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Stickier News

What Newspapers Don't Know about Web Traffic Has Hurt Them Badly – But There is a Better Way

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In early 2000, Google conducted one of its first online experiments. The result was a disaster.

Google's experiment split off several groups of users to receive 20, 25, or 30 results instead of the standard 10. When Google checked six weeks later, they found – to their shock – that traffic had plummeted. Users given 30 results were doing 20 percent fewer searches.

Google eventually traced this drop to a surprising source. It took Google half a second longer to return more results: 0.4 seconds to return 10 results, but 0.9 seconds to return 30.[1] Over a day or two this slight delay meant little. But as the weeks wore on, the difference of that extra half-second was compounded again and again. People visited Google less often – and when that smaller group did return, they were a bit less likely to come back next time. Small traffic losses snowballed.

The most important lesson of Google's experiment concerns what is loosely termed *stickiness.* Stickiness is like a compounded Internet interest rate: it measures how likely users are to visit, and how often they go beyond the first click to the second or third. Sites with above-average stickiness grow their audience share over time, by definition; those with below-average stickiness shrink. Site speed is one of hundreds of site features that affect audience growth.

The problem of stickiness, of generating compounded audience growth, is the most urgent problem facing journalism today. If journalism needs an audience to succeed, then most digital publications are failing. This dearth of digital readers is especially dire with local newspapers.

Local newspapers have always been the core of American journalism, employing most of the nation's reporters. But with massive drops in ad revenue, in circulation, and in reporting staff, many local papers are now struggling to survive. Forget facile talk about "unique visitors" and misleading claims that newspaper audience is "larger than ever." As this paper will show, the truth is grim: digital audiences are small, digital revenue is paltry, and paywalls have significant long-term costs.

The good news is that newspapers can do much better. Newspapers can adopt better models of how Internet traffic works, and better metrics for measuring success. Digital newspapers can take a page from the Web giants who now dominate traffic and online revenue. With the right metrics, and a robust infrastructure for testing, newspapers can put themselves on a path to consistent growth.

Achieving these gains starts by thinking differently about digital traffic. In the past decade there have been countless computer science studies on digital audience building. For newspapers, though, this research on stickiness reads like an indictment. Local newspaper sites – and *especially* smaller newspapers – have long broken all the rules for building a sticky site. Most still load painfully slowly, a problem that has gotten even worse with the shift to mobile news. They are difficult to navigate and – let's be honest – often ugly. Many newspaper sites still showcase static content that changes little throughout the day. They display flat headlines, often without accompanying photos or multimedia elements. They are poorly integrated with social media. They lack personalized recommendation systems to move users seamlessly from one article to the next. And while newspapers increasingly pay attention to digital traffic, they often do not understand what online metrics really mean.

Unlike Google and Microsoft, newspapers cannot afford to spend tens of millions in across-the-board investments. Newspapers have to do triage, identifying changes that produce the *most additional stickiness for the least cost*. This requires significant spending on A/B testing, the central tool Google and other sites used to get big in the first place. But online experiments are only effective if they are used to optimize the right things.

Compounded audience is the most powerful force on the Internet. The success of local news in the 21st century depends on this compounding process, on measuring stickiness and optimizing for it. First, though, newspapers have to acknowledge some uncomfortable truths.

The Myth of Monetization

It is no secret that newspapers are in a bad way. Adjusted for inflation, three-quarters of newspaper print ad revenue has evaporated over the last decade. A third of newsroom jobs have been lost, and print circulation has fallen by roughly half.[2] Even amidst this retrenchment, however, newspapers have spent millions retooling themselves as digital news providers. In many newsrooms digital is the only team that is hiring.

Unfortunately, faith in a digital newspaper revival is often built on myths and misunderstandings. The central fable of digital news is what we might call the Myth of Monetization.

There is a large audience for online news, we are told – it is just hard to get these readers to pay. Industry leaders have declared over and over that the total newspaper audience, digital included, is larger than ever. Such talk is usually justified with references to “unique visitors” or "audience reach,” shallow and sloppy statistics that usually overstate the true audience by a factor of four or more.[3]

When we look at better metrics a bleaker picture emerges. Different data sources all tell the same general story about how people spend their attention online. Web users spend a lot of time with Google and Facebook and pornographic sites. They visit Yahoo and Bing, they shop, they read their email.

Against this broad backdrop, news sites get only about three percent of Web traffic.[4] Even worse, a huge majority of that audience goes to national news outlets instead of local news organizations. According to comScore data, only about one-sixth of news traffic – half a percent overall – goes to local news sources.[5]

With local traffic split between newspaper sites and television stations, local papers are left with just a quarter of a percent of time spent online. The typical local newspaper gets about *five minutes per capita per month* in Web user attention,[6] less than a local TV station earns in a single hour.[7] Local newspaper traffic is just a rounding error on the larger Web.

The bottom line is that newspapers cannot monetize audience they do not have.

The problems with the myth of monetization do not stop there. Local sites have long asserted that their digital audiences were especially valuable because they were locally targeted. Such talk misses just how sweeping the digital revolution has been. The Internet has turned traditional advertising economics on its head: it is hard for *any* small digital audience to be valuable to advertisers, no matter how locally concentrated that audience is.

Local media in the U.S. have long thrived on the fact that, *per person*, local audiences were more valuable than national audiences. It might be expensive to buy a 30-second spot on the NBC nightly news, but it is much cheaper than taking out ads on every local NBC affiliate. Local advertising was worth a premium because it was more precise than national advertising.

In the age of big data, however, this logic is reversed. Paradoxically, it is the largest media outlets that are most targeted. Instead of putting a print ad in the paper, digital firms can target just the (far smaller) group of people who are the likeliest customers. The largest digital ad campaigns, on the very largest websites, can be orders of magnitude more efficient than the quaint geographic targeting that newspapers offer.[8] There is nothing newspapers can do to change this: it is simply the way the math works. The fact that data mining gets more accurate with audience size is as indelible as 2 plus 2 equals 4.

The greater efficiency of big online players has led to their total domination of the online ad marketplace. The five largest Web firms earn 64 percent of all online ad spending. The top 50 get 90 percent.[9] Little ad revenue is left for smaller sites.

