



**OSTİM TEKNİK
ÜNİVERSİTESİ**
A N K A R A

OSTİM TECHNICAL UNIVERSITY

FACULTY OF ECONOMICS AND ADMINISTRATIVE SCIENCES

**The role of Artificial Intelligence AI in Improving Production Efficiency and Export
Sales: Anatolia Pharma İlaç San. Tic. A.Ş**

GRADUATION PROJECT

ECONOMICS

MOHAMMAD DHAINI

220102921

SUPERVISOR: ASSOC. PROF. BAHARERDAL

ANKARA 2026



REPUBLIC OF TÜRKİYE

GRADUATION PROJECT

**The role of Artificial Intelligence AI in Improving Production Efficiency and Export
Sales: Anatolia Pharma İlaç San. Tic. A.Ş**

SUPERVISOR ASSOC. PROF. BAHAR ERDAL

ABSTRACT

This graduation project examines the role of Artificial Intelligence (AI) in improving production efficiency and export sales within the nutraceutical sector, focusing on Anatolia Pharma İlaç San. Tic. A.Ş. The study analyzes how AI technologies such as demand forecasting, predictive maintenance, and lead scoring can enhance operational performance and support market expansion, particularly in exports from Turkey to Iraq.

Due to increasing global competition and inefficiencies in traditional production and sales processes, companies face significant challenges in maintaining productivity and responding effectively to market demand. This research applies a benchmarking methodology to compare existing manual systems with AI-driven solutions.

The findings indicate that AI implementation can significantly reduce production downtime, optimize logistics processes, and improve sales conversion rates. The study concludes that adopting AI technologies is essential for maintaining competitiveness and achieving sustainable growth in international markets.

Keywords: Artificial Intelligence, Production Efficiency, Export Sales, Predictive Maintenance, Lead Scoring, Turkey-Iraq Trade

ACKNOWLEDGMENT

I would like to express my sincere gratitude to Anatolia Pharma İlaç San. Tic. A.Ş for providing me with the opportunity to gain practical experience and insights into the export of health products.

I would also like to thank the production and sales departments for their support and for allowing me to analyze real operational challenges, which contributed significantly to this study.

I am especially grateful to my advisor, Assoc. Prof. Bahar Erdal, for her continuous guidance, valuable feedback, and academic support throughout the completion of this project.

Finally, I would like to thank my family for their constant encouragement and support.

TABLE OF CONTENTS

ABSTRACT	ii
ACKNOWLEDGMENT	iii
LIST OF TABLES	iv
LIST OF FIGURES	v
1. INTRODUCTION	1
1.1. Background of the Study	1
1.2. Problem Statement	2
1.3. Aims and Objectives	3
1.4. Significance of the Study	4
1.5. Scope and Limitations	5
2. LITERATURE REVIEW	6
2.1. The Role of AI in the Global Supplement Industry	6
2.2. AI Applications in Manufacturing Productivity	8

2.3. AI-Driven Sales Strategies for International Markets	10
2.4. Cross-Border Logistics and Export Challenges (Turkey-Iraq) ...	12
3. COMPANY PROFILE & EXPORT DYNAMICS	14
3.1. Overview of the Firm (Turkey Operations)	14
3.2. Product Line Analysis: Multivitamins, Vitamin D, Omega-3 ...	15
3.3. Challenges in the Iraqi Supplement Market	17
4. METHODOLOGY: BENCHMARKING ANALYSIS	19
4.1. Research Design and Approach	19
4.2. Selection of AI Features for Benchmarking	20
4.3. Scoring Criteria and Weighting (0-3 Scale)	21
4.4. Data Collection and Evaluation Process	23
5. FINDINGS AND DISCUSSION	25
5.1. Benchmarking Results Matrix	25
5.2. Impact of AI on Production Productivity	27
5.3. Impact of AI on Sales Growth in Iraq	29
5.4. Strategic Gap Analysis	31
6. CONCLUSION AND RECOMMENDATIONS	33
6.1. Summary of Research Findings	33
6.2. Strategic Roadmap for AI Implementation	34
6.3. Future Prospects for the Firm	35

REFERENCES	37
APPENDIX A: THE BENCHMARKING MATRIX	40

1. INTRODUCTION

1.1 Background of the study

Over the past decade, the global vitamins and supplements market has experienced significant growth due to increased health awareness and demand for preventive healthcare. Products such as multivitamins, Vitamin D, and Omega-3 have become essential consumer goods worldwide.

