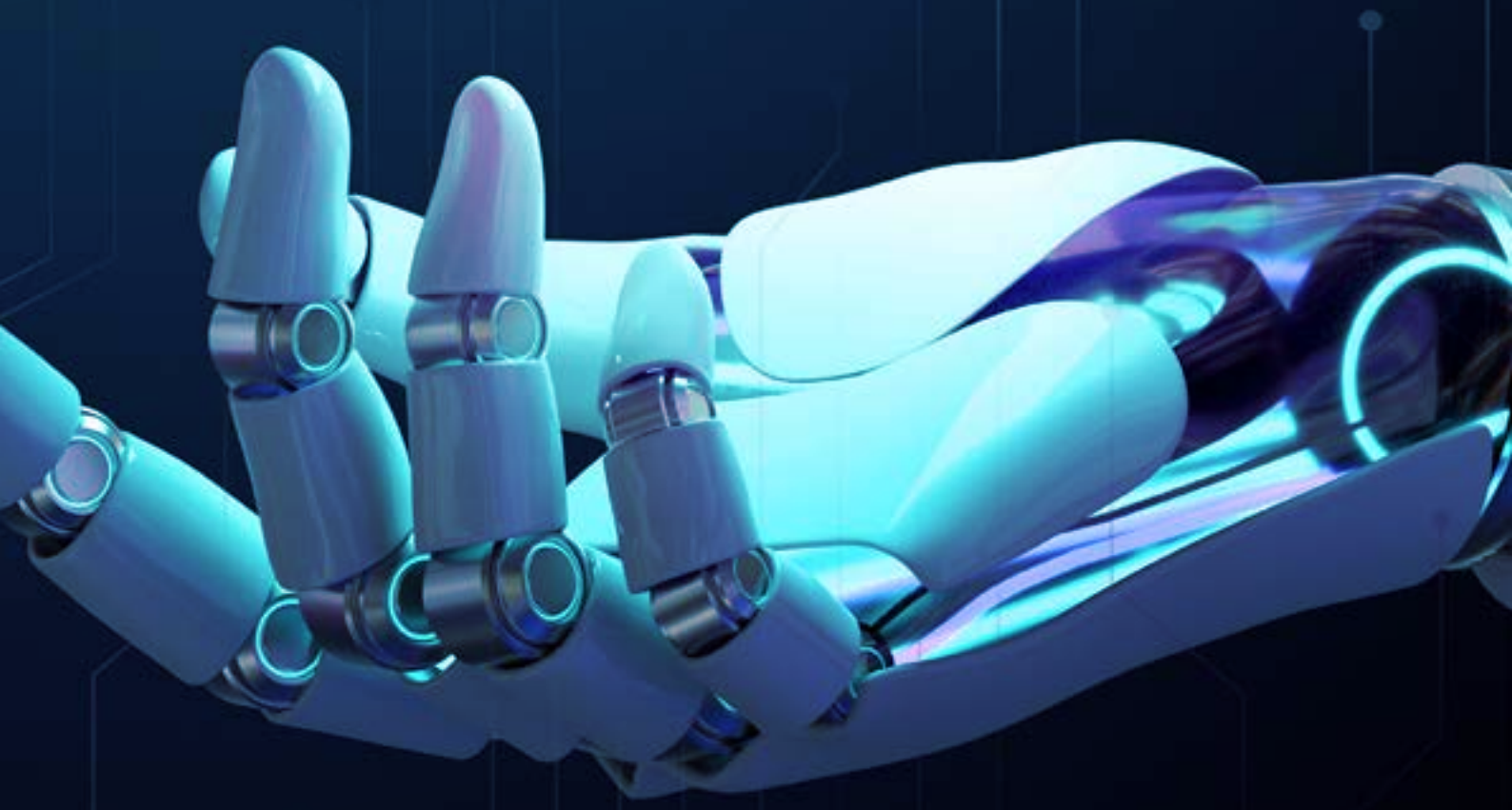
وزارة الاتصالات
وتقنية المعلومات
MINISTRY OF COMMUNICATIONS
AND INFORMATION TECHNOLOGY

AdopTech



AdopTech

As part of its efforts to promote the adoption of Fourth Industrial Revolution (Industry 4.0) technologies, the Ministry of Communications and Information Technology leads this initiative to enable organizations to leverage emerging technologies in addressing operational challenges and improving efficiency.

The initiative focuses on developing and implementing impactful, value-driven use cases across key sectors such as industry, logistics, energy, and mining, which are core to Industry 4.0 transformation. These use cases highlight the positive impact of technology on performance and contribute to building a more advanced and sustainable industrial environment.

This effort strengthens the Kingdom's position as a regional hub for innovation and technology while supporting organizations in their digital transformation journey and long-term growth.This booklet presents a selection of implemented use cases under the initiative, highlighting some of the most notable Industry 4.0 successes.

Digital Transformation in Dry Gas Monitoring

شركة توزيع الغاز الطبيعي
Natural Gas Distribution Company

- **Dry Gas Consumption Monitoring Project for Pipeline Customers**
- **Beneficiary Organization: Natural Gas Distribution Company**
- **Location: Riyadh**

About the Organization: The Natural Gas Distribution Company is a leading provider in the dry natural gas sector. It is the official supplier of dry gas to factories located in Riyadh's Second Industrial City.

Service Provider: E | SQUARE Innovations for life

Technologies Used:

Internet of Things (IoT) - Artificial Intelligence (AI)

The Challenge and Solution:

The organization faced a dual challenge: Managing energy distribution efficiently across industrial clients, which was due to lack of real time tats, and anticipating potential system downtime amid a growing consumer base.

