

## GSMA 5G TRANSFORMATION HUB

The world's most innovative 5G solutions



# 5G Drives Digital Transformation of Manufacturing

5G connectivity helps China's SMEs to boost labour productivity by up to 60%

Thousands of manufacturing businesses in the Chinese city of Foshan are using 5G, the cloud and other digital technologies to transform their operations. China Unicom Guangdong, Huawei and Midea are working together to provide these small and medium enterprises (SMEs) with the 5G connectivity and IT systems they need to achieve major improvements in productivity and efficiency.




# 5G Drives Digital Transformation of Manufacturing




**CASE STUDY LEAD: CHINA UNICOM GUANGDONG, HUAWEI**

speeds, ultra-reliability-low-latency connectivity, precise positioning, and local area networking capabilities.

## + CHALLENGE

 As the manufacturing industry digitises, there is a danger that small and medium-sized players will be left behind. In particular, SMEs can lack the capital, talent and technological expertise to harness advanced digital systems required to produce customized products at scale.

## + SOLUTION

 To deliver low-latency and high-bandwidth connectivity for manufacturing applications that are difficult to support with a traditional closed and siloed network architecture, Unicom Guangdong is combining 5G with multi-access edge computing (MEC). The telco's 5G edge compute platform already supports more than 1,000 SMEs in the Foshan area. It says these businesses benefit from 5G uplink

## + IMPACT & STATISTICS


 Unicom Guangdong says that following a digital transformation, Foshan's SMEs typically increase labour productivity by 40-60%, inventory usage by 20-40%, overall equipment effectiveness by 15-25% and "first time quality" by 5-8%, while lowering direct manufacturing costs by 25-35%. Furthermore, the energy consumption of production equipment is reduced by 15-20%, and total energy consumption is reduced by 5-8%, according to the mobile operator.

## + WIDER IMPLICATIONS

 Unicom Guangdong's 5G, cloud and MEC infrastructure is supporting the delivery of Foshan City's *Action Plan for Digital Transformation and Upgrading of Foshan Manufacturing Industry*, which was announced in July 2021. The plan calls for Foshan to invest 10 billion yuan (US\$1.48 billion) in the next three years to fund the digital transformation of manufacturing enterprises. By the end of 2023, Foshan is aiming to build "50 digital benchmark factories" and "100 digital benchmark workshops" to drive the digital transformation of 3,000 manufacturing enterprises. Foshan is hoping the digital economy will add 20% to GDP by 2025, paving the

way to boost the value of the city's digital economy to two trillion yuan (US\$300 billion) by 2035.

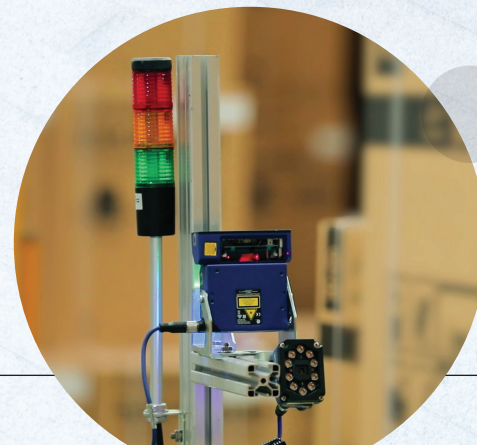
## + STAKEHOLDERS

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# 5G Drives Digital Transformation of Manufacturing

## 5G connectivity helps China's SMEs to boost labour productivity by up to 60%

As the manufacturing industry digitises, there is a danger that small and medium-sized players will be left behind. That represents a major challenge for the Chinese city of Foshan, a manufacturing hub in the interior of the Pearl River Delta, east of Guangzhou, and adjacent to Shenzhen, Hong Kong and Macao. Foshan is home to more than 9,000 industrial businesses, of which 95% are small and medium enterprises (SMEs).

