

The future of WOAN

Can Malaysia's
dual 5G approach
turn the
tide?

Can Malaysia be a north star for 5G wholesale open access network?



“Given the uncertainty surrounding 5G deployment in Malaysia, Malaysian MNOs must plan now to successfully navigate a global first: A dual 5G access network”

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WOAN or Wholesale Open Access Network is not a new concept. Several countries such as South Africa, Mexico and Rwanda have experimented with the idea before Malaysia. However, despite its numerous potential benefits, the world is yet to see a successful implementation of the WOAN. Why has the WOAN failed to gain traction with Mobile Network Operators despite the promise of substantial cost savings, up to ten times compared to the DIY model, and a reduction in time to market by up to 50%? Why has the WOAN faced pushback from the very MNOs who are supposed to benefit from it? Here we take an impartial look at Malaysia’s unique Dual 5G network approach and whether it will be enough to address the concerns of Malaysian MNOs around the pitfalls of a single nationalized WOAN.

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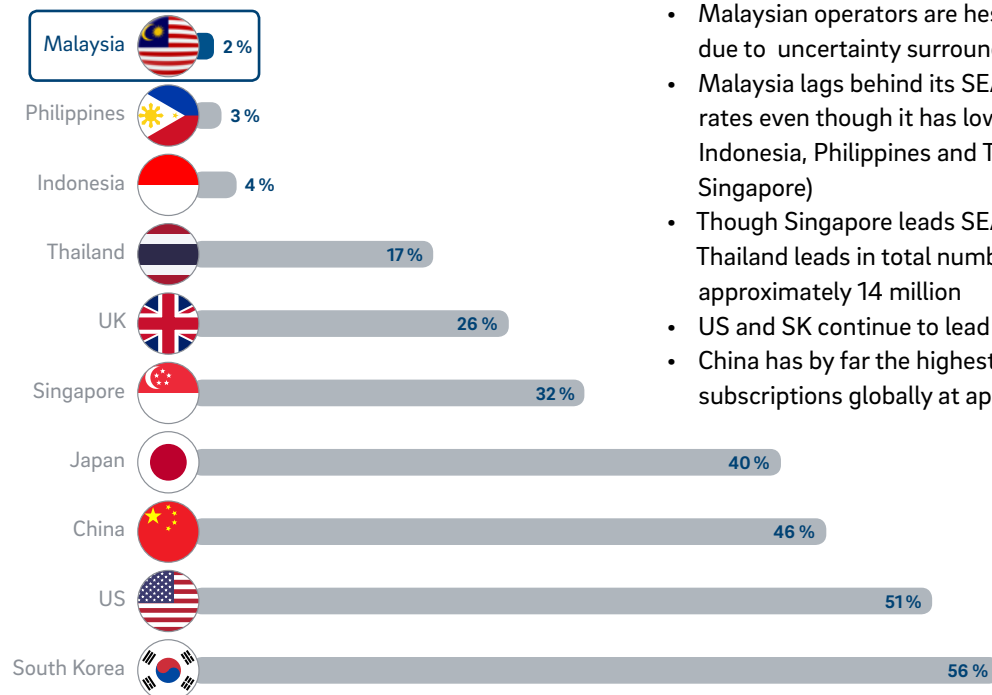
1 / The 5G landscape in Malaysia

5 G roll-out in Malaysia was delayed, compared to its regional counterparts and global peers. Neighbors – Singapore and Thailand powered ahead in their 5G roll-outs with Singapore becoming the first country globally to reach almost 99% SA-5G coverage, and Thailand recording the highest number of active 5G subscribers in the region at approximately 14 million. Indonesia set a new roll-out record with almost 40,000

5G sites (as of Q3 2023). Malaysia is still undecided on its nationwide 5G roll-out plans. With 5G poised to become the backbone of industry 4.0, Malaysia risks "being" left behind in ASEAN's \$3trillion 5G-enabled-economy (by 2030). This delay has the potential to dent the reputation of Malaysia as a regional economic powerhouse.

