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How 'New Technologies' impact Community Radio[1]

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Abstract:
Community Radio, small-scale, not-for-profit broadcasting, is a recent addition to the airwaves of the United Kingdom. These new stations have emerged into a competitive broadcasting environment at a time of great technological change. New digital broadcasting platforms are beginning to become established in parallel with Internet and mobile phone network audio delivery mechanisms and, as a result, the future technical development of the medium as a whole is in something of a state of flux.
At the heart of Community Radio is a range of diverse linkages and interactions with members of individual target communities. Within such a diverse broadcasting sector, how has the uptake of so-called new media technologies developed, not just in terms of linear programme delivery, but also with respect to podcasting, "listen again" services and the provision of additional text and video-based content?
This paper summarises the degree of uptake of new media technologies by the Community Radio sector and examines some of the impacts that may result from their use, both concerning the consumption and the production of broadcast content. It concludes by suggesting how the future development of Community Radio broadcasting in the UK may be influenced by the gradual acceptance of such new delivery platforms and the opportunities that may arise from such acceptance.

Keywords: radio, community radio, technology

Introduction

Over recent years, the impact of Internet-based and other so-called 'new technologies' on Community Radio services has become increasingly important in a wide variety of ways stretching beyond the obvious provision of additional programme content delivery opportunities. However, the arrival of the various new technologies is also something of a double-edged sword, bringing threats as well as opportunities to the Community Radio sector around the world.

As the senior electronic medium, broadcast radio has a long history. Evolving over time, radio has expanded both in terms of the number of stations broadcast and the nature of such stations. In a European context, following an early experimental period, most jurisdictions established public service broadcasting as the foundation of their broadcast radio provision. Later, legislative and regulatory frameworks were adapted and PSB providers found themselves subject of commercial competition. More recently, European legislative and

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regulatory frameworks have gradually begun to change again, this time to accommodate Community Radio, the increasing variety of broadcast radio services reflecting the growing diversity of the societies in which they are based.

At the same time, however, broadcast media infrastructure is also changing. Internally, the medium is adapting to the emergence of various digital radio broadcasting platforms, whilst externally, the effectiveness of so-called new media platforms is also creating opportunities and threats for broadcasters. The result of this combination of circumstances is that proponents of Community Radio seeking to establish and cement the sector as a robust and integral third-tier of radio broadcasting, are doing so in an atmosphere of regulatory and technological uncertainty and flux.

Alongside the development of platforms specifically designed for broadcasting purposes, new media technologies have also been impacting on the operation of broadcast radio. Not only do the Internet the mobile phone networks provide alternative platforms for the delivery of linear radio in real time, but they also provide opportunities for the delivery of radio which is directly linked to other types of media content, and which can include 'on-demand' elements that can be both time-shifted and non-linear, such as 'listen again' services and podcast programmes.

The Role of Community Radio

There are some underlying commonalities which define community radio, such as operation on a not for profit basis, a commitment to accountability and to the involvement of members of the target community in the operation and management of the service concerned. However, a key feature of the sector as a whole lies in its diversity, each station is inevitably "shaped by its environment and the distinct culture, history and reality of the community it serves" (Buckley *et al.*, 2008: 207). Put another way, there is no such thing as a typical community radio service.

Fundamentally, Community Radio services exist to serve defined communities, of place, or of interest. In the United Kingdom, the Community Radio licensing process is quite complex, see for example "The Community Radio Order, 2004 / 2010" (HMG, 2004 & 2010) and "Notes of Guidance for Community Radio Licence [sic] Applicants and Licensees (revised)" (Ofcom, 2010). Nevertheless, well over 200 such stations have been given permission to broadcast since full-time licensing commenced in 2004, and more are currently in the process of being licensed. As well as stations broadcasting to geographical communities, there are stations serving a variety of niche and specialist communities, including ethnic and religious minorities, children, retired people, military garrisons, universities and the arts. The precise make-up of the target communities concerned is defined in each station's application and then enshrined in what is known as a "Key Commitments" document, which forms part of each station's operational licensing requirements. This public document, which is made available on-line by the U.K. broadcasting regulator, Ofcom (the Office of Communications), commits each station to various on-air broadcasting requirements (hours of live output, broadcast languages, music genres, etc.); to the delivery of "Social Gain" (community benefits, such as training, education, outreach, etc.); and, to the provision of access and accountability.

