

**Saudi Arabia**  
Centre for the  
Fourth Industrial  
Revolution

**WORLD  
ECONOMIC  
FORUM**

# Digital Transformation for SMEs: A Strategic Framework

**BRIEFING PAPER**  
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# Foreword



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Small and medium-sized enterprises (SMEs) are the backbone of thriving economies worldwide, and Saudi Arabia is no exception. Their agility, innovative capacities and potential to drive growth and job creation are critical to national economic success. The adoption of the industrial internet of things (IIoT) by SMEs presents significant opportunities, such as enhanced productivity, reduced operational costs and predictive maintenance, which can minimize downtime and extend equipment lifespan. However, this journey is not without challenges, including financial constraints, gaps in technical expertise and regulatory hurdles.

A comprehensive, multifaceted strategic framework is crucial for facilitating IIoT adoption among SMEs in Saudi Arabia. This framework should encompass incentive mechanisms, education and training, stakeholder engagement and robust digital infrastructure development. Pilot programmes, capacity-building initiatives and government-backed

financial incentives can be instrumental in lowering entry barriers, bridging expertise gaps and fostering a supportive ecosystem that encourages innovation and sustainability.

The insights presented in this paper offer a detailed overview of the opportunities and challenges associated with IIoT integration in SMEs in Saudi Arabia. It outlines policy recommendations focused on financial incentives, regulatory support and infrastructure development, providing a blueprint for a strategic framework to support SMEs. By aligning with global best practices and its Vision 2030, Saudi Arabia can position itself as a global leader in technology adoption, ensuring long-term economic resilience and diversification. This paper is an essential resource for policy-makers, business leaders and stakeholders committed to advancing digital transformation and fostering a sustainable and competitive industrial landscape.

# Introduction

The opportunities presented by digital transformation are vast, including enhanced operational efficiency, improved decision-making, opening up of new business models, increased competitiveness and support for sustainable practices. For small and medium-sized enterprises (SMEs), adopting digital technologies is particularly transformative. Studies show that SMEs that embrace digital tools can achieve up to 25% productivity improvements<sup>1</sup> and reduce operational costs by up to 30% through automation and improved resource management.<sup>2</sup>

This briefing paper outlines policy recommendations to support and incentivize the adoption of digital technologies by SMEs. In Saudi Arabia, this effort is part of the larger strategy to develop local capabilities, enhance operational efficiency, reduce costs and improve global competitiveness. The insights and recommendations in this paper are based on a multistakeholder effort in Saudi Arabia, involving workshops, interviews and surveys with key stakeholders from the public and private sectors.



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# Strategic approach and cross-sector collaborations

To help SMEs effectively integrate digital technologies in their workflows and processes, the IIoT for SMEs project led by the Centre for the Fourth Industrial Revolution Saudi Arabia adopts a multi-pronged approach to identify the pain

points and formulate well-informed solutions to address them. The approach involves engaging stakeholders, conducting market and regional analyses, benchmarking against global best practices and launching pilot programmes.

## 1.1 Stakeholder engagement

A key aspect of identifying needs is direct engagement with stakeholders, including SME owners, industry experts, government officials and technology providers. Through interviews, surveys, seminars/webinars and workshops, the project has gained valuable insights into SMEs' real-world challenges. These include financial constraints, technological barriers and lack of awareness about the advantages of adopting IIoT solutions.

Building on this, the project has fostered a collaborative community of stakeholders to create a supportive ecosystem for knowledge-sharing and collaboration. By leveraging insights from these engagements, clear, measurable goals have been

set, aligning with the needs of Saudi Arabia's SMEs such as workforce upskilling and job creation in their journey to IIoT adoption.

This collaborative approach has facilitated the sharing of best practices, challenges and success stories, helping SMEs stay current with the rapid technological changes of the Fourth Industrial Revolution. The community-driven model has ensured that the knowledge gained is effectively disseminated and sustained. Moreover, this collective effort has incentivized all participants to take ownership and contribute actively, fostering a sense of shared responsibility and commitment to the project's success.

## 1.2 Market research and industry assessment

The project team has conducted comprehensive research to analyse the current state of IIoT adoption in various industries across Saudi Arabia. It has included assessments, a study of existing technological capabilities and digital maturity levels among SMEs, and identification of gaps in adoption due to reasons such as outdated systems and infrastructure inadequacies.

The project has conducted a sector-specific and regional analysis to identify industries where IIoT

adoption could have the most significant impact. This analysis has been based on data collected from different initiatives and assessments undertaken by the public sector in Saudi Arabia. This includes sectors such as manufacturing, logistics and energy, which are critical to Saudi Arabia's economy. Additionally, regional factors, such as the availability of technological infrastructure, skilled workforce and support from local authorities, have been evaluated to tailor solutions to the needs of different areas across the kingdom.

