

Midocean University
College of Management
Master of Business Administration



The Effect of Management on Reliability and Efficiency in Food and Beverage Production Lines A within the Saudi Arabian Industry

أثر الإدارة على الاعتمادية والكفاءة في خطوط إنتاج الأغذية والمشروبات في الصناعة السعودية

Prepared By: Ahmed Salem Yousef

Supervisors \

Dr. Al-Feisal Hasan

Dr. Fayez Jrad

Third Trimester 2024

Table of Contents:

Dedication

Thanks and Appreciation

Abstract of the Study in Arabic

Abstract of the Study in English

List of Contents

Chapter One: Introduction to the Study

Introduction

Defining the study problem

Importance of the study

Theoretical importance

Practical importance

Objectives of the study

Study Questions

Study Concepts:

Production lines

Management

Management Practices

Reliability

Efficiency

Chapter Two: Theoretical Framework

The first topic: The Role of Management in Production Line Efficiency

The second topic: Factors Influencing Reliability in Food and Beverage Production

The third topic: The Impact of Management on Production Line Efficiency through Reduced Maintenance Budgets

The forth topic: Management Strategies in Saudi Arabia's Food and Beverage industry

The fifth topic: Previous Studies

Local studies

Arabian studies

Global Studies

Chapter Three: Methodological procedures for the study

Study methodology

Study tool

Limitations and field of study

Study population and sample

Study variables

Chapter Four: Presentation and analysis of the results of the field study

Chapter Five: Results and recommendations of the study

The first section: results of the study

The second section: Discussing the results in light of the theoretical framework and questions

The third section: Recommendations

List of References

Appendices

Chapter One: Introduction to the Study

Introduction

The modern world is experiencing a rapid succession of changes in the industry field. as result of the Fourth industrial revolution often referred to as industry 4.0, it represents a significant transformation in manufacturing and society driven by advanced technologies this revolution is characterized by innovations such as artificial intelligence (AI), robotics, the Internet of Things (IoT). In this context, production lines have being redefined and modernized to Improve efficiency, reduce errors, and optimize product flow through effective design and planning. Automation is also increasing productivity while minimizing waste. The integration of these technologies within production lines allows companies to improving overall productivity and efficiency.

In recent years, The Kingdom of Saudi Arabia as one of the modern world and societies was not far from this revolution. For several decades, the industry field has witnessed significant growth benefiting from the advantages offered by new technology, fueled by economic diversification efforts and increased consumer demand. According to Dr. Noor in his research in page number 3 in 2011, “The significance of studying and enhancing productivity has become increasingly evident in both industrialized and developing countries, primarily due to its direct link to the effective utilization of economic resources”.

Food and beverage industry in the Kingdom of Saudi Arabia has been more restricted and more important by SFDA (Saudi Food and Drug Authority), that caused all factories in food and beverage industry must improve their management strategy and fallowing the best manufacturing practices. According to Ahmed Kamal in his research in page number 613 in 2011 “Good manufacturing practices (GMP) is One of the most important tools used in the fields of pharmaceutical and food industries”. Therefore, this study explores the influence of management practices on the reliability and efficiency of production lines in this critical sector, with a particular focus on local challenges and best practices.

In light of the above-mentioned points, this study aims to examine the impact of management on reliability and efficiency in food and beverage production lines within the Kingdom of Saudi Arabia industry.

Defining the Study Problem

With an increased demand for high-quality and safe food products, managing production lines to ensure efficiency and reliability is crucial. However, the lack of effective management practices could result in inefficiencies, impacting overall productivity, cost-effectiveness, and quality in the Saudi Arabian food and beverage industry. So from here the research problem revolves around the researcher's exploration through over 11 years of expertise in food and beverage industry field and the researcher believe have gained extensive knowledge and experience that inform the understanding of industry trends, best practices, and effective management strategies

Importance of the Study

Theoretical importance

This study appears to enrich the field of management science by enhancing the efficiency of production lines and expanding its direct impact on the manufacturing culture and attitudes of the management. Consequently, this research focuses on the relationship between management and performance efficiency in production. The researcher hopes that this study will inspire to creating more studies on similar topics in a scientific and comprehensive manner, in order to contributing to the accumulation of knowledge and research in this field.