Size matters enormously online. Compared to firms like Google or Yahoo or Amazon, *all* newspapers are at a profound disadvantage. While newspapers can adopt better or worse strategies, they cannot change this basic fact. Still, *relative* size matters too. And one silver lining for newspapers is that they are far larger than other local news competitors. In recent years there has been much hype about the prospect of “hyperlocal” news, small neighborhood-scale digital news

sites that were supposed to draw readers and (ostensibly valuable) locally-targeted ad dollars. On a slightly larger scale, others have proposed that new digital-only news organizations might move into metro news.

On both of these points the data is overwhelming: traffic to online-only local news sites is tiny, even by the diminished standards of digital news. In a recent report for the Federal Communications Commission, the author examined data on the audience for digital local news. Even with a comScore data set of 250,000 panelists in 100 media markets, only 17 digital-only local news sites appeared in the data at all, compared to 1057 sites affiliated with traditional media.[10] Recent years have seen the shutdown of many prominent hyperlocal news sites, including the closure of NBC-owned EveryBlock, the liquidation of AOL's Patch.com, and the shutdown of Washington DC's Homicide Watch and TBD.com and Philadelphia's GunCrisis.org.

Even the clearest local digital success stories employ only a few reporters – far less than the number laid off from the papers in their own cities. Worrisome, too, is the fact they have found the most traction in the affluent, social-capital rich communities that need them least. Employing a few reporters in Minneapolis or West Seattle or New Haven is great. But the same model has failed in many other places, even when the journalism produced was high quality.

Newspapers thus remain by far the most important source for local news. Not only do they have the largest local news audience, they set the news agenda for local communities, breaking far more stories than local TV.[11] While newspapers face a severe size disparity when competing with Google, the logic is reversed at the local level: newspapers have a leg up on any nascent digital-only competitors. Like it or not, solutions to save local journalism are about saving newspapers, and easing their transition to the digital news era.

The Dynamics of Web Traffic

Journalists and editors today are provided with an enormous amount of data on their digital audiences. What newsrooms do with that data, however, varies enormously. Many newspapers still reward making the print front page over

topping the most emailed list, as Nikki Usher found at the *The New York Times*.[12] Others, such as the *Des Moines Register*, have integrated analytics much more strongly into their daily workflow.[13]

Even those newsrooms that aggressively adopted metrics, though, have missed an important part of the picture. Newspapers need to focus not on total traffic, but on stickiness – on a site's growth rate over time. In short, newspapers need to think dynamically.

To understand why thinking dynamically makes a difference, consider a simple puzzle: Why are there guest bloggers?

From the earliest days of blogging, it was clear that the blogs that grew fastest were those with many posts throughout the day. The frequency of new posts was a key factor in stickiness, and the reverse chronological order format highlighted the newest posts. Bloggers soon discovered that taking a break, or even a short vacation, was disastrous. Users who had made the sites part of their daily reading soon stopped visiting. Bloggers therefore might return from vacation to find that they had lost most of their audience.

Once bloggers returned their audience would start to grow again, but from the new, much lower baseline. It could take weeks or months to recover the previous level of traffic. The solution to this conundrum was to find someone to take over the blog while its main author was away. Guest bloggers typically do not stop the process of audience decline entirely, but they ensure that traffic shrinks at a smaller rate.

Political blogging remains one of the simplest forms of content creation online. It thus shows more clearly how traffic dynamics play out over time – and even how the entire blogging ecosystem can be subject to selection pressure.

Consider, for example, the remarkable decline of the solo blogger. In the early days of blogging – say, 1998 to 2003 – the overwhelming majority of blogs were solo authored. Yet by the mid-2000s, a shift had taken place. The large majority of "A-list" bloggers either banded together to join superblogs, or moved themselves onto the site of a news organization. Today unaffiliated, solo-authored blogs are

the exception in the top ranks of the blogosphere. Moreover, those solo bloggers who held out the longest were those with exceptionally high posting rates.

This is evolution, of a sort. Call it user selection, or digital Darwinism. On a given day, users will pick sites with small advantages at slightly higher rates. Favored sites thus grow just a bit more quickly. Many solo authored blogs who remained independent didn't go away – they just didn't grow as fast, and ended up being dwarfed by their competitors.

The examples above show how strong selection for a single characteristic – frequency of posting – has transformed the landscape of blogging over time. Yet there has been strong selection pressure for a host of other site characteristics, too. All else equal, users select faster sites over slower ones. Sites that better exploit social media, such as Buzzfeed and the Huffington Post, have seen their audience balloon. Sites with good content recommendation engines have grown at the expense of competing outlets. (More about these factors below).

The evolutionary character of online media stems from the fact that digital audiences are more dynamic than those in traditional media. Traditional media outlets could count on a more-or-less built in audience. This is particularly true for print newspapers, whose audiences were remarkably stable over years or even decades.

Yet for Web sites this is not true. Online audience growth or decline comes at the margins. It comes from making users more likely to view that extra news story, more likely to come back next time. These tiny marginal effects matter because they accrue exponentially over time.

False Solutions

Understanding the dynamic character of digital audiences in this way has important consequences. To begin with, it forces us to reconsider the numerous "solutions" offered to fix local journalism.

In recent years, saving journalism has become something of a cottage industry. Myriad observers – editors, journalists, academics, consultants, policymakers – have offered proposals to preserve local journalism. These

schemes have run the gamut. Newspapers have alternatively been told to put up paywalls, and to shut down their presses and embrace the open Web. News organizations have been told to think smaller, through a sharper focus on local and hyperlocal content. Still others have proposed that newspapers stop trying to make a profit at all, with journalism relying on philanthropy, government subsidies, nonprofit status, or even citizen-produced content. More recently, the growth of mobile phones and especially tablet devices has been hailed as a "digital do-over" for newspapers.

These proposals are so contradictory that they can't all be wrong. Some of these are bad ideas; others are zero sum proposals that help some newspaper organizations – and usually the largest news organization – at the expense of others. If we take seriously the notion that web traffic is dynamic, though, each of these proposals is built on a misdiagnosis of the problem. Positive sum solutions, that grow the digital pie for all news organizations, have remained elusive.

We will take each of these proposals in turn.

The Problem with Paywalls

Perhaps no "solution" in recent years has been as celebrated as the erection of paywalls. Yet the benefits of paywalls are often exaggerated, and their true costs overlooked.

Many have claimed that newspapers' failure to erect paywalls in the early years of the Web was their "original sin,"[14] the originating mistake of the newspaper crisis. In fact, paywalls were tried repeatedly, by a host of different news organizations, from the mid-1990s onward.