## 1.3 Benchmarking

The needs assessment has also involved benchmarking Saudi Arabia's IIoT adoption against global best practices. This has helped identify where the country lags and what steps could be taken to accelerate progress. The benchmarking

process, coupled with market research and industry assessment, has helped identify specific areas where upskilling, technological upgrades and policy support are necessary.

## 1.4 Pilot programmes and prototypes

The previous steps have helped inform the early-stage pilot programmes and prototypes to test IIoT solutions in controlled environments. Feedback from these pilots has provided concrete data on the specific needs of SMEs, such as the need for training programmes, financial incentives and technical support. It has also helped refine the solutions to ensure they are practical and scalable.

The needs identification process has been closely aligned with Saudi Arabia's Vision 2030.<sup>3</sup> The project has considered national strategic goals such as economic diversification, job creation and workforce development. The identified needs, therefore, have focused on creating long-term and sustainable impacts.

With the community in place, the project has moved on to prototyping and implementing a pilot programme. This phase involves developing and testing IIoT solutions in a controlled environment to validate their effectiveness – to generate proofs of concept – in order to identify potential improvements and leverage these for creating awareness among SMEs. By starting with small-scale experiments, the approach can be refined before scaling up.

The prototype project has been developed partly from the recommendations of the Smart Industry Readiness Index (SIRI) assessment, which aims to equip companies with insights on the maturity of

their organizations and facilities, and into how they can improve in a targeted and incremental manner. Created by the Singapore Economic Development Board (EDB) in partnership with a network of leading technology companies, consultancy firms and industry and academic experts, SIRI comprises a suite of frameworks and tools to help manufacturers “regardless of their size and industry” to start, scale and sustain their manufacturing transformation journeys.

One of the opportunities identified by SIRI assessment in Saudi Arabia is to equip legacy machines with external sensors to allow for real-time data collection on various operational metrics, such as temperature, vibration and usage patterns. Implementing this pilot has shown that upgrading legacy machines with sensors is often more cost-effective than complete replacement – it leverages existing equipment while adding new capabilities. This approach allows and incentivizes companies to modernize their operations without the significant capital expenditure associated with purchasing new machines.

All through its functioning, the project has continuously monitored progress and gathered feedback from stakeholders. This has enabled the necessary adjustments and improvements, ensuring that the project remains aligned with its goals and the evolving needs of the ecosystem.

# The opportunities and challenges of IIoT solutions for SMEs

## 2.1 Opportunities

IIoT technology is transforming the way SMEs operate. With a robust growth rate of 12-15% annually, the Saudi IIoT market, particularly in the industrial sector, is flourishing. Government initiatives such as industrial zones and the National Industrial Development and Logistics Programme (NIDLDP) are further encouraging IIoT adoption in the industrial sector, fostering economic diversification and sustainability.

The real-time insights that IIoT provides reduce guesswork, minimize risks and improve resource allocation. Additionally, IIoT data allows SMEs to tailor products and services to customer preferences, boosting satisfaction and loyalty.

### Enhanced operational efficiency

IIoT technologies provide real-time visibility into operations. Through continuous monitoring and data collection, organizations can optimize resource allocation, reduce costs and make data-driven decisions. SMEs can significantly benefit from IIoT by implementing solutions for:

- **Predictive maintenance:** Identifying potential equipment failures before they occur, minimizing downtime and maintenance costs.
- **Inventory management:** Tracking stock levels in real time, preventing stockouts and overstocking and helping optimize supply chain logistics.
- **Supply chain optimization:** Improving supply chain visibility, reducing lead times and enhancing overall efficiency.

By harnessing the power of IIoT, SMEs can gain a competitive edge, improve customer satisfaction and drive sustainable growth. This translates into better customer service, with shorter delivery times and improved product quality driving an estimated 15% increase in customer retention.<sup>4</sup>

### Improved decision-making

IIoT empowers SMEs with real-time data analytics, facilitating effective decision-making. By leveraging actionable insights, businesses can:

- **Enhance customer satisfaction:** Anticipate customer needs, personalize interactions and address issues promptly.
- **Optimize marketing strategies:** Tailor campaigns based on customer behaviour and preferences, increasing the return on investment.
- **Streamline operations:** Identify bottlenecks, optimize resource allocation and improve overall efficiency.

IIoT-driven data analytics provide the foundation for a more agile and competitive business.