A: Malaysia's 5G uptake rates are behind regional and global peers

Percentage of population with an active 5G subscription [September 2023]



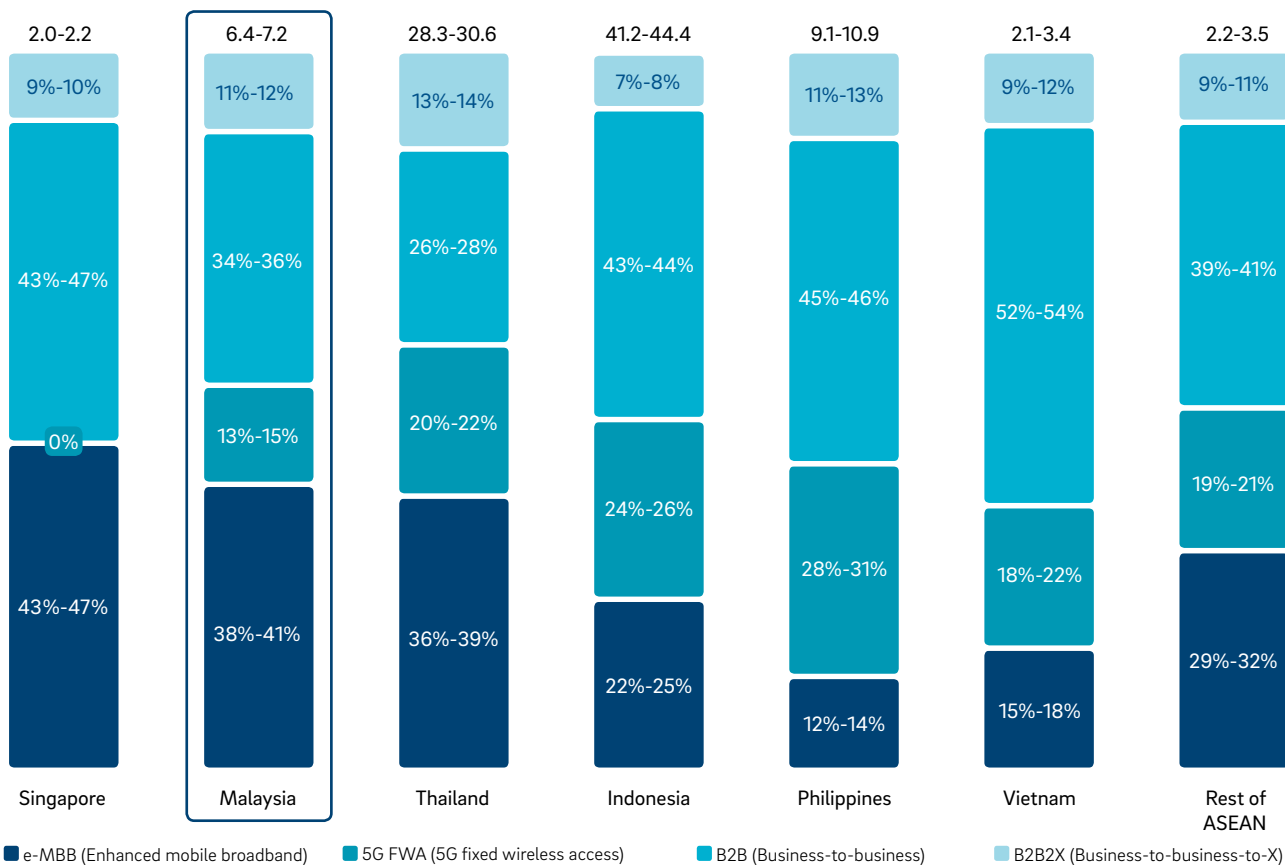
COMMENT

- Malaysian operators are hesitant to commit CAPEX \$ due to uncertainty surrounding the Dual 5G Network
- Malaysia lags behind its SEA counterparts in 5G uptake rates even though it has lower population compared to Indonesia, Philippines and Thailand (excluding Singapore)
- Though Singapore leads SEA in 5G uptake rates, Thailand leads in total number 5G subscriptions at approximately 14 million
- US and SK continue to lead in terms of 5G uptake rates
- China has by far the highest number of 5G subscriptions globally at approximately 700 million