Financial publications, such as the *Wall Street Journal* and the *Financial Times*, quickly had success with paywalled content. But for daily newspapers, experience after experience showed that paywalls were a failure: they reduced Web traffic and online advertising to a single-digit percentage of previous levels, while generating little new revenue.

These longtime negative assessments of paywalls changed dramatically in 2011, when the *New York Times* implemented a so-called metered paywall. Visitors to the *Times* would be given a set number of articles a month, and when that quota was reached individuals would be asked to subscribe. The result was widely heralded as a success. By the end of 2013, approximately 30 percent of the *Times'* subscription revenue – and 10 percent of total revenue – came from digital subscriptions.[15] The perceived success of the *Times* has led to a rush by other newspapers to implement similar systems. More than 450 US dailies have now implemented a metered paywall.[16]

It's easy to understand why "soft" paywalls have outperformed previous versions. As the traffic numbers above suggest, most newspaper site users visit just a few times a month. More than 90 percent of site visitors never hit the paywall in the first place. Metered paywalls thus ask for subscription revenue only from heavier users. Paywalls allow newspapers to perform price discrimination – to figure out which users are most willing to pay, and then ask that group alone to pony up.

But while metered paywalls provide a better series of trade-offs than hard paywalls, they are not a free lunch. The biggest cost of paywalls lies in lower traffic. This lost traffic doesn't manifest as a one time drop.[17] More insidiously, it comes in the form of permanently lower traffic growth. This missing audience may look small at first, but the audience gap grows exponentially over time.

No local newspaper, however, has enjoyed anything like the *Times'* digital success. The *Times* is sui generis: it owns the nation's best news brand, and it produces an enormous, varied, and uniformly high-quality bundle of content. A more typical case is Gannett, the nation's largest print newspaper chain. In 2013, after adopting paywalls at all 80 of its community newspapers, Gannett reported that it had signed up only a paltry 46,000 subscribers. These are dismal numbers, which suggest that none of its properties come close to viability as digital-only enterprises.

Paywalls, then, are not in themselves a solution to what ails newspapers. Thus far paywalls have acted as a tourniquet, slowing the bleeding of revenue away from the newspaper's core print business. That does not mean they are, on balance, a bad idea – after all, sometimes a tourniquet is a medial necessity. But the costs of paywalls are large, even if they are paid on the installment plan.

The Open Web

Paywalls may have problems, but so do most of the proposed alternatives. While many have argued that newspapers need to "stop giving it away for free," a smaller group has argued that newspapers need to go in the opposite direction. Newspapers, according to this logic, need to become digital only publications – and in the process, save the 40-50 percent of their overhead devoted to printing presses, ink, paper, and delivery vans. Papers have been told to shut down the presses, "burn the boats" and commit irrevocably to the web.[18]

There are many problems with this view. For starters, it grossly overstates both the *amount* of traffic the newspaper sites receive, and *how valuable* that traffic is. The myth of monetization is the central driver behind these digital-only fantasies. Even The *New York Times* get only one-fifth of its total revenue from digital, enough to support a newsroom of just a few hundred people.

Online-only proposals for local news depend on misleading figures about the amount of money raised by digital advertising. Some of the confusion comes from newspapers' creative accounting of online ad revenue. In fact, a large fraction of digital advertising comes as a part of a joint print advertising buy. For McClatchy, for example, 41 percent of their online advertising spending was bundled with print advertising sales.[19] "Full price" digital ads are often sold only because they come with corresponding discounts on print advertising. If newspapers really did end their print editions, much of this joint digital revenue would quickly disappear too.

Philanthropy, Nonprofit News, and Government Subsidies

Some have proposed that philanthropy, nonprofit journalism, or government subsidies could help solve the local crisis. But here again, the data show problems.

Talk about philanthropic or nonprofit journalism has been animated by a few prominent national examples, such as the award-winning nontraditional news organizations ProPublica or the Center for Public Integrity. Alternatively, a handful of local efforts such as the New Haven Independent, or statewide efforts such as the Texas Tribune, have attracted significant attention. But these examples can distract us from the big picture: philanthropic journalism is inadequate to the size of the local journalism crisis.

As of 2013, philanthropic efforts, personal wealth, and venture capital funding together accounted for just one percent of local journalism funding nationwide.[20] Even if newspaper-focused philanthropy could grow ten-fold, local journalism would be forced to continue with a skeleton crew. There is simply not enough money to replicate the national examples above in thousands of local communities.

Given the scale of the problem, other commentators have proposed direct, large-scale government funding for journalism.[21] Government funding does have one advantage: implemented properly, it is the one proposed solution that might be able to provide ample resources. Because news is a public good, government subsidies can be justified by the same logic seen in dozens of other policy areas, from national defense to public education. And while concerns that direct government funding would compromise press independence are worth considering, there are examples of state-supported journalism with a long track record of political independence.

Still, large-scale government subsidies remain a political nonstarter. Hundreds of millions of dollars – and likely many billions of dollars – would be required annually to sustain local journalism at even a fraction of current levels. That level of resources requires national government action rather than a state or

municipal-level program. The odds of the U.S. Congress passing new, large-scale government subsidies is remote.

Alternatively, some have proposed allowing newspapers to become nonprofit organizations, a strategy that combines government tax subsidies and philanthropic efforts. Certainly offering tax benefits to news organizations and their potential donors is more politically tractable than direct appropriations. Yet the nonprofit strategy, too, is more challenging than many have let on.

Nonprofit status would not lower newspapers' tax bills – for the simple reason that they now pay little or no tax, because their gross revenue is almost always offset by deductible expenses. [22] Moreover, newspapers likely could not legally qualify as nonprofits without cutting most of their non-hard news content – the most popular part of the paper – and eliminating most of their commercial advertising. This is a lot to give up on the theory that new tax incentives will inspire generosity among nascent donors. Even if current owners could be inspired to step aside, as of this writing the shift would dramatically worsen the financial plight of nearly all local newspapers. Nonprofit organizations are also not allowed to endorse candidates in partisan elections, meaning that newspapers would have to abdicate a small but important traditional role.

Both philanthropic journalism and government subsidies would lessen, somewhat, the pressure of local news organizations to find an audience. But this relief is only partial. *The point of funding local journalism is that people supposedly read it*. Both private benefactors and government funders want to see impact from their news dollars. Whether the funding comes from a congressional committee or a Wall Street financier, stable future funding streams require similarly robust digital audiences.

