



Fact based analysis and opinions – problems in the telecom and professional service industries

A discussion of problems with opinions

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This document is intended to provoke thought and debate.

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The irony of this report making claims, and questioning claims/statements made by others without sufficient evidence, is acknowledged. For reasons of brevity this report does not include extensive supporting evidence and analysis. The key points remain valid. Counter-discussions are invited.

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Document history

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1 Problems need to be understood

1.1 The current situation has increased concerns

This Telzed report was written during the Covid-19 global outbreak. This period increased a number of pre-existing problems in the telecoms and professional services industries. Even after the Covid-19 outbreak has subsided, this report's comments and analysis should remain valid.

A general concern is with the number and types of claims being made by both "experts" and lay persons. In some cases these are creating confusion and could result in erroneous decisions. Decision makers have to rely on inputs from economic, legal, financial, market, business, technical etc. specialists. Telecoms is complex and a wide range of skills and knowledge are required. Those making major decisions ideally will have broad knowledge, plus deeper knowledge (and experience) in a number of fields. They cannot have the depth of knowledge of a specialist, in all areas. Therefore opinions and advice from specialists or professional services (possibly claiming to be experts) can have wider influence – in part due to the ease for ideas/opinions to promulgate in the media. Decision makers often have to accept and trust opinions, advice and recommendations.

Managing the information and making decisions is a normal part of management. All players need to be aware of the robustness of statements and analysis, in order to make informed decisions. With increasing numbers of false/doubtful statements, this creates a fog which increases the potential for wrong decisions. This is greater when many parties make the same (wrong/doubtful) claims or if the claim comes from seemingly reputable sources.

The problems have wider implications for everyone. The fog of false/dubious claims creates doubt that spreads: decision makers are unable to know who is right as they do not have the in-depth expertise (that resides in the specialist advisory teams and input sources). Wrong claims cast doubts on all analysis and so devalues the work of even the most professional.

Telzed (R Steele) has noted the problem of questionable claims before the Covid-19 outbreak (see past Telzed papers). This paper highlights the problems and proposes some actions.

1.2 Summary of the situation

Poor or incorrect opinions have been quoted recently. The (debatable) increase in these sources seems to be part of a wider concern where news outlets and politicians seem less professional and informed. Myths, false stories and opinions abound. Perhaps this zeitgeist has encouraged ill-informed analysis within the telecoms industry. This report keeps clear of the wider politics and news outlets, but with: social media; ease of publishing reports; and the ability to rapidly disseminate information, then both good and bad information/analysis can flourish. The separation of: analysis; reporting of facts; giving of opinions; and the

assessment of how good each is, has been blurred. It is harder to differentiate where stories came from and what is fact-based analysis with reasonable deductions/insights¹.

A recent 2020 example was a newspaper headline reporting a claim that the UK telecoms networks were about to be overloaded by home working and chaos would naturally ensue. As well as reports from such claimants, the article did at least report a BT manager who pointed out this this was unlikely due to pre-existing facts about telecoms traffic and how the network is engineered. The melt down of UK broadband/Internet did not happen, of course. But a reader without any telecoms knowledge would not know that the headline was misleading (wrong!), and the real expert to believe was BT. This was not helped by the negative-outcome commentators getting reported on first. Of course: "Everything will work as normal," is not news. Even though anyone² with telecoms industry knowledge ought to have known about time of day traffic and some elementary network design, the risks were still real. The new ways of working *could* overload the networks. There *are* realistic scenarios for major overloads that these vary by country, network and even locality within a network. Current reporting gives extensive coverage to *claims*: someone claims something could/will happen, is now deemed to be news. It is reported, even if fanciful or false. With the modern ease of spreading views, claims can easily flourish.

A new aspect of the industry is the (seemingly) increasing numbers of totally fanciful claims. Example: 5G masts (or any mobile) and their signals cause Covid-19. Equipment and masts have been set on fire in the UK. This is a flat-earth (fruitcake) type belief, but the irony is worth noting. Lack of mobile communications could cost lives in an emergency – rather more than the zero lives lost by a "5G induced virus." Although fruitcake opinions are not worthy of professional analysis, they are relevant to how decisions are made and have wider impacts.

We have a spectrum of claims from the fruitcake through points that are extremely unlikely or only possible in rare circumstances. This is more subtle: the claim is this *might/could* happen. Technically this is often correct³. In contrast to those who say: it *will or shall* happen. Such absolutism can often be disproved. But even that can be defended by: "Yes, I may be wrong, if you wish to be pedantic, but it still might happen and it is 'fair comment' anyway."

