

GSMA 5G TRANSFORMATION HUB

The world's most innovative 5G solutions



Revolutionising the LG Uplus Smart Factory Industry in South Korea with 5G

LG Uplus

The turn of the new decade has seen a remarkable surge in productivity within South Korea's industrial landscape. This surge is largely credited to the implementation of cutting-edge technologies like Artificial Intelligence (AI) and the Internet of Things (IoT). LG Uplus, a leading telecommunications provider and innovator, has been at the forefront of this technology-led transformation. Beginning in 2016, the company launched its U+Smart Factory solution, a comprehensive AI and IoT-based system designed to boost operational efficiency and stability. The U+Smart Factory solution was tested in an array of business facilities, ranging from LG affiliate sites to national power plants and heavy industries.

This case study underscores the potential of AI and IoT as major drivers of industrial productivity. South Korea's success story provides a blueprint for other countries and companies to leverage these technologies in their quest for improved efficiency and performance.



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⊕ CHALLENGE:



The past decade has seen intensified market competition and cost reduction pressures alongside an ageing frontline workforce, leading to a skilled labour shortage. However, falling device prices and improved machine/computing performance, especially the transition from wired to wireless networks in telecom, have sparked a significant shift. This is the dawn of the 4th Industrial Revolution, a revolution in intelligent information technology that offers a potential path through these industry challenges.

⊕ SOLUTION



In South Korea, LG Uplus is steering the new industrial wave with its pioneering smart factory solutions. Harnessing the power of 5G, the company is driving data-centric smart businesses while offering added value through its Digital Transformation (DX) solutions across various sectors, including manufacturing, finance, public, retail, and service.

LG Uplus' Smart Factory delivers a comprehensive suite of 22 tailor-made solutions across five key sectors: network infrastructure (5G/LTE dedicated lines and private 5G), safety, environment, quality control, and supply management. This integration of 5G dedicated lines with an industrial DX solutions platform enables customers to

exercise integrated control over their facilities, leading to more systematic and efficient field management.

With an affiliate boasting 76 years of manufacturing history, LG Uplus' Smart Factory stands out for its reliability. As the sole telecom company with a dedicated organisation for smart factory business, LG Uplus has grown its client base from 9 LG affiliates in 35 factories to over 250 domestic and overseas factories across diverse sectors such as power plants, finance, retail, and the public sector.

⊕ IMPACTS AND STATISTICS:



LG Uplus' Smart Factory has demonstrated impressive performance, with a 3-year CAGR of 78%. The goal is to generate \$74 million in total revenue by 2026. In 2021 alone, the Smart Factory saw a remarkable growth of 77%. Through strategic partnerships with LS Electric and LG Electronics Production Technology Institute, the company introduced additional features such as switchboard inspections, AI vision tests, and intelligent CCTV. These innovative

additions have contributed significantly to sales, accounting for 23% of total sales. Marketing efforts under the unified brand "U+ Smart Factory" have led to a 20% increase in unique homepage visitors and a remarkable 150% increase in inbound inquiries.

The "Smart Pier Project" exemplifies the competitiveness of U+ Smart Factory. The global automated container terminal market has grown by 204% since 2016, and South Korea is looking to advance in this area due to the lack of full automation in domestic piers and the high rate of on-site accidents. The introduction of the Severe Accident Punishment Act in 2022 has underscored the need for improved field safety management. The application of 5G network technology enables real-time communication and control of high-capacity data, duplex real-time telecommunication, augmented/virtual reality, and the utilisation of various sensors and devices, positioning U+ Smart Factory as a leading player in advancing South Korea's industrial landscape.

⊕ WIDER IMPLICATIONS:



LG Uplus' initiatives hold vast implications for industry and society at large, presenting opportunities of strategic significance. While the current focus is on mirroring and monitoring industrial sites with an integrated control platform, future plans involve the application of data analysis for enhanced operational intelligence and predictive analytics. By incorporating AI into these

systems, LG Uplus aims to improve the functionality and efficiency of industrial processes. Such improvements, when scaled up or replicated globally, could revolutionise industry operations across the world, setting new standards for safety, productivity, and efficiency. Moreover, the integration of U+5G with Smart Factory solutions has the potential to create a significantly safer society. This advancement highlights the crucial role of technology in addressing contemporary challenges and shaping a more secure, efficient future.

⊕ STAKEHOLDERS:



Corporations in various industries such as manufacturing companies, power plants, banks, retailers, and public institutions (Busan Port Authority, etc).

