

Whitepaper

The Smart Home Revolution

A Roadmap for CSPs

February 2025



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Foreword

Over the last few decades, the global connectivity landscape has transformed. Shifting from an exciting new technology to a lynchpin of day-to-day society, connectivity services have helped businesses, organisations, and consumers across the world to enable more effective communication, improve productivity and drive innovation.

This is partly due to the phenomenal growth of the industry. According to the International Telecommunication Union (ITU), in 30 years, the number of Internet users surged from a few million to almost five billion.

Both the functionality of connectivity services and the typical telco service offering have evolved dramatically since conception. From the 1980s, where the internet was primarily used for more basic tasks such as email and file sharing, to modern day where it has become a non-negotiable element of countless areas of our lives, connectivity has revolutionised the way with live, work, and interact with the world around us.

However, the connectivity landscape is still shifting, and as a result, Communications Service Providers (CSPs) need to be more agile than ever to remain competitive. This means actively listening to consumers and continuously evolving service offerings to align with emerging technologies and user needs.



Market overview

CSPs are currently navigating a period of unprecedented change. While the world becomes increasingly connected and digital, revenues from traditional connectivity services like voice and data plans are stagnating. This presents a paradoxical situation where even as the number of mobile users and global internet penetration soar, the value derived per connected device for CSPs is declining.

So why aren't CSPs reaping the rewards that should be associated with this significant increase in connected devices, global internet users and network coverage? Insights from management consultancy, Oliver Wyman, suggest that the drivers are three-fold, being led by regulatory action, supply over demand, and market disruption.

- **Regulatory hurdles:** Efforts to protect consumers, such as blocking mergers between major telcos, have limited the potential for revenue growth from consolidation. Stringent conditions around these deals can restrict CSPs' ability to optimise their networks and service offerings.
- **Supply exceeding demand:** With unlimited data plans becoming increasingly common, the supply of data is outstripping consumer demand in many markets. This is creating an environment where competition focuses on price, leading to a decline in per-user revenue.
- **Market disruption:** The arrival of challenger operators, often offering niche services or targeting specific demographics, has fragmented the market. This disrupts the traditional dominance of established CSPs and further intensifies competition.

By understanding these challenges, CSPs can develop new strategies to adapt and thrive in this evolving landscape.

Legacy infrastructure

In addition to the challenges posed by shifting market dynamics, many CSPs are facing

ongoing challenges when it comes to managing, maintaining or upgrading legacy networks and systems. High operational costs associated with these aging networking plays a big part in these difficulties.

However, as many telco organisations are starting to identify this financial burden, they are increasingly turning to modernisation strategies to streamline operations, reduce costs, and unlock new opportunities.

In 2022, BT reported that the company could save around £500m over the next eight years by switching off its legacy fixed networks. As part of the organisation's long-term infrastructure evolution plans, this involved switching off the 3G systems, and migrating customers to 4G and 5G services. As, BT plans to scrap a long list of networks and services based on legacy technologies by the end of 2025. Technologies on the list include: the 3G mobile network layer; copper line-based voice and data services; and legacy optical transport systems. This scenario isn't unique; telco

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organisations across the world are moving away from technologies such as 2G and 3G, to newer connectivity services such as 4G and 5G. For example, data from Cullen International found that Mobile Network Operators (MNO) in 22 out of the 31 countries researched have completed or have plans to switch off their legacy 2G or 3G networks. The switch-off of older connectivity services will provide many benefits for CSPs, including helping to manage high operational costs for



In this new era, CSPs cannot differentiate themselves solely through sophisticated infrastructure or router capabilities.

The move away from legacy infrastructure is essential for CSPs to remain competitive.

legacy services, and freeing up valuable capacity on networks for 4G and 5G services. However, this transition is by no means an easy task, and has been complicated by a variety of factors including:

- **Customer disruption:** Migrating customers from older technologies to newer ones requires careful planning and communication to minimise disruption to service.
- **Technical complexity:** The process of decommissioning legacy infrastructure can be complex and time-consuming, requiring careful coordination across different teams.
- **Regulatory hurdles:** Regulations may complicate the shutdown of certain legacy networks, especially in areas where there is limited alternative coverage.

Despite these challenges, the move away from legacy infrastructure is essential for CSPs to remain competitive in the evolving market. By embracing newer technologies and streamlining their networks, CSPs can pave the way for innovation and cost reduction.

The 'era of the wholesale model'

It's safe to say that the telco industry has reached a new age. With revenues stagnating for traditional connectivity options, telcos are having to reconsider their offering and approach. This is driving many telco organisations towards services that are not considered to be in their traditional wheelhouse.