The "will, could or might" issue is complex. There *was* a reasonable potential for network overload (even if often far less than some "experts" might have thought). But other claims might be fanciful. As Bertrand Russell noted, there could be a tea set and tray orbiting in the asteroid belt. I (and BR) certainly could not prove its non-existence. But we can reasonably assume it does not exist. Some industry claims may be similar.

¹ This is a central aspect of consulting and professional service industries and how complex problems are addressed. It is not simply done through giving opinions or saying what was done elsewhere (but that still has a role). Often the same situation has never occurred - that is why we are used

² If you are in a senior role or doing critical strategic planning or analysis and have never heard of time of day traffic, busy hour and network statistics, then perhaps something is seriously wrong. You still do not have to be an expert, of course. Most should have known that more traffic in the day does not impact the early evening busy hour, so a lot more day-time traffic is needed before the video-based early evening busy hour traffic is exceeded. Yes this *is* conceivable as might more home working traffic in the evening busy hour. A simple leap to one conclusion was proved to be false

³ An appreciation of the issues and how they vary is needed: the answer is rarely the same everywhere. This is profound (and not new). Many common principles of the telecoms industry are not universal: there is nearly always an exception. Understanding this subtly is vital. This complexity is probably not currently and adequately understood

1.3 Messages from this report

This paper lists a number of claims, including myths. Problems are noted. The reader can use this list as a basis for further reading and better understanding. New ways of working could follow. Key points include:

- Beware of claims. Sources may not be as robust as you might think. Wider reporting of claims compounds the problem. The quality is not altered by frequency
- Know the clear fruitcake issues and gain an understanding of the more disreputable sources. The sources can be media and even professional service companies⁴
- Media are also of varied quality (as we all know) but they often “simply” report the claims. However they are seemingly less able (or willing) to sieve and assess the claims. The claim is the news. Social media have almost no controls. So, LinkedIn simply has a claim posted.
- The source must be understood – just because it is reported on, now provides little significant verification of its quality
- Managers must have broad skills and experience. They must have trusted advisors who have the in-depth abilities to cover the full complexity of the telecoms industry. A corollary to this is that decision makers must be industry and business experts. “I managed successful retail clothing stores, and telecoms is really just a retail business,” is surely a danger sign for appointments of CEO and senior figures. The horrible history of many spectacular failures in telecoms shows that wrong and even stupid decisions are made. Knowledge, experience and many skills are vital. Even with these, errors were and will be made – do not make it worse by having ill-informed leaders and poor expert teams. The leader has to assess the sources, and it is better if they are of good quality
- Professional service businesses should maintain the highest standards possible. The good ones will, by example, reveal the lesser players
- There is a role to identify the fruitcakes and fanciful. This did not matter in the past⁵. Perhaps it does now
- Everyone needs to understand the spectrum of outcomes. The fruitcake; unlikely; possible under X circumstance; this depends on country history and GDP; might be true now but less likely in 3 years; or, a moot point that even experts can dis-agree upon etc.
- Managers and professional workers need to be informed and make reasonable deductions and opinions. This is critical in Expert Witness work. Do not be tempted into using claims and beliefs from others – they may be totally wrong. Do not assume

⁴ Consultants, market analysis companies, technical firms, operators, vendors. “Opinion givers” who have no professional basis might masquerade as these

⁵ Not long ago many doubted the need for many national/international fibre cables or faster broadband. “64kbit/s was enough.” “The traffic cannot rise exponentially for ever” [strictly correct as infinity is a big number, but has it has done so for 40 years]. We mostly dismissed these past claims and have forgotten those who made them ~20+ years ago]. Were these ever really sensible claims at the time or a fruitcake denial of the obvious trends?

things if you do not know the subject. You must be able to assess the claims and do the analysis, if you really are an expert⁶

- Telecoms is a rapidly changing business. Very few know what will really happen in say 7 years' time. We must expect the unexpected. New ways of using broadband and the Internet arise all the time. Even successful ones fail. Absolute certainty does not exist
- A few consistent aspects of telecoms are unlikely to change:
 - The need for more speed. This is a subtly complex subject (see later and past Telzed papers), but the basic global needs and trends are clear
 - The need for more traffic (bytes)
 - New ways of making use of telecoms will always arise – the greatest value to society is from *using* telecoms. Think: education, information, avoidance of travel, healthcare, shopping, trading, gaming etc.
 - Companies will fail. This is normal. It is part of competitive capital markets. In itself, this is not always bad.
- Even junior analysts and consultants must think carefully about what they do. A market demand model depends on the numbers you enter. You have to make a decision and have an opinion. Small inputs do matter. Those in charge have to appreciate this and manage the work. Do not be distracted by “claims,” but keep to your professional principles of working. If there is no robust evidence for 20% growth, then do not use the value just because the client/chief wants that to happen. Your manager has to trust that you have selected sensible values
- Avoid *opinions* wherever possible, but consultants/analysts *et al* have to make/gave them. Keep connected to the *facts* and use *reasonable* analysis plus experience for the deductions and insights
- The decision maker makes a final opinion and must justify the decision. This is difficult: assessing other opinions and the ensemble of facts. *Some* decision-data is often doubtful. Understanding this is a key to know when the analysis is robust/sensible or based on a house of cards and questionable opinions
- There is still a role for opinions and predictions. Without visionaries and actions without full evidence, the world would be a lesser place. There is often no hard evidence that some things will work until you try to make them.

