

## Issues and Implementations 5G in Malaysia

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### Abstract

*Malaysia's adoption of 5G technology has drawn a lot of interest and presented both opportunities and challenges. This article examines the problems and developments related to the installation of 5G networks in Malaysia. It investigates important elements like spectrum distribution, infrastructure construction, prices, and public-private partnerships. The article also emphasizes how crucial customer acceptance and cost are to enabling widespread access to 5G services. There is also discussion of the laws and regulations guiding the rollout of 5G. This article provides helpful insights into the challenges encountered and the actions taken in the process of developing a strong 5G ecosystem in Malaysia by illuminating the current situation. The issues and implementation of 5G in Malaysia are covered in this article. The potential benefits of 5G for the nation compared with 4G are also discussed.*

**Keywords:** 4G network, 5G network, issues 5G, problems, 5G implementations, advantages

### 1. Introduction

5G technology provides significantly higher data speeds and lower latency compared to previous generations (Shafinaz, 2017). It is the fifth generation of cellular network technology, and Malaysia began its 5G rollout in 2021. As of June 2023, approximately 62.1% of the country's population has access to 5G (Razak, 2023). However, Malaysia's 5G deployment has faced challenges, particularly concerning pricing, transparency, and monopoly issues during the rollout (Latiff & Lee, 2021). Some consumers in Malaysia have expressed concerns about the higher costs of 5G plans compared to the previous 4G offerings. Transparency has been a concern as well, especially regarding the wholesale cost of 5G connectivity.

The 5G network in Malaysia is managed by a single government-owned organization called Digital Nasional Berhad (DNB) (Latiff & Lee, 2021). This has raised worries about potential market dominance and the possibility of limiting competition in the industry. Despite these difficulties, Malaysia's 5G deployment is progressing steadily. The government remains committed to expanding 5G coverage, and it is expected that the number of 5G subscribers will continue to grow over time (Latiff & Lee, 2021).

### 2. Issues

#### 2.1 Technical Challenges

The rollout of 5G requires a significant investment in infrastructure, and there are some technical challenges that need to be overcome, such as the need for more base stations and the need to manage the spectrum more efficiently (Fuente et al. 2016; Rao, S., & Prasad, R. 2018; Yang, C., et al. 2016). The government is aware of these challenges and is taking steps to address them. The government has announced that it will move to a dual network model for 5G once the current rollout under

DNB has reached 80% of populated areas (Razak, 2023). This will allow other telcos to build their own 5G networks, which should help to improve competition and drive down prices. The government is also working to increase the availability of 5G devices in Malaysia. In addition, the government is investing in research and development to improve the indoor penetration of 5G signals.

### **1.2 Regulatory uncertainty in industry collaboration**

The Malaysian government is still in the process of developing regulations for 5G, which has created some uncertainty for businesses and investors. The Digital Nasional Berhad (DNB) is a government-owned company that was established in 2021 to build and operate the SWN (Single Wholesale Network) for 5G in Malaysia. DNB has been given a monopoly on the provision of wholesale 5G services, but it is required to offer open, fair, and equal access to all mobile operators. Four of the biggest telco providers in Malaysia presented a counter-proposal to the government, which has hurt the rollout of 5G (Raj, 2022). According to the plan, the four telecommunications companies are looking for majority ownership in Digital Nasional Berhad (DNB), the government organisation in charge of overseeing the country's 5G network rollout. The four leading providers are Celcom Axiata Bhd, DiGi Telecommunications, Maxis Bhd, and U Mobile, according to a Reuters article. The four carriers also want DNB's pricing strategy and network access plan to be reviewed. (Latiff & Lee, 2021).

### **2.3 High Price**

The Malaysian government awarded Digital Nasional Berhad (DNB) a monopoly to supply wholesale 5G services, which implies that DNB is the only organization in charge of giving mobile operators access to 5G infrastructure (Radhi, 2023). There is a possible impact on market dynamics, competition, and consumer prices when a single provider has a monopoly (Wong, 2023). Mobile carriers may face higher costs if DNB sets high price points for their wholesale 5G services, which could lead to higher consumer prices for 5G services. This can thus have an impact on the demand for 5G services, especially if there is little differentiation or there are several use cases that make 5G networks' faster speeds and low latency necessary. Given that there may not be much demand for 5G services at the moment and that many Malaysians are still utilizing 4G networks, cellphone carriers may not feel much need to cut their pricing. This might be because of a number of things, including the fact that current 4G networks perform satisfactorily, the fact that there isn't much consumer demand for particular 5G applications, and the fact that adopting 5G could cost more money.

