

# The Saudi Industrial Revolution 4.0

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**W**hen we talk about Saudi Arabia and technologies as part of the 4IR, we should focus on digitizing mechanisms in production systems, particularly within manufacturing. Digitalization is spreading across all sectors; in the banking sector, it has advanced to a point that we now have digital currencies. But when it comes to manufacturing, we see much less application.

Manufacturing is capital intensive and is also one of the most labor intensive industries, so applying 4IR tools is hard as it requires getting through many layers. Ironically, this same toolbox should enable us to leapfrog into the future of production processes. It can help manage supply chains for example; factories in Saudi Arabia use both locally manufactured and imported parts. The 4IR allows vertical and horizontal communication to occur between suppliers and operators to monitor and track when products are needed to be replaced.

The manufacturing system in Saudi Arabia has traditionally targeted low value, low margin products. But we need to be focusing on higher margin, high value items similar to the ones we see in the defence, medical and healthcare sectors. How do we go about establishing 4IR capabilities in industry in Saudi Arabia? How can we facilitate individuals to learn about it, investors to use it and government to support it?

We have developed a strategy that focuses on one important pillar – contact between government and industry. We have identified five ‘capability centers’, which will be built and financed by the government and located mostly in MODON (Saudi Authority for Industrial Cities and Technology Zones). These centers will have four main functions.

Firstly, they will be a place where individuals and companies can enquire and learn about 4IR technologies and how they could be adopted in Saudi Arabia. The second purpose will be to function as a RD&I (research, development and innovation) system where academics and students can connect their laboratories in an interactive way. The third function is to showcase examples of the latest global Industrial

Revolution 4.0 technologies. Lastly, we want to model a ‘future factory’, which will demonstrate how SMEs can use these technologies in a shared manufacturing facility. 3D printing equipment is very expensive to purchase and maintain for example, so if we can provide these machines to be shared by SMEs and start-ups, they could have time to build enough demand for their product before committing to investing in their own equipment. With these four elements, we are building a strong interface between the government and the industrial sector with a focus on production.

## Embracing Unknowns

Industrialization encompasses around 50% of Saudi Arabia's Vision 2030, which also aims to create 1.6 million new jobs. How do we reach these targets? We need to use technology and train the workforce to use it. The current generation, both in the kingdom and around the world, is simply not getting the same focus of manufacturing training that others did in previous decades. If we are not careful, countries will lose their capacity for production. Let's also remember that the need for a service sector is built on the back of manufacturing. If you lose the latter, you could start losing your RD&I ecosystem.

Initiatives to address this are under way, but the challenge remains that investors are often reluctant to switch from established processes. MODON is leading a very interesting ‘lighthouse’ project, to transform 100 factories by helping them digitize under a process of assessment and accreditation and so they know what can be achieved with new technologies at hand. This project will likely face delays and difficulties, but we need to persevere as we simply don't have a choice. If we are serious about realizing Vision 2030 and diversifying our economy, production systems and investment in industry is the key.

A foundation of our strategy is a concept called ‘Product Life Management System’, which is a digital platform where an idea can be translated into engineering drawings that can be used by individuals, SMEs and government for analysis or production.



## Bridge the Gap

**T**here is a big gap between the government's vision and basic industry realities. For example, we are producing increasing amounts of aluminium and exporting it. We then re-import it as aluminium oxide, aluminium chloride and other derivatives. The same applies to hydrocarbons. We are spending billions of Saudi Riyals re-importing materials that we export at higher value. Maybe 4IR can also help address this gap. Millions of dollars of investment initiatives in the kingdom have been made in big data and AI, for example, in the last decade. Yet, very few people are aware of this. We should have a knowledge-sharing hub that lists and shares this information.

The tools that we establish at King Abdulaziz City for Science and Technology (KACST) will be available, in addition to an incubation system. In essence, we are creating a virtual industry before we realize it on the ground. This should also help the development of human capital. We have started aiding universities to establish this. At Prince Sultan University, there are two courses and a lab for students. This example of contact points between technology, strategy and students can be replicated and scaled up. We can get vendors to supply e-learning platforms and make them available for students and SMEs, helping them navigate the otherwise very expensive access to these tools. This digital mapping, which shows where resources are needed, can also guide investors in the right direction.

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## Simplicity wins

From a legal point of view, harnessing 4.0 tools such as artificial intelligence (AI), the industrial internet of things (IIoT) and robotics into a factory or production system is not straightforward. It took Samsung, Google and Apple about 15 years to agree on a common USB interface for their devices, used by millions around the world. Imagine what it will take to standardize the use of these technologies in a whole factory system. If we take 3D printing as an example, it is usually associated with harmful chemicals. So, as a factory, you would have to know how to deal with customs when the component parts are entering the country. Another health and safety executive (HSE) example are robots that move around and interact with technicians. There may be accidents, so where does the liability lie? Is it with the manufacturer, the installer, the user or the factory owner? The same thinking applies to data security in the banking system. All these are examples of the need for common standardization.