To achieve the various social gain, access and accountability objectives effectively, Community Radio services require a high degree of integration with the membership of their target communities. Such integration takes time and effort to develop and sustain. In practical terms, effective and successful Community Radio services require underpinning structures and processes to help establish, sustain and broaden the range of linkages and opportunities for interaction with their target communities. The often "distanced" (both physically and metaphorically) and "top-down" approaches, all too often common within public service broadcasting, and especially prevalent within the commercial radio sector, are antithetic to the creation and strengthening of strong two-way linkages which are a fundamental prerequisite for community broadcasters. In the U.K. at least, the

requirement for such interaction is enshrined in legislation (HMG, 2004). This exists not only to promote the long-term provision of such linkages, but also to help ensure that the Community Radio sector remains distinctive from its public service and commercial radio counterparts through the provision of focused "additionality" (broadcast and other outputs that established forms of radio are either unwilling or unable to provide).

A Digital Dilemma?

Although the world of radio broadcasting is changing fast, the vast majority of Community Radio services still currently depend on analogue broadcast frequencies in order to deliver their programming to mass audiences in a cost effective manner. It is increasingly the case that other non-broadcast delivery methods, such as web-streaming and pod-casting, are also able to attract listeners. However, despite their ability to deliver both linear and non-linear content, as yet, such platforms can only be considered supplementary to the use of traditional broadcast technologies and they are certainly not yet universally available in the same way that content delivery via the analogue broadcasting domain has been for many years.

In parallel, the arrival of digital radio broadcasting, in all its various forms, has resulted in politicians and regulators attempting to drive forward a process of technological transition. European governments and regulators in particular are attempting to drive the gradual migration of large-scale services in particular from analogue (FM & AM) frequencies to digital radio alternatives such as DAB and DAB Plus. A key problem for the Community Radio sector is that the various proposals put forward by European policy makers, have tended to focus predominantly on the requirements of the commercial and PSB sectors, thereby leaving Community Radio broadcasters on the periphery with a variety of resultant problems and risks for the future.

Ask politicians or regulators about Community Radio and they won't always know what you are talking about. Ask the same people about PSB or commercial radio and not only will they know what you are talking about but, almost certainly, they will also have some pretty firm opinions on the subject, perhaps dictated by their political affiliations rather than by any deep interest and understanding of the specific issues involved! The comparatively limited profile of Community Radio is, in part, due to the sector's relatively small-scale (both numerically in terms of stations broadcasting, and in relation to the often deliberately limited geographical focus of such stations). However, it is also due to the fact that, in most jurisdictions, the sector is comparatively young and therefore inevitably lacking in terms of track-record. It is a simple fact that, in addition to requiring a great deal of effort, relationships with politicians, regulators, funding bodies and partner organisations take a considerable length of time to establish and solidify.

The historical tendency of European policy-makers to prioritise the requirements of larger PSB and commercial broadcasters is perhaps not surprising, given the far greater scale of these sectors in comparison to Community Radio broadcasting. The difficult for community broadcasters is that, in practice, this approach has resulted in the promotion of multiplex digital platforms, such as DAB, which are simply not designed to cater for smaller-scale local commercial and 'non-profit' Community Radio services, each with its own defined geographical coverage requirements. Furthermore the current existence of a variety of jurisdiction-specific approaches to the 'digital migration' of radio services in Europe creates uncertainty as to the eventual shape of the emerging technical and policy environment.

Such political and regulatory involvement in the promotion of digital radio broadcasting, is in complete contrast to the virtual lack of such engagement with the various emerging non-broadcast delivery methods for 'radio' programming content, using mobile phone networks and the Internet. Historically, the digitalisation discourse as it relates to radio broadcasting has typically been characterised by considerable optimism on the part of those developing the various systems involved. Encouraged by such optimism, and by the promise of additional broadcasting capacity, politicians and regulators in many jurisdictions have driven forward the introduction of new transmission platforms. However, despite such official support, broadcasters and the public

tend to remain somewhat wary of investing in the technology and conversely remain largely supportive of traditional FM broadcasting in particular. In short, the problem with digital radio platforms is that they offer too few advantages over the older, established, analogue technologies. In the eyes of the general public, the peripheral advantages offered, including additional channel capacity and enhanced radio-text etc., are more than outweighed by the disadvantages, which include the cost of replacement receivers, patchy reception and typical received audio quality which is not perceptibly better than that which is achieved via existing FM stereo broadcasts.