To address this, a smart and integrated solution was developed using Internet of Things (IoT) technologies and artificial intelligence (AI), which enabled real-time monitoring and analysis of consumption and performance data, accurate forecasting of future needs, and early detection of malfunctions.

Key Achievements:

- Reduced fault detection time.
- Improved customer satisfaction through quicker response time to malfunctions.
- Reduced service delivery costs for customers.
- Signing of an expansion agreement between the organization and the technology provider to extend system coverage to all stations.

Smart Technologies for Fire Protection System Manufacturing

ARIF AL-NAHDI CO.LTD.
Fire Pumps & Safety Projects

- **Automated Welding and Quality Assurance with AI**
- **Beneficiary Organization: Aref Al Nahdi Fire Protection Systems**
- **Location: Riyadh**

About the Organization: Aref Al Nahdi Co. Ltd. is a Saudi company specializing in the manufacturing and supply of fire protection systems. The company established its factory in Riyadh in 2013 to produce fire pumps.

Service Provider:

SWARM ROBOTICS

Technologies Used:

Internet of Things (IoT) - Artificial Intelligence (AI)

The Challenge and Solution:

Manual welding of fire system pipes poses significant risks due to its complexity and hazardous nature. This results in slower production rates, quality control issues, and concerns for worker safety.

To overcome these challenges, a fully automated solution was developed using an industrial welding robot powered by Internet of Things (IoT) and Artificial Intelligence (AI) technologies.

The system enables end-to-end automation, from identifying welding points to executing precise, high-quality welds, thus boosting production efficiency, improving welding quality, and significantly reducing risk to human workers.

Key Achievements:

- Improved production efficiency by reducing the welding time per pipe.
- Only one operator needed per shift to run the robot
  Reduced operational costs.
- Enhanced worker safety by minimizing their presence near the welding area and reducing exposure to harmful gases and fumes
  .

Integrated Systems for Smarter Logistics

MML Logistics Services

- **Integrated Transport Systems and Enhanced Logistics Efficiency**
- **Beneficiary Organization: Al-Mudaifer Company for Logistic Services**
- **Location: Riyadh**

About the Organization: The company has been operating in customs clearance and transportation for over 57 years. The company began as a clearing agent for the Tapline Company and has since grown to cover ports and airports across the Kingdom of Saudi Arabia.

Service Provider: CAMION

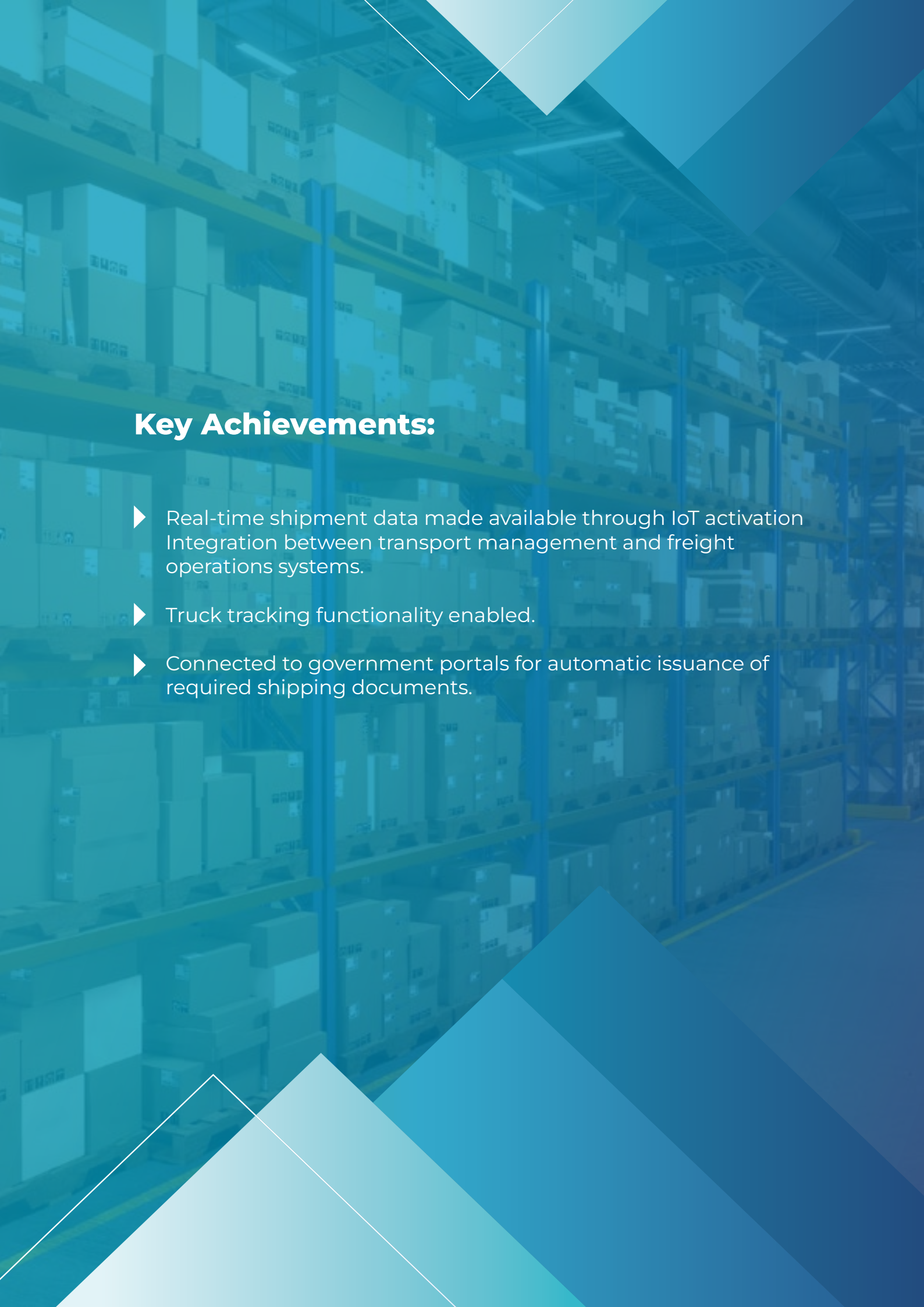
Technologies Used:

Internet of Things (IoT) - Artificial Intelligence (AI)

The Challenge and Solution:

Logistics operations faced major challenges due to reliance on manual processes, lack of system integration, and limited tools for monitoring and analysis. This led to delays, high operational costs, and difficulty in making accurate decisions.

A comprehensive digital freight management system was developed to remedy this, leveraging Internet of Things (IoT) technologies and integrating with relevant government systems. The solution enables real-time tracking of shipments and vehicles, automated data entry, and accurate performance analysis—resulting in improved operational efficiency, reduced waste, and data-driven decision-making.



Key Achievements:

- Real-time shipment data made available through IoT activation Integration between transport management and freight operations systems.
- Truck tracking functionality enabled.
- Connected to government portals for automatic issuance of required shipping documents.

Advanced Systems for Drainage Network Monitoring

- **Monitoring of Manhole Covers and Surrounding Environmental Conditions**
- **Beneficiary Organization: Saudi Cypriot Foundry and Metal Forming Co. Ltd**
- **Location: Jeddah**

About the Organization: Founded in 1977 and based in Jeddah, the Saudi Cypriot Foundry is a leading company in the Kingdom specializing in metal casting and forming. It manufactures a wide range of products including manhole covers, metal alloys, and spare parts.

Service Provider: Sadeem

Technologies Used:

Internet of Things (IoT)

The Challenge and Solution:

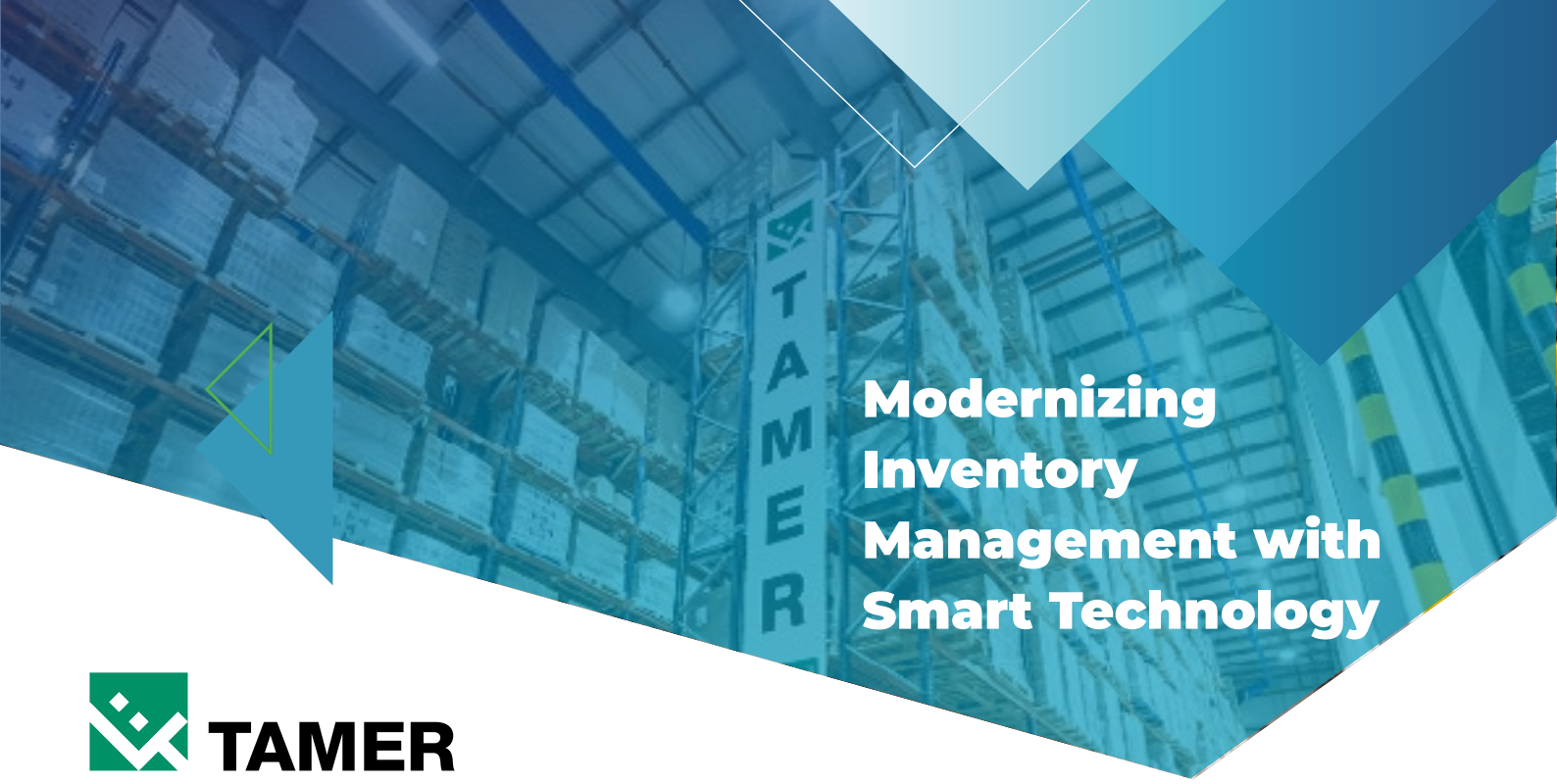
Stormwater drainage networks face critical issues such as theft of manhole covers, unnecessary maintenance costs, and blockage risks caused by environmental pollutants—all in the absence of effective monitoring systems.