These points in no way avoid all errors and mistakes. Almost everyone makes wrong analyses and mistakes. We often have different opinions, even if the same information is available. This does not excuse lack of professional approaches and not making fact-based assessments. Ensure that the information and analysis is assessed against the possible sources: fruitcake; manager who did similar in last company 2 years ago; incomprehensible Excel business model; or clear list of relevant examples with analysed outcomes.

⁶ The Author has been part of legal cases and has been an Expert Witness

The concerns are accentuated by the ongoing 5G saga. A feature of the last few years has been a number of claims that stretch credulity of many in the industry. It is vital that this is understood: why might a vendor claim X or an operator claim Y? They have vested interests, and perhaps have a fiduciary responsibility to help their company. Might this bias their claim? In contrast, professional service companies do not have this obligation. The accent needs to be on: “professional.” The balance with “putting the client first” needs to be understood⁷.

⁷ Most experienced consultants have been in this situation. A client wants X or Y but we know that to be false or unlikely. Not doing what the client demands (and taking the penalty) can be a painful decision. Alternatively, you can cross the Rubicon and agree to entering fanciful numbers in the business model or confirm a claim that is far up the wrong end the spectrum of credibility

2 Claims and problems

In this section a selection of areas of concern are listed. It is possible to categorise these each into fruitcake, mainstream or area of current professional debate etc. This is not done. This emphasises that almost every point is open to debate. Readers may define their own order-of-credibility.

The list is not comprehensive. It provides only a selection of beliefs and areas of debate. The approach does not deliver a full, balanced discussion. Only a high-level view of the diverse issues is provided. The reader can carry out further research (or contact Telzed).

5G causes Covid-19. The fact that even a tiny minority think this and are willing to act, is a problem. This reflects a wider international problem where crazy ideas and beliefs become accepted and get the publicity that would not have been given in the past. Furthermore, we even have effectively seen this belief supported on the dubious basis that: it is a justified view and should not be dismissed because it is counter to the established view. Effectively: counter views to the rational *should* be considered *because* they are counter to mainstream reality/rational-thinking⁸.

Certainly everyone has the *right* to think what they want (at least in most countries) but it is not normal to allow widespread quotation of the absurd claims. Should reputable media or professional firms repeat them? Anyone can list a load of non-telecoms odious or crazy claims. Fruitcake telecoms ideas are not justifiable for widespread quotation just because they are “valid as ideas” or even “fair comment.” The right to mock or counter such claims is vital. Note: it is surely best to ignore most such claims.

5G and mobile causes cancer (or other ailments). This has been a recurring type of claim. This could require extensive debate and analysis based on many expert reports and tests. This is best avoided. If we cannot respect the science and past work, then there are serious problems. Are these experts hiding evidence and/or making false claims that the *permitted* signal levels are safe? Few readers have the skills to assess the work. Surely, we have to accept the status quo and past decisions. If not, then why carry a mobile phone? Why are masses of people not having ailments close to the ear or the pocket where phone is held. Yes, the debate is worthy but surely now it is best parked by the rational majority. Get on with life and enjoy your mobile phone, WiFi, TV, satellite etc.

5G/mobile and radio/microwave signals is a complex issue. *In extremis* high level radio or microwave can cause harm. At normal power levels it *is* generally accepted to be safe or the risks are so small as to be acceptable. This lack of an absolute proof that is acceptable to everyone, is a more subtle discussion.

Perceptions and reality must be also separated. Rational thinkers may know signal levels are safe, but would every one of them be happy with a 5G/4G microwave transmitter on a lamppost outside their family’s bedroom? It is probably acceptable if down the street, of course. Why the difference? This is critical to mobile/telecoms plans:

⁸ This is a wider problem. Fruitcake claims are commonly given coverage. The news *is* the claim being made, not the quality of the claim. This is part of today’s world

- Mass deployment of mini masts could have huge planning hurdles in many countries
- Permissions might be given in some areas but not in others, making a business plan almost unviable
- Would a mobile mast be allowed outside a school? Probably not in many places, even though it is “safe.”