Tablet and Mobile

Another source of hope for some has been the rise of mobile and tablet news. One group of commentators has proposed that the shift to tablets offers newspapers a "digital do-over,"[23] an opportunity to learn from previous mistakes.

Certainly the growth in tablet and mobile ownership is impressive. The iPhone and iPad, both category-defining products, date to just 2007 and 2010 respectively. By January 2014, 58 percent of U.S. adults owned a smartphone.[24] News is a popular activity for those who own both sets of devices; a third of all U.S. adults report consuming news on their smartphone or tablet at least once a week.[25] Unfortunately, though, the shift to mobile and tablet news makes the situation of local newspapers even more precarious.

Early audience data seemed to show tablet users with much higher news engagement than those on other platforms. Much of this effect, however, has turned out to be just selection bias. Affluent, tech savvy, Apple-loving early adopters are heavy news consumers, a group especially likely to rely on news apps. As tablets and smartphones have diffused, and mostly-cheaper Android devices have taken over most of the market, the portion of users relying on apps for all or part of their news has *shrunk* instead of grown. Of those who consume news mostly in the browser – 61 percent of tablet news consumers, according to Pew survey numbers – only 2 percent report paying for digital news.[26]

Instead of being a dramatic departure, then, news consumption on tablets and mobile mirrors patterns of news on the Web. Tablet and mobile devices, just like traditional Web news, send the overwhelming majority of their audience to large, national news organizations. Like the Web overall, the audience for mobile and tablet news is broad but exceedingly shallow. According to Nielsen, users spent only 31 minutes a month on average in mobile news apps.[27] Roughly 5 percent of time spent on apps goes toward news, only a small improvement over browsing patterns on the broader Web.

For smaller news organizations, the shift towards tablets and mobile has been especially bad news. Ad revenue on mobile is only a fraction of that for the same traffic on the non-mobile Web – though to be sure, mobile advertising is growing at an explosive pace. The growth of mobile ad revenue has been of little benefit to local newspapers, with Google and Facebook together raking in two-thirds of tablet and mobile advertising.[28]

The move to mobile and tablets also dramatically raises development costs. Newspapers have no choice but to redesign their sites in order to perform well on these new platforms. The (usually few) computer programmers and Web designers working for newspapers overwhelmingly know Web-focused languages and standards like HTML, CSS, and JavaScript. By contrast, apps are real software programs, mostly written in Objective C, a programming language virtually unknown by current newspaper staffers.[29] Building a newspaper app therefore requires outsourcing development to a specialized software firm at great cost.

Monitoring user experience across a profusion of platforms is now a nightmare. Newspapers must support both iPhone and Android operation systems, different app versions and browser versions for both phones and tablets, and even both "landscape" and "portrait" format depending on how the user is holding the device. Large, national news outlets can more easily absorb these new development and testing costs than local newspapers can.

This multiplatform development effort is unavoidable. There are few mobile-only news readers: even those who do get news on their phone strongly prefer other platforms when available.[30] Most news is still consumed at work,[31] a setting where users are not going to be using their iPads. The result has been an often-terrible smartphone and tablet experience for local newspaper readers. Some smaller publications have given up on building their own news apps, concluding that the development and maintenance costs are simply not worth it.[32]

The mobile and tablet shift magnifies other changes in the news landscape, such as the shift towards Facebook and Twitter as major traffic drivers. Apple takes a hefty 30 percent of all subscription revenue generated through apps – and while there are workarounds, they are generally inelegant.

Mobile and tablets, like social networks, make it harder for news sites to control their own destiny. Growing mobile traffic means Apple takes a cut of tablet subscription revenue. Digital ad networks like Google take a cut of much online advertising. Facebook and Twitter control a large fraction of newspaper

traffic. Many of the innovations that were supposed to empower papers have instead left them in thrall to digital goliaths.

The bottom line is that *any successful strategy for digital local news requires sites to grow their audience*. This is obviously true for sites relying on ad revenue – though local newspaper sites cannot expect the same level of ad revenue per person that larger websites earn. Audience growth is just as essential for plans that rely on selling subscriptions. The current core audience of local news sites is too small to provide digital sustainability. Visitors who spend just a few minutes a month on a site are not good subscriber prospects. Even nonprofit journalism efforts need to demonstrate that their work is reaching a broad audience in order to ensure continued funding.

Web traffic and stickiness: What works?

If the raft of solutions proposed above won't work, what will? Growing local news audiences online boils down to two questions. First, how can we make news stickier compared to all of the other content – from Facebook to email to pornography to shopping to YouTube – that competes for users' attention? Second, how can local news sites make themselves stickier compared to the large national news brands that soak up 85 percent of the news audience?

The good news is that newspaper organizations do not have to start from scratch. Almost two decades of research have documented the factors that allow some sites to build habits of readership. Newspapers need to adopt the same tools and techniques and strategies that allowed web giants like Google to get so big in the first place.

Perhaps the single most consistent finding, across the entire web traffic literature, is that ***faster load times*** lead to higher traffic. Dozens of studies have replicated this result across different sites and diverse categories of content.[33] Even tiny user delays, on the order of 100 milliseconds, have been shown to reduce traffic.

News sites today still load more slowly than any other type of content.[34] When Google CEO Eric Schmidt visited the Newspaper Association of America convention in 2009, his first complaint about digital newspapers was that "the sites are slow. They literally are not fast. They're actually slower than reading the paper."[35]

In recent years, though, a few newspapers have gotten the message. Upon buying the *Washington Post,* Amazon.com CEO Jeff Bezos insisted on reducing load times by 40 percent.[36] Since 2013 *The New York Times* has revamped its entire Web architecture, everything from hardware to server configuration to its massive code base, to meet new speed targets.[37] *The Guardian* has dropped page loads from 12.1 seconds to 3.2 seconds.[38] *The Guardian* now aims to load core page elements – layout, headline, and article text – in no more than a second, even for mobile users. These are welcome changes, but they need to be replicated at hundreds of other organizations. The fact that large newspapers got there first underscores the size disadvantages that small newspapers face.

Beyond speed, ***site design and layout*** has a large effect on site traffic and on purchase decisions. Some of this effect might stem from simple aesthetic considerations. But there are other factors, too, that make design especially important in building traffic.

Several lines of research show that site design and layout is used as a proxy for site quality and trustworthiness.[39] Design also has big impacts on users' abilities to navigate the site. Sites that are easier to navigate generate more return traffic and higher sales.