Source: GSMA Intelligence 2023 Report

B: Total 5G Market expected to be - \$100B by 2027

5G Market segments as a % of total market [USD bn, 2027]



COMMENT

Source: ASEAN Business Advisory Council & Roland Berger

- Indonesia will be biggest market for 5G in SEA
- Thailand to witness the fastest 5G market growth rate at 6.8%
- Malaysia ranks 4th with approximately a USD 7 bn 5G market by 2027
- FWA growth not included in Singapore due to 100% FBB penetration
- Thailand with second best FBB penetration in SEA will have a thriving FWA segment

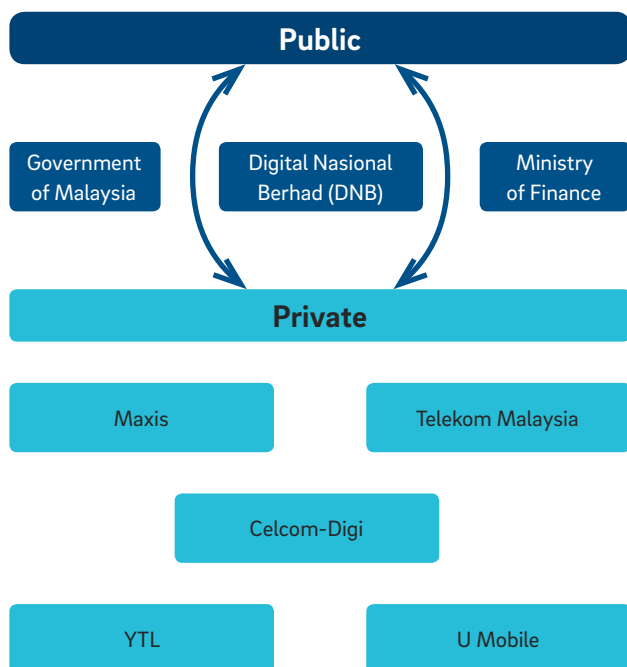
2 / The PPP (Public Private Partnership) Model of 5G roll-out

Unlike most countries globally, Malaysia chose a PPP model for its 5G roll-out, with a government owned SPV (Special Purpose Vehicle) as the sole provider of wholesale 5G access to MNOs in the country. The aim was simple - to reduce deployment costs versus MNO led 5G deployment by

- a) avoiding duplication of infrastructure
- b) maximizing the use of scarce resources such as spectrum
- c) and therefore providing cost effective and quality 5G services to all Malaysians

DNB or Digital Nasional Berhad was born in March 2021 to fulfill these objectives.