### New business models

IIoT is a catalyst for innovation, enabling SMEs to explore new business models. By connecting physical assets to the digital world, businesses can:

- **Create subscription-based services:** Offer ongoing value to customers through data-driven services and product usage monitoring.

**Example: MachineMetrics (United States (US))** is an SME offering a platform for manufacturers that provides machine data analytics. It offers subscription-based services where customers can monitor the performance of their machines in real time, predict maintenance needs and optimize production processes. This helps manufacturers reduce downtime and improve efficiency.

- **Provide remote monitoring solutions:** Deliver proactive maintenance, asset management and performance optimization services.

**Example: Senseye (United Kingdom (UK))** offers predictive maintenance software that remotely monitors industrial equipment. Its platform uses data from sensors to predict potential failures, allowing companies to perform maintenance before a breakdown occurs. This proactive approach helps reduce downtime and extends the life of equipment, providing significant value to manufacturers.

- **Develop customized product offerings:** Utilize real-time data to tailor products and services to individual customer preferences.

**Example: Ekso Bionics (US)** specializes in developing exoskeletons and wearable robotics for industrial applications, such as in construction and manufacturing. The company uses real-time data to customize its exoskeleton solutions for different industrial environments and user requirements.

These IIoT-driven business models not only generate new revenue streams but also foster deeper customer relationships and brand loyalty.

## Increased competitiveness

IIoT has levelled the playing field, empowering SMEs to challenge larger competitors. By embracing IIoT, small businesses can:

- **Achieve operational scalability:** Handle increased demand and growth without compromising efficiency or quality.

- **Enhance product quality:** Utilize IIoT data for continuous improvement and defect reduction.

- **Deliver differentiated services:** Offer unique value propositions through personalized and data-driven offerings.

For example, an SME specializing in custom packaging solutions uses IIoT to offer personalized packaging designs based on real-time customer feedback and market trends. This data-driven approach allows the company to provide unique packaging solutions that larger competitors may not offer, creating a niche market for its services.

## Support for sustainable practices

IIoT is a valuable asset for SMEs seeking to decrease their environmental impact while increasing profitability. By leveraging IIoT, businesses can:

- **Optimize energy consumption:** Monitor energy usage in real time, identify inefficiencies and implement energy-saving measures.
- **Minimize waste:** Track inventory levels and optimize packaging to minimize waste.
- **Enhance resource utilization:** Optimize water usage, improve supply chain efficiency and reduce waste through data-driven insights.

Embracing sustainability through IIoT benefits the planet while enhancing a company's reputation, attracting environmentally conscious customers and enabling cost savings.

## 2.2 Challenges

While the adoption of IIoT offers transformative potential for SMEs, several significant challenges must be addressed to fully realize these benefits. The following key barriers – financial constraints, gaps in technical expertise, regulatory requirements, connectivity issues and difficulty of integration with existing systems – highlight the complexities that SMEs face in embracing IIoT technologies.

### Financial constraints

Initial investment costs and ongoing maintenance expenses represent a financial barrier hindering IIoT adoption among SMEs. The outlay required for hardware, software, installation and ongoing support

often outweighs perceived short-term benefits, deterring many businesses from embracing this transformative technology. To bridge this gap and foster wider IIoT adoption, accessible financing options and government incentives are essential.

### Gaps in technical expertise

A lack of skilled personnel and technical expertise significantly hinders IIoT adoption among SMEs. Many small businesses lack the in-house capabilities to effectively plan, implement and manage IIoT projects. Comprehensive training and capacity-building programmes are therefore essential to equip SMEs with the necessary skills.



## **Regulatory requirements**

The complex and evolving regulatory landscape surrounding IIoT presents a significant challenge for SMEs. Adhering to data privacy, cybersecurity and other relevant regulations can be time-consuming and resource-intensive. To facilitate IIoT adoption, clear and actionable guidelines, as well as dedicated compliance support, are essential.

## **Connectivity and infrastructure issues**

Reliable internet connectivity and robust digital infrastructure are prerequisites for successful IIoT implementation. SMEs operating in remote or underserved areas often face significant challenges due to limited network coverage, low bandwidth and unreliable connectivity. These infrastructure gaps can hinder IIoT adoption and limit its potential benefits.

## **Difficulty of integration with existing systems**

Integrating IIoT solutions with legacy systems can be challenging for SMEs due to compatibility issues, integration costs and potential disruptions to existing operations. The need for scalable and interoperable IIoT solutions that can seamlessly integrate with existing technologies is crucial for successful adoption.