SOURCES AND FURTHER INFORMATION



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Embracing Innovative Safety Solutions: The Core of U+ Smart Factory

Harnessing Digital Technologies for Enhanced Safety Management

LG Uplus has introduced a suite of cutting-edge solutions to enhance safety in industrial operations:

Smart Safety Solutions: These incorporate 5G RTK (real-time kinematic) for tracking the locations and movements of operational equipment. The solutions also include safety vests with smart security alerts, remote crane control, self-driving patrol robots, cameras to prevent vehicle crashes and drowsy driving, and smart watches and helmets equipped with body sensors.

Integrated Safety Control Platform: Operated on the 5G network, this platform is founded on digital twin technology. It digitalises the operational safety status of workers, trucks, and cranes, enabling terminal staff to manage field safety more intelligently. A main dashboard provides real-time status updates on frontline workers and detailed information during emergencies. Staff can monitor the real-time locations and videos of equipment and devices using a detailed map. This platform can also be directly integrated with a Terminal Operating System (TOS), as demonstrated in one use case.

Through these innovative solutions, LG Uplus is setting new safety standards in the industrial sector, leveraging the power of technology to improve both operational efficiency and safety protocols.



Pioneering the New Industrial Wave:

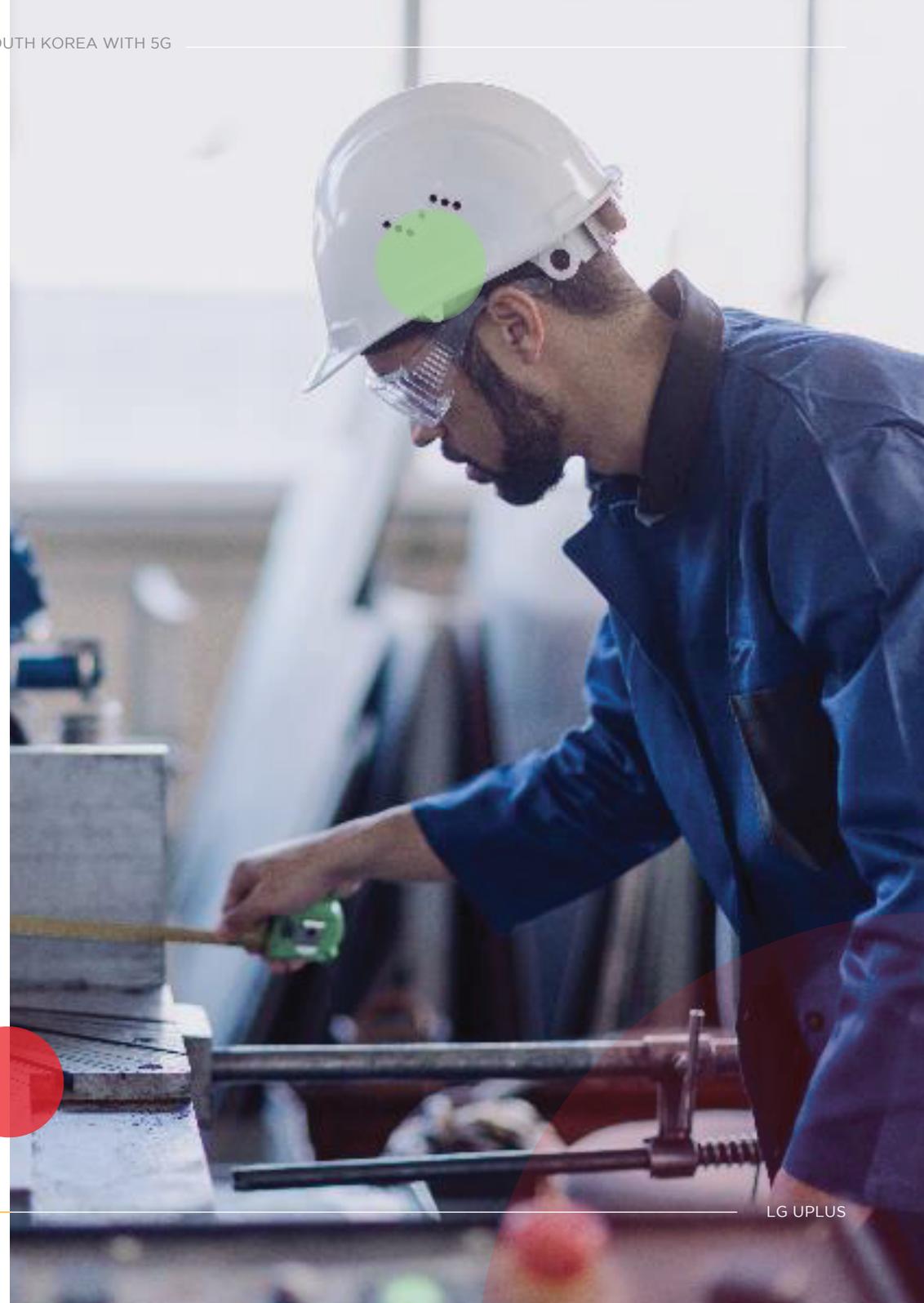
LG Uplus's Smart Factory Solutions

Leveraging 5G and Digital Transformation to Revolutionise Industries

In response to the evolving industrial landscape, LG Uplus has taken a proactive approach, leading the new industrial wave in South Korea with its innovative smart factory solutions. Capitalising on the competitive edge provided by 5G technology, LG Uplus has established itself as a leader in data-driven smart businesses. The company not only offers innovative solutions but also provides value by implementing digital transformation (DX) solutions across multiple sectors, including manufacturing, finance, public, retail, and service industries.

The U+ Smart Factory offers 22 customised solutions across five key areas: network infrastructure, safety, environment, quality control, and supply management. These are all facilitated by the integration of 5G dedicated lines and the industrial DX solutions platform, enabling customers to have centralised control over their facilities. This all-encompassing service has streamlined field management, making it more systematic and efficient.