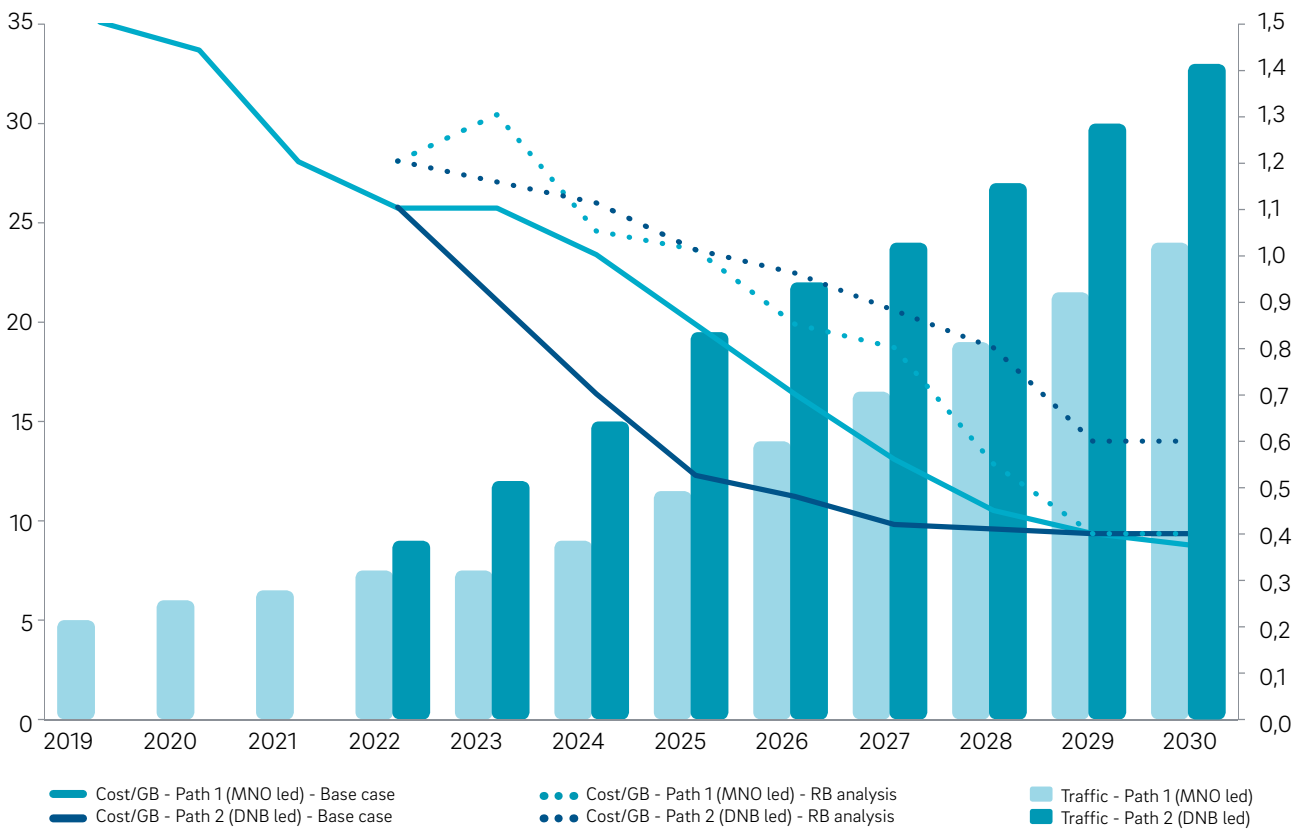
KEY STAKEHOLDERS IN THE MALAYSIAN 5G LANDSCAPE (CURRENT)



Despite the common aim of providing cost-effective & high-quality 5G services for all Malaysians, finding a common ground between the key stakeholders has proven difficult, except for the unanimity of the MNO's concerns surrounding the state-owned single 5G wholesale access provider - DNB, which can be summarized as follows:

1. MNOs argue that creating a nationalized monopoly will **reduce service quality, hinder innovation and increase prices for the end consumer** due to lack of competition, defeating the very purpose of DNB's creation – quality and affordable 5G for all Malaysians.
2. SWN (Single Wholesale Network) will **lack the capabilities to address different requirements (e.g. architecture, technology, performance) of MNOs** which is the key to maintaining their market positioning and differentiation. A one-size fits all approach will not work due to different priorities, business needs and technical requirements of mobile operators.
3. **SWN will increase roll-out costs** due to long-term lock-ins at high wholesale prices (~RM 30,000/Gbps/month). Instead, a DIY (Do-It-Yourself) approach would be more cost effective and provide the necessary flexibility and redundancy critical national infrastructure like 5G needs. Our initial estimates suggest total cost of ownership could go up by as much as 40% in a SWN led model vs a DIY model.