Site design seems to have effects on e-commerce revenue that are even stronger than its effects on raw traffic – something that should give newspapers pause. The paywall push means that *most newspapers are now e-commerce sites*, as they scramble to sign up digital subscribers. Amateurish and dated web designs are disastrous for reader's perceptions of quality.

Another key finding in the literature is the crucial importance of ***personalized content recommendations systems***. Automated, algorithmic recommendations are the cornerstone of most large digital firms. Companies like

Amazon and Netflix depend on content recommendation systems for a large portion of their revenue, and an even bigger chunk of their profits.[40]

Lists of "most popular" or "most emailed" articles are increasingly common on news and media websites, and they can raise traffic numbers if given a prominent spot on the page. But a large body of research shows that recommendation systems can do much better. Google News' personalized news recommendation system increased traffic on its homepage dramatically.[41] Similarly, when *Fortune* tested a content recommendation system page views spiked by 30 percent.[42]

To be sure, recommendation systems are challenging to get right. Newspapers have limited staff expertise in these areas, and they often have trouble paying for the high salaries this specialized knowledge commands. But recommendation systems deserve more investment: few technical changes can provide such a big boost to news traffic.

Technical issues like site speed and content recommendation are both important, and underappreciated. But building local news audiences depends not just on site features, but on creating more and more compelling digital content. Here, too, the results are clear: sites with ***more content, more frequently updated***, are much better at building traffic. Large news volume is a necessary, though not sufficient, condition for strong audience growth.

It is impossible to build audience with a mostly static site. By definition static sites provide no reason to come back. As one executive at *The Atlantic* remarked to the author, "if a user returns to your site, and finds that nothing has changed, you have just taught them to come back less frequently."

The importance of fresh content is at the heart of recent discussion of so-called "hamster wheel journalism." The evolutionary pressure for more content more often has led to enormous focus on immediacy, and breakneck production of short news articles.[43] In a widely-discussed *Columbia Journalism Review* article Dean Starkman decried these trends:

> The Hamster Wheel isn't speed; it's motion for motion's sake. The Hamster Wheel is volume without thought. It is news panic, a lack of discipline, an

inability to say no. It is copy produced to meet arbitrary productivity metrics.[44]

Certainly Starkman is right that these tactics sometimes challenge traditional news values (more on that below). But these approaches are not just "mindless volume"; rather, they are the considered outcome of much research on what builds readership. The reason these techniques have taken over is that the news organizations that adopted them have grown faster than their competitors.

All else equal, news organizations generate more traffic with lots of little stories, rather than fewer medium-sized ones. Data from Chartbeat shows less than 10 percent of users scroll down to the end of a typical news article – most users, in fact, scroll only to the halfway point.[45] This suggests that reporters often spend lots of time writing words that barely get read. Increasingly these findings are shaping newsroom policies. On May 6, 2014, both the Associate Press and Reuters (apparently coincidentally) issued separate memos asking reporters to keep most news stories under 500 words.[46] In addition to saving reporters' and editors' time, the AP's memo decried a "sea of bloated mid-level copy," declaring that "our digital customers know readers do not have the attention span for most long stories and are in fact turned off when they are too long."[47]

To be clear, research *does not* suggest that newspaper sites can maximize their traffic by eliminating all of their long articles. Research on recommender systems, among other lines of evidence, suggests that the best solution for most newspapers is *diversity* in article content and format, including article length.[48] Longer feature articles dominate the "most read" lists at most digital newspapers. But local newspaper sites cannot build up a consistent daily audience just with lengthy features. A constant stream of short pieces is the first step to ensuring site stickiness.

Newspapers can also make significant gains by even just better utilizing the content they already produce. In particular, ***headline testing and improved lede-writing*** can result in substantial jumps of traffic.

One of the most striking differences between successful online media startups like Upworthy, Buzzfeed or the Huffington Post is just how much time their editors spend writing headlines. Upworthy, a site that often promotes news and public affairs content, requires its staff to write 25 headlines for every story. Interviews with Buzzfeed staff emphasize the same point: a majority of writers' time is spent writing the headline and the lede, even for stories with original reporting. Practices at the Huffington Post are similar.

Headline testing comes with perils for newspapers. Going too far down the clickbait path, with catchy headlines that misrepresent the article, can diminish the newspaper's brand and squander readers' trust. Still, the headline is by far the most read part of the article, and the greatest opportunity to alter reader behavior. Again and again, online aggregators have taken other organizations' reporting and garnered a tsunami of traffic by adding an A/B tested headline and a quantifiably catchier lede.

Recent shifts in news organizations have suggested greater investment in this area, and a growing acknowledgement of the importance of headlines. Among other recent investments of the Bezos era, the *Washington Post* has created a new team of 16 people focused on rewriting headlines to boost traffic.[49] Headline writing is not an either/or choice between the tepid titles of many newspapers, and Upworthy-style "you won't believe what happened next" headlines. Newspapers can write more compelling headlines while still respecting their values and their brand identity.

In the same vein, ***optimizing news sites for social media*** can also boost readership. Many news sites find that Facebook is their single largest source of traffic, with sites like Buzzfeed and Huffington Post high-end outliers. Moreover, referral data often underestimates the role of Facebook: much of so-called "dark social" traffic has turned out to be mobile Facebook users, though sources like Chartbeat have recently gotten better at correctly attributing the traffic source.[50] Capturing even a trickle from the Facebook firehose can produce wild traffic spikes.

Optimizing for social media is about more than adding “like” and “tweet” buttons to the website, or requiring reporters to tweet, or even Facebook-friendly headline testing like the sort above. Most mid-size and larger local papers now have at least one person focused on social media, which is a start. But the features of a good social media story need to be considered at every part of the news process, from story pitch to final publication. Increasingly, digital news sites have deployed dedicated social media teams to coordinate this process, and push a set of promising stories in the hope that they will go viral. With the Huffington Post, for example, different sections and “verticals” are required to pitch stories to the social media team several times a day.

Facebook-referred traffic is actually even *more* biased towards large, national news outlets than Web traffic as a whole. Newspapers need not (and should not) turn their sites wholly over to social content, but they do need a consistent stream of suitable articles. Even modest improvements would have an outsize impact on closing the gap between local papers and national outlets.