With various digital transmission platforms now either operational or nearing launch, it remains impossible to predict which option (or options) will eventually emerge as the accepted standards in the longer term. This process of change is being further complicated by the increasing impacts of other, non-broadcast, audio delivery platforms. However, what is clear is that some digital radio broadcasting platforms are more flexible than others and that some are best suited only to particular types of radio broadcasting. As they exist today, none of the digital broadcast radio platforms currently operating are able to provide a completely compatible alternative to analogue radio broadcasting in all its various forms.

Despite pressure for the 'digital migration' of many radio services, given the ubiquitous and flexible nature of FM broadcasting, it also seems likely that, in the majority of jurisdictions at least, its continued use for broadcasting remains secure for the foreseeable future. The 'opportunity cost' associated with continuing to use Band II (FM) for small-scale broadcasting services, even after larger stations have moved to alternative platforms, is minimal because the frequencies involved have wavelengths which make their use for telecommunications services less than ideal. In addition, as both the AM and FM bands are internationally allocated for broadcasting (and are likely to remain so for many years to come), there are limits as to what other uses they may be put to. Recent suggestions by Ed Richards, the Chief Executive of Ofcom, that Band II could be used for so-called 'white-space' devices (Ofcom, 2011) may have some validity in the medium term, but, even if this proves to be the case, such devices could be interleaved to operate alongside traditional analogue broadcasting transmitters.

Although the advent of digital radio transmission platforms offers at least the potential to help reduce the imbalance between supply and demand in terms of broadcast frequency availability, such developments certainly do not herald a complete end to frequency scarcity. Inevitably therefore, competition for access to broadcasting spectrum rights will remain a barrier to entry for the foreseeable future and for many years to come. Assuming an ongoing requirement for access to the airwaves, the question for Community Radio broadcasters is how best can they obtain usage rights to a higher percentage of total available radio-broadcasting frequencies than is presently the case? If the sector is to be successful in such endeavours, it needs to continue to build up its circle of friends. It will need to convince politicians and regulators of the strength of its case, something which may be easier said than done in the context of the strong, well organised lobbying capacity available to competing PSB and commercial operators.

In part because of such frequency scarcity issues, but also because of the various additional advantages which such technologies offer. Community Radio has been quick to embrace a variety of Internet-based and mobile phone network technologies in order to enhance the delivery of their various services. However, when it comes to the alternative of delivery of content via the Internet and other communications networks, the economic and operational models are somewhat different, for both broadcaster and listener alike. For the purposes of this paper, mobile phone networks can be considered a sub-set of Internet delivery, adding not only long-range wireless connectivity and the delivery of web-based and other applications to portable devices, but also providing their own specific additional facilities such as text and picture messaging. Modern digital mobile phone networks and their evolving successors (3G, 3G-LTE, WiMax, 4G, etc.) are capable of carrying increasing amounts of IP (Internet Protocol) based information, at data transfer rates, which, although slow compared to many parts of the fixed-line Internet, are, nevertheless, capable of delivering streamed audio and other types of data useful to both

broadcasters and their listeners. In light of such developments and as new forms of mobile devices, such as smart-phones and 3G connected net-books, laptops and the tablet form PC, become increasingly prevalent, the divide between the fixed line Internet and mobile telephony networks is becoming increasingly blurred.

Dealing with the broadcaster first, in some respects, the Internet provides additional opportunities that are, quite simply, beyond the capability of traditional broadcasting platforms. Starting with the basics, as well as providing a simple visual interface in the form of a web-site as a "shop-front" and signpost toward a station's traditional broadcast output, the Internet offers a variety of opportunities for interaction with members of a target community. E-mail is an obvious example, but, depending on the demographics of the target audience, social networking tools (such as Facebook & Twitter), as well as instant-messenger links direct to the studio may also be effective. More advanced station web-sites, based on content management systems (CMSs) such as Word-Press, Drupal and Joomla etc., provide opportunities for blogging, local news aggregation, photo galleries, etc. with some offering modules of specific relevance to radio broadcasters such as schedule listings and play-list management tools.