D: A DIY Approach may be more cost-effective for Malaysian MNO's compared to leasing capacity from DNB
 Traffic, cost/GB : DNB Led 5G deployment V MNO Led 5G deployment



1) MNO: Mobile network operator; 2) DNB: Digital Nasional Bhd

Source: Roland Berger

COMMENT

- Based on RB analysis MNO led roll-out may cost up-to 40% less compared to DNB led
- Given "As-is" MNO led 5G roll-out costs will be higher compared to DNB led until Q3 2023
- From Q4 2023 onwards, MNO led 5G roll-out will be more cost effective compared to DNB led

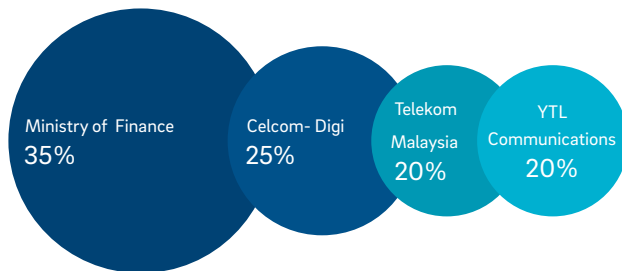
ASSUMPTIONS

- 1) Full TCO view considered
- 2) Based on the assumption that operators will use all possible levers to offset CAPEX pressures such as sharing, co-build etc

3 / Entry of the second 5G network

To allay the fears of mobile operators, Malaysian government decided to offer equity stakes to the six Malaysian MNOs in DNB (Jun 2022). Despite their initial reluctance, four out of six decided to proceed, while the remaining two (Maxis, U-Mobile) backed out from acquiring stakes in the state-run entity.

E: Digital Nasional Berhad (DNB) proposed shareholding



Fast-forward one year later, with a new government at the helm of affairs in April 2023, a decision was taken to launch a second 5G network to boost competition and ensure a better quality of service. Lack of transparency in the previous 5G plan (a charge firmly denied by DNB) was cited by the government as the major reason for the pivot to a dual network strategy. Soon after Celcom-Digi and TM decided to terminate their deals.

There has been a lot of debate around who the second vendor might be. Another state-backed SPV or a Consortium of MNOs? Which OEM could deploy the second network? US-EU-based OEMs will get the nod, or will Chinese OEMs be preferred to diversify and reduce risks? How will the spectrum be allocated to the second network? Will DNB relinquish spectrum, or will government release more?

Either way, one thing is sure – with no global precedent to follow - Malaysian MNOs would be entering uncharted territory. A well thought-out roll-out strategy could be the difference between winning and losing.

GLOBAL FACTORS AT PLAY

Most countries, including Malaysia, have declared 5G as “Critical National Infrastructure.” 5G will form the cornerstone of Industry 4.0. and a source of competitive advantage for nations as they vie for technological superiority. The stakes are high, and Governments worldwide have been highly vocal about their priorities and concerns surrounding 5G w.r.t architecture, standards, security and choice of suppliers that can be summed up as follows:

- a) *unconstrained capacity*
- b) *zero-trust security*
- c) *maximum self-reliance.*

The current US-China tensions that span multiple dimensions, such as technology, trade, and territory, plus the ongoing conflict in Ukraine, have only exacerbated these concerns. Though Malaysia has remained largely unaffected, it is not isolated from the political and economic ramifications of the global factors at play. Malaysia’s positioning on these issues will influence its access to technology, semiconductor supply chains, and the overall investment climate in the country. While it may be impossible to predict how the current global geopolitics and economics unfold in the long term, Malaysian operators must factor these in before making strategic choices on their financial and technical roadmaps.

IS TWO 5G ACCESS NETWORKS REALLY THE SOLUTION?

While a second 5G wholesale network will address the immediate concerns of Malaysian MNOs to some degree, key questions will remain.