In this new era, CSPs cannot differentiate themselves solely through sophisticated infrastructure or router capabilities. Instead, they must focus on providing value-added services that enhance the customer experience. Some of the key opportunities include:

- **Smart Home solutions:** By leveraging their network infrastructure and expertise, CSPs can offer a range of smart home services.
- **IoT and connected devices:** CSPs can capitalise on the growth of IoT devices by providing connectivity and data management solutions for businesses and consumers.

- **Digital content and entertainment:** Offering a variety of digital content, including streaming services, gaming, and virtual reality experiences, can attract new customers and boost revenue.
- **Cybersecurity services:** With increasing cyber threats, CSPs can provide advanced cybersecurity solutions to protect businesses and individuals from cyberattacks.

By embracing these new opportunities, CSPs can not only survive but thrive in the evolving telecommunications landscape.

As consumers become more aware of the benefits of smart homes, demand for these products and services is surging.



example, AI can be used to adjust lighting and temperature based on occupancy, optimize energy consumption, and even predict appliance failures. As AI technology continues to develop, we can expect to see even more innovative and intelligent applications emerge within the Smart Home, further enhancing convenience, security, and efficiency.

Growing urbanisation and aging population

Urbanisation and an aging population are creating a need for smart homes that can provide increased accessibility, security, and remote monitoring features.

According to the World Health Organization , people are living longer than ever before. Data from the United Nations agency suggests that by 2030, 1 in 6, or 1.4 billion people in the world will be aged 60 years – this is increasing from 1 billion in 2020. Meanwhile, by 2050, the world's population of people aged 60 years and older will double to reach 2.1 billion.

As a result, many older consumers are looking for a more safe and secure approach to home management, which can be achieved by the Smart Home. Incorporating features of a smart security system such as smart locks and doorbells can provide residents with much needed peace of mind when living independently.

Driving change in the industry

So, what exactly does the growing Smart Home market mean for CSPs and the wider connectivity industry? Given the challenges that telco organisations are facing when it comes to traditional connectivity services, Smart Homes present a new and exciting opportunity for telcos to drive new revenue streams, diversify their offering and enhance their customer experience and relationships.

By adding Smart Home technologies to their portfolio, CSPs can offer a variety of value-added services within the areas of smart home management, security, and energy efficiency solutions. But what are some of the key elements of the Smart Home and how can they benefit consumers?

list of desired functionalities in future smart tech devices. In line with this, smart security systems (32%) and smart thermostats (17%) are the devices consumers are most willing to invest in.

Advances in technology

Rapid advancements in technology, including IoT, and AI, are driving the development of more sophisticated and user-friendly smart home devices. In particular, the growth of IoT devices has been one of the most impactful drivers of the Smart Home concept. And the number of IoT devices in use has grown exponentially over the last few years and is expected to grow even further in the coming years.

According to Exploding Topics , the number of current IoT devices has grown from 10 billion in 2019 to approximately 18.8 billion at the end of 2024 – to put this into context, this is more than double the number of humans on the planet. Not to mention, this number is expected to grow even further to over 41 billion IoT devices by 2030. With every new IoT device created, more opportunities are unveiled for automating tasks, personalising experiences, and ultimately, creating a smarter and more connected living environment in the Smart Home.

Artificial intelligence (AI) is also playing an increasingly important role in the Smart Home revolution. AI-powered devices can learn user preferences and routines, automating tasks and personalizing the Smart Home experience. For

Growth of the smart home

The Smart Home industry is growing at pace. The global market size was valued at USD 79.16 billion in 2022 and is expected to grow at a compound annual growth rate (CAGR) of 27.07% from 2023 to 2030. But what's behind this significant growth, and in what direction is the industry moving?

The Smart Home concept is by no means a new initiative. Insights from Tech Target suggest that the very first elements of the Smart Home date back to the 1970s. However, today's Smart Home has come a long way from these initial developments. From smart speakers, lights, locks, and thermostats, the

sky is now the limit when it comes to connected devices.

Increasing consumer demand

Consumer demand for various different elements of the Smart Home has played an instrumental role in the growth of the industry. As consumers become more aware of the benefits of smart home technology, such as increased convenience, energy efficiency, and security, demand for these products and services is surging.

In a survey from Hisense UK , looking at the future of the Smart Home, consumers revealed which elements of the Smart Home they value the most. The data found that when looking ahead, energy efficiency management (36%), advanced security features (33%), and health monitoring and assistance (26%), hit the top spots on the



As technology continues to advance, the possibilities presented by the Smart Home are becoming truly endless.