What distinguishes LG Uplus Smart Factory from other telecom companies is its exceptional reliability. As the only carrier with an affiliate boasting 76 years of manufacturing history and the sole telecom company with a dedicated organisation for smart factory business, LG Uplus stands out in the sector. Beginning with nine LG affiliates across 35 factories, the company now serves over 250 domestic and international factories in various industries such as power plants, finance, retail, and the public sector. This wide-ranging impact is a testament to the effectiveness and adaptability of LG Uplus's smart factory solutions.



The Tangible Impact: A Close Look at U+ Smart Factory's Performance

Harnessing Growth and Enhancing Safety Through Innovation

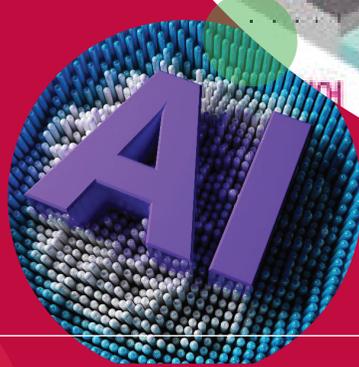
The U+ Smart Factory has demonstrated significant growth, achieving a 3-year compound annual growth rate (CAGR) of 78%. Their ambitious goal for the future is to reach \$74 million in total revenue by 2026. Remarkably, in 2021 alone, the factory witnessed a growth of 77%.

This impressive growth has been fuelled by strategic partnerships and innovation. Partnerships with LS Electric, the leading electric equipment examination company in Korea, and LG Electronics Production Technology Institute have added new facets to the smart factory's solutions, including switchboard inspections, AI vision tests, and intelligent CCTV. These additions have greatly enhanced the factory's offering, accounting for 23% of total sales.

Moreover, the marketing campaign under the unified brand "U+ Smart Factory" has increased web traffic, with a 20% boost in unique visitors and a remarkable 150% rise in inbound inquiries.

The effectiveness of U+ Smart Factory has been most evident in the Smart Pier Project. The global automated container terminal market has grown 204% since 2016, signalling an area ripe for innovation. The domestic context in South Korea has been challenging, with piers not fully automated and a high rate of worker accidents. This has highlighted the importance of safety management, further reinforced by the enforcement of the Severe Accident Punishment Act in 2022.

The application of 5G networking in the Smart Pier Project has allowed for real-time communication, control of high-capacity data, and the use of augmented/virtual reality, various sensors, and devices, demonstrating the power and potential of digital transformation in enhancing safety and efficiency.