To be sure, there are limits to the gains social media can provide. Facebook visitors are mostly flybys, looking at a single page and spending less than a minute.[51] Facebook users are difficult to keep for that second or third page view, let alone convert to paid subscribers. News organizations overly dependent on Facebook visitors are quietly ceding a great deal of control.

Moreover, even substantial investments in social media can evaporate without notice when Facebook or Twitter changes their rules. One prominent example is the *Washington Post*’s Social Reader. The app is promised to “share what you read with your friends,” and it added recently read articles to subscribers’ news feeds. Social Reader’s developers got substantial technical help and encouragement from Facebook's own staff in building the app, and at its height the app had more than 17 million users. Yet in late spring 2012, without any warning, Facebook redesigned its site and altered its algorithms. Traffic plummeted almost overnight. By December 2012, the *Post* had killed the app. *The Guardian’s* similar social reader app, also created with help from Facebook, suffered the same fate.

Lastly, ***multimedia content*** attracts more traffic than plain-vanilla text articles. This includes interactive elements and graphics, which have long been associated with high levels of reader engagement.[52] But video content and even simple slide shows typically outperform text alone. Some digital news sites already aggressively exploit this finding. Huffington Post and Buzzfeed, for example, have both invested heavily in slideshows (HuffPo) and scrollable image galleries (Buzzfeed). The Huffington Post is so committed to the strategy that, as of this writing, it requires that slideshows accompany most of its articles.

In this regard newspapers are missing an easy layup. Reporters in the print paper are strongly limited in the number of photos they can publish, but there are no such limits online. Digital newspaper articles are often text-only, when they would earn more time and attention from users with a handful of photos or even a gallery.

Yet for content that requires higher levels of investment, this finding is more equivocal. The *New York Times*' story "Snowfall," about a deadly Washington state avalanche, is an oft-cited example of how digital news organizations can tell stories in new and sometimes dazzling ways. But "Snowfall" required enormous investment of journalist resources. It took John Branch six months to report the story, plus the work of a photographer, a researcher, three video people, and an 11-person (!) graphics and design team. Because the *Times*' content management system could not support the story's rich content, the entire page format had to be built from scratch. Some of this functionality might eventually be built into the newspaper's standard digital platform, making future projects easier. Still, the bottom line remains: multimedia content might generate more traffic, but it also requires more resources to produce. For many pieces of rich content the opportunity cost is simply too high.

The Infrastructure of Growth

The tactics discussed above are not a comprehensive list of everything newspapers could do to grow their digital audience, but they are a start. The median local newspaper could be improved in every single one of these areas. If

money were no object, the prescription would be simple: do everything, and do it now.

Of course, for newspapers money *is exactly* the issue, and everything-at-once is not a viable strategy. Newspapers need to think marginally, to identify the changes that provide the most stickiness for the least additional cost.

Some strategies are so important that they should be implemented immediately. For any editors reading this: If your site is slow, you are bleeding traffic day after day after day. If your site does not work seamlessly on mobile or tablet devices, drop everything and fix it. If your homepage does not have at least some visible new content every hour, you are throwing away traffic. Fix these problems first.

Beyond these easy gains, though, the problems of increasing stickiness get harder and the trade-offs trickier. For these more difficult questions testing is crucial. Newspapers have to perform live experiments on their websites, in order to learn what they need to know. There is no substitute for data.

Online field experiments are the single most important strategy that has allowed today's web giants to get big in the first place. Google researchers report that they “evaluate almost every change that potentially affects what our users experience.”[53] Increasingly sites have moved beyond testing just two variants of a Web page, as A/B testing implies, to multivariate testing (MVT) in which many variables are tested simultaneously. Ron Kohavi, formerly of Amazon and now head of experiments at Microsoft, credits online experiments with adding hundreds of millions of dollars to Microsoft’s bottom line.[54] Less appreciated but just as important, similar sums were saved by catching damaging features before they went live. Large firms such as Google, Microsoft, and Facebook have more than a thousand experiments running at any given time.

Though A/B testing began to be employed at sites like Amazon.com and Yahoo in the 1990s, most newspapers still lack the infrastructure or expertise to perform online experiments. First, newspapers must reliably track individual users, both over time and across devices. This is not trivial. If users cannot be reliably separated into treatment and control groups no experiment can work. Newsroom

subscriptions to services like Omniture and Chartbeat are one way to solve the problem of tracking users.

Second, newspapers need to be able to serve altered versions of their webpages. Most newspapers currently do not have this ability – but this should be easy to fix. Cloud computing platforms such as Amazon Web Services or Google App Engine/Compute Engine are easy to use and astonishingly cheap – though of course newspapers need to make sure that load times and responsiveness are equal across different servers. Many vendors now provide A/B testing as a service with just a few extra lines of code on the target webpage. New open source multivariate testing platforms, such as Facebook's recently-released PlanOut,[55] are even more sophisticated, and cost nothing other than developers' time.

Increasingly, then, newspapers have no excuse not to perform online experiments. Many news organizations are already doing substantial online testing. Large online-only news outlets, news divisions that are part of larger digital firms (e.g. Yahoo!), and a few prestige news brands have invested heavily in measurement. Yet even amongst this group there remains too little understanding of what exactly news sites should be optimizing for. This uncertainty can also be seen in missives about the journalism crisis, which are filled with vague, contentless calls for "innovation." Newspapers have been told to "experiment, experiment, experiment" without specifying what hypotheses these experiments are supposed to test.[56]

Often discussions of A/B testing in the newsroom have dealt with the total traffic gained or lost. But this reflects old-media thinking, the notion that audiences are mostly stable, and that any changes to the site bring a near-immediate boost or drop to that total. To be most effective, A/B testing has to begin from the understanding that web traffic is dynamic. Newspapers are looking not for changes in their total traffic, but rather changes in their *growth rate*. Positive changes that make people more likely to come back, or more likely to view that extra article, compound over months and years. Tests need to run for weeks, or even a couple of months, in order to accurately gauge their impact.

Moreover, A/B testing makes it all too easy to optimize for the wrong thing. Consider the case of one large national newspaper, which embarked on a program to test headlines. To their surprise, they found that headlines chosen for maximum clicks actually *lowered* total news traffic. Dramatic headlines attracted a larger fly-by social media audience, but turned off those readers most inclined to visit the second or third article once they were on the paper's homepage. This example emphasizes, again, the need to focus on robust metrics that are harder to game and less likely to lead analysts astray.