Practical importance:

This study is essential for understanding the impact of management on production reliability and efficiency, which directly influences operational costs, Equipment maintenance, and regulatory compliance. Improved management practices could have far-reaching effects on the competitiveness of the Saudi Arabian food and beverage industry in regional and global markets.

Objectives of the Study

The study aims to:

- Identify key management factors that influence production line efficiency and reliability.
- Examine current management practices within food and beverage companies at the Kingdom of Saudi Arabia.
- Assess the effect of these practices on production outcomes and identify potential areas for improvement.

Study Questions

- How does management impact production line efficiency in food and beverage companies at the Kingdom of Saudi Arabia?
- What are the primary management challenges in achieving production reliability?
- How does management impact the efficiency of production line by reducing the maintenance budgets?
- How do management practices align with the industry standards in Saudi Arabia?

Study Concepts

Key concepts in this study include:

- **Production lines:**

It refers to a series of sequential processes or stations where raw materials are converted into finished products. Each station (machine) is responsible for a specific task, such as assembly, or packaging, allowing for the efficient flow of materials and labor. According to V. Narayan in his book in page number 18 in 2012, "It is the process of converting raw materials into useful products". Production lines are designed to maximize productivity and minimize waste. It is often using new techniques or technology such as automation. It plays an important role in many industries, including automotive, electronics, and consumer goods, in order to provide high production with consistent quality.

- **Management:**

It is the process of coordinating and organizing human, financial, and material resources to achieve specific goals efficiently and effectively. It encompasses a range of activities, including planning, organizing, leading, directing, and monitoring performance. The primary goals of management is to increase productivity, encourage innovation, and contributing to sustainable success of organizations. In addition, management plays a crucial role for decisions making and adapting to environmental and market changes.

- **Management Practices:**

It refers to the methods and strategies used by leaders and managers to coordinate and guide an organization's resources and activities. These practices including a range of functions, planning, organizing, leading, and controlling, for achieving organizational goals. Effective management practices involve setting clear objectives, fostering communication, motivating employees, and implementing performance measurement systems. According to Khalid in their research in page number 2 in 2020, "It is the behavior to allow the institution or

factory to be managed by conscious management. Which makes its decisions on real information through statistical or numerical data from the work environment, and analyzes this data to reaches a solution that contributes to solving problems and reducing defects permanently and continuously”. They also include adopting best practices in decision-making, problem solving, and conflict resolution. In other words, it is an action taken by company leadership to oversee and improve production operations.

- **Reliability:**

It is refers to the ability of a system, component, or process to perform its required functions under stated conditions for a specified period of time. It is a critical measurement which often evaluated through statistical analysis and testing. According to V. Narayan in his book in page number 15 in 2012, “it is failure histograms data and probability curves to identify maintenance strategies”. In contexts of engineering, manufacturing, and service industries, reliability refers to how well a product or service can be expected to perform without failure. High reliability reduces costs associated with failures, and contributes to overall operational efficiency. Ensuring reliability often includes quality control, regular maintenance, and continuous improvement practices.

- **Efficiency:**

It is refers to the ability to achieve maximum output with minimum input, often measured in terms of resource utilization. It reflects how well resources such as time, money, and materials are used to produce desired outcomes or results. In various contexts, efficiency can relate to processes, systems, or organizations, highlighting the importance of streamlining operations to minimize waste and enhance productivity. High efficiency is associated with improved performance, cost savings, and the ability to meet goals effectively. According to V. Narayan in his book in page number 15 in 2012, “In any process, we can obtain the end result in one or more ways. When one method needs less energy or raw materials than

another, we say it is more efficient". Striving for efficiency often involves optimizing workflows, implementing best practices, and leveraging technology to improve overall performance.

Chapter Two: Theoretical Framework

The first topic: The Role of Management in Production Line Efficiency

The role of management in production line efficiency is critical, as it directly influences the overall productivity, quality, and cost-effectiveness of manufacturing operations. Effective management involves overseeing the optimization of workflows, ensuring that resources such as labor, equipment, and materials are utilized to their maximum potential. This includes scheduling and planning to minimize downtime, implementing lean practices to reduce waste, and adopting a culture of continuous improvement. Managers also need to monitor performance metrics, identify bottlenecks, and make decisions based on data to adjust processes when necessary. Strong leadership, clear communication, and effective training are essential in motivating teams, ensuring safety standards are met, and maintaining high morale. According to Khalid in their research in page number 6 in 2020, "The labor's problems are due to lack of training programs to raise the level of performance and skills". In addition to that the role of management is to balance efficiency with quality, maintaining a streamlined production process while meeting customer demands and keeping costs under control.