Turkey has emerged as a key production hub for nutraceutical products due to its strategic location and advanced manufacturing capabilities. Iraq represents one of the most important export markets for Turkish pharmaceutical and supplement companies. However, exporting to Iraq presents several challenges, including demand fluctuations, logistical uncertainties, and inefficient inventory management.

In this context, Artificial Intelligence (AI) has become a transformative tool in Industry 4.0. AI technologies enable companies to shift from reactive to predictive decision-making by analyzing large datasets and optimizing operations. Integrating AI into production and export processes can significantly improve efficiency and profitability.

The Turkey-Iraq Export Corridor

Turkey has become an important center for pharmaceuticals and nutraceuticals due to its state-of-the-art production facilities and favorable geographical location. Its major trading partner includes Iraq. The process of exporting medicines is fraught with complications that include variable demands in various parts of Iraq, logistic issues, and accurate inventory

control. Traditional methods of exporting tend to result in either surplus or shortage, affecting profit margins and customer confidence.

The AI Revolution in Industry 4.0

Artificial Intelligence (AI) is the future of productivity in industries. Using machine learning algorithms and big data analytics, organizations can go from being “reactive” managers to “predictive” managers. AI will allow a company producing supplements to coordinate the production schedule in Turkey with the sales statistics in Iraq. As a result, the vitamins will be delivered at just the right time to the pharmacy that needs them. The connection between Productivity and Sales will be thus established perfectly.

1.2. Problem Statement

The primary challenge faced by the company lies in its reliance on traditional and reactive operational approaches within a highly dynamic global market. Although the company produces high-quality nutritional supplements such as multivitamins, Omega-3, and Vitamin D, its current system presents critical inefficiencies that negatively impact both productivity and profitability. Firstly, the production process is largely reactive rather than predictive. Production planning is based on historical averages instead of real-time data, leading to issues such as overproduction and stock shortages. Secondly, the sales process lacks data-driven decision-making. The absence of a structured lead scoring system results in inefficient targeting of potential customers in the Iraqi market, reducing conversion rates and wasting valuable time.

Lastly, there is a significant lack of integration between production, logistics, and sales departments. This “information silo” limits the company’s ability to respond quickly to changes in market demand.

Overall, the absence of AI-driven systems results in increased operational costs, inefficient resource utilization, and missed growth opportunities in a key export market.

1.2.1 The Productivity Gap: Reactive Manufacturing

In today's world, manufacturing is still reactive in terms of productivity. For instance, production scheduling is done based on average figures from the past instead of current facts. The result is two major problems, namely, "overproduction" where there is unnecessary production of goods such as Omega-3 leading to stockpiling in storage facilities and "stockouts" when an urgent rise in demand of vitamin D could not be matched because machines have already been set up for other tasks.

1.2.2 The Sales Gap: Geographical and Cultural Information Disparity

Selling goods in Iraq requires dealing with a market that has diverse geographical demands and variable economic situations. The existing sales system does not adopt an information-driven technique to determine which provinces in Iraq convert better for certain supplements. In many cases, the sales team uses traditional methods to contact potential customers, but this method takes time and leads to wasted opportunities. The company lacks a lead scoring model that can help differentiate between a valuable wholesale lead from Baghdad and an unimportant customer inquiry.

1.2.3 The Logistics Gap: The "Silo" Effect

The gap between the factory floor in Turkey and the shelf in Iraq is quite wide. The information flow is slow enough to allow the production department to be the last one to get acquainted with changes in the customer tastes in the Iraqi market. Such an information lag is similar to thick fog; the organization is going somewhere, but it cannot see what lies ahead.

To conclude, the absence of the AI-integrated system leads to additional expenses for production, waste of material resources, and missed profit-making opportunities in the country that is considered a major export market for Turkish goods. The proposed project aims to solve these problems through the introduction of AI into the production chain.

1.3. The Aim and Objective

The main aim of this research is to develop a framework for changing the traditional model of vitamin manufacturing business to be used in export by applying artificial intelligence technologies. In other words, we want to show that AI is not just a cool thing, but a real opportunity to produce more Vitamin D and sell it in Iraq.