Costs

Testing may be crucial, but it tells us only half of what we want to know. Just as important is measuring the costs of pro-stickiness tactics. The good news is that, with the growth of cloud computing, there is no need for newspapers to spend tens of thousands of dollars on new hardware – though newspapers must spend money to hire new staff, especially technical staff. But the question of costs goes beyond new financial outlays, and requires deeper thinking about the altered economics of newspapers. Staff time, even more than money, is the most crucial scarce resource for news organizations.

A large fraction of newspapers' budgets go to fixed costs, such as rent and capital equipment. As one editor-in-chief remarked to the author, "I don't know the [total] cost of anything." Yet investing in growth, fortunately, does not require accounting for total costs. Like stickiness itself, the price of growth strategies needs to be calculated on the margin: *How much extra* will it cost to hire a blogger, or a new Web analytics specialist? What is the additional development cost to make the site faster, or the extra expense to put a Twitter crawl on the front page?

The biggest line item is the hiring of new technical staff, especially software engineers, Web designers, and analysts with statistics training. In the author's conversations with newspaper executives, several complained about the difficulty in attracting and retaining programmers and other technical staff. When pressed, though, this difficulty turns out not to be mysterious.

The software engineers that newspapers need – those experienced with Web-scale technologies in a live production environment – can command six-figure salaries at tech firms, plus bonuses, stock options, and other forms of compensation. Not only can the best programmers earn more elsewhere, the working environment at newspapers is often unattractive to technical staff. Software engineers want to work at companies that employ a cadre of peers, and that view their work as core to the organization's mission – not at firms where their coworkers ask them to fix the printer.

All of these barriers could be overcome if news organizations committed to spend what it takes. Newspapers need to get over their sticker shock, pay market rate salaries to programmers and analysts, and fix the workplace issues that make retention of digital staff difficult. Newspapers understand that other technical investments, such as printing presses, are mission critical. If the presses do not work, the paper does not reach its readers. But lack of digital staff has the same effect: without smart design and constant testing the paper loses most of its digital audience. *Technical staffers are just as much a distribution cost as printing presses,* and just as mandatory.

Spending more in-house on technology staff can also help newspapers change their broken site development models. Many newspapers practice Web development through punctuated equilibrium. Site templates will be static for years, until the site is embarrassing enough to demand a refresh, and an outside firm is hired to undertake a redesign. The resulting update might be pretty, or it might not, but the key design decisions are rarely informed by a deep understanding of how traffic flows through the site. Internal staffers are best positioned to understand traffic flow, and to make the key design decisions. Without in-house technical expertise it is hard to get good results from outside contractors, because no one in the organization can adequately oversee the quality of the work.

Moreover, even if an outside firm does a good job, they usually leave the job half-finished. The experience of Google, Yahoo!, and other digital firms shows that optimizing a Web design often has a bigger impact than the initial shift to a new layout. The launch of a site design needs to be followed by many rounds of testing and tweaking, squeezing every ounce of additional stickiness out of the new site template. Design contracts often do not allow for this crucial final stage of the process, and many newspapers lack the expertise to carry out this work themselves.

Chain newspapers can suffer from similar problems, even when they do not hire outside firms. In theory, multi-newspaper firms should enjoy economies of scale in Web design and analytics. Instead, though, newspaper companies often produce one-size-fits-none websites, in which all of the chain's newspapers are shoehorned into a single Web template. Any design element needed by *one* of the firm's newspapers is imposed on *all* of them. The result is cluttered, ugly, and difficult to navigate – far from the clean, streamlined, even elegant designs that successful sites have gravitated toward.

On the content production side, as well as the technical side, most newspapers need to make hires and shift staff to new roles. Most local newspapers still do not have any high-volume bloggers, or a clear social media strategy. (Many have hired a social media editor, but that alone does not a strategy make.) Few local newspapers feature constantly updated content on their front page. Almost none have formal programs to identify and foster key digital skills among their existing reporters and editors. With the right metrics, for example, newsroom contests to pick the best-performing headlines can identify top performers and help newsroom staff as a whole improve their skills.

Even many newspapers that talk a good game about digital have their institutional incentives backward. Hundreds of newspapers fill their digital journalism jobs with their cheapest staffers, often even interns. But the data show that these jobs are among the most critical for building readership. This is the equivalent of an NFL team spending tens of millions on its receivers and offensive line, while using an undrafted free agent at quarterback. Salaries and

non-tangible rewards both have to shift, so that the best staffers – not just the newest or youngest or cheapest – are the ones filling high-impact roles.

It would be nice to think that newspapers could adopt growth-driven strategies just by picking up a few strategic hires. In reality, most local newspapers will need to make this shift through a combination of key hires, shifting existing staff, and – if revenue declines continue – layoffs. For the last category, understanding which staff to lay off is crucial.

Some digital journalists succeed by producing the hard news and showcase reporting that is core to the organization's mission – stories that have an outsize influence on the paper's brand regardless of their raw readership. Other digital journalists generate high readership among the paper's core audience, the heavy readers who visit habitually and are the best candidates for digital subscriptions. Still other journalists reach a broad but shallow audience, bringing in a few pageviews each from a wide cross-section of the community.

A few digital journalists rank highly in two or even three of the categories above. Most succeed at just one. And many digital journalists, unfortunately, rank poorly compared to their colleagues on all three metrics. These journalists produce little hard news, while attracting neither broad nor deep readership. They contribute neither home runs, nor a regular drumbeat of base hits.

These are the cases where a change has to be made, and the problem diagnosed and fixed. Poor editorial supervision and story assignment is a common culprit. Better social media support, stronger headlines, and more photos can broaden a reporter's readership. But if the problem persists, the journalist or responsible editor needs to be reassigned – and if that does not work, he or she needs to be let go.

Hiring new staff can be expensive, and laying off current staff painful – but neither of these are the largest cost of retooling for digital growth. The biggest price by far comes from opportunity cost: reassigning staff to new roles, reporting some stories instead of others, trading off a half-dozen short articles for a single long feature, investing in some site features while other potential improvements are neglected. Growing digital audiences requires the willingness

to forgo much of what newspapers are already doing. Some of these changes will inevitably be unpopular, both within the newsroom and among some in the current newspaper audience. But testing gives us the best assurance possible that these sacrifices will be worth it.

Cooperation

A/B testing is indispensable, but it is expensive in terms of staffing and newsroom resources. One strategy to defray these costs is broader industry-wide cooperation.