Staying with tools for broadcasters themselves, a further advantage of the Internet is its ability to deliver streams of a station's live output. In other words, a copy of the station's traditional broadcast output can be delivered in real-time to listeners who might be outside the coverage (service) area of the station's AM or FM transmissions, or who might, for example, prefer to access such a stream while they work at an office computer terminal or from a laptop.

Beyond simply streaming a duplicate of existing real-time output, the Internet also offers opportunities to reuse such content in non-linear forms such as "listen-again" type services and podcasts. "Listen-again" services provide for time-shifted streaming of previously broadcast content, as well as an ability to offer additional specialist streams in parallel with primary broadcast output, for example in conjunction with specific events or campaigns. Because of the streaming nature of such services, their consumption requires that each listener accessing them has ongoing connectivity to the Internet for the duration of listening. Such "listen-again" content will typically have a relatively short shelf-life, remaining available for a few days or weeks from the date of original broadcast.

Most flexible in terms of options for its consumption is the podcast. Those provided by radio broadcasters can be regarded as being similar to those from other sources, although, because of their expertise and experience in the sound medium, podcasts produced by radio professionals often have higher than average production values. The main advantage of the podcast over streaming is that it frees the user from the need for a constant connection to the Internet. Typically, in a matter of a few seconds these can be downloaded to a computer, MP3 player or mobile phone for later consumption and this process can be automated such that series programming content is not missed by accident. Once downloaded, not only can they be listened to at any time, but also, they can then be easily archived and stored indefinitely by the user, for repeated listening at a later date. Copyright issues aside, being typically provided in MP3 format, they can, at least in practical terms, also be copied for onward distribution to other potential listeners.

The key point regarding these Internet delivery options is that, to a greater or lesser extent, each provides additional flexibility in relation to the consumption of broadcast content. Not only are the temporal constraints of scheduling removed, but also, because content can be accessed outside the broadcast transmission service area of the station concerned, so too are geographical constraints on reception. Moreover, because, unlike traditional broadcasting, the Internet is fundamentally a bi-directional medium, it intrinsically enhances opportunities for interaction between broadcasters and their audiences generally, and specifically in relation to the focus of this paper, between Community Radio services and members of their target communities. With a little effort, community-based broadcasters can learn a great deal about their target community through a simple analysis of who is listening to what and where on-line. Whilst on-line consumption of content cannot be assumed to

duplicate that carried out via traditional broadcasting platforms, it can at least provide some useful qualitative data for programme makers and station management.

The Limits of New Technologies

Although the use of such non-broadcast platforms can provide broadcasters with additional flexibility, for a variety of reasons, they do not yet constitute a replacement for traditional broadcast platforms. To begin with, rather than being one-to-many broadcasting platforms, both the Internet (as currently constituted for audio content) and the mobile phone are primarily designed as one-to-one communications platforms. At present, mobile phone and mobile Internet platforms, lack universality and tend towards end-user cost models which discourage the consumption of large amounts of data. In addition, the take-up of such platforms can be lower in areas of relative socio-economic deprivation, which are often the focus of Community Radio services. However, it is quite clear that, as the carrying capacity of mobile phone networks expands and as improved methods of mobile Internet delivery, such as WiMax, are implemented, this situation will change for the better. In some jurisdictions "all-you-can-eat" data tariffs are already becoming available at a relatively reasonable cost (although connectivity and capacity both remain potential stumbling blocks to reliable portable operation). Despite various limitations, convergence between broadcasting and communications platforms is already happening and, as a result, after a long period of relative inertia, radio broadcasting is currently being exposed to the challenges of a period of considerable ongoing change.

Despite its various advantages and benefits for broadcasters, whatever else it may be, the Internet is most definitely not a broadcast medium, that is to say, it is not a one-to-many medium, free at the point of consumption. In particular, when it comes to “broadcasting” via the Internet, in the form of streaming live or “listen again” audio content, the economic model is immediately very different. On the plus side, from a broadcaster’s perspective, there is no cost implication for increased range and the resultant benefit for listeners is the availability of additional services. At least in technical terms, once a content stream has been made available, where in the world it is consumed becomes largely irrelevant (although, for some forms of content at least, there may be financial implications related to copyright issues). While it may be technically possible for individual jurisdictions to block or otherwise make unavailable specific types of content or particular web addresses, such techniques are rarely applied to anything other than overtly sexually explicit materials and, in some more authoritarian regimes, particular types of political content.