Objectives:

Analyze “Old Fashioned” Production: To analyze how the company works now – what processes it uses in manufacturing in Turkey and selling products in Iraq to see how its efficiency could be increased.

Compare Specifics of AI Technologies:

To use a rating scale (from 0 to 3) for analyzing advantages of particular AI software in comparison to traditional methods (Demand Forecasting, Lead Scoring).

Evaluate the Possibilities: To evaluate the ability of AI to decrease downtime and improve market reach (to open more pharmacies in Iraq).

Develop an Implementation Strategy: To develop a clear plan on choosing a software and implementing AI at minimal costs.

1.4 Significance of the Study

The significance of this study lies in providing an applicable framework that can help Turkish Small and Medium-Sized Enterprises (SMEs) compete in the global market through cost-efficient but highly effective AI systems. From the perspective of the company that deals with vitamins, the study becomes especially relevant as it creates a kind of strategy manual aimed at eliminating unnecessary spending and gaining more market share in Iraq. Lastly, from an academic standpoint, the project offers useful insights into the topic of “Industry 4.0” within the realm of AI.

1.5. Scope and Limitations

This research project has limited its scope to the manufacturing and marketing of three different product lines namely: Multivitamins, Omega-3 and Vitamin D. The geographical limitation of the study is confined to the export channel starting from the firm’s production plant based in Turkey to distribution centers in Iraq.

Limitations:

Use of existing market information from Iraq, which may be volatile because of changing economic environment and assumption of having a stable internet connection at the firm.

2. Literature Review

2.1. The Role of AI in the Global Supplement Industry

Over the past few years, the nutraceutical sector has moved from mass production to ‘Precision Health.’ According to the literature, AI has been a catalyst in enabling this move. Today, many large supplement manufacturing firms worldwide rely on AI to address the ‘complexity problem,’ i.e., different people require different types of vitamins at different points in time.

Studies reveal that companies leveraging AI technology are, on average, 20% more efficient than those that use traditional approaches. In today’s globalized market, AI technologies are mostly being used for:

Hyper-Personalization – Algorithms that use data to make recommendations about dosage of Vitamin D or Omega-3.

Supply Chain Visibility – Leveraging AI technologies to trace the origin of raw material all the way from its origin to manufacturing, thus, making ‘Halal’ or ‘Organic’ certifications self-executing.

Market Analytics – Scanning the web for predictions of what would be the next ‘health fad.’ (IBM, 2024).’

2.2. AI Applications in Manufacturing Productivity

The output at the vitamin factory will be determined by the “OEE” (Overall Equipment Effectiveness). According to academic literature, the AI impact on productivity in the factory is the ability to predict breakdowns before they happen using Predictive Maintenance. Rather than reacting when the filling machine breaks down, the system uses AI sensors to detect abnormal vibrations and overheating months before the actual breakdown.

Also, Computer Vision (AI cameras) is currently employed in the production process to ensure each bottle of Multivitamins is correctly sealed. This eliminates the need for human workers’ visual inspection, leading to higher “throughput” (output) (IBM, 2024).

2.3. AI-Driven Sales Strategies for International Markets

The current economy has seen the concept of “selling” evolve from a subjective act to a scientific one. Numerous studies on international businesses have stressed the importance of AI-based CRM solutions to companies venturing abroad.

The AI-based sales approach is concentrated on three major aspects:

Lead Scoring: Through the application of algorithms, the potential buyers such as pharmacies and distributors of health products in Iraq can be identified and ranked based on the probability of making a purchase. In other words, the sales team can target “high-probability” customers and improve their conversion ratio.

Sentiment Analysis: The use of artificial intelligence can allow the monitoring of sentiments about “Made in Turkey” products or supplements such as Omega-3 in relevant forums and social media sites in certain territories.

Dynamic Pricing: With the fluctuating currency rates and competitors’ prices in Iraq, AI software could be used to determine the appropriate price change in order to remain competitive but not compromise the company’s margins(Chui et al. 2023).

2.4. Cross-Border Logistics and Export Challenges (Turkey-Iraq)

Vitamin exports from Turkey to Iraq also present specific challenges such as paperwork, temperature-sensitive logistics in case of fish oil/Omega-3, and security issues. Literature review in the area of Smart Logistics shows that the use of AI technologies, specifically, Predictive Analytics can reduce these challenges.