1. Current 5G spectrum is exclusively owned by DNB and would most likely be re-allocated between the two 5G networks, which could mean further painstaking negotiations and hence, further delays. **Spectrum fragmentation will also have an adverse impact on the 5G QOS.** Operators will need to mitigate QOS degradation by using technological enhancements such as higher order MIMO, UL/DL Carrier Aggregation and Multi-band radios which means more CAPEX!
2. After spending nearly \$5B in taxpayer money on DNB, are Malaysians ready for further delays and another spending spree on a second 5G network? Public opinion seems otherwise. Six out of ten Malaysians are frustrated by the delays in being able to access high-speed data services as their south-east Asian neighbors and not in favor of the second 5G network (Source: Bloomberg Survey). With growing negative public sentiment regarding Malaysia's 5G roll-out strategy, **operators must ensure that any potential cost benefits of such an arrangement are passed on to the consumer.**
3. The second 5G network roll-out starts early next year (Jan 2024) and is contingent upon DNB reaching 80% 5G coverage by the end of this year. **What will happen to DNB once its mandate is fulfilled? How will MNOs manage the "Wholesaler-Retailer under the same roof conundrum"?** If they will be equity holders in both the networks, then they are ultimately funding two

networks which a) they did not want to begin with and b) puts further strain on their already debt ridden balance sheets.

4. Malaysian MNOs need to make this work, and the onus is on them to ensure **seamless interoperability between the two 5G networks and their respective cores.** As of today, inter-vendor interoperability is far from plug-and-play and will be a challenge for most telcos. Not to mention a further increase in Operating Costs of up to 10%.

(Note: This increase in OPEX is factored in our analysis in Fig D).

4 / How can Malaysian MNOs navigate the Dual 5G Network without a precedent? – «Let chaos reign and then rein in chaos»

