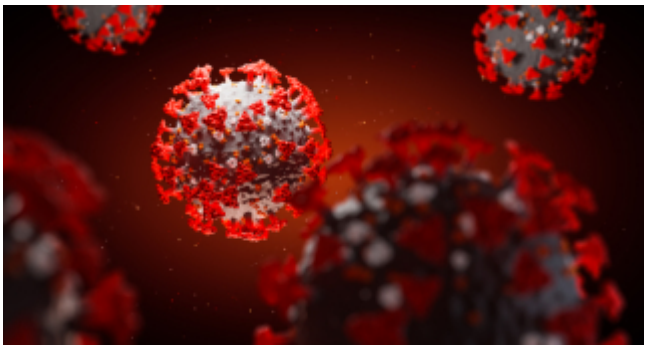
Small Island Developing States, COVID-19 and Digital Technology



Posted by David Fellows[1] and John Leonardo[2]

The impact of COVID-19

COVID-19 has changed behaviour throughout the world and social distancing has been the key driver. Workers in factories, shops and offices have been protected by creating greater space between workstations, erecting protective screens and using protective clothing. Distancing requirements have been introduced in bars, cafes, restaurants, hotels, markets and shopping centres. All economies have suffered, especially the hospitality industry, air travel and public transport. Unemployment has soared. Schools and higher education colleges have closed. Many countries are turning to the IMF for support.

The internet has proved a beneficial facilitator of economic

activity, allowing most administrative work and the ordering of goods and services to be undertaken at home. Video conferencing has facilitated meetings with colleagues, business partners and clients, and helped maintain contact with friends. Online learning has featured in reopening plans for higher education and some schools. In this new world digital technology has achieved an elevated significance beyond its already pervasive presence in the pre-COVID era. In some ways it has already established a new normal.

This brief piece focuses on small island developing states (SIDS) but even here the challenges are not identical. Some countries depend heavily on a now-dormant tourist industry and shoulder severe difficulties. These include poverty, remoteness, disbursed communities and the need to combat the threat of natural disasters. The virus demands a minimisation of personal contact for which the absence of good quality, low cost digital communication leaves many states poorly prepared. The UN E-Government Survey 2020 notes that of the SIDS only Singapore and Bahrain have high overall scores; almost half scored less than 50% of Singapore's score for infrastructure.

Communication infrastructure

Good quality digital communication requires fibre-optic broadband cabling to support business use and homeworking with adequate resilience, even including 4G and Wi-Fi. 5G is costly and has potential shortcomings at present. This option requires specialist advice.

Understanding behaviour is important to government strategy. Contributing factors include levels of public education,

affluence, user tariffs and local cost factors. Lobbying based on knowledge of the operational intentions of the marine cable-laying industry could be important.

Regional collaboration could provide impetus to network improvement strategies, regulatory frameworks and licensing agreements.

Technology applications

The digital service revolution discussed above and already taking place across the world, accelerated by the onset of COVID-19, is inescapably relevant to SIDS. There are many specific business applications of relevance to SIDS, including: health advice (including C-19) and personal consultations; agricultural monitoring and market information on crops and livestock; and weather monitoring for fishing, agriculture and general safety considerations. Additionally, expatriate monetary transfers are being undertaken increasingly using digital systems. The creation of digital services relevant to developing countries gathers pace and must be encouraged.

Video conferencing, email and document handling systems provide an essential communication layer that is particularly useful to achieve social distancing.

Apart from their use of major business applications governments can make use of social media for public messaging, for instance, demonstrating transparency and engaging citizens the struggle against corruption when resources are so scarce.

Technology skills

Digital communication infrastructure must be complemented by a capacity for: upgrading, expansion and rerouting of infrastructure; installing application software; implementing major software packages; and even the development of service applications. This requires learning at various levels gained from school, college, in-service courses and practical experience.

An understanding of the technology is also required to educate potential adopters about the possibilities that digital communication offers them. This includes the general public, small businesses, the public sector and larger private sector organisations.

Digital technology skill development is essential to help SIDS adjust to the current situation.

Towards cost-effective solutions

COVID-19 is forcing change to the way people live throughout the world and economies are in crisis. Digital communication offers the capacity for helping maintain business continuity. Most SIDS would benefit from a higher standard of affordable digital communication supporting improved digital service delivery.

Digital technology must be designed to the needs and circumstances of individual states. Nevertheless, there could be much to gain from cost-effective collaboration between SIDS

for the purposes of sharing and developing:

(i) an understanding of the economic and social impact of COVID-19 and ways of mitigating these effects through digital communications;

(ii) market-shaping policies and practices for increasing the availability of digital communication at an affordable price;

(iii) strategies and programs to support the provision of expertise in digital technology and its use by business, public services and the general public; and

(iv) knowledge of relevant progress made on these issues throughout the world.