### **2.4 Slow Deployment Rate**

One problem with 5G in Malaysia is that it is being deployed at a slower rate than other APAC countries such as Singapore, China, and South Korea (Interesse & Capelli, 2023)(Kim & Oh, 2020). Although Malaysia began rolling out 5G in 2021, it fell behind these nations in terms of when 5G networks would be implemented and have a sizable population coverage. As of May 31, 2023, the rollout of the 5G network in Malaysia has achieved 62.1% COPA (Coverage of Population Area) involving 5,058 5G sites, an increase of 2.6% from the previous month (59.5% COPA was reported as of end April 2023), a number which these countries have achieved a year ago, this clearly shows how behind Malaysia currently is (Razak, 2023). With earlier releases and greater coverage, Singapore, China, and South Korea have been in the forefront of 5G rollout. These nations have made large infrastructure investments and experienced higher adoption rates. A slower growth of 5G coverage

has resulted from Malaysia's delayed entry into the 5G market and contracting delays, which have limited the rate at which 5G base stations may be deployed. This variation in deployment times and coverage may have several effects. First off, it might have an impact on Malaysia's ability to compete in the global digital economy. Advanced services and applications that rely on high-speed connectivity can be provided by nations with more advanced 5G infrastructure, which can also draw in investments and promote innovation. Second, Malaysia may not be able to fully reap the rewards of 5G technology due to its slower 5G implementation than in these nations. Singapore, China, and South Korea's enterprises and industries may benefit from utilizing 5G's transformational features, such as autonomous vehicles, smart cities, and industrial automation. Figure 1 below shows the adoption rate for 5G among different countries.