Of course, mass deployment of many 5G or mobile/FWA masts is unlikely due to many other reasons⁹. Nevertheless, simple planning rules and public perceptions could be the biggest barrier.

5G will replace over 80% of fixed broadband. This will not happen in developed markets like the UK. The reasons need not be listed here (if anyone struggles to form a good list, then contact Telzed). Even if changed to *could replace*, then it is still worth opposing on the unlikelihood of such an outcome. See also footnote 9 and Mr Russell.

5G and mobile will be the solution in lockdown Covid-19 or if we work more at home after the crisis. Many countries and networks have seen mobile use increase. Some have seen a larger increase in the use of fixed lines and WiFi. Some have seen less mobile use, as when at home, we almost all use the WiFi and fixed broadband. Such observations/conclusions are rather obvious with some thinking. There seems to be a willingness to make rapid claims, without sufficient thought or knowledge of basics of telecoms traffic and customer behaviour. The fact that some countries have over 80% of traffic on mobile, is not a justification for “mobile/5G is the primary future” type claims in countries where mobile is less than 4% (e.g. UK) - a figure that has not changed significantly for many years.

Why are some mobile and 5G claims fanciful? This is a deeper question and problem. Remember: vendors, operators *et al* have vested interests. Professional services should be aware of this. Certainly, mistakes can be made. Also, perceptions and reality differ. Mobile devices are heavily used and are an essential part of almost everyone’s life. Smartphone devices are actually used most of the time on WiFi (fixed) and far more data is downloaded over fixed lines. But we use far more web sites (apps) per Gbyte of data on mobile. So, we do more diverse things on a mobile network, but large volume usage is almost always on the fixed network. Perhaps the end user benefits *are* from the number of web sites, but from a network view it is the traffic that matters. Appendix A explores this “why” question further. That summary shows that mobile usage is generally far less compared to fixed usage. Also the use of 5G and mobile *devices* gives a distorted view as the devices usually uses fixed/WiFi. Vendor and mobile-operator promotions of 5G have probably also influenced beliefs.

You do not need Gbit/s broadband (or superfast or ultrafast). This is true but also wrong. There have long been arguments about what speeds are needed by premises at work or home and by mobile devices. The essential problem with the statement is the inherent “telecom fascism” where “experts” or politicians tell the markets/public what they need. The

⁹ See Telzed papers. Simple technical/financial analysis and ratiocination shows it would be very unlikely in UK the markets. Of course, 5G or other mobile *can* be almost the only solution in some countries (e.g. emerging markets) and is an ideal solution or additional-solution in many locations and for some customers. In many markets, mobile is a vital *addition* to fixed-line based communications

market and the end user can decide. If no one is willing to pay for it, then it will not be deployed after a few trials. Telecoms has been full of statements in this vein: dial up is all you need; 64k ISDN is enough; 1Mbit/s xDSL will never be filled; 20Mbit/s fibre to cabinet¹⁰ with xDSL is enough etc. Appendix B examines the speed issue further. Most currently do not need Gbit/s services. But why stop others getting it who do? As the cost of 1Gbit/s or 50/100Mbit/s are similar (assuming sensible technology), why worry, as the service will often be available anyway?

Chinese vendors should not be used. This is a major political and commercial issue in many countries. Huawei *et al* have been banned. The use is restricted in the UK to parts of the network. Key questions are: can they be trusted and can operators manage the equipment to keep networks and information safe? BT has worked with Huawei for many years. Were the testing and controls always sufficient? This moves to a trust level of the operators and sometimes of government experts who also get involved. Few telecoms experts even with a technical background can assess the equipment, even with hands-on access. How can telecoms professionals make a fact-based judgement? We can all give an opinion, of course. A sound judgement based just on operator/press/government/vendor statements is almost impossible. Arguably the quality of BT management (or that of other operators) is the main assessment basis. Readers can make their own deductions.

5G will produce masses of new revenues. The 5G hype seems to have subsided recently. It is certainly a good way to deliver more data at a faster speed. A few new services may emerge (beyond vanilla data) but will they be significant? Where are the mass Internet of Things services? Privately owned base stations or masts or sub-services may exist but who really thinks this is significant? What pays for the additional masts? The fundamental problem is clear in the market data – almost constant customer revenues but new masts are *major incremental* costs. Significant growth of 5G traffic or replacement of existing fixed line services would need the additional masts and the seemingly mythical revenue. Like many ideas in telecoms: does it pass the sanity test of credibility with telecoms industry experts?

