دور التكنولوجيا في تحقيق الميزة التنافسية، مسح آراء المهندسين في مصنع النسيج. بغداد: مجلة جامعة كركوك للعلوم الادارية والاقتصادية، 2011، المجلد 1، العدد 2
- عزبة كرم عبد الرحمن، عفاف هادي الساعاتي، التصنيع السريع الاستجابة (QRM) وأثره على جدولة العمليات التشغيلية والبحوث التطبيقية في الشركة العامة لصناعة الزيوت النباتية مصنع الفارابي، جامعة بغداد، المجلة الاقتصادية والإدارية 2016، المجلد 22، العدد 91.
- علي محمد المعموري، و نبيل فرحان الخالدي، امكانية تطبيق التصنيع الهجين على واقع الصناعات العراقية ودوره في تعزيز ميزتها التنافسية بحث ميداني في الشركة العامة لتصنيع السيارات والمعدات بالإسكندرية. جامعة بغداد: المعهد العالي للدراسات المالية والمحاسبية، مجلة المثقفي، 2017، المجلد 7، العدد 4.

- عقيلة مصطفى الأتروشي، سهلة سالم العبادي، نظام التصنيع والاستجابة السريعة QRM وأفاق التنفيذ، دراسة حالة لمختبر الموصل للملابس الأطفال، بغداد، جامعة الموصل، كلية الإدارة والاقتصاد. مجلة تنمية الراءدين 2006. المجلد 28، العدد 83.
- عماد وهاب الحسيني، دور التصنيع بالاستجابة السريعة في الاسبقيات التنافسية من خلال الصيانة المنتجة الشاملة، رسالة دكتوراة منشورة، العراق، جامعة كربلاء، 2021،
- محمد طالب، تخفيض تكاليف الإنتاج كمدخل لتحقيق الميزة التنافسية في المؤسسات الصناعية المؤسسات الصناعية دراسة ميدانية لمؤسسة AGRODIV وحدة المسيلة، الجزائر: جامعة محمد بوضياف المسيلة رسالة ماجستير منشورة، 2019.
- محمد ظاهر، اباد عبد الكريم، اسيل مظهر، التصنيع سريع الاستجابة ودوره في خفض التكاليف- دراسة حالة في الشركة الدولية للأثاث المنزلي والمكتبي، العراق: جامعة القادسية. مجلة القادسية للعلوم الإدارية والاقتصادية 2017، المجلد 19، العدد 1.
- نازم محمود ملكاوي د.شحاده مفلح الغرابيه، تكنولوجيا المعلومات وأثرها على الميزة التنافسية دراسة في شركات السياحة والسفر الأردنية، عمان: مجلة جامعة جدارا للدراسات والبحوث، 2015م. المجلد 1، العدد 1.

Second: Foreign References:

- Bong Cheng, Siong & Chong Kuan, Enge, International Journal of Engineering & Technology, "Implementing Quick Response Manufacturing to Improve Delivery Performance in an ETO Company", V7, N28., 2018.
- Center of quick response manufacturing what is QRM ,Madison University of Wisconsin, 2018, <https://qrm.engr.wisc.edu/index.php/what-is-qrm>
- Dave Manney, The Strategy and Benefit of Using QRM, Schuette Metals Blog, 2020., <https://www.schuette-metals.com/blog/id.25>.
- Elizaveta Gromova, Quick response manufacturing as a promising alternative manufacturing paradigm, Russia: IOP Conf. Series: Materials Science and Engineering 2020.
- Fábio Nogueira Emboava, Rodolfo Cardoso, Iara Tammela,, A comparative analysis between the quick response manufacturing and time-based competition methodologies, Brazil: Brazilian Journal of Operations & Production Management, 2017, N14.
- Fong Nga Hin Benjamin, Modeling, Analysis, and Design of Responsive Manufacturing Systems Using Classical Control Theory, USA: ETDs: Virginia Tech Electronic Theses and Dissertations, 2005.
- Hui, Ling Wang, theories for competitive advantage: Australia ,university of Wollongong faculty of business, . 2014, <https://ro.uow.edu.au/buspapers/408>
- Murray Marian, Quick Response Manufacturing (QRM) Logistics and Supply Chain, 2018, <https://www.thebalancesmb.com/quick-response-manufacturing-qrm>.
- Nelfiyanti, & Nik Mohamed Nik Mohd Zuki, Quick response manufacturing and ergonomic consequences in manufacturing environment, IOP Conf. Series: Materials Science and Engineering, 2020.
- Rajan Suri ,QRM and POLCA: A Winning Combination for, Technical Report, Center for Quick Response Manufacturing, , 2003. . www.meteconline.org .
- Rajah Suri. Quick Response Manufacturing: A Companywide Approach to Reducing, lead times Productivity Press Portland, 1998.
- Sabah Agha. Laith Alrabee & Manar mhour, International Journal of Business and Management, Effect of Core Competence on Competitive Advantage and Organizational Performance, Jordan, 2012, Vol. 7, No. 1;
- Wanzhu Wang, Qazi Salman Khalid, Muhammad Abas, et al, Implementation of POLCA Integrated QRM Framework for Optimized Production Performance, A Case Study, 2021, <https://www.mdpi.com/journal/sustainability>.
- Vytis Varanavicius, Aida Navikaite, journal of international studies, Competitive advantage attainment via synergy in green offices, 2015 ,vol.8, N03.