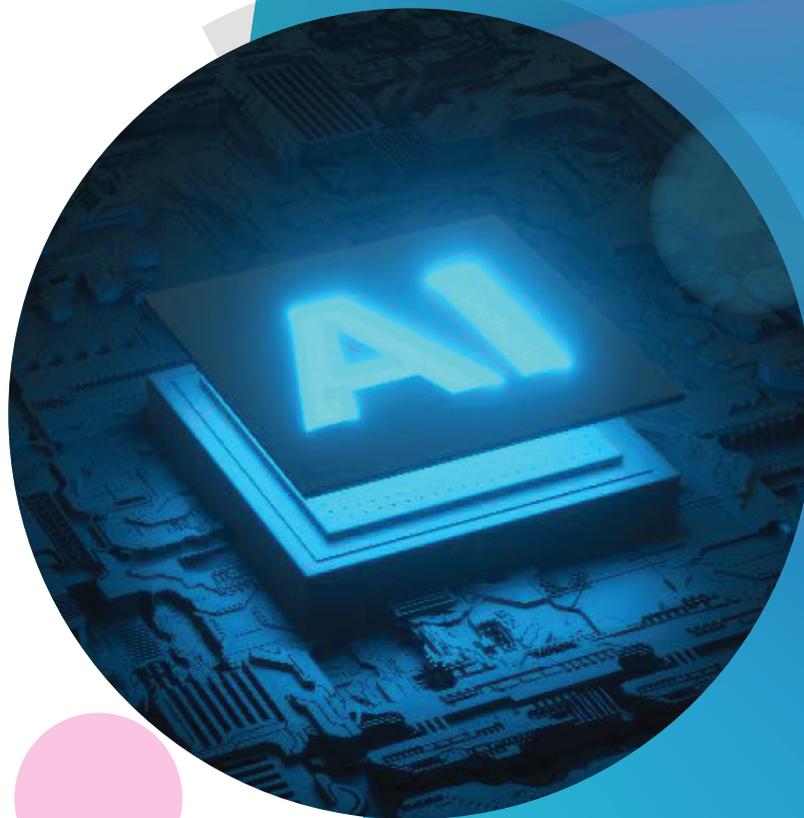
Way Forward: Envisioning a Safer, More Efficient Industrial Landscape

Harnessing AI and Predictive Analysis for the Next Industrial Leap

As LG Uplus charts the way forward, the company's focus is clear: to leverage its U+ Smart Factory solutions to push the boundaries of what is achievable in industrial operations. Central to this vision is the company's commitment to capitalising on the opportunities presented by digital transformation and 5G technology.

In the immediate future, the company plans to further enhance its integrated control platform, not just to monitor but also to analyse and predict industrial site operations. The application of AI-based operational intelligence and predictive analysis systems will lead to more effective and efficient industrial processes.

Furthermore, LG Uplus intends to continue expanding the reach of its smart factory solutions, both domestically and overseas. With a clear vision and a robust strategy, LG Uplus is poised to continue driving progress in South Korea's industrial sector and beyond, shaping a future where industry operations are safer, more efficient, and increasingly driven by innovative technologies.



LG Uplus' Visionary Future Plans: Pioneering a Safer, More Efficient Industrial Landscape with 5G and AI

Leveraging Technological Advancements to Lead the 4th Industrial Revolution

In the immediate future, LG Uplus aims to enhance its integrated control platform to not only monitor but also analyze and predict industrial site operations. By incorporating AI-based operational intelligence and predictive analysis systems, the company envisions more effective and efficient industrial processes, leading to increased productivity and safety.

By continuing to forge strategic partnerships and introducing innovative features to its smart factory solutions, LG Uplus aims to stay ahead of the industry curve. The company's remarkable growth rate and revenue projections demonstrate its commitment to staying at the forefront of the 4th Industrial Revolution.

LG Uplus recognizes the potential of 5G technology in creating a safer society, especially in areas like the Smart Pier Project. By utilizing real-time communication, high-capacity data control, and augmented/-virtual reality, the company is addressing safety challenges and enhancing operational efficiency in the industrial landscape.

Looking ahead, LG Uplus envisions a future where AI and predictive analysis will play a central role in industrial operations, allowing for even greater advancements in efficiency and safety. Through its innovative approach to safety and efficiency, the company is not only transforming its own operations but also inspiring change throughout the entire industrial sector.

"LG Uplus's U+ Smart Factory solutions are at the forefront of South Korea's industrial wave, leading a transformative charge across a multitude of sectors. We not only provide smart business solutions but also catalyze the digital transformation of industries through our innovative platform."

"With our unique approach to safety and efficiency, powered by our Integrated Safety Control Platform, we are setting new standards for industrial operations. Our smart safety solutions are driving innovation, not just within our company, but throughout the entire industrial landscape."

"The future of LG Uplus is one of continual growth and innovation. We are committed to utilizing AI and predictive analysis systems, taking our U+ Smart Factory solutions to the next level. We firmly believe that our focus on technological advancement will make our society safer and more efficient."



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.

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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 and this particular Case Study are both sponsored by Qualcomm.

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