To help these SMEs go digital and remain competitive, China Unicom Guangdong is providing modularised networking solutions to smaller manufacturers looking to benefit from the same digital capabilities as larger enterprises. Unicom Guangdong, in cooperation with Midea Group and Huawei, has identified 50 scenarios in which 5G and other digital technologies can be applied in factories to deliver smart logistics, flexible manufacturing, quality management, safe production and other requirements.

The Foshan region has comprehensive 5G coverage: Unicom Guangdong claims to have built the world's largest standalone 5G network, with more than 94,000 sites. It also offers its Unicom Cloud Infrastructure in 21 cities of Guangdong, with two core nodes in Guangzhou and Foshan.

To deliver low-latency connectivity for business applications that are difficult to support with a traditional closed and siloed network architecture, Unicom Guangdong is supplementing its 5G and cloud infrastructure with multi-access edge computing (MEC). Designed to support fast uplink speeds, ultra-reliability-low-latency connectivity, precise positioning, and local area networking capabilities, the telco's 5G edge compute platform already supports more than 1,000 SMEs in the Foshan area.



Unicom Guangdong estimates that more than 3,000 of the 9,456 industrial enterprises in Foshan have now started a digital transformation. It says that this process typically increases SMEs' labour productivity by 40-60%, inventory usage by 20-40%, overall equipment effectiveness by 15-25% and "first time quality" by 5-8%, while lowering direct manufacturing costs by 25-35%. Furthermore, the energy consumption of production equipment is reduced by 15-20%, and total energy consumption is lowered by 5-8%, according to the mobile operator.

"In the 5G era, MEC is the key enabler for operators to transform from traditional pipeline builder to information service provider," says Guixin Pan, General Manager of Network Product Innovation Centre of Unicom Guangdong. "As the largest provincial-level branch of China Unicom, Guangdong Unicom is responsible for building the MEC operation system of China Unicom, providing related platform products, exploring business models, setting up a cooperative ecosystem, and achieving the target of innovation and rapid replication."

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**Guixin Pan** - General Manager of Network Product Innovation Centre of Unicom Guangdong



# Enabling customisation at scale

Since its factory was built in 2006, furniture maker Foshan WISION Technologies has invested about 400-500 million yuan (US\$60-75 million) in digital transformation. It is now using 5G to interconnect equipment, collect data, support machine vision and enable cloud computing. As a result, WISION is able to fulfil customised orders on a large scale, lowering its order production cycle from 15 days to 10 days. At the same time, the main equipment failure rate has decreased to 0.26% with 5G+AI enabled predictive maintenance, from Guixin Pan, General Manager of Network Product Innovation Centre of Unicom Guangdong.

WISION, which has provided home design solutions for more than six million families, says the only way to achieve large-scale flexible production of customised products is through digitisation. “We believe that the home should be personalised and customised,” says Gan Li, General Manager of WISION. “We have always believed that 5G-enabled digitalisation can promote the progress of the decoration industry and bring visible implementation to users.”

In the WISION Furniture Technology Centre, customer orders from all over China are uploaded to the order management cloud. Then, the company’s production scheduling system will automatically digitise the order based on the length, width, height data and description of the product requirement. A virtual manufacturing assembly system translates the front-end order and picture information into data with manufacturing processing attributes.

The orders are uploaded to the production planning and scheduling centre, which scans thousands of orders to select products that match in colour, material utilisation, delivery time, logistics direction and other conditions to create a production batch. The system also calculates the optimal order production time and order combination for batches. In this way, WISION says it achieves a material utilisation rate of 93%, compared with 75% rate in traditional woodcraft.