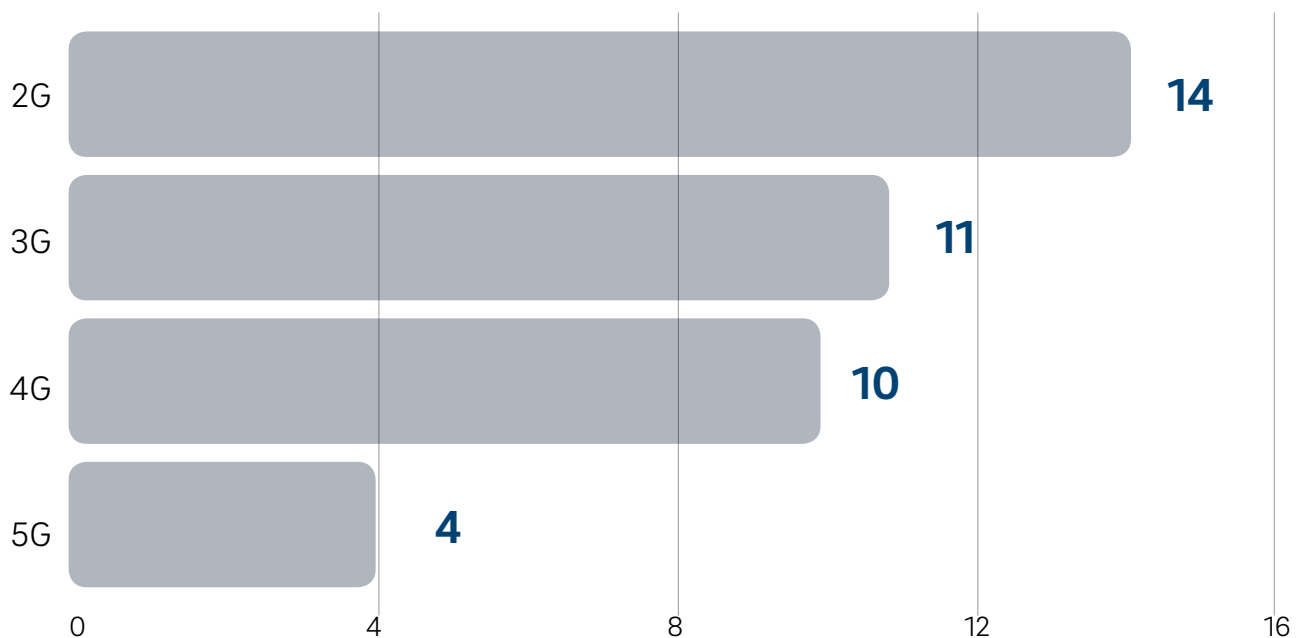
Andrew S. Grove
ex-CEO Intel Corp

While there seems to be no silver bullet, operators can employ proactive strategies to be better prepared for the new realities, and the challenges they bring.

1. Timing is the key: Operators must decide whether to wait for the second 5G network and get dragged further behind in their 5G plans or move to finalize capacity agreements with DNB. If history has shown anything regarding 5G, laggards almost inevitably lose market share to first movers (up to 40%), for which they later need to spend almost 3X the marketing dollars they spend on retention.

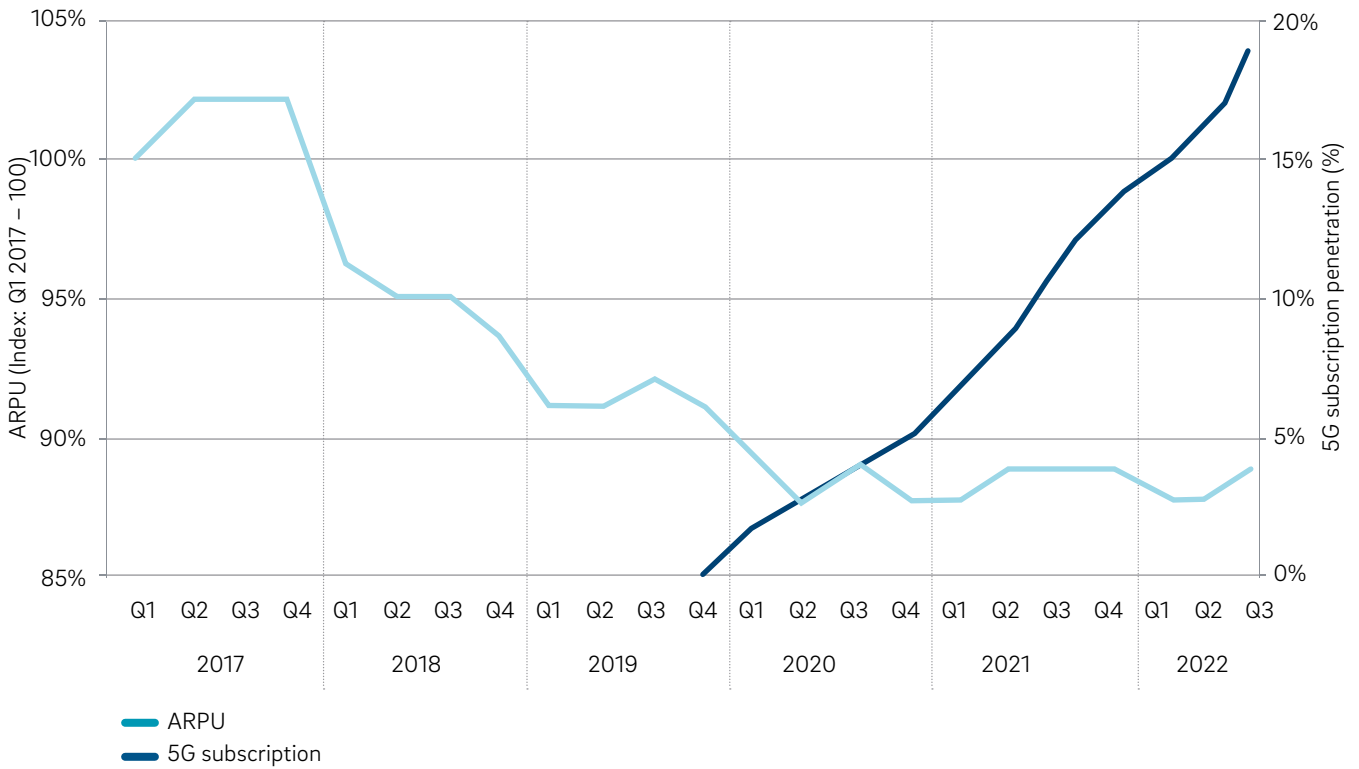
2. Technology and Architecture: >90% of the 200+ live commercial networks globally have followed the LTE > NSA > SA evolution curve for 5G, as it maximizes the use of existing assets and significantly reduces costs by up to 10X vs the LTE > SA option. Malaysian operators have a significant 4G footprint (>95% pop coverage) and taking this tried and tested route would make sense. However, another option exists to compensate for lost time, i.e., going directly to the SA option. Even though counter-intuitive, we believe every MNO in Malaysia should evaluate this option as the benefits might outweigh the cost. Front-runners have seen significant ARPU up-lift since the launch of their SA-5G networks.