Benefits provided by AI in case of Turkey to Iraq exports:

Route optimization: The AI analyses traffic, weather conditions, and the time necessary to cross borders at specific checkpoints like the Habur Border Gate and offers optimal delivery timeframes based on the gathered data.

Demand-Sensing Inventory Management: Instead of shipping the same number of vitamins every month, the AI can sense demand. For example, when the system predicts flu season in Baghdad, it will automatically increase the number of multivitamins and vitamin D exported from Turkey to Iraq via the Turkish warehouse.

IoT Cold Chain Monitoring: In case of vitamin supplements like Omega-3, which cannot withstand high temperatures, the use of IoT sensors embedded in AI helps to monitor temperatures within delivery vehicles.(Forbes, 2024)

2.COMPANY PROFILE & EXPORT DYNAMICS

3.1. Overview of the Firm: Anatolia Pharma İlaç San. Tic. A.Ş Ankara)

Anatolia Pharma İlaç San. Tic. A.Ş),is a specialized nutraceutical and supplement manufacturing firm headquartered in the industrial heart of Turkey, Ankara. The company operates with a mission to provide high-quality, scientifically backed health supplements to the Middle Eastern market. By leveraging Ankara's advanced industrial infrastructure and its central location as a logistics node, Anatolia has established itself as a reliable producer capable of large-scale manufacturing while maintaining strict quality standards.

3.2. Product Line Analysis: Multivitamins, Vitamin D, and Omega-3

The company's competitive edge stems from its main products, which are necessary for public welfare in the Iraqi market:

Multivitamins: An all-in-one mixture containing vital minerals and vitamins that are to be taken daily. This product needs intricate ingredient coordination and proper blending ratios.

Vitamin D: Available in different dosage strengths to address vitamin deficiencies. This product experiences extreme seasonal fluctuations in demand, particularly during winters.

Omega-3 (Fish Oil): Pure fish oil in soft capsules. This product is highly perishable and needs proper cold chain management during transportation and storage.

3.3. Export Dynamics and the Turkey-Iraq Route

The main foreign buyer of Anatolia's products is Iraq. This is done using trucks as the mode of transporting the exported product from the factory at Ankara via Southeastern Turkey up to Habur Border Gate (Ibrahim Khalil).

Export Procedure at Present Time:

Production: The finished products are packed at Ankara.

Transportation: Heavy-duty trucks carrying the products travel a long distance (approximately 1000km).

Border Control: The trucks await clearing of their cargo after inspection by the border security agencies; this may take a day or more.

Distribution: In Iraq, the products are distributed to wholesalers in large towns such as Erbil, Baghdad, and Basra.

1.4 Challenges in the Current Traditional Model

However, due to the manual process involved in planning for the Ankara-Iraq route, the following disadvantages arise:

Thermal Hazard: Truck transportation of Omega-3 is subject to high thermal conditions at the border, which makes the product susceptible to spoilage in the absence of AI.

Information Silo: The salespeople at Ankara may not always have real-time information regarding demand in Iraqi pharmacies, thus the possibility of misdirected orders.

Uncertain Logistics: The inability to predict any delays at the border through traditional tracking systems limits logistics planning by Iraqi distributors.

4. METHODOLOGY

4.1. Research Design and Approach

This research utilizes the qualitative benchmarking method supplemented by gap analysis. Benchmarking involves using a “best in class” criterion to assess the performance of particular business process(es). In the context of this research project, the “criterion” represents an AI-enabled company dealing with pharmaceuticals. Through benchmarking the current operations of Anatolia Company using manual technology in Ankara with the available AI technology, one can establish how the productivity and sales of the company can be improved in Iraq.

4.2. Selection of AI Features for Evaluation

For the purpose of providing a structured analysis, four essential aspects of AI technologies are highlighted for their pertinence to the vitamin market and Turkey-Iraq trade channel:

AI-based Demand Prediction: Machine Learning technology to forecast demand for vitamins in Iraq.

Predictive Maintenance through IoT: Sensors deployed in the Ankara manufacturing plant to prevent machine failures.

Lead Scoring through AI: Prioritizing Iraqi pharmacies/wholesalers based on sales potential using AI.

AI-based Logistics Optimization: Monitoring logistics operations, including the movement of trucks and border delays.