The proposed solution is a smart system based on IoT technologies and advanced sensors that enable real-time monitoring of cover status, water levels, and ambient temperature.

This system ensures faster emergency response, minimizes flood risks, improves infrastructure performance, and supports the objectives of public safety and smart city development.

Key Achievements:

- Enhanced local product competitiveness in domestic and international markets through the production of smart manhole covers.
- Compliance with national digital transformation initiatives and updated cover standards.
- Implementation of a real-time monitoring system for water levels, cover movement, and temperature.



Modernizing Inventory Management with Smart Technology

TAMER

- **Automating Inventory Scanning and Management in Warehouses**
- **Beneficiary Organization: TAMER Logistics**
- **Location: Riyadh**

About the Organization: Established in 2011 by Tamer Group, TAMER Logistics is headquartered in Jeddah with branches in seven major cities across the Kingdom. The company provides integrated logistics solutions across the supply chain and is a leading provider in the consumer goods, healthcare, and cosmetics sectors.

Service Provider:

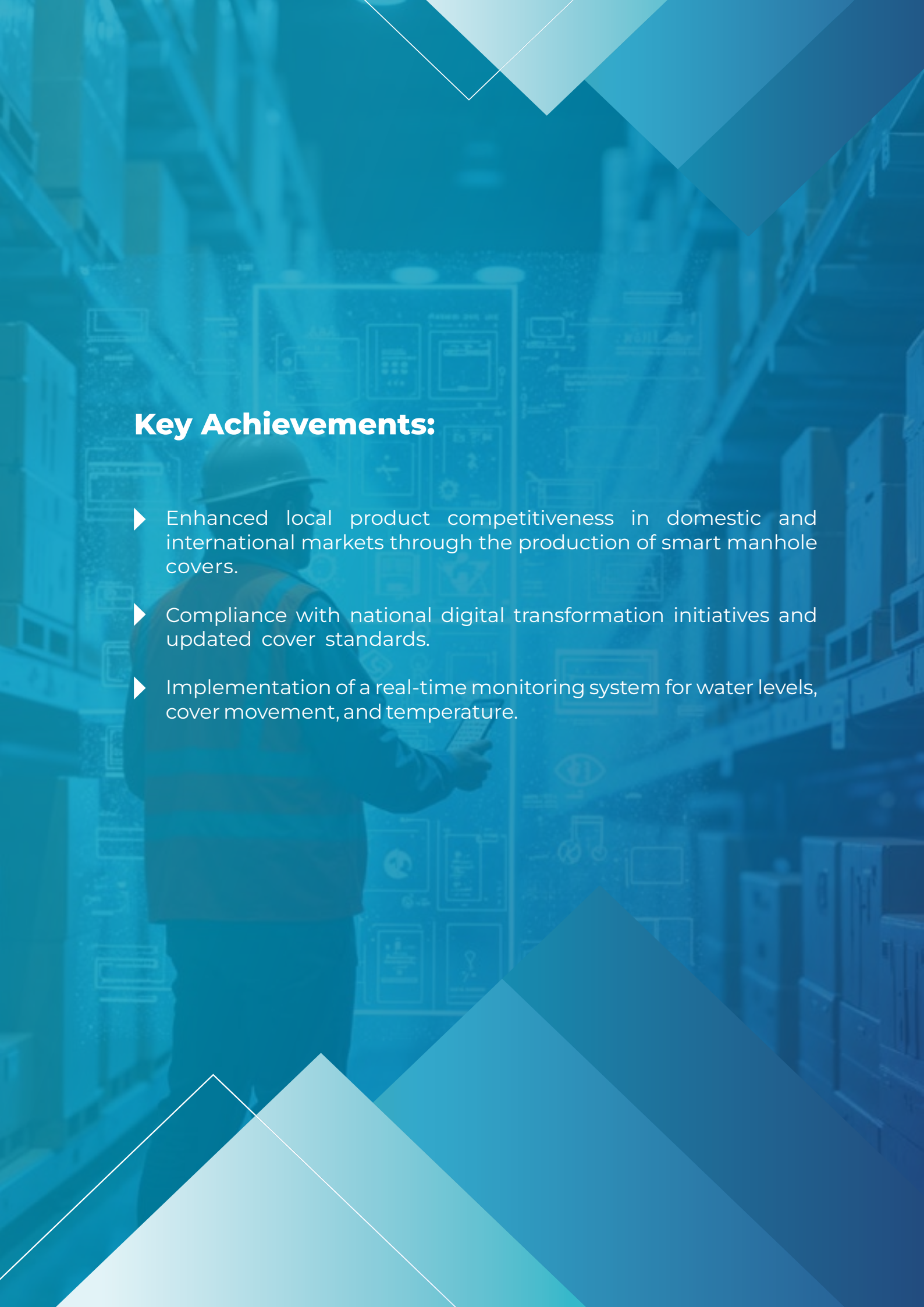
Invdro

Technologies Used:

Artificial Intelligence (AI) - Digital Twin - Drones

The Challenge and Solution:

Traditional inventory practices rely heavily on manual labor and equipment, leading to slow processes, operational disruptions, high costs, and frequent errors. The solution was to automate stocktaking using AI-powered drones that swiftly and accurately scan inventory without interruptions to operations. The system integrates with warehouse management software, enabling high-efficiency performance and real-time data accuracy. This leads to a significant boost in inventory efficiency, reduced operational costs, and greater data reliability.



Key Achievements:

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- Implementation of a real-time monitoring system for water levels, cover movement, and temperature.

Improving Internal Warehouse Transport with Autonomous Vehicles

- **Deploying Autonomous Vehicles for Intra-Warehouse Transport**
- **Beneficiary Organization: MAS Logistics**
- **Location: Riyadh**

About the Organization: MAS Logistics is a Saudi company established in 2014 by the MAS Group, headquartered in Riyadh. The company offers a broad range of integrated logistics services including catering, warehousing, transportation and delivery, inventory management, as well as additional services like packing and sorting.

Service Provider: RIYADH DYNAMICS

Technologies Used:

Artificial Intelligence (AI) - AMR - IoT

The Challenge and Solution:

Warehouses face operational challenges due to reliance on manual processes for inventory handling and internal transport.

The solution involves automating warehouse transport using Autonomous Mobile Robots (AMRs) supported by IoT and AI technologies. These vehicles perform tasks with high accuracy and efficiency, intelligently interacting with their environment. This solution enhances productivity, reduces errors, and accelerates processes beyond traditional methods.

Key Achievements:

- Enhanced local product competitiveness in domestic and international markets through the production of smart manhole covers.
- Compliance with national digital transformation initiatives and updated cover standards.
- Implementation of a real-time monitoring system for water levels, cover movement, and temperature.

Implementing IoT Solutions for Production Monitoring and Analysis

شركة أراك للمنتجات البلاستيكية
Arak Plastic Products Company

- **Monitoring Production Operations with Operational Planning for Customer Orders**
- **Beneficiary Organization: Arak Plastic Products Company**
- **Location: Riyadh**

About the Organization: Established in 1991 in the Second Industrial City of Riyadh, Arak Plastic Products specializes in manufacturing a wide range of plastic film products serving diverse customer segments. Its product range includes table covers, garbage bags, shopping bags, flexible packaging rolls, and adhesive sealing rolls.

Service Provider:

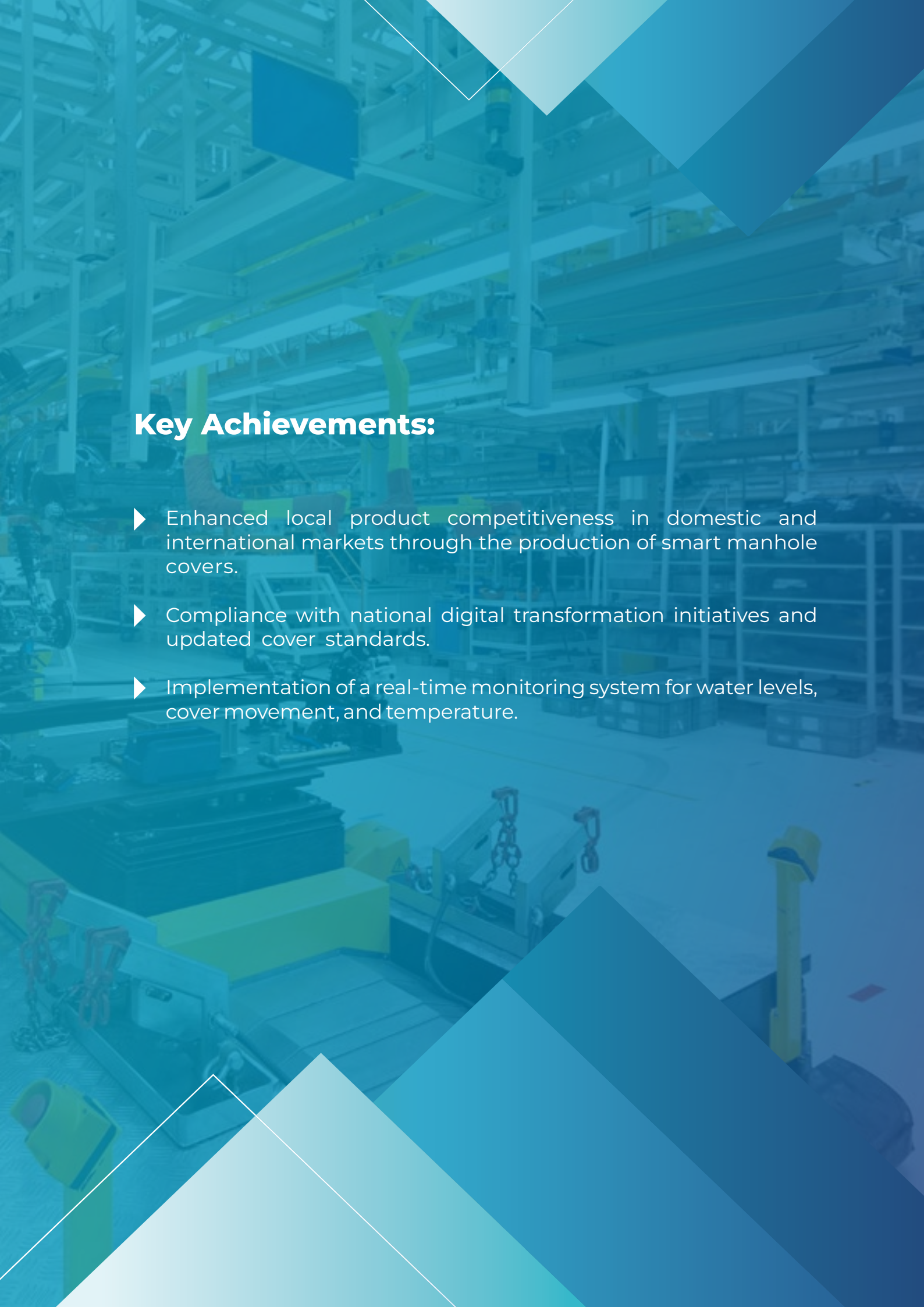
BMS
Beyound Modern Systems

Technologies Used:

IoT

The Challenge and Solution:

The company faces challenges in tracking performance indicators of production operations and supply chains due to reliance on manual data collection and reporting. This negatively impacts order planning, scheduling, and capacity determination. The solution involved implementing IoT technologies to connect production lines and machinery, enabling real-time performance monitoring and data analysis. This contributes to enhancing operational efficiency, accelerating response to changes, and supporting precise decision-making to effectively meet customer demands.



Key Achievements:

- Enhanced local product competitiveness in domestic and international markets through the production of smart manhole covers.
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- Implementation of a real-time monitoring system for water levels, cover movement, and temperature.

Enhancing Fuel Station Efficiency with Digital Twin Technology

- **Implementing Fuel Station Monitoring and Management System Using Digital Twin Technology**
- **Beneficiary Organization: Darb Fuel Company Limited**
- **Location: Mecca / Jeddah**

About the Organization: A specialized company providing petroleum and automotive services, founded through continuous Saudi efforts. Since its inception, the company has achieved rapid growth and outstanding results, consistently striving to deliver the best services to its customers.

Service Provider:

Virtual Dimensions
الأبعاد الإفتراضية

Technologies Used:

IoT - Digital Twin - Artificial Intelligence (AI)

The Challenge and Solution:

Fuel stations face difficulties in monitoring performance indicators, limiting their ability to respond quickly and improve operational efficiency. Predicting faults amid increasing demand is also difficult. The solution was to develop an integrated digital twin system based on IoT and artificial intelligence technologies. This system enables real-time monitoring and performance analysis, early fault prediction, and improved energy consumption and transportation management. The solution enhances operational continuity, supports data-driven decision-making, and meets the requirements for smart station operations.

Key Achievements:

- Creation of a 3D model matching three existing stations, linked to all sensors and IoT devices in the stations.
- The system includes an AI model to monitor worker behavior and performance indicators, issuing alerts upon violations.
- Real-time readings of consumption indicators (flow, pressure, evaporation rates, temperature, leakage, and consumption per pump).

  Reduction of operational costs.

Optimizing Energy Efficiency for Operational Equipment

- **Implementing Smart System to Rationalize Consumption Based on Operational Patterns**
- **Beneficiary Organization: Safa Makkah Water Company**
- **Location: Mecca**

About the Organization: Established in 1976 in Mecca, the company is a leading producer and exporter of bottled drinking water to Gulf countries and other international markets. The production process was supervised by the French company Evian to ensure high quality.