Online testing is particularly challenging for smaller organizations. Per reader, experiments are more costly with a smaller audience. The *Times* or the *Guardian* can spread the costs of testing infrastructure and analytics staff across many hundreds of thousands of readers, while a midsized metro daily cannot. Even worse, the math of testing itself creates a challenge. Big firms like Google and Yahoo have been able to test thousands upon thousands of potential improvements. Often these changes are small or seemingly trivial, such as a site's color scheme, or a margin's width in pixels. Yet the aggregate effect of this testing is profound. Nearly every element of their Web pages, every piece of their user experience, has been tested and optimized.

Newspapers, especially smaller-circulation newspapers, will never be able to detect such tiny effects. Web traffic is highly variable. Some of this variation in traffic is systematic, such as higher traffic on weekdays versus weekends, or a boost in traffic surrounding an election, or a particular story that goes viral. But most of these ups and downs are just random noise.

This noise means that two groups of randomly-selected readers will never show exactly the same level of traffic growth over time. The treatment group will always be at least a little higher or lower than the control group. The challenge is to discern whether the gap between treatment and control is a genuine treatment effect or just the result of chance. Big sites like Google and Yahoo can be confident that even very small gaps between treatment and control represent

real differences. If Google and Yahoo have 10,000 times more traffic than a typical midsized newspaper, they can detect effects roughly 100 times smaller.

Because of the statistical challenges of detecting small effects, and limited analytic resources, newspapers need to join forces, sharing research and expertise with other news organizations. The advantages of cooperation are many. Newspapers can pursue a far broader research agenda and limit redundant effort. Analytics expertise is one of the scarcest resources in journalism, and sharing allows those skills to be leveraged highly. Joint work provides greater statistical power – especially important with smaller audiences and long testing windows – and it ensures that important results replicate.

Of course, much informal sharing already takes place. Ideas and research are shared on Twitter and blogs, at industry conferences, through email, and in one-on-one conversations. Newspapers such as the *New York Times* and the *Guardian* have been laudably forthcoming about their research findings and technical platforms (see above). The American Press Institute, the Knight Foundation, and the Pew Research Center, among several other industry groups and academic centers, have fostered sharing of research across news organizations.

Still, none of this is a substitute for more organized efforts. Newspapers need a forum through which they can *outline a common research agenda*, *share results*, *receive peer feedback*, and *synthesize findings*. Failed experiments need to be highlighted, too, in order to avoid the file drawer problem. Such a research group could be organized through a professional association, such as the American Association of Newspaper Editors or the Online News Association. Alternatively, foundations could provide the organizing role.

In many industries firms are understandably reluctant to share core business information, or to collaborate in building common infrastructure. But newspapers are in an unusual situation. Newspapers rarely compete directly with each other. The *Seattle Times* is not a rival to the *Tampa Bay Times*, though both are now facing off against sites like CNN.com and Yahoo and Buzzfeed. Moreover, as reporters and editors themselves loudly declare, journalism is not just another business. Journalism's commitment to openness is part of what

makes it worth saving. Harnessing that public-spirited ethos, and being willing to share with their peers, is essential if newspapers are to adapt to the digital age.

Conclusion

The plight of newspapers is far worse than many journalists and editors realize. Local newspapers' digital audiences are simply too small to be sustainable as print ad revenue continues to shrink. No matter which strategy newspapers pursue, from paywalls to nonprofit journalism to doubling-down on tablets, digital audience growth is essential.

It is unclear how large the paying audience for digital local news can ever be. Ironically, though, the fact that newspaper websites *as websites* have long been terrible is one reason for optimism. Longstanding errors provide an opportunity for rapid improvements.

Doing better requires newspapers to think differently about Web traffic. Newspapers need to invest heavily in measurement and online experiments. Just as important, they need to rethink what they are optimizing for: not raw traffic, but audience growth. Small gains in stickiness can compound enormously over time.

The strategy outlined in this paper is unabashedly data-driven, which may be cause for suspicion. Some argue that a myopic focus on metrics has already damaged journalism, that pageview-chasing has betrayed journalism's core values and alienated loyal readers. A renewed focus on metrics might be seen as an excuse to turn newspapers into a thousand local editions of Buzzfeed, complete with curiosity gap headlines and puppy slideshows and "Which local official are you"? quizzes.

These complaints about measurement, though, have the issue backwards. Journalists portray themselves as indispensable public servants: as Kovach and Rosenstiel aptly put it, "the primary purpose of journalism is to provide citizens with the information they need to be free and self-governing."[57] But audience numbers are so shockingly low that newspapers are clearly failing in their civic role.

The silver lining is that journalists have a new toolkit with which to diagnose and mend the problem. Big scientific leaps have often followed improvements in measurement, as when Newton's laws followed the invention of the telescope. Journalism today is at such a juncture. Journalists no longer have to rely on the so-called "imagined audience" or faulty conventional wisdom. For the first time, individual journalists can directly measure the readership their stories receive. With practice, the hope is that journalists can distill broader lessons about how to attract readers to the stories that really matter.

Maximizing the wrong metrics can be disastrous, as examples above show. But metrics can also be used to enlarge the audience for hard news, if newspapers are willing to put in the effort. Nearly every story characteristic can be tested: which headlines keep readers, which framing is most compelling, even which specific paragraphs chase away readers. As newspapers look beyond crude measures such as pageviews, and instead focus on deeper metrics such as reader attention and compounded audience growth, they can narrow the gap between expediency and their ideals.

That is not to say that tough tradeoffs can always be avoided. But making smart compromises between commercial pressures and democratic values requires data, and most newsrooms today are still flying blind. Do those slideshows of kittens expand the hard news audience, or do they crowd out coverage of the mayor's race? How much does a section's readership suffer when a reporter goes off to pursue a month-long investigation? If we want to maximize hard news readership, should reporters spend less time reporting and more time writing decent headlines? Every newsroom needs to be asking these questions. We cannot get the ethics of digital journalism right without first getting the facts about Web traffic. Empowering editors and journalists begins by mapping out what exactly the costs and benefits are.

Of course, all of these ethical debates are moot if newspapers do not survive in a recognizable form. The decline in the economic health of local newspapers is so severe that there are no guarantees. Traffic dynamics mean newspapers are racing the clock: readers lost today get ever harder to replace tomorrow.

Growing the digital newspaper audience is still possible – but we need to hurry.

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