Best of the Smart Home

As technology continues to advance, the possibilities presented by the Smart Home are becoming truly endless. In the 1980s and 1990s, early home automation systems offered users basic control of areas such as heating, lighting and security.

However, as the Smart Home concept continues to evolve in functionality and sophistication, we look to explore and uncover some of the most notable and advantageous Smart Home applications.

Prioritising energy management

In an era of increasing energy costs and environmental concerns, Smart Home technology offers a range of solutions to optimise energy consumption and reduce costs and carbon footprint. There are a number of Smart Home features which can be used to improve energy management in the home, including:

- Smart thermostats can be controlled remotely and integrate features like occupancy sensors and weather data to manage temperature in the home and minimize energy waste.
- Smart lighting can also be controlled remotely and can be programmed to turn on and off automatically based on occupancy sensors, timers, or even natural light levels. This can

significantly reduce energy consumption, especially when consumers are not at home or when there's sufficient natural light.

- Energy monitoring systems provide users with real-time data about energy consumption patterns so they can make informed decisions about energy management decisions, optimise usage and reduce costs.

By empowering homeowners with real-time data and intelligent controls, smart home technologies can provide a more comprehensive approach to energy management, leading to significant cost savings and a more comfortable and efficient living environment.

Bolstering home security

Home security is becoming an increasingly important priority for many consumers. Survey data from Resideo GB found that 32% of homeowners now feel more concerned about home security than they did before the COVID crisis, with 59% of consumers sharing that they were worried about being broken into when they were not at home. By incorporating elements of the Smart Home into their households, consumers can gain peace of mind and deter potential threats. But what are the key element of the Smart Home security system that consumers should look to adopt?

- Smart security cameras allow consumers to monitor their home in by watching a live feed, and provide real-time alerts, deterring intruders and protecting property.
- Smart locks offer keyless entry and remote



access to property, enhancing convenience and security.

- Smart Doorbells enable remote monitoring and two-way communication, allowing homeowners to see and speak with visitors even when they're not at home. This can deter potential intruders and allowing consumers to respond to deliveries or unexpected guests even when they're away.
- Smart motion sensors detect movement within the home when it's unoccupied and can trigger alarms, send alerts to your smartphone, or automatically activate smart lights.
- Smart window and door sensors detect unauthorised entry and can trigger security measures like alarms or notifications.

By incorporating these smart security elements, consumers can create a comprehensive security system that offers peace of mind and deters potential threats, allowing them to feel more secure in their homes.

Health and wellness

Connected devices such as smart watches and smart scales have already made a huge impact in the health and wellness sector, allowing users to track fitness metrics, monitor sleep patterns, and gain valuable insights to maintain a healthy lifestyle. Data from Deloitte suggested that by 2022, 25% of UK citizens aged 16-75 had access to a smartwatch. However, the health and wellness implications are poised to get even more sophisticated as technology continues to advance and the integration of AI offers even more personalised health management. Some of the key applications include:

- **Remote health monitoring:** Smart home devices can be used to monitor vital signs, such as heart rate, blood pressure, and blood oxygen levels, remotely. This is particularly beneficial for elderly individuals or those with chronic conditions.
- **Personalised nutrition:** Smart kitchen appliances can analyse food intake and provide personalised dietary



recommendations based on individual needs and goals.

- **Mental health support:** Smart home devices can track sleep patterns, stress levels, and mood, providing insights and tools to improve mental well-being. For example, smart lighting can be adjusted to influence mood and circadian rhythms.
- **Elderly care:** Smart home systems can be used to monitor the health and well-being of elderly individuals, alerting caregivers to potential issues such as falls or missed medication doses.

Smart Homes and Heights Telecom

While incorporating the appropriate individual elements is essential, the magic of the Smart Homes lies in its ability to bring all the different applications and features together in one convenient, integrated system or platform. Not only does this provide a seamless experience for the end user, but it allows for more sophisticated capabilities. For example, by using smart motion detectors to understand when residents are home, the system can automatically adjust lighting, temperature, and security settings, creating a personalized and energy-efficient environment.

For CSPs looking to capitalise on Smart Home technologies, they must offer hardware compatible with open-source home automation software. Heights is committed to utilising an open-source software stack, granting CSPs the freedom to be interoperable with other devices and participate in a larger community. One example of such open-source software is Jeedom, which can play a crucial role in managing the homes of the future.

This software could be used in conjunction with Heights Gateway that have hardware modules to allow:

Device compatibility

- Wide range of protocols: Jeedom supports various communication protocols (Z-Wave, Zigbee, RF, Bluetooth, etc.), allowing the integration with a vast array of smart devices, including lights, sensors, cameras, and thermostats.