# 3

# Policy recommendations

To address the identified challenges and facilitate IIoT adoption among SMEs, the following policy recommendations are proposed.

## 3.1 Financial incentives and support

### Public-private partnerships

- Encourage collaboration between the government, private sector and financial institutions to create innovative financing models for IIoT projects. A concrete example is Seedra Ventures. Seedra is a Saudi equity crowdfunding platform that allows investors to fund early-stage start-ups, including those in the IIoT space. This model provides SMEs

with alternative financing options by connecting them with a network of investors interested in technological innovations.

- Build a portfolio based on industry’s technological needs and support development of new companies as well as growth of existing ones.
- Establish a direct investment fund supported by public and private stakeholders.

### BOX 1

#### Main digitization

The Main Digitization Track initiative led by the Saudi Ministry of Industry and Mineral Resources aims to increase the productivity, competitiveness and operational efficiency of factories with main digitization<sup>5</sup> and automation. Solutions include:

- Resource planning.
- Customer relationship management and production planning systems.

- Communication and control systems for production lines.
- Material handling systems (such as cranes and warehouse management systems).
- IIoT software and sensors.

The programme covers 80% of the cost of the solution for selected factories and compensates for up to SAR 300,000.

### IIoT funding programmes

- Establish dedicated funding programmes with clear eligibility criteria and application processes to streamline the application process for SMEs.
- Include Industry 4.0<sup>6</sup> projects in existing industrial loan programmes and create specific processes, teams and features.
- Offer tax and investment incentives.
- Cover a share of training costs related to upskilling existing workers towards Industry 4.0 needs, through the Industry 4.0 Capability Centres initiative and other institutions – including the newly inaugurated Centre for the Fourth Industrial Revolution Saudi Arabia.

### Risk-sharing mechanisms

- Implement mechanisms to share the financial risks associated with IIoT projects, such as government-backed guarantees and insurance options.
- Develop IIoT risk assessment centres as part of the government’s digital hubs or Industry 4.0 Capability Centres, starting with the existing one. These centres could offer consulting services to help businesses evaluate the risks of their IIoT projects and implement strategies to mitigate these risks before execution.
- Partner with insurance providers to create specialized insurance products tailored for IIoT projects, covering potential risks such as technology failure, data breaches and operational interruptions. The government

could subsidize the premiums for these insurance products for SMEs, lowering the financial barriers to entry.

- Cost-sharing initiatives where the government offers matching funds for the budget invested by private firms in IIoT infrastructure upgrades or digital monitoring technologies.

## 3.2 Capacity-building and training programmes

- **Customized training:** Offer tailored training programmes to meet the specific needs of different SME sectors and sizes.
- **Mentorship programmes:** Establish mentorship programmes to pair experienced IIoT professionals with SMEs.
- **Skill gap assessments:** Conduct regular assessments to identify skill shortages and prioritize training initiatives accordingly.
- **Public-private partnerships:** Encourage collaboration between industry and academia to develop practical training modules.

## 3.3 Regulatory guidance and compliance support

Clear and accessible regulatory guidelines should be developed for IIoT adoption, focusing on data privacy, cybersecurity and interoperability standards. Establishing regulatory sandboxes can provide SMEs with a controlled environment to test IIoT solutions without immediate regulatory pressures.

- **Regulatory clarity:** Provide clear definitions and explanations of IIoT-related regulations to reduce ambiguity and compliance burdens.
- **Compliance assistance:** Offer practical guidance and support to help SMEs navigate the regulatory landscape.
- **Industry collaboration:** Involve industry stakeholders in the development of regulations to ensure they are practical and effective.
- **Risk-based approach:** Adopt a risk-based approach to regulation, focusing on high-risk areas and providing flexibility for low-risk activities.



## 3.4 Infrastructure development

Investment in digital infrastructure, including high-speed internet and data centres, is crucial to support IIoT adoption. Governments should prioritize expanding connectivity in remote and underserved areas to ensure equitable access to IIoT technologies.

- **Public-private partnerships:** Encourage collaboration between the government and the private sector to accelerate infrastructure development.

- **Infrastructure sharing:** Promote sharing of infrastructure among different stakeholders to optimize resource utilization.
- **Standardization:** Establish clear standards and guidelines for IIoT infrastructure to facilitate interoperability and compatibility.
- **Digital divide:** Implement targeted initiatives to bridge the digital divide and ensure equal access to IIoT opportunities for all regions.

## 3.5 Awareness and education

To fully realize the potential of Industry 4.0, governments must prioritize awareness and education at all levels of society.

- **Public awareness:** Create a general understanding of Industry 4.0, its benefits and its impact on daily life. This can be achieved through media campaigns, public events and educational programmes.