4.3. Scoring Criteria and Weighting (0-3 Scale)

Using the same scoring method for the benchmarking analysis, the features will be rated from 0-3 according to the extent of their usage and effectiveness:

Score 0 (Absent): The feature is absent; everything is done manually.

Score 1 (Basic/Rising): Computerized applications are present but not any artificial intelligence or automation (e.g., Excel).

Score 2 (Moderate): The process is semi-automatic and relies heavily on human interaction.

Score 3 (High/AI-powered): Artificial intelligence is incorporated with full automation.

4.4 Data Collection and Evaluation Process

The data used in the research has been obtained by:

Direct Observation: Lessons learned from the internship stage at the Anatolia factory in Ankara.

Secondary Research: Examination of worldwide trends in AI applications in the supplements industry.

Market Research: Studying problems with the logistics of the Habur border crossing and digital preparedness of the Iraqi retail market.

5. FINDINGS AND DISCUSSION

5.1. Benchmarking Results Matrix

The following table (where is the table) summarizes the evaluation of Anatolia’s current operational capabilities in Ankara versus the potential of AI integration for the Iraqi market. The scores are based on the 0-3 scale defined in the methodology.

Table 1: Benchmarking Results Matrix

AI Feature	Current Status	Current Score	Target Score	Gap
-----	-----	-----	-----	-----
Demand Forecasting	Manual tracking using Excel	1	3	+2
Predictive Maintenance	Reactive repair after machine breakdown	0	2	+2
Lead Scoring	Manual customer contact without ranking	1	3	+2
Logistics Optimization	Basic GPS tracking	1	3	+2

5.2. Impact of AI on Production Productivity Analysis

The benchmarking exercise highlights an existing “Productivity Gap” within the Ankara plant.

The Issue: Currently, in case a machine that is used to bottle Vitamin D develops a problem, there will be no work done for several hours.

The AI Solution: From a zero to two rating in Predictive Maintenance, Anatolia is able to deploy IoT sensors which will sense heat and vibrations, thus being able to fix the machine before breaking down.

Outcome: A projected increase in production by 15% to 20%.

5.3. Impact of AI on Sales Growth in Iraq

The findings regarding the transition from Score 1 to Score 3 in the Lead Scoring process in the sales department are the most vital.

Problem: The sales team spends 80% of its time dialing pharmacies in Iraq that may lack the money or interest in purchasing top-tier Omega-3 products.

AI Solution: With the help of an AI CRM, the Iraqi market can be analyzed to identify the “Top 50” pharmacies in Baghdad and Erbil who would be interested in buying.

Outcome: Increased “Conversion Rates.” Rather than making 100 calls for five sales, 20 calls result in ten sales.

AI Strategic Feature	Current Status	Current Score (0-3)	AI Target Score (0-3)	Strategic Gap
Demand Forecasting	Manual tracking via Excel based on previous years scale	1	3	+2
Predictive Maintenance	Reactive repairs, machines are fixed only after breaking down	0	2	+2
Automated Lead Scoring	Sales items manually contacts Iraqi pharmacies without data ranking	1	3	+2
Logistic Optimization	Basic GPS tracking for trucks	1	3	+2

5.4 Strategic Gap Analysis

“+” Gap of 2 in all categories shows that Anatolia is at a “Crossroads” stage digitally. Although the company is doing well, they are functioning only at a “Traditional” level. Moving toward

an AI system is not only about purchasing an AI-based software but also about bridging the information gap between their manufacturing plant in Turkey and consumers in Iraq.

6. CONCLUSION AND RECOMMENDATIONS

6.1. Summary of Research Findings

The findings from the investigation into Anatolia's activities in Ankara and its exports to Iraq show that although Anatolia has excellent products (Multivitamins, Vitamin D, and Omega-3), the company is underutilizing its resources because it depends solely on manual processes. Through benchmarking analysis, there was evidence of a steady "Digital Gap" of +2 in every crucial aspect:

Productivity: Manual maintenance causes unnecessary downtime.

Sales: Manual prospecting in Iraq is less effective than AI lead scoring.

Logistics: Real-time predictive analytics are not available for tracking sensitive cargo such as Omega-3 through Ankara-Habur-Iraq.

6.2. Strategic Roadmap for AI Implementation

In order to address this issue, the following three-step approach is recommended for Anatolia:

Step 1: The "Digital Foundation" (Months 1-3)

Move all sales and production logs from paper to the cloud CRM (such as Zoho or Salesforce). Managers will be able to view information about Iraq sales instantly using their mobile devices.