The second topic: Factors Influencing Reliability in Food and Beverage Production

Reliability in food and beverage production is affected by several factors that include both operational practices and external conditions. The key elements include commitment to high quality control measures, which ensure that products meet standards. The sourcing of high-quality raw materials also plays a crucial role, as it directly impacts the final product's taste and safety. Additionally, the training and competency of staff are vital,

as skilled employees are more likely to follow protocols and troubleshoot issues effectively. According to Ahmed Kamal in his research in page number 621 in 2011, "It is important to conduct training programs for all employees to enhance their cultural awareness and quality standards, and some of these courses are general for all levels". Equipment maintenance and technology utilization further enhance reliability by minimizing breakdowns and ensuring efficient production processes. Finally, regulatory compliance and industry standards must be consistently met to build consumer trust and brand reputation, reinforcing the overall reliability of food and beverage products.

The third topic: The Impact of Management on Production Line Efficiency through Reduced Maintenance Budgets

Management's approach to production line efficiency can be significantly impacted by reduced maintenance budgets, often leading to a balancing between cost savings and operational reliability. While reducing in maintenance spending may appear to improve short-term financial performance but it may result in decreased efficiency in the long term. Without proper maintenance the equipment may experience more frequent breakdowns leading to increased downtime, lower production rates, and potential quality issues. Machines with poor maintenance may lead to higher repair costs over time, offsetting any initial savings. According to V. Narayan in his book in page number 349 in 2012, "Reducing in maintenance cost will result to increase the risks to the organization". Effective management must carefully allocate resources to ensure that maintenance is prioritized in critical areas, balancing cost reductions with the need for consistent and reliable production. A proactive approach investing in (PM) preventive maintenance, training staff, and implementing predictive technologies may help mitigate the risks of underfunding while still keeping maintaining operational efficiency. Additionally, management's ability to navigate this complex balancing directly affects both the smooth running of production lines and the long-term profitability of the organization.

The forth topic: Management Strategies in Saudi Arabia's Food and Beverage industry

This section focuses on the unique context of Saudi Arabia, considering cultural, economic, and regulatory factors that shape management practices in the local food and beverage industry. Also focused on adapting to evolving consumer preferences, technological advancements, and regulatory requirements. Using some new technique and new strategies such as PMP and Six sigma. According to Khalid in their research in page number 2 in 2020 “ Six Sigma is utilizing rigorous data collection, statistical analysis and research to identify defects and find ways to eliminate them”. One key strategy is to focus on quality control and food safety standards, driven by both local regulations and international certifications. With the growing demand for health-conscious and sustainable products, companies are diversifying their offerings, incorporating organic, low-calorie, and locally sourced ingredients into their menus. Additionally, many businesses are leveraging advanced technologies such as automation, artificial intelligence, and data analytics to optimize production processes, enhance supply chain efficiency, and reduce waste. In line with Vision 2030, which encourages economic diversification, the sector is also seeing a rise in the adoption of digital platforms for E commerce and delivery services, catering to the increasingly smart tech and convenience oriented consumer base. Furthermore, strategic partnerships with global and local suppliers are helping firms strengthen their market position, improve cost management, and ensure a steady supply of high-quality ingredients. According to Dr. Noor in his research in page number 546 in 2011, “As a result of the development and progress that has happened in the production of industrial projects in machinery, equipment and production lines, the management strategy is an important element in the development of the industry”. Through these strategies, Saudi food and beverage companies are positioning themselves for sustained growth and competitive advantage in a rapidly evolving market.

The fifth topic: Previous Studies

The previous studies have addressed that management responsible for productivity. Most of the studies have focused on the impact on reliability and efficiency. Some studies have also focused on the management strategies. However, there was also a difference in the manufacturers in which previous studies were applied.