Huge new ways of working will happen due to 5G. What cannot be done over 4G or WiFi/fixed? Mostly, realistic/prosaic outcomes must be expected – extensions of today. Mass communications between fridges and devices when you are heading to the shops, is surely fanciful. The need for cameras in the cupboard and fridge, need to be treated with the required level of respect (low!).

5G will save money from lower power bills. We can turn things off now. Almost every remote-control solution can be done over existing networks. Why has remote control of the house not been a boon so far? We all can save ~€1 per year by turning off the smart meter. ~€500 per year savings from power, smart devices (e.g. waste bins!) and other applications based on 5G have been suggested. They surely work already on 4G and/or exist today (smart traffic maps for example). So why are our bills not falling? Are the claims fanciful?

5G is needed for healthcare and remote operations. Interactive video and interactive devices work over any network. Video has huge inherent limitations, but has been growing

¹⁰ This is deployed in UK by BT. 40Mbit/s or more can be delivered. But, it can also deliver only 5Mbit/s – anything over existing copper wires is limited and anecdotal to the house location and copper wire quality. The speed is only what you get, which *just might* be enough

for over 30 years. The limitations remain¹¹. There are niches, but is 5G or mobile the critical path? Claimed 5G opportunities in the Covid-19 outbreak rapidly proved to be false. We use the WiFi and any mobile traffic increases have worked just as well over 4G. Remote operations are surely an almost vanishingly small application, but fantastic and worth research. Remote healthcare has a major role everywhere, especially in emerging markets. But must it rely on a mobile signal?

Low latency is vital. This is a good development and certainly it helps some applications. Will this be a huge factor? The realistic answer is obvious. There certainly *could be some* new major solutions that can *only* be done with low latency. Let it happen, if it happens.

New satellites (being deployed in 2020) can replace fixed and mobile services. This is of course true – satellites do in some places and are vital in some situations. But will this cause a disaster for the existing operators? Will substitution be of any significance? The answer is obvious: no. The new satellite plans are no threat. They address huge markets that are not properly serviced already. Did anyone really think Starlink would cause mass substitution?¹² It is fanciful - revealed with just some ratiocination and a few numbers on a pocket calculator. Good consultants ought to still be able to list a few solutions that *can* successfully supplement/duplicate an existing service, but these are not mass-market applications.

Fixed wireless access is one of the first/major applications for 5G. This is fanciful – the number of masts would be excessive plus a host of other problems exist. It has not happened. 5G/4G/mobile can be the major solution in some countries and some locations and for some customers. It works so long as the traffic is low. Developed countries have >300Gbyte/month to fixed line premises, rising 30-50% per year =10x in circa 7 years). A simple calculation of the number of masts needed for c2000+Gbyte provides the answer. 5G capacity is needed simply to cope for the known truly mobile growth (also about 10x in 7 years). Most consultants *should* be able to list many factors that show the FWA/fixed-substitution potential to be limited.

Limitations are emphasised by the fact that fixed line growth, every ~2 months, is more than the *entire capacity* of all mobile networks. See UK data. We need comments to be set into a realistic context.

Interactive systems with 3D virtual reality and “hands in glove” type sensors will be the future for many. This is surely a possibility. But virtual reality headsets? It is hard to get many to even make a video call. The barrier is not technical but social. Many do not like cameras and screens or to use video, and to wear a headset and interactive gloves - then this is off the scale of acceptability. The outcome is surely more of a niche, but: let it happen! It might take off. A more realistic prediction might relate to a more likely application – adult entertainment.

Huge volume growth makes a good business case. This seems to be true. But think of the 1990s and (correct) predictions for international traffic to grow enormously. This growth

¹¹ Think! Else, ask Telzed. Recent experience of home working and lockdown video should provide most with a good understanding

¹² Elon Musk confirms that Starlink is not a threat to existing operators
<https://www.youtube.com/watch?v=UF1viuwr2ig&feature=youtu.be>

continues today. Many international carriers and cable operator later still failed. Investors forgot a basic fact – the prices might fall as fast as the volume rose. Was that obvious only in hindsight? Most should have had greater doubts at the time. Why were so many proved wrong? This is a more significant question that remains valid for today's investors and advisors.