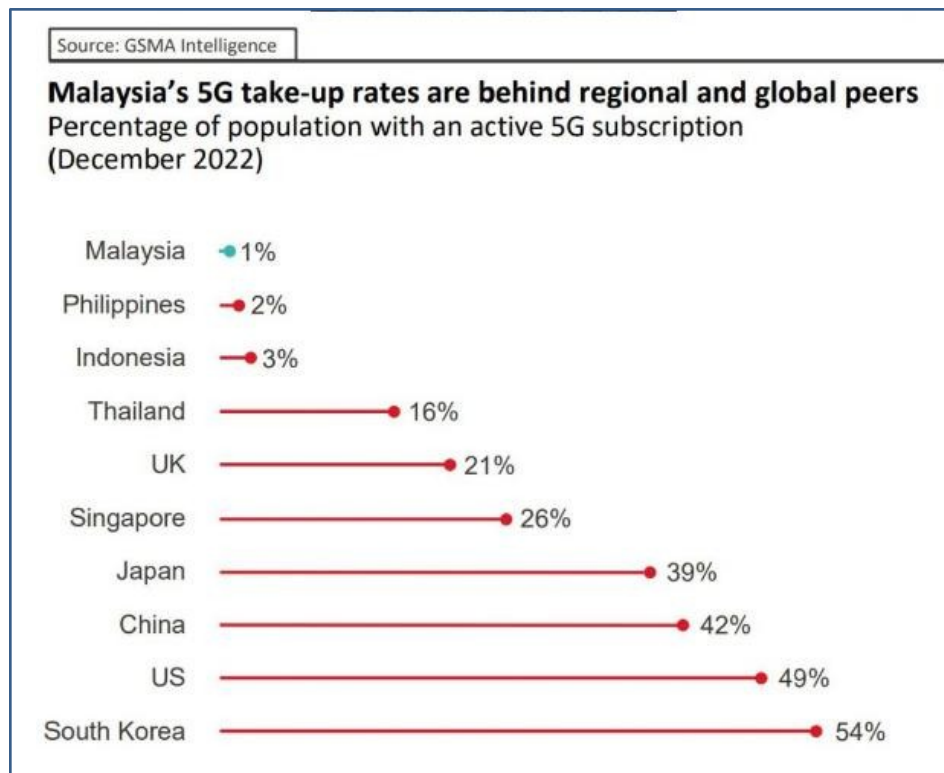


Figure 1: Adoption rate among Asian Countries

## 2.5 Download Speed

The main issue with 5G following its introduction in Malaysia is its second-lowest download speed of 13.5 Mbps. Experiences with download speed are critical for 5G readiness, which could affect how well users would accept 5G technology in general. Prior to the rollout of 5G, Malaysia had quicker average mobile download speeds than other nations, however by the end of 2021, this situation no longer exist. (Fogg, 2022). Thailand, Indonesia, and the Philippines have eclipsed Malaysia in terms of average download speeds as a result of the delayed rollout of 5G. After the rollout of 5G, Malaysia has the second-lowest download speed experience (13.5 Mbps), which will affect 5G readiness. Table 1 below shows statistics of download speed experience of 5G technology.

Table 1: Statistic of download speed experience of 5G technology (Fogg, 2022)

Country	Download Speed Experience (Mbps)		Global Rank (out of 100)
	Before 5G launched	After 5G launched	
Singapore	39.3 Mbps	49.9 Mbps	9
Vietnam	14.1 Mbps	25.5 Mbps	45
Thailand	5.7 Mbps	17.4 Mbps	60
Philippines	8.0 Mbps	15.1 Mbps	67
Indonesia	6.9 Mbps	14.4 Mbps	68
Malaysia	11.5 Mbps	13.5 Mbps	70
Cambodia	5.6 Mbps	12.2 Mbps	76

### 3. Comparison Between 4G and 5G

Due to the increasing importance of technology and the internet in modern life, internet-related problems are now the top concern (Computing Now, 2013; Mucci, 2017). The findings demonstrate that 5G technology is highly advantageous, not just because it is less expensive than 4G LTE networks, but also because 5G mobile technologies enable higher average data consumptions and are seeing rapid user growth (Smail, 2017).

In terms of speed, 5G is much faster than 4G, with a maximum download speed of 2.5 Gbps compared to 1 Gbps for 4G (Geeks, 2022). This means that 5G can support more data-intensive applications, such as high-resolution video streaming, virtual reality, and cloud gaming. 5G also has a lower latency, or lag time, of about 1 ms, while 4G has a latency of about 50 ms (Tim Fisher, 2023). This means that 5G can enable more responsive and real-time communication between devices and servers, such as remote control of vehicles, robots, and medical procedure.

5G can support more devices and users on the same network without reducing service quality because it has a larger bandwidth than 4G. To do this, 5G makes use of several radio frequencies and antenna types. Certain 5G networks deploy frequencies as high as 30 GHz or greater, whereas 4G networks deploy frequencies lower than 6 GHz (Tim Fisher, 2023). These high frequencies have the capacity to transmit more information and are less congested with current cellular data. They do, however, have several disadvantages, including the need for a clear line of sight between the antenna and the device and their susceptibility to absorption by moisture, rain, and other things. For this reason, to guarantee coverage and dependability, 5G networks might also need to install more base stations and utilize lower frequencies.

Since 5G is more capable than 4G, it can accommodate a greater variety of services and applications that call for high bandwidth, low latency, and fast speeds. Smart homes, smart grids, smart cities, edge computing, blockchain, artificial intelligence, machine learning, and the internet of things are a few examples. Additionally, 5G can use cognitive radio techniques to distinguish between mobile and fixed devices and provide the best possible delivery channel (Tim Fisher, 2023). This implies that 5G will be able to tailor network efficiency and performance to the requirements and preferences of every user and device.

The introduction of additional wireless airwaves in Malaysia should dramatically enhance speeds, even in areas where 5G is already available. Significant latency improvements from 5G will open

up a whole new world of mobile use cases. The adoption of 5G will take much longer than that of 4G, nevertheless (Peter, 2020). Table 2 below shows comparisons in terms of limitation and benefits between 4G and 5G.