Such an initiative, whether on a global or regional basis, could include SIDS, development agencies, the digital service industry, other private sector partners and potentially the Commonwealth Small States Centre of Excellence. Is this a step too far?

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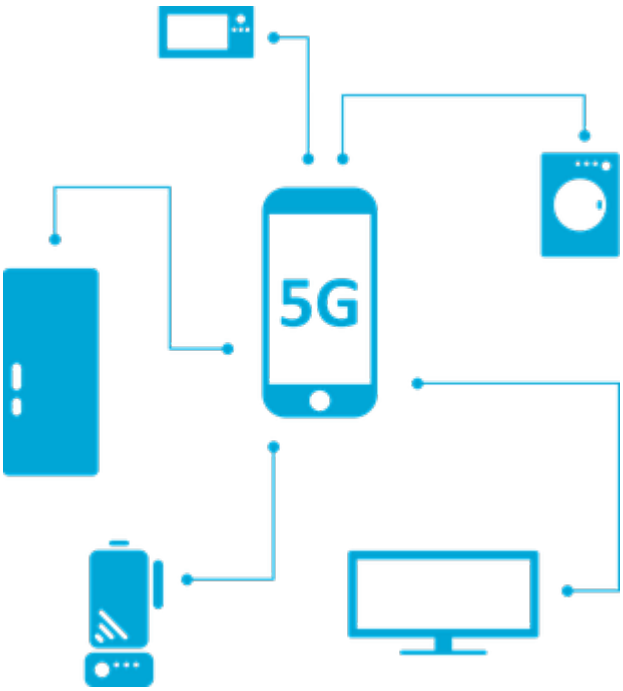
Progress with 5G Digital Coverage in the UK & Developing World Implications



Smartphone Technique

by David Fellows [1]

The 5G mobile communication offers the prospect of high bandwidth reception for rapid video downloads, gaming, instant replay coverage at major sporting events and simultaneous service to heavy concentrations of digital devices. It is a highly topical subject across the world including developing countries.

This article tempers expectations of widespread 5G coverage in developed countries on grounds of financial viability and suggests that developing countries are better served by centring digital infrastructure investment on broadband cable and lower frequency 4G mobile services.

Digital Communication costs and coverage

I start by introducing a sense of realism about internet speeds and coverage by looking at actual practice in the UK which has reasonably average internet services for a developed country.

Table 1: UK internet speeds

User	Mobile	Fixed Line	Comments
Personal devices	4G (15/30 Mbps) 5G (2/100+Mbps)	Approx 30 Mbps (usually advertised as 50)	4G reaches 75% to 90% of the population depending on provider. 5G has hardly started(see discussion below). All-fibre cabling of 120 Mbps will become common in the next decade.
Small/ Medium businesses	–	100Mbps/ 1000Mbps	In this group call centres tend to need the higher capacity
Major businesses	–	1000Mbps+	

Note: 4G speed depends on provider and time of day [2], the better the infrastructure provision the better the service. 5G is said to relieve congestion although this too is infrastructure-dependent (see Table 3). For some time to come, even in developed countries, 4G will outstrip 5G coverage by some considerable margin.

In 2016 Universities of Cambridge & Madrid undertook a study [3] into the viability of introducing 5G mobile communication in the UK. Tables 2 & 3 summarise some conclusions from the study.

Table 2: UK Demographic Profile (total population 63 million)

Settlement Type	Proportion of Population (%)	Approximate Distribution of Total 5G Cost (%)
Urban	8	2
Suburban	62	19
Rural	30	79

Notes: (i) total cost adds capex & opex (see Table 3 below); (ii) the study anticipates that the roll out of 5G will take place over the next decade.

Table 3: 5G Options for UK (selected from UC&M study)

Aspect	Option S2 £bn	Option S5 £bn	Option S8 £bn

Features	One 50Mbps network sharedby 4 operators	Using competitive 50Mbps networks except for ruralareas where a shared 50Mbps rural network applies	Using two 50Mbps networks shared by 4 operators except for rural areas where a shared 10Mbps network applies
Capital Cost	22	24	15
Revenue Cost (10 yr NPV)	13	17	10
Study Conclusion	Not viable; Scotland is dramatically more expensiveexcept for S8	Not viable; Scotland is dramatically more expensiveexcept for S8	Not viable; the lower rural bandwidth avoids the cost rising exponentially to cover the final 10% of population

Notes: (i) M**ost 5G signals are highly directional, require a direct line-of-sight between the antenna and the device receiving the signal and can be absorbed by humidity, rain, and physical object including trees, therefore they don't travel as far as the more robust, omnidirectional 4G signals (as a result they require very high aerial density and present**

problems for some applications under discussion such as driverless vehicles) [4]; (ii) 5G networks can make use of existing 4G aerial stock and cable support but the higher aerial density makes the transition from 4G very expensive; (iii) the cost of covering the most expensive 10% of population at 50Mbps is equivalent to that for the first 90%; (iv) the study assessed the total cost (capex & opex for 10years) of 5G coverage for the UK's rail and motorway networks would be £0.922bn & £0.253bn respectively.