- **Talent and educational reform:** Integrate Industry 4.0 concepts into the national curriculum, from primary to higher education. This includes developing new subjects, updating existing ones and providing teacher training.
- **Workforce development:** Offer targeted training programmes for existing employees to upskill and reskill for Industry 4.0 roles. This can be done through partnerships between industry and academia.

## 3.6 Integration support and interoperability standards

To facilitate the integration of IIoT solutions with existing systems, governments should promote the development and adoption of interoperability standards. Providing technical support and consultancy services to SMEs can help them navigate the complexities of IIoT integration.

- **Interoperability testing facilities:** Establish testing facilities to certify the interoperability of IIoT devices and systems.

- **Open-source platforms:** Promote the use of open-source IIoT platforms to foster innovation and reduce costs.
- **Integration grants:** Offer financial incentives for SMEs to develop and implement successful IIoT integration projects.
- **Industry-led initiatives:** Encourage industry associations to develop and promote interoperability standards.

# Conclusion

Implementation of IIoT offers a transformative opportunity for SMEs globally to enhance operational efficiency, improve decision-making processes and innovate business models. The potential of IIoT is vast, yet realizing these benefits requires a strategic approach that addresses the common challenges that SMEs face, including financial constraints, gaps in technical expertise and regulatory compliance.

This paper serves as a comprehensive guide for countries aiming to accelerate IIoT adoption among SMEs. By fostering public-private partnerships and providing financial incentives, nations can create supportive ecosystems that facilitate IIoT adoption. Additionally, investing in infrastructure and capacity-building initiatives can empower SMEs to fully leverage IIoT technologies.

Aligning these efforts with broader national goals can enhance global competitiveness, drive economic diversification and promote sustainable growth. By supporting SMEs in overcoming barriers to IIoT implementation, countries can position themselves as leaders in the Fourth Industrial

Revolution, ensuring that these enterprises are well-equipped to thrive in a rapidly evolving global economy.

Ultimately, the successful adoption of IIoT technologies will contribute significantly to the sustainable development of economies worldwide, fostering innovation and resilience among SMEs. As nations embark on this transformative journey, it is crucial to maintain a collaborative approach that prioritizes the needs of SMEs, ensuring they can harness the full potential of IIoT for long-term success. In Saudi Arabia, these efforts will contribute to the broader goals of Vision 2030, fostering jobs of the future and ensuring that enterprises are well-equipped to thrive in a rapidly evolving global economy.

The insights and strategies in this paper can be adapted and implemented by other countries, facilitating a global exchange of knowledge and best practices in IIoT adoption. By learning from each other's experiences, countries can collectively advance towards a more connected, efficient and innovative industrial landscape.

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1. OECD. (2021). *The digital transformation of SMEs*. OECD Publishing. [https://www.oecd.org/en/publications/the-digital-transformation-of-smes\\_bdb9256a-en.html](https://www.oecd.org/en/publications/the-digital-transformation-of-smes_bdb9256a-en.html)
2. Deloitte. (2019). *Automation with intelligence: Pursuing organization-wide reimagination*. Deloitte. <https://www2.deloitte.com/content/dam/Deloitte/tw/Documents/strategy/tw-Automation-with-intelligence.pdf>
3. Vision 2030 (2016). *Kingdom of Saudi Arabia Vision 2030*. [https://www.vision2030.gov.sa/media/rc0b5oy1/saudi\\_vision203.pdf](https://www.vision2030.gov.sa/media/rc0b5oy1/saudi_vision203.pdf)
4. Deloitte. (2018). *The rise of the connected world: How IoT is transforming the industry*. Deloitte. [https://www2.deloitte.com/content/dam/Deloitte/in/Documents/technology-media-telecommunications/in-tmt-iot\\_TheRiseoftheconnectedworld-28aug-noexp.pdf](https://www2.deloitte.com/content/dam/Deloitte/in/Documents/technology-media-telecommunications/in-tmt-iot_TheRiseoftheconnectedworld-28aug-noexp.pdf)
5. These solutions include digitization of procedures, planning, communication systems, control of production lines, material handling and packaging systems and machines, and have high upfront costs. See Ministry of Industry and Mineral Resources, *Future Factories Initiative - The Main Digitization Track*. <https://mim.gov.sa/en/issi/31164/>
6. McKinsey & Company (2022). *What are Industry 4.0, the Fourth Industrial Revolution, and 4IR?*. McKinsey & Company. <https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-are-industry-4-0-the-fourth-industrial-revolution-and-4ir>





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