Energy monitoring

- Energy management: Jeedom supports energy monitoring devices, enabling users to track and analyse their energy consumption, which can help in reducing costs and environmental impact.

Automation/AI

- Profile creation: Based on consumer habits, open-source software could be used with Heights Telecom Gateway to identify consumer profiles and create automatic actions, like open window shadows on a specific timing, predict home arrival and turn on AC for a better comfort temperature, etc.

By leveraging open-source software like Jeedom in conjunction with Heights' compatible gateways, CSPs can empower their customers with a robust and interoperable Smart Home ecosystem that offers advanced features.

Spotlighting products and solutions

The smart home revolution presents a wealth of opportunities for CSPs, but capitalising on this burgeoning market requires more than just providing connectivity. It demands innovative solutions that empower CSPs to deliver a new generation of value-added services, enhance the customer experience, and unlock significant new revenue streams. Heights Telecom's cutting-edge gateway products, are specifically designed to address the challenges and opportunities of the smart home era. These gateways, including the flagship Wi-Fi 7 HT-6766, provide the foundation for CSPs to transform the connected home experience and solidify their position as leaders in this rapidly evolving landscape.

HT-880

The HT-880 Wi-Fi 7 Gateway from Heights Telecom is a game-changer for CSPs seeking to provide a premium smart home experience. This tri-band powerhouse, featuring XGSPON and Active Ethernet alongside a robust 4x4 + 4x4 + 4x4 Wi-Fi 7 architecture, delivers the ultimate in-home connectivity. Its cutting-edge design ensures seamless performance for even the most demanding smart home ecosystems. Moreover, the HT-880's innovative containerised software empowers CSPs to quickly deploy new services, enhancing customer satisfaction and driving revenue. With the HT-880, CSPs can offer an unrivalled smart home experience, defined by speed, reliability, and future-ready technology.



HT-6766

The HT-6766 Wi-Fi 7 gateway is Heights Telecom's answer to the surging demand for robust smart home connectivity. Designed specifically for CSPs, this powerhouse enables the delivery of next-generation services that homeowners crave. Leveraging tri-band technology and 2.5G Active Ethernet, the HT-6766 delivers unparalleled speed and reliability, eliminating bottlenecks and ensuring seamless performance for even the most demanding smart home applications, from 8K streaming to real-time security. Its dedicated VoIP port allows integrated voice capabilities, enhancing the connected experience. Critically, the HT-6766's advanced architecture allows CSPs to deploy and manage value-added services efficiently, unlocking new revenue streams and solidifying their position in the rapidly expanding smart home market. With the HT-6766, CSPs can offer a truly future-proof smart home experience.





Looking ahead: the future of the Smart Home

The Smart Home is a rapidly evolving landscape, driven by technological advancements and changing consumer preferences. As we look to the future, several key trends are poised to shape the evolution of the Smart Home:

- **Increased AI integration:** AI-powered devices will become even more sophisticated, enabling personalised experiences, predictive maintenance, and seamless integration with other smart devices.
- **Enhanced security:** Advanced security systems, including biometric authentication and facial recognition, will provide greater protection and peace of mind.
- **Sustainable living:** Smart homes will play a crucial role in promoting sustainability by optimising energy consumption, reducing waste, and minimising environmental impact.

Conclusion

The Smart Home revolution is upon us. It's undeniable that connected devices in and around the home offer consumers an exciting and accessible opportunity to transform the way they live their lives. However, the Smart Home also presents a golden opportunity for CSPs.

With the telco landscape shifting, the Smart Home market offers immense potential for growth and transformation. By leveraging technology and

- **Health and wellness:** Smart home devices will continue to support health and wellness initiatives, tracking vital signs, monitoring sleep patterns, and providing personalized health recommendations.

As the Smart Home ecosystem continues to expand, CSPs have a unique opportunity to capitalise on this growth by offering innovative solutions that address the evolving needs of consumers. By staying ahead of the curve and embracing emerging technologies, CSPs can position themselves as leaders in the Smart Home market.

CSPs have a unique opportunity to capitalise by offering innovative solutions.

innovation, CSPs can play a pivotal role in shaping the future of connected living.

However, to fully capitalise on this opportunity, CSPs must understand the evolving needs of consumers, invest in innovative technologies, forge strategic partnerships, prioritise cybersecurity, and offer tailored solutions. By embracing these strategies, CSPs can not only drive revenue growth but also strengthen their brand reputation and solidify their position as leaders in the digital age.

For more information about Smart Homes and Heights Telecom's range of Home Gateway solutions, visit www.heights-t.com.

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