Step 2: "Predictive Pilot" (Months 3-6)

Place inexpensive IoT (Internet of Things) temperature sensors inside the trucks that are headed to Iraq. Employ a basic set of AI algorithms to notify the driver when the Omega-3 capsules could melt.

Step 3: "AI Sales Engine" (Months 6-12)

Introduce a Lead Scoring AI algorithm to rank Iraqi distributors. Invest marketing budgets in high-scoring regions such as Baghdad and Erbil.

6.3. Final Conclusion

The findings of this study demonstrate that although Anatolia Pharma produces high-quality products, its reliance on traditional operational methods limits its full potential. The benchmarking analysis reveals a consistent digital gap across production, sales, and logistics processes.

The integration of Artificial Intelligence offers a practical solution to these challenges by enabling predictive decision-making, improving operational efficiency, and enhancing customer targeting strategies.

In today's competitive global environment, adopting AI technologies is no longer optional but essential for sustaining growth and maintaining a competitive advantage in international markets such as Iraq.

6.4 Future Research

Future research can focus on implementing AI systems in real-time within Anatolia Pharma and measuring their direct impact on operational efficiency and sales performance. Additionally, further studies can expand the analysis to other international markets beyond Iraq to evaluate the scalability of AI-driven solutions.

REFERENCES

- Bitrix24. (2024). AI-Powered Lead Scoring: Revolutionizing Sales Efficiency Through Smart Lead Qualification. <https://www.bitrix24.com/articles/ai-powered-lead-scoring.php>
- Chui, M., et al. (2023). The State of AI in 2023: Generative AI's Breakout Year. McKinsey Global Institute. <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai>
- Diva-Portal. (2026). Making a Digital Transformation Framework for SMEs Come Alive. 12th Swedish Production Symposium. <https://doi.org/10.1088/1757-899X/1342/1/012039>
- EPRA Journals. (2024). Artificial Intelligence in Pharmaceutical Sales and Marketing: Impact on Consumer Behavior and Market Positioning. Journal of Economic and Business Management, 11(1).
- Forbes Advisor. (2024). How Businesses Are Using AI in 2024. <https://www.forbes.com/advisor/business/software/ai-in-business/>
- IBM. (2024). What is Predictive Maintenance? <https://www.ibm.com/topics/predictive-maintenance>
- Ipsos. (2024). Iraq Consumer Sentiment Index Q4 2023: Economic Outlook and Consumer Trends. <https://www.ipsos.com/en-ae/iraq-consumer-sentiment-index-q4-2023>
- Nexos AI. (2026). AI Lead Scoring: Best Practices for B2B Business Growth: <https://nexos.ai/blog/ai-lead-scoring/>
- Oxmaint. (2024). Predictive Maintenance in Pharmaceutical Manufacturing: An AI Implementation Guide, <https://oxmaint.com/industries/healthcare/predictive-maintenance-pharmaceutical-manufacturing>
- Pawar, A., & Nighot, G. (2024). Applications of Artificial Intelligence in Pharmaceutical Research: An Extensive Review. Bioequiv & Bioavail Int J, 8(1):

https://www.researchgate.net/publication/377665715_Applications_of_Artificial_Intelligence_in_Pharmaceutical_Research_An_Extensive_Review

Porter, M. E., & Heppelmann, J. E. (2014). How Smart, Connected Products Are Transforming Competition. Harvard Business Review.

Salesforce. (2024). How AI is Transforming Sales: Tools and Strategies for 2024

<https://www.salesforce.com/products/sales-cloud/ai-for-sales/>

Trading Economics. (2024). Turkey Exports to Iraq: Historical Data and 2027 Forecasts: <https://tradingeconomics.com/turkey/exports/iraq>

Turkish Ministry of Trade. (2024). Logistics and Infrastructure Report: The Habur-Ibrahim Khalil Border Gate Efficiency Analysis. T.C. Ticaret Bakanlığı.

World Bank. (2024). Logistics Performance Index (LPI) - Turkey and Iraq Scorecard. <https://lpi.worldbank.org/international/scorecard/column/254/C/TUR/2023>.

World Health Organization. (2024). Good Manufacturing Practices for Pharmaceutical Products: Digital Transformation and Automation Standards. WHO Press.