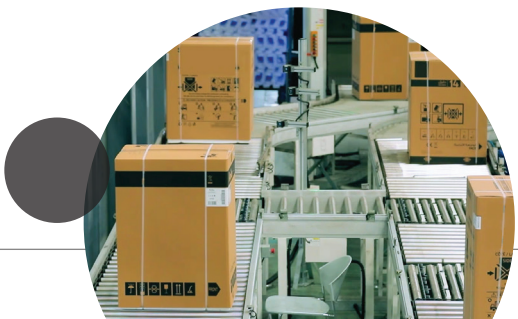
As well as supplying customised furniture, WISION offers home decoration services. Using its BIM

(building information model) system and 5G connectivity, WISION is able to perform digital management of customers’ construction sites, conducting unified scheduling, distribution, supervision, and quality inspection jobs simultaneously. At the same time, householders can monitor the progress of their home decoration in real time via their mobile phones.

Gan Li says that there are about 600 construction sites in operation every day. “Our existing digital capabilities are not only used by ourselves, but also used to enable other decoration

We have always believed that 5G-enabled digitalisation can promote the progress of the decoration industry and bring visible implementation to users

Gan Li - General Manager of WISION



enterprises,” he adds. “This is actually a symbiotic system, in which all the enterprises in the industry chain work together to expand the subdivision fields.”

Gan Li explains that Unicom Guangdong’s 5G connectivity supports WISION in four key ways. The first is through the efficient collection of data. Whereas Wi-Fi connectivity would frequently lose data packets and 4G networks are not sufficiently responsive, with 5G, “the production process in WISION is well synchronised,” he says. The second way is through support for machine vision, which allows WISION to automatically inspect the quality of components.

WISION also uses 5G to access the cloud computing needed to support large-scale flexible production. Guixin Pan, president of Unicom Guangdong 5G Innovation Centre, says the industrial clusters in Foshan each require powerful storage and

computing power in the cloud. “5G is required to upload and download a large amount of data in real time,” he adds.

The fourth scenario is 5G intelligent robot. Enter any WISION decoration site, you can find a 5G intelligent robot. It is responsible for ordering and dispatching on customers’ construction sites through 5G intelligent connections. The large screen of the robot also displays a rotating 3D model of the currently renovated house. On-site personnel can click into any construction node to view the related information of the current construction progress. At the same time, homeowners

can control the movement of robots at will, and through 5G HD live streaming to view the decoration site in real time from different positions and angles.

In the future, WISION plans to work with Unicom Guangdong to explore how a combination of 5G and MEC can support other manufacturing application scenarios. They are also planning to build a digital twin (a dynamic digital model) to support customised furniture production lines.

5G is required to upload and download a large amount of data in real time

Gan Li - General Manager of WISION



# Harnessing 5G across the manufacturing sector

Unicom Guangdong's 5G, cloud and MEC infrastructure is supporting the delivery of Foshan City's *Action Plan for Digital Transformation and Upgrading of Foshan Manufacturing Industry*, which was announced in July 2021. The plan calls for Foshan to invest 10 billion yuan (US\$1.48 billion) in the next three years to fund the digital transformation of manufacturing enterprises. By the end of 2023, Foshan is aiming to build "50 digital benchmark factories" and "100 digital benchmark workshops" to drive the digital transformation of 3,000 manufacturing enterprises.

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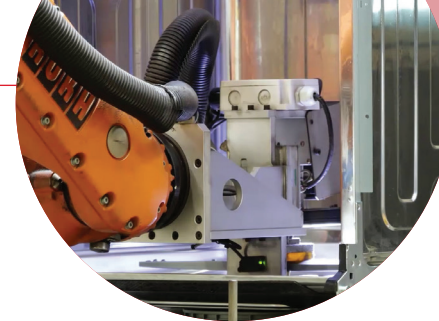
To support the digital transformation of Foshan's manufacturing sector, Unicom Guangdong and Huawei launched Foshan Manufacturing City in June 2022 as part of the U-Joy Cities programme - a joint 5G network innovation initiative to better serve people and facilitate the transformation of smart industries in Guangdong and the Greater Bay Area. Together with major enterprises in Foshan, such as Midea, Country Garden, FAW-Volkswagen, and Haitian, Unicom Guangdong has built a number of digital factories and workshops.