Part way through 2019 several UK mobile service providers have commenced or announced their intention to provide 5G coverage. Some have published city roll-out programmes although details of schedules, geographical boundaries and bandwidth are sketchy at present. None of this equates to a city-wide coverage commitment let alone national coverage. Unsurprisingly the focus appears to be areas of potential high traffic where improved service reliability will be the driving advantage. Available bandwidth could be as low as 2Mbps for entry level packages.

5G services may be offered for pop concerts, major sporting events, shopping malls, some public buildings and crowded city centres. Some of the infrastructure could be provided by venue owners or organisers as Wi-Fi is at present.

The European Union produced a policy document '5G for Europe: An Action Plan' in September 2016 that seeks to drive progress towards realising substantial financial benefits from the technology. The Action Plan, quoted in a recent review of the Commission's achievements, seeks to harmonise European preparations giving priority to infrastructure coverage of major urban areas and transport routes by 2025.

Implications for Developing Countries

1. Given the financial viability challenges in developed countries such as the UK it is clear that rolling out 5G services in developing countries will be hampered to an even greater extent by the financial returns required to support infrastructure provision.
2. 4G coverage is indisputably more readily viable than 5G and is a more obvious objective for developing countries for the foreseeable future. Governments need to consider their bandwidth licencing programmes accordingly.
3. Conventional public Wi-Fi systems can offer mobile text communication to supplement overloading of 3G and 4G reception in public areas with high demand for digital services.
4. In the author’s opinion 4G mobile coverage and fibre-optic cabling of CBD areas for super high bandwidth communication offer the basis for viable digital communication strategies in developing countries.

General conclusions

1. At the present time commercial ambitions for 5G in the UK appear limited. The financial viability of the aerial installation costs on a large scale compared to 4G is a considerable constraint. For some time to come 5G may be largely confined to high income high demand locations and some venues where owners provide the necessary infrastructure as an added attraction. It is a solution waiting for a killer application or acceptance as a social status imperative. The current service and economic priority for mobile infrastructure must be the completion of 4G coverage. This reasoning would seem applicable throughout the world although it is reported

[6] that Malaysia intends to adopt 5G fully by 2023. Malaysia is undoubtedly a leader in digital technology but this claim is something that requires clarification.
2. It is generally presumed that the long-term intention of 5G service providers is transmission speeds of 50+Mbps but at current revenue levels this form of coverage is deemed to be unviable in UK rural areas. The UC&M study suggests that shared rural networks operating at 10Mbps would reduce cost significantly and a broadly similar cost reduction could be achieved by omitting 10% of the population (equivalent to 33% of rural population) from 5G coverage. Even these two reduced service options would still appear unviable assuming current service revenues.
3. The UC&M study hints that technologies under development may deliver significant cost savings for 5G provision although details of how this might happen are not well understood at present.
4. 5G viability in the UK and other developed countries would therefore seem to depend on some or all of: (i) restricted service provision targeting areas of high demand; (ii) technological advances bringing cost-savings; (iii) user willingness to pay higher fee rates for 5G than its predecessor services; and (iv) modest, possibly shared, bandwidth in rural areas.
5. Given these 5G service limitations, upgrading to 5G-enabled smartphones may be a nuanced decision for many users for some considerable time. Roll-out costs and user hesitancy will, in turn, impact commercial investment.

In My Opinion

1. Countries have much more to gain from improving the reach of 4G mobile communication than encouraging

service provider interest in 5G roll-out which will be a niche offering for some years to come. Developing countries should not feel that they must jump now or miss the bus.

2. 5G mobile communication is not a natural alternative to fixed cable support for business purposes. In this market fibre optic broadband cable services offer the ideal of high bandwidth, service reliability and relatively low cost.

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[1] David Fellows is a specialist in public financial management and digital government reform and is a director of PFMConnect. He is a recipient of the Swedish Prize for Democratic Digital Service Delivery.

[2] See: https://www.ispreview.co.uk/index.php/2019/02/countries-ranked-by-4g-download-speed-at-different-times-of-day.html

[3] See: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/577965/exploring_the_cost_coverage_and_rollout_implications_of_5G_in_britain_-_oughton_and_frias_report_for_the_nic.pdf

[4] See: Lifewire https://www.lifewire.com/5g-vs-4g-4156322

[5] See: https://5g.co.uk/news/ee-5g-launch-plans-roadmap/4900/

[6] See: OpenGov Asia (10th September 2019): https://www.opengovasia.com/malaysia-will-fully-adopt-5g-by-2023/