The benefits of increased geographical reach, do however come at a price. Broadcasters using the Internet are faced with a marginal cost per each additional listener to the data-stream concerned. In other words, because costs to the broadcaster are directly related to the total amount of data being delivered by it, the greater the average number of listeners, and the longer they listen, the greater the total cost to the broadcaster. More specifically, it is the concurrent total number of listeners which can have the greatest impact upon streaming costs. Here it is the cost of overall capacity provision rather than the actual cost of data delivery which is the issue. The greater the potential number of concurrent streams that provision is made for, the greater the cost to the broadcaster. Thus, in a financial sense at least, popular Internet broadcasters really can become victims of their own success!

The issue of limitations within the network structure and the transmission protocols of the Internet and other IP-based networks is beyond the scope of this paper. However, it is worth noting that although there are ways to ameliorate the marginal cost per additional listener (for example though the use of multi-cast protocols where available, or by employing torrent-like streams), for smaller broadcasters, and for reasons of economies of scale, such approaches are likely to be impractical, or at best yield only marginally beneficial economic gains.

A potential problem for small-scale broadcasters in some jurisdictions is the issue of net-neutrality. In those countries where telecommunications companies and Internet service providers have been allowed to give

priority to some forms of data traffic over others, through "traffic shaping" and other technical measures, there is a risk of reduced streaming and downloading speeds for content providers such as Community Radio operators, which cannot afford to pay extra to ensure their content is in the fast-lane of the information super-highway. In areas where network infrastructure is well-developed, this issue may not be too serious a problem, as even high quality audio streams occupy a relatively small amount of bandwidth when compared to either standard or high definition video streams. However, where network capacity is limited, Community Radio services could find their streams disrupted by parallel demand for priority traffic.

A further issue confronting broadcasters when using the Internet as a delivery platform is its lack of universality when compared to traditional broadcasting. To begin with, the required broad-band Internet connection is by no means universal, especially within less economically prosperous communities. Even where a broad-band connection is present, listening to audio streams on a computer is one thing, but delivering that stream to elsewhere in the home or office is quite another. Wi-fi enabled Internet radio receivers, which combine the ability to receive traditional FM and AM broadcasts as well as streaming services, do exist, but are not straightforward to set up and can be limited to a "walled garden" of Internet services which may not include the streams from specific Community Radio stations. Even more difficult is the delivery of live streaming content to mobile and portable devices. Although it is theoretically possible to receive such material via 3G and other high-capacity mobile phone data networks, at present such networks lack robust capacity, and are particularly bad at delivering linear content to a device on the move.

Extrapolating from recent history, there seems very little doubt that the capacity of fixed and mobile networks will continue to increase and that, conversely, the associated costs of such distribution are likely to decrease. However, for the present, although the Internet is already expanding the delivery options for Community Radio services, specifically in relation to streamed audio many of the theoretical advantages it offers are currently somewhat hampered by technical and capacity network infrastructure limitations and, for mobile users, the similar content capacity limitations found in associated mobile phone networks.

Conclusions

Digital delivery methods are already impacting on the activities of Community Radio broadcasters, but not in the way that might have been supposed a decade or so ago. In the United Kingdom at least, the sector's interest in taking up digital radio broadcasting opportunities has been almost non-existent, but, conversely, the vast majority of community stations have already embraced considerable use of web-based digital delivery opportunities to supplement their traditional analogue broadcasting output.