"Although large enterprises have become the pioneer of the digital and intelligent transformation in manufacturing industry, the large number of SMEs are the decisive players of this digitalisation game," says Guixin Pan, General Manager of Network Product Innovation Centre of

Unicom Guangdong. "SMEs have disadvantages in capital, talents, and technology in digital transformation. However, more and more SMEs in Foshan realise the great value of digital and intelligent transformation and devote themselves to it with the help of Guangdong Unicom's 5G U-Joy Cities programme."

For example, Guangdong SIMCHENG Plastics Machinery Co. has digitalized all paper drawings

and manual programming links, thereby avoiding errors from human operations, refining the production process, and also improving efficiency. The company says its overall capacity increased by 20%, the average order lead time was shortened from 240 days to 200 days, and profit increased by 64.3%, compared with the previous year.



## SIMCHENG PLASTICS MACHINERY CO.



OVERALL CAPACITY +

20%



ORDER LEAD TIME -

16.6%



PROFIT INCREASED +

64.3%



## Working with **specialist industry partners**

Unicom Guangdong and its partners continue to harness 5G to develop new capabilities for the manufacturing sector. The telco has joined forces with Midea Cloud, part of the Midea Group, to build an enterprise digital transformation co-creation model they call “government + service provider + SME”. The partners have jointly released an overall digital transformation solution for the manufacturing industry, with IT systems encompassing advanced planning and scheduling (APS), manufacturing execution (MES), supplier relationship management (SRM), and supervisory control and data acquisition (SCADA) as the core. Their goal is to help establish a unified information platform for enterprises and make the digital transformation of SMEs easier.

Unicom Guangdong, Huawei, and Midea have also jointly developed a MEC and 5G-based positioning system, which uses a private network architecture to provide accurate positioning of connected equipment within a metre.

In the 5G era, Unicom Guangdong intends to be a leader in digital transformation. “We have four identities for ourselves,” explains Guixin Pan of Unicom Guangdong 5G Innovation Center. “First, we are promoters who propagate digital transformation policies in a timely manner. The second is aggregator, which aggregates the

best resources in the industry to provide high quality services to our enterprise customers. The third, we are enabler that packages our core capabilities with the capabilities of our industry partners and output them to our enterprise customers. Finally, we are still practitioners.”

Unicom Guangdong has a team of hundreds of people in Foshan working together with the Foshan government’s economic promotion departments. The team visits enterprises to help them with digital transformation.

China Unicom Guangdong also plans to further increase its investment in its 5G network in Foshan, while strengthening its cooperation with the city in digital infrastructure, industrial IoT, smart city, smart health, digital agriculture, and data security, and jointly build an important engine for Foshan’s modern economic development,” explains Liqian Hao, general manager of China Unicom Guangdong.

Unicom Guangdong plans to build another 2,400 5G base stations in 2023, while enhancing the computing network architecture of Unicom Cloud to meet the distinct characteristics and requirements of each district in Foshan.



## About the GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry, and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

For more information, please visit the GSMA corporate website at [www.gsma.com](http://www.gsma.com).

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## GSMA 5G Transformation Hub

The GSMA 5G Transformation Hub is a source of information on some of the most innovative 5G solutions in the world. This portal contains case studies detailing design, benefits, key players, measured value and the future impact of scaling up these 5G solutions worldwide. The 5G Era is now firmly established and this family of standardised GSM technologies, including mmWave, are being rolled out successfully across the globe. The GSMA 5G Transformation Hub, launched at MWC Barcelona in 2022, provides details of how 5G is best placed to deliver real value for a range of key sectors including manufacturing, energy, transportation, media and live entertainment, smart cities and construction. Many more case studies will be added, in the coming months, covering even more industries and the GSMA is asking Members to nominate innovative 5G case studies to add to this global digital showcase. The 5G Transformation Hub is sponsored by Qualcomm. This case study is sponsored by ZTE Corporation.

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