A mobile phone that truly works anywhere is a sure success. Satellite phones were developed ~20 years ago. This did not pass basic thresholds of sanity. The prices were c\$5+/minute yet many (like the Author) thought even \$2/minute for GSM roaming was expensive. The expensive phones were clunky at a time when Nokia handsets were cool [some readers may not recall the pre-smartphone era, but these simple phones were a key to mobile success. Smartphone devices are still objects of desire that help drive mobile expansion]. Even as a roaming international consultant, with almost no limit on call expenses, the Author could not consider such a satellite phone. The idea was “sort of good” but it did not pass the sanity test: would many really pay that amount, would it work well indoors [it often reputedly did not, even if a satellite was in range] and it was not cool. Satellites succeeded but more as a good *niche* solution. If a project does not feel right/sensible/viable, then it probably is not. This is a debatable point, but if you have a lot of relevant experience in the industry then this judgment is probably valid. Just because it has not existed before, we can still make a judgement. We have to make a judgment on future things that do not yet exist. Think carefully and take a critical balanced view.

The world is further complicated: different views might be all be justified. Europe has adhered to Net Neutrality but US maintains a very different approach. Could they both be right or at least work adequately, *in their own markets*? Disaster has not ensued on either side of the Atlantic. A more subtle debate is often needed on which is best given the circumstances, laws and history etc. Not: “which is best.” Telecoms *is* complex and diverse. Many seemingly obvious things are not always true. The Author has often found a counter-factual to claims that might at first seem sensible to others.

3 Implications for professional services

The examples above are designed to raise debate and to help everyone realise how even apparently sound ideas may not be so solid after sensible assessment and probes of the facts and assumptions. The situation is often complex and absolute facts may be hard to get or else exceptions also exist. Things may be true in country A but not in B.

The issues should help to identify the need to consider:

- How everyone acts. This is relevant from the most junior to the most senior partner in the consulting and analysis industry. The decision on what to put in a report or in an Excel cell *does* matter. A simple start is the use of adjectives: “very high growth” – is that really sensible or is “75% more growth than seen in any previous year” a better approach? Not mentioning anything about the growth figure in a report may be even worse
- How to balance the need to make assumptions and estimates versus “making it up.” Many need to understand when to stop before creating a “make-believe” model/report. Certainly, the problem is reduced if the quality/confidence of the assumptions/data is stated. Yet we still have to make assumptions and estimates
- How to use the data provided, even if you cannot verify it or have doubts. This relates to or giving professional support for opinions from vendors/politicians/operators who have vested interest. *They* do not need to be totally honest. They can be (and can justify) “biasing up” the figures. Regulators should also be careful (there is a natural tendency to prefer numbers that emphasise the good outcomes). Perhaps everyone needs to examine more carefully what is done, the sources and exactly what is stated in a report or recommendation
- Look carefully into the reports and data. A seemingly solid report may include disclaimers [do they invalidate the report’s solidity?]. Even small comments matter: “the market modelling used the analyst’s own data and *client’s inputs*.” This may be a euphemism to say this is a report that shows what the client wants, but the analyst company is not really putting its name to it. Do we all need to make clearer what the solidity is and what direction things are biased?
- How to combine the right information and experts to make informed and more robust decisions. Managers need to have the right teams and skills. This also relates to using the right professional services and using the external sources properly. How good is the analysis/report/model? Does the letter head really improve the quality if you do not believe the team had a lot of experience?
- How to judge the claims and sources. This report shows how this is not simple and has surely become harder. If the level of professionalism in some circles has dropped, along with a greater fog of doubtful claims, then greater care is needed. There is no simple solution, but it starts by being acutely aware of the risks and looking critically. Using a range of the right skills helps
- There is no substitute for experience. A counter argument is: we are trying to plan for a future that no one has experienced this situation, so the past expertise is not relevant. This is clearly suspect, even if there is some validity

- Legal cases may need even more careful thought. Experts are often brought in. As opinions are seemingly a more acceptable part of working life, we could expect more experts to convincingly say X is the likely outcome, and they may also really believe it. Evaluation of the statements may become harder as the claim may have evidence of others saying the same. The mere existence of such supporting claims need not be strong supporting evidence unless it is assessed on the spectrum of credibility. Everyone has to be aware the risks. Does the view have real evidence?

Readers should be able to draw up a list of questions on the work they do, how it is done and how to make it better. Understanding the complex nature of the issues is a start towards asking the right questions and providing the right outputs that assist with better decisions.

4 Actions are needed

Issues with media and reporting quality are far beyond this report.

This report is designed to promote thinking and questioning of the industry. In some cases, the action is clear – as when the claim is fanciful or of the fruitcake quality. However just ignoring these, is not sufficient as they can still have an impact. We must all try to spot them when they masquerade as plausible. Furthermore, as they become more prevalent, this encourages more claims that have only a limited foundation.

Some new ways of managing decisions seem sensible. More careful assessments and a greater emphasis on experience and critical questioning will help.

It is worth emphasising the principles of what the consulting company stands for and how it operates. All employees should follow this. This must cover professional standards and the approach to giving opinions and views, that go beyond fact-based analysis and insights based on experience. Proper balances between being professional and the client's interests are needed. This may conflict with making money.