F: Lead time for adoption for first 17.7 million customers by generation (in Quarters)



Source: 5G Americas

G: Average revenue per user VS subscription penetration



Note: SA-5G deployment picked up since 2021, since then ARPU has been on an up-swing

3. B2S or Build to Specification: While having two 5G networks does provide some flexibility, it is still not the same as a DIY model and limits the options of MNOs to build networks tailor-made to their specifications. While having wholesale provider levels the playing field for challengers to some extent, access network, being closest to the customer, is the biggest differentiator for MNO's and they must build in mechanisms to preserve their differentiation on network quality during negotiations with the two 5G networks.

4. Align vendor strategy with the 5G Network Provider: By aligning their vendor strategies with their 5G network providers, Malaysian MNOs can reduce testing and system integration costs by up to 10% and TTM by up to 25%. Therefore, MNOs must be proactive and devise network roll-out and evolution plans in lockstep with

the technology roadmap of their 5G network providers. Based on our experience, a joint Go-To-Market by MNOs in such a scenario could provide cost benefits of up to 30% in procurement synergies.

5. Start with a Target Operating Model in mind and align the pyramid bottom up with their 5G Network Provider, starting with Platforms > Technology > Processes > People > and Governance to minimize friction and ensure clear demarcation of SOW vertically and horizontally. Start building capabilities and re-skilling the workforce to transition to more agile workflows. Based on our experience, operators today possess < 50% of the capabilities that a fully virtualized and disaggregated 5G network of tomorrow will need.

Conclusion

While Malaysia's 5G roll-out has not come sprinting out of the blocks, we believe it can make up lost ground, but time is of the essence, and any further delays could be detrimental not just for the MNOs but for the Malaysian economy as a whole. After all, MNOs are the lifeblood of a thriving digital economy, and it is time all parties put aside their differences and build the necessary consensus to turn Malaysia's Digital Economy Blueprint (MyDigital) into a resounding success.

While Malaysia's unique approach to 5G is fraught with unseen challenges, at the same time, it is also a tremendous opportunity to be the North Star for the WOAN approach to 5G deployment. Will Malaysia walk the path successfully where many have failed?

Glossary

MNO	–	Mobile Network Operator
WOAN	–	Wholesale Open Access Network
PPP	–	Public Private Partnership
FWA	–	Fixed Wireless Access
FBB	–	Fixed Broadband
DNB	–	Digital Nasional Berhad
SWN	–	Single Wholesale Network
DIY approach	–	Do-It-Yourself approach
TCO	–	Total Cost of Ownership
QOS	–	Quality of Service
B2S	–	Build to Specification

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