On the broadcast radio front, recognising the various benefits of FM, the community radio sector is lobbying for greater access to Band II spectrum, if and when other PSB and commercial broadcasters are persuaded to give up simulcasting and switch their broadcasting output to digital platforms. The UK broadcast regulator, Ofcom has long since accepted that an increase in Community Radio provision on FM could be one outcome of any move of larger services to alternative digital platforms, such as DAB:

> *In time, it is possible that changes such as an end to simulcasting of existing radio services on analogue and digital platforms could free-up spectrum that will create more space for new community radio stations. (Ofcom, 2005: 28)*

There is however an element of risk associated with such an approach to the long-term expansion of Community Radio provision. Specifically, there remains no guarantee that digital migration will be implemented and without it access to additional FM spectrum cannot be provided. On the other hand, should digital migration be achieved for the majority of radio stations, then community broadcasters remaining on FM could find themselves in what has by then become an 'analogue backwater' which the majority of potential listeners are no longer inclined to explore.

Nevertheless, given the largely inappropriate nature of existing operaional digital radio broadcasting platforms for community radio services, it is difficult to envisage how else the sector might currently approach this issue. That said, the current limitations of digital radio broadcasting are, to a large extent, technology specific and emerging second generation platforms, such as Digital Radio Mondiale (DRM) and the more advanced DRM Plus standard, have at least the potential to be more relevant to the needs of community broadcasters, assuming that they do eventually become an integral part of the radio broadcasting landscape.

In practical terms, the potential emergence of digital radio platforms suitable for use by independent small-scale remains, at best, some years off. Whilst it would be prudent for community broadcasters not to dismiss the future potential of such systems, continuing to exploit technologies which provide immediate benefits has to remain the priority. The approach of utilising web-based digital delivery methods, accessible through computers and mobile devices, is already providing increased flexibility and the ability to reach out to community diasporas which are not within the coverage of traditional analogue broadcasts.

The Internet and associated new technologies certainly offer some clear benefits for both Community Radio broadcasters and for members of their target communities. For Community Radio, in addition to opportunities for increased operational efficiency and flexibility, the fundamental impacts of the various developments set out in this paper are three-fold. To begin with, access to, non-broadcast communication networks provides various opportunities for the delivery of additional non-linear and time-shifted content, making specific "appointment to listen" content more conveniently available. In addition, such networks provide numerous opportunities for interaction, which traditional broadcast platforms simply cannot provide. Finally, and perhaps more profoundly, by removing the limitations of broadcast coverage, not only are individual listeners able to access a wider range of content, but also, as a result, the very nature of target communities is altered. For stations which serve a specific "community of place" this means that the relevant diaspora can now gain access to their content. For stations serving a "community of interest," such a specialist minority interest music genre, the classic "long-tail" characteristic of the Internet means that they have an opportunity to build a larger total audience than would otherwise be possible.

However, new technologies also have their limits, lacking the universality of traditional broadcast platforms and reaching only those who are sufficiently motivated, resourced and media literate enough to engage with the various opportunities available through them. As yet therefore, and despite all their obvious additional benefits, they cannot be considered as replacement technologies for traditional radio broadcasting. That said, given the various opportunities for enhanced interactivity and flexibility which they offer, and given the underlying importance of such interactivity, it is perhaps not surprising that many Community Radio services have already embraced such technologies as part of their wider approach to building relationships with their target communities. As Internet and related technologies develop further and as their acceptance increases, there is no doubt that Community Radio services will increasingly consider them to be an integral part of their wider "broadcasting" toolkit. However, for the foreseeable future at least, traditional analogue broadcasting will continue to be unique in its ability to provide locally focused, universal availability at minimal cost to both Community Radio broadcasters and listeners alike.

Community radio broadcasters are typically, both by nature and necessity, pragmatists, seeking to serve their target communities in the most effective and cost effective ways possible. Digital radio platforms may not be suitable today and whilst they may just become so in future, by that time it may well be the case that other non-broadcast solutions will have begun to dominate what today we call radio. Alternatively, FM (Band II) radio spectrum may gradually be digitised, using a system such as DRM Plus, which should be more appropriate for small scale Community Radio Services than current generation digital platforms such as DAB.

In fact, the most likely future for Community Radio is probably an increasingly hybrid model combining, analogue radio and digital radio platforms with Internet and mobile phone network delivery systems. Given the

pragmatic nature of community-based broadcasters it is likely that individual Community Radio services will take a nuanced approach to the delivery of their output, selecting appropriate technologies, on a case by case basis, according to their specific coverage and content delivery requirements. However, as the technologies used to deliver Community Radio outputs develop over the coming years, already there is no doubt that the days of single platform analogue broadcasting have effectively gone forever.

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