It is important that analysis is not carried out to show the “right outcome” just because the desired outcome is so strongly put and/or made by a seemingly reputable source or a lot of money is offered. Does the claim really stand up and is it really credible?

This report's discussions show that many of the telecom industry's concerns and options are complex. Broadband is a central debate. Certainly, over time we will almost all need (or want) more data and many need faster services. *How* this is supplied (technically and what market structure) is less obvious, even though fibre will be a key to almost all solutions. Solutions will be a mix of mobile, wireless, cable-TV and yes also copper [copper is still valid, but a fading legacy as fundamentally limited and expensive]). The access network evolution is probably the biggest issue today as the largest investment is needed here and it has the greatest long-term impact on the national communications network and on customers.

Readers may consider the real impact of 5G with a fresh view and based on recent evidence.

Analysts and advisors need to appreciate that what is an optimum solution in one country or location may not work in another. Absolute claims are often wrong. However the simple facts of the current rapid build of FTTP (or close to P) in many countries probably says most.

The last section's discussion should help professional services workers at all levels to think more carefully about their actions and to help ask the right questions in a complex world. This will help to provide better answers and so help with better decisions.

Please contact Telzed for further advice and help if needed,

See Telzed web site for additional relevant papers

Appendix A Mobile usage is less than some may think

Understanding mobile usage helps dispel some common current misunderstandings on the evolution of telecoms. Some have even suggested that fixed lines are no longer required.

Mobile network usage is to many web sites but usually each are used small amounts of data. We use the mobile device (especially 5G and smartphone devices) extensively. Therefore it is easy to think that we are more mobile centric than is actually the case. From a usage view, the vast majority of traffic is delivered over fixed¹³, even if a mobile device is used. This is clear from Ofcom and Cisco data.

A deeper insight comes from:

- 4G users download far more over the fixed network than the mobile network
- 5G device/network users **take even more traffic over WiFi, as a percentage of the total traffic**. This is initially counter intuitive to some, but of course the numbers are quite rational. 5G devices are used for more complex interactive applications and more video than older mobile devices. So the total data download is far higher. But this is far better done over the WiFi. Large downloads are almost always when at home or office. So, more 5G data usage (compared to 4G usage) actually increases the fixed WiFi usage by far more than the additional volumes carried by the 5G network.

This means that 5G (devices) boost the fixed network usage more than the 5G network. This is true even though mobile data usage also increases. Arguably 5G devices should be called *fixed/WiFi communicators with a mobile capability* – to be used for small downloads when out of the home or office. Almost all serious use is on the fixed line. This probably explains why many *think* that mobile networks are used far more than is actually the case. That said, good market analysts and telecoms professionals should already know this – the data is available or obvious with a bit of thinking.

Simple lack of understanding of such key points has probably been partly behind some of the doubtful claims for mobile and 5G. In addition, the situation is radically different in some countries: mobile can play a far bigger role. Mobile is the only solution in many areas, even in countries with reasonable fixed lines. Where and why this can happen versus many European countries should be a basic foundation of knowledge for most industry experts.

So the mobile/5G versus fixed broadband discussion is complicated. Contact Telzed for more assistance if needed. This discussion serves to show how it is easy to assume an outcome or to ignore how the outcomes will vary so widely by market.

¹³ Most developed countries have <20% of traffic over mobile networks. <4% in the UK. Contrast: the majority traffic is on mobile in emerging markets and some “interesting countries.” Mobile having the majority share usually only happens if the total download per capita is low. Contact Telzed if this needs to be discussed. See also: Telzed UK market [data review](#), Cisco VNI data or a recent [EU paper](#)

Appendix B Speed needs

This section discusses the speed issue and some of the claims made. Broadband speed and technical choices is a key area of debate. A number of views are probably wrong, but at times several solutions/views can all be right.

A general lesson is clear. The demand for faster services and massively more traffic has not faltered in over 30 years. The actual growth in speed has been close to 50% per year (see Nielsen's law). Telzed has noted a slow-down in the rate of growth but the trend is ever up – see recent market analysis. The fact that 1Gbit/s is more than most currently need/want *at present* misses the point:

- The markets and end users can decide
- The increase in traffic and the need for speed has not and surely will not diminish
- If just a few businesses, SoHo premises and some intensive households need very fast speeds, then why dictate they do not get it because 98% do not need it
- With technical advances (fibre to premise or close to, cable TV and some hybrid fibre/radio solutions) the faster speed has negligible cost difference. 100Mbit/s or 1000Mbit/s fibre cost almost the same. Of course the technical solution does not matter – we buy the service not a fibre. But after 40 years, no technology has ever emerged that has the capacity and distance capability of fibre, or the low operational costs
- A key reason for moving to fibre centred solutions is to reduce costs. But this only happens with removal of most copper and radical change¹⁴. Existing networks are based on a hundred year old copper limit of about 5km from the exchange to premise. Fibre centred nodes could be 50km away. The savings are huge. But the investment and change costs are not to be dismissed. This needs a bigger discussion but simply looking at the incremental cost of fibre ignores longer term savings and the future irrelevance of speed and data capacity with fibre use
- A long-standing maxim is: traffic and customer needs always expand to exceed the capacity available. Any telecoms worker should be familiar with this (perhaps in different forms). You do not have to be in network planning.

Some counter points are valid. What are the services that need 100Mbit/s or more? Current data shows households with 200Mbit/s barely use more than those with 50Mbit/s. But we know the traffic grows. It is not for telecoms experts to dictate what network will be used for.

¹⁴ Copper in parallel creates a cost-hump of dual networks and technologies to manage – higher costs. Copper cabinets and many small exchanges are hugely costly to manage. Note how all (?) new entrants choose FTTP (or close to Premise). The author reported on the hump problem long ago. In conversation with a FTTP pioneer operator this report's Author asked: what are the opex savings from the fibre? A: I will tell you when we get rid of the copper. This is a profound statement. It also shows why retaining copper on the doubtful/debatable basis that fibre costs too much, may be wrong

New applications and needs always arise. The next 20 years will surely be no different to the last, even if we cannot predict the details. Expect the unexpected.

As a simple indicator, the usage of telecoms has mirrored the development of computing. Look at the speed, size and cost of memory and processing. File sizes always increase. Telecoms has linked these together and it has grown to meet the exponential growth. This has been achieved without significant increases in cost per house/person. This is phenomenal achievement over ~40 years. Those who suggest many should remain on ~5Mbit/s copper because they do not *really need* more or are not worthy economic cases, need to be treated with the 'level of respect' that they deserve.

The costs to serve remote areas is possibly prohibitive, even with lower opex from fibre. This is understood and maybe alternatives and hybrid approaches are needed. But alternatives will almost always be fibre based: what else has the distance and capacity ability? A USO cost issue has always existed, even with copper. The problem is not new. Even to a remote location, fibre is obviously (?) the likely best solution if a new cable is needed.

The key point of the above is not to justify the economics and benefit of fibre, but to highlight the wrong thinking and dictation on what users need or should get. The technology was worked out ~30+ years ago. It has been widely available and used ~20 years ago. The costs have plummeted as the technology has improved. A more interesting discussion is still needed on why it was not more widely used. We now see fibre dominating in EU countries that never had much copper and also in some other countries (Spain). Almost all new-network-builder use fibre. Contact Telzed to further understand the history and choices made.

A valid point is: should we spend money on superfast for some who want/need it, but could cope easily with just 20-30Mbit/s¹⁵ when we have so many with ~5Mbit/s or even less and some areas have almost no broadband at all. *In extremis*, everyone must get a basic service before we spend money on an elite with superfast. We hold back some, to help others. A counter to this is:

- The cost to service the lucky ones on >100Mbit/s has almost zero impact on the rest as the superfast is a profitable and sensible solution
- Fibre creates synergies. It cuts the cost of backhaul to other services and to masts. Lower costs are obtained from economies of scale and more usage of a duct and cable
- Economic gains by a few probably help the GDP – superfast to a few, in an emerging market, surely helps businesses to develop and encourages investment by attracting high end users.

The answers are not simple. A full understanding is needed. Simple dictates of we do not need fibre or we can live with 10/20Mbit/s are not helpful and are basically wrong. Of course we can “live” with just 10Mbit/s (the Author has home worked until recently on 3Mbit/s). To restrict the speed because someone else can live with a low speed and few currently need >100Mbit/s is... Readers can select their own phrases.

¹⁵ This seems to be adequate for many households today. Due to traffic increases this is unlikely to remain the case long term

Figure 1 Copper wires in a UK manhole under repair



Source: Telzed

Copper is still claimed to be all we need and best economically. Is this really a low operational cost solution viable for another 30 years? This might explain why your broadband speed is not as good as the UK average. Readers are recommended to look into a copper distribution cabinet when it is being serviced. This also helps to explain why there is a man doing repairs.

Ever increasing speeds and 30-50% more traffic per year are normal: telecoms can still thrive with this due the ever-improving cost reductions and performance improvements from technology. The costs of broadband remain similar despite the speed increases of c50% per year seen for over 20 years. Copper has obvious problems.