Local studies:

Factors Affecting Production Lines in the Industry of Jeddah City

This study was conducted by Dr. Noor Abdulhadi Al-Subayani in 2011. The study was conducted on a sample of 10 factories in Jeddah, Saudi Arabia, selected based on they employ experts with at least 10 years of experience. This study aims to identify and developing a scale to study the factors affecting production lines in factories in Jeddah City. The study tools included a questionnaire, data collection, and sample description. The study came to these results that:

- The first group that have lower score in the scale that was created is less than 82.75.
- The second group that have higher score in the scale that was created is greater than 110.

Arabian studies

The Impact of Improving the Quality Culture of Management and Employees Using the (GMP) Good Manufacturing Principles on Production Quality

This study was done by Ahmed Kamal and his research group for their PhD in 2011. The study was conducted through 112 surveys on 83 labors, 20 supervisors, 6 administration Managers and 1 general manager. This study aims to improve and develop the quality of production sector by applying total quality management using the manufacturing

principles program to reduce rejected production rates. The study tools is consists of an analysis, and descriptive methodology. The study came to these results that:

- From the surveys increase the rate of rejected units than the average (6% from the overall production compere to the planed which is 2% that led to increase the production cost).
- From the surveys, the rate of using row materials in the production has increased by 5.34%.
- There is a strong relationship between production quality and the use of Good Manufacturing Practices (GMP).
- It is necessary to have training programs for all employees to raise their level of quality culture.

The impact of using Six Sigma Methodology on Operational Stages of Production in Egyptian Factories

This study was conducted by Khaled Al-Najjar and his research group in 2020 for their master degree. This study aims to the impact of using Lean Six Sigma to obtain a high-quality product in the operating stages of production lines, and the possibility of achieving six sigma to reduce production defects in factories. The study tools included a descriptive and experimental methodology. The study came to these results that:

- Applying the Six Sigma methodology has led to an increase in the quality level from 3 sigma to 4 sigma with 4.6% difference, which has led to an improvement in performance and a decrease in the percentage of rejected products.
- The Six Sigma level not reach due to several of obstacles such as maintenance, employees training, and the difficulty of purchasing some high-end machines due to their high price.

Global studies

Effective Maintenance Management Risk and Reliability Strategies for Optimizing Performance

This study was conducted by V. Narayan in 2012 for his book. This study aims to improve technical and production efficiency, which helps reduce safety, health, and environmental issues, while also increasing quality, production levels, and reducing costs and industrial risks. The study tools included a descriptive, data collection, and experimental methodology. The book came to these results which:

- The professionals in maintenance must understand the importance of data in the continuous improvement process and improvements in maintenance performance.
- To stay in business, managers need to adapt to changing situations. Some changes are within their control, but market forces can also affect the operating context with the passage of time, managers must make decisions with limited information.

List of References

All sources used in the study, including academic journals, industry reports, and relevant publications, will be listed here:

- دراسة أثر تحسين ثقافة الجودة لدى الإدارة والعاملين باستخدام برنامج اساسيات التصنيع الجيد على جودة الإنتاج بواسطة احمد كمال البسطويسي ، محمود أبو سكين ، أشرف نوفل ، ياسر مدنى
https://jesr.journals.ekb.eg/article_68250_9a533a9cf555dcef329e418bbb7d3354.pdf.
- دراسة العوامل المؤثرة على الإنتاج في صناعة الملابس الجاهزة بمدينة جدة بواسطة نور عبد الهادي الصبياني
https://journals.ekb.eg/article_145142.html
- دراسة أثر استخدام منهجية 6 سيجما على مراحل تشغيل الملابس الرياضية في انتاج التيشيرت بواسطة داليا عبدالقادر زكي ; خالد النجار ; عبد الرحيم رمضان ; شيماء مصطفى
https://journals.ekb.eg/article_228040_0.html
- **Book of Effective Maintenance Management Risk and Reliability Strategies for Optimizing Performance** by V. Narayan
[Effective Maintenance Management: Risk and Reliability Strategies for ... - V. Narayan](#) - كتب - [Google](#)

Appendices

The appendices will include supplementary information such as survey questions, raw data, and additional documentation used in the study.



أثر تحسين ثقافة



العوامل المؤثرة على أثر استخدام منهجية 6



الجاهزة بمدينة جدة في انتاج التيشيرت الجيد على جودة الإنتاج



Effective

Maintenance Management