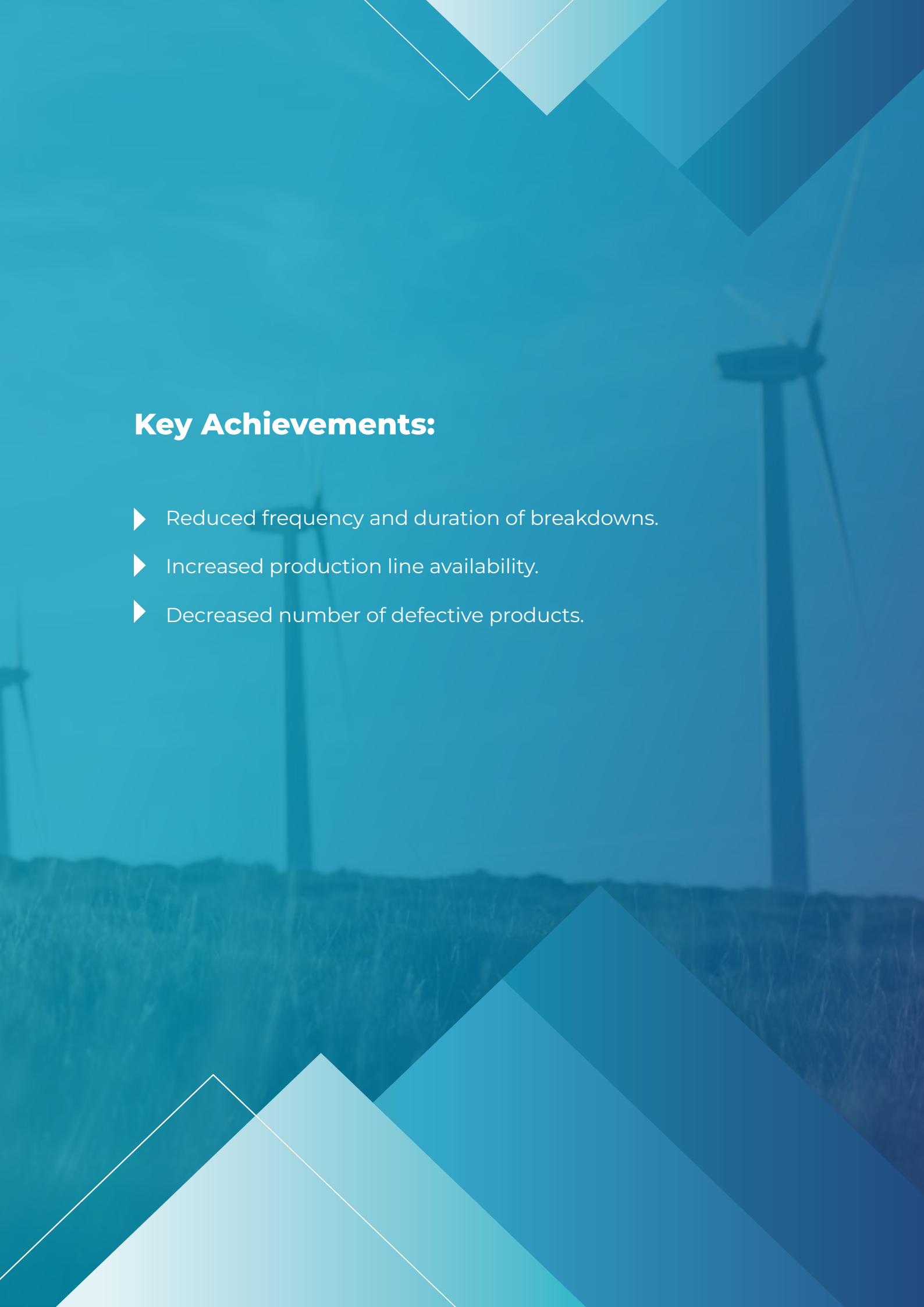
Service Provider: gns. Embrace innovation

Technologies Used:

IoT - VF Drive

The Challenge and Solution:

The facility struggles with energy wastage and the impact of sudden electrical current fluctuations on equipment stability and efficiency. The solution involves implementing a smart system based on IoT technologies to control the speed of electric motors using variable frequency drives, allowing energy consumption adjustment based on actual demand. The system also monitors vital data such as voltage, current, and consumed energy in real time, which helps improve energy efficiency, protect equipment, and sustainably reduce operational costs.



Key Achievements:

- Reduced frequency and duration of breakdowns.
- Increased production line availability.
- Decreased number of defective products.

Enhancing Environmental Monitoring

اسمنت اليمامة
YAMAMA CEMENT

- **Implementing Smart System to Rationalize Consumption Based on Operational Patterns**
- **Beneficiary Organization: Yamamah Cement**
- **Location: Riyadh**

About the Organization: Founded in 1956, Yamama Cement Company is one of Saudi Arabia's oldest cement producers, headquartered in Riyadh. It specializes in manufacturing cement and related products, as well as trading domestically and internationally.

Service Provider:

EVOSTEL

Technologies Used:

IoT - AI

The Challenge and Solution:

The factory experienced difficulties in accurately tracking sources of air pollution and lacked real-time data on pollutant types and levels, hindering effective decision-making for environmental protection and worker safety. The solution involved implementing a smart air quality monitoring system using advanced sensors, IoT, and AI technologies, enabling real-time data collection and analysis with instant alerts when thresholds are exceeded. This system also provides an analytical database that helps mitigate environmental risks and sustainably improve workplace conditions.

Key Achievements:

- The system generates detailed reports on pollution levels with real-time monitoring of all indicators and instant readings.
- Significant reduction in pollution levels.
- Reduced annual maintenance costs.

Smart Energy Control for Mining Operations

- **Energy Management and Optimization System**
- **Beneficiary Organization: United Mining Industries Company Ltd.**
- **Location: Yanbu**

About the Organization: Founded in 2006 and listed on the Saudi stock market in October 2023, the company is a joint venture between three leading construction companies: Al Jibs Al Ahliya, Al Wakeel, and Al Omran. It holds a distinguished position in producing gypsum products for local and regional markets.

Service Provider: PYLON

Technologies Used:
IoT - AI

The Challenge and Solution:
The company faced challenges in energy efficiency, including high costs and frequent faults. An integrated smart system based on IoT and AI was implemented to monitor energy consumption in real time, detect abnormal patterns early, and issue instant alerts. The system includes a virtual AI assistant that provides tailored analyses and recommendations to optimize consumption and sustainably improve operational efficiency.

Key Achievements:

- Real-time monitoring of equipment performance and energy consumption.
- Reduction in electrical faults.
- Improved energy efficiency and cost reduction.
- Decreased carbon emissions.

Smart Data Management and Process Automation in Labs

MEFSCO
مفسكو
شركة الشرق الأوسط لحلول الأغذية
Middle East Food Solutions Company

- **Implementing a Laboratory Quality Management System (LIMS)**
- **Beneficiary Organization: Middle East Food Solutions Company (MEFSCO)**
- **Location: Riyadh**

About the Organization: Founded in 2013, MEFSCO is a leading Saudi company in the production of food and animal feed. Formerly known as "Arasco Corn Products," it now serves as Arasco's manufacturing arm for corn starch and glucose syrup.