Table 2: The benefits of 5G which overcome the limitations of 4G (Chew et al., 2020)

No.	Limitations of 4G	Benefits of 5G
1	Longer wait due to latency, lag, and the application getting stuck at regular intervals.	Low latency, high network speed, no lag.
2	Interference on 4G connection.	No interference in 5G connection.
3	Connectivity issues (varied connection strength, intermittent disconnection).	Steady, consistent, and high-speed connection strength.
4	No end-to-end control.	Can be customized specifically to AR/VR end-to-end needs.
5	Less scalable to high device requirements.	Scalable to high devices requirements.
6	Unavailability of a consistent high-speed network for remote learning. Fixed to space.	Network speed can be available for all locations with consistency. Does not have to be confined to a pre-determined space.
7	Inconsistent speed leads to high-end PC requirements in VR for local rendering.	High speed enables the use of all-in-one wireless device (lightweight with mobility) and replace PC with a cloud server.
8	No efficient method for locating and resolving Wi-Fi performance issues.	Can be customized for VR experience.
9	Signal interference, signal attenuation, and mutual influence of services.	No issues in 5G connection.

#### 4. Implementations

##### 4.1 Technical Challenges

To overcome technical challenges, Malaysia can focus on increasing infrastructure investment, particularly in expanding the number of base stations to improve coverage and capacity. Efficient spectrum management techniques can also be employed to optimize spectrum usage and enhance network performance. Additionally, the government can encourage research and development efforts to improve indoor penetration of 5G signals and ensure seamless connectivity.

##### 4.2 Regulatory Uncertainty in Industry Collaboration

The Malaysian government needs to expedite the development of clear regulations for 5G deployment and ensure a fair and competitive market environment. Clarifying the role of Digital Nasional Berhad (DNB) and its relationship with mobile operators can help alleviate concerns of a monopoly. Open dialogues and collaboration between government agencies, telco companies, and other stakeholders can help establish transparent and inclusive regulatory frameworks for industry collaboration.

##### 4.3 High Price

To address the issue of high prices for 5G services, the government can promote competition by allowing multiple providers to build their own 5G networks. This retail-led competition approach can create market-based pricing, incentive innovation, and provide consumers with more affordable

options. Additionally, the government can consider providing incentives or subsidies to lower the costs of 5G devices and encourage wider adoption among the population.

#### **4.4 Slow Deployment Rate**

To catch up with other APAC countries in terms of 5G deployment, Malaysia should focus on expediting the rollout of 5G infrastructure. This includes streamlining administrative processes, facilitating faster contracting with licensees, and providing support to telco companies in terms of funding and resources. Public-private partnerships can also be fostered to accelerate the deployment and ensure widespread coverage, particularly in rural areas.

#### **4.5 Download Speed:**

Improving the download speed experience of 5G is crucial for its acceptance and success in Malaysia. Telecom operators can invest in enhancing network infrastructure and capacity to deliver faster and more reliable download speeds. Collaboration with technology providers can help optimize network performance and ensure a seamless user experience. Continuous monitoring and benchmarking of download speeds can guide improvements and ensure the delivery of satisfactory 5G services.

### **5. Conclusion and Future Recommendations**

In conclusion, Malaysia's adoption of 5G technology has brought both opportunities and challenges. Although the nation has made headway in deploying 5G networks, there are still a number of problems that need to be resolved. To enhance coverage and network performance, technical issues such as infrastructure investment and spectrum management must be addressed. Concerns regarding monopolies and fair competition have been raised by the regulatory uncertainties surrounding industry collaboration and the function of Digital Nasional Berhad (DNB).

Consumer affordability concerns caused by high 5G service fees are preventing wide adoption. In order to solve this, it may be possible to increase the accessibility of 5G services by encouraging competition and market-based pricing as well as offering incentives for 5G device affordability.

Malaysia is at a disadvantage in the global digital economy as a result of its slower deployment pace as compared to other APAC nations. Broader coverage can be achieved through accelerating the implementation of 5G infrastructure, reducing administrative procedures, and strengthening public-private collaborations.

For 5G to be accepted and be successful in Malaysia, download speeds must be increased. To optimise performance and create satisfying user experiences, telecom operators should make investments in upgrading network infrastructure and partner with technology providers.

Overall, tackling these issues and taking the appropriate steps would help Malaysia build a robust 5G ecosystem, unlocking its potential advantages and empowering the country to compete in the digital era.

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