Service Provider: SIEMENS

Technologies Used:

IoT - AI - Machine learning

The Challenge and Solution:

The organization is facing a challenge in integrating inspection devices, data analysis, and results documentation, which impacts the accuracy of testing and operational efficiency. The proposed solution lies in developing a comprehensive digital laboratory system that leverages Internet of Things (IoT) and Artificial Intelligence (AI) technologies to automate data collection and analysis, and to connect devices with the Laboratory Information Management System (LIMS). The solution also includes digitizing archiving processes and documenting procedures to ensure quick access to information, reduce waste, and enhance the quality and efficiency of operations.

Key Achievements:

- Faster collection, processing, analysis, and reporting of lab data.
- Increased test accuracy by integrating lab equipment with the LIMS.
- Significant reduction or elimination of paper-based processes

Real-Time Monitoring for Safer Transport

- **Driver Behavior Monitoring and Preventive Alert System**
- **Beneficiary Organization: Mahmal Al-Madina Company**
- **Location: Madinah**

About the Organization: Mahmal Al-Madina Water Company was established in 2016 and began production in January 2018, aiming to provide bottled drinking water in the Madinah and Riyadh regions. The company deploys world-class water treatment technologies and operates fully automated production lines that eliminate the need for manual labor.

Service Provider:

AUTILENT

Technologies Used:

IoT - AI

The Challenge and Solution:

The company faced challenges in effectively monitoring driver behavior, posing risks to vehicle and passenger safety, along with difficulties in accurately tracking locations and working hours.The proposed solution involved implementing an integrated smart system powered by IoT, Artificial Intelligence, and Advanced Driver Assistance Systems (ADAS). This solution monitors driver behavior, analyzes potential risks, issues real-time alerts, and identifies unsafe behaviors and driver identity.It enhances overall safety, supports regulatory compliance, and provides accurate data to optimize fleet management and improve operational efficiency.

Key Achievements:

- Reduced vehicle idle time.
- Lower fuel consumption.
- Fewer traffic violations.

Data-Driven Efficiency in IndustrialOperations

- **Real-Time Monitoring of Manufacturing Operations**
- **Beneficiary Organization: National Manufacturing Company / Taldeen**
- **Location: Ha'il**

About the Organization: Taldin is a newly established company based in Ha'il, providing specialized plastic solutions across four key sectors: piping, agriculture, water, and general plastic applications. The company leverages cutting-edge technologies to ensure the highest standards of production quality and efficiency.

Service Provider:

AL ERADA
Promoting Innovation

Technologies Used:

IoT - AI

The Challenge and Solution:

The company is facing a challenge in obtaining a comprehensive and real-time view of its production operations, which impacts response speed. The solution was to develop a unified platform leveraging Internet of Things (IoT) and Artificial Intelligence (AI) technologies, enabling real-time monitoring and analysis of machine and operational data. The platform contributed to operational sustainability and waste reduction by supporting strategic decision-making based on accurate and immediate data.

Key Achievements:

- Digitized monitoring of production metrics (operation rate, production rate, runtime), leading to improved decision-making and productivity.
- Enhanced Overall Equipment Effectiveness (OEE).
  Reduced waste levels.
- Minimized unplanned downtime.

On-Demand Spare Parts, Locally Made

- **Spare Parts Management and 3D Printing**
- **Beneficiary Organization: Southern Province Cement Company**
- **Location: Bisha**

About the Organization: Founded in 1978, Southern Province Cement Company specializes in the manufacturing and production of cement and its derivatives. It is one of the largest cement producers in the Middle East and actively participates in events organized by chambers of commerce, the Arab Union for Cement and Building Materials, and international cement industry conferences.

Service Provider:

nami
a 3D Printing Company

Technologies Used:

3D Printing

The Challenge and Solution:

The company faced significant challenges due to delays and high costs associated with importing spare parts, compounded by the lack of local alternatives. This forced the company to stockpile large quantities to avoid unplanned downtimes, increasing operational burden and storage costs.

The proposed solution involved utilizing scanning and 3D printing technologies to locally manufacture spare parts on demand using accurate digital models that match original specifications.

This approach reduced lead times from months to days, lowered overall costs, and improved the flexibility and sustainability of the supply chain.

Key Achievements:

- Reduced delays in spare part delivery.
- Enabled local availability through advanced technologies.
- Lowered storage costs and freed up space.

Reducing Waste by Optimizing Distribution with AI

- **Enhancing Poultry Supply Chain Using AI Through Accurate Demand Forecasting and Distribution**
- **Beneficiary Organization: National Poultry Company**
- **Location: Qassim**

About the Organization: As one of the leading poultry producers in the Middle East, the National Poultry Company plays a vital role in national food security. The company produces over one million chickens and 1.5 million eggs daily, supported by an extensive distribution network that ensures efficient delivery to diverse markets,

Service Provider:

hyper solutions

Technologies Used:

AI

The Challenge and Solution:

The company struggled with waste caused by product expiry, negatively affecting efficiency and profitability.

Artificial intelligence was applied to analyze historical data, seasonal, and economic factors to deliver accurate demand forecasts and optimize distribution decisions.

This smart system boosts supply chain efficiency, reduces waste, and achieves an optimal balance between production and demand with high effectiveness.

Key Achievements:

- Improved accuracy of demand forecasting.
- Reduced return rates.
- Enhanced planning flexibility to minimize waste and adapt to changing market needs.

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Thank you