



Streams of Content, Limited Attention: The Flow of Information through Social Media

By danah boyd

In his seminal book *Flow: The Psychology of Optimal Experience* (1990), Mihaly Csikszentmihalyi argued that people are happiest when they can reach a state of “flow.” He talks about performers and athletes at the height of their profession and the experience they feel as time passes by and everything clicks. People reach a state where attention appears focused and, simultaneously, not in need of focus. The world is aligned and everything just feels right.

If we consider what it means to be “in flow” in an information landscape defined by networked media, we will see where Web 2.0 is taking us. The goal is not to be a passive consumer of information or to simply tune in when the time is right, but rather to be attentive in a world where information is everywhere. To be peripherally aware of information as it flows by, grabbing it at the right moment when it is most relevant, valuable, entertaining, or insightful. To be living with, in, and around information. Most of that information

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is social information, but some of it is entertainment information or news information or productive information. Being “in flow” with information differs from Csikszentmihalyi’s sense of reaching a state of flow, since the former is not about perfect attention but is instead about a sense of alignment, of being attentively aligned with information.

Lately, technologists have been talking a lot about content streams or streams of information. The metaphor implied by “streams” is powerful. The idea is that we are living inside the stream: adding to it, consuming it, redirecting it. The stream metaphor is about being in flow. It’s also about restructuring the ways in which information flows in modern society. Those who are most enamored with social media services like Twitter talk passionately about feeling as though they are living and breathing with the world around them, peripherally aware and in tune,

adding content to the stream and grabbing content when appropriate. But this state is delicate, plagued by information overload and weighed down by frustrating tools.

For the longest time, we have focused on sites of information as a destination; we have viewed accessing information as a process and producing information as a task. What happens when all of this changes? While things are certainly clunky at best, this is the promised land of the technologies we are creating. This is all happening because of how our

information society is changing. But before we talk more about flow, we need to step back and talk about shifts in the media landscape.

From Broadcast to Networked

For the last few centuries, we have been living in an era of broadcast media, but we have been moving to an era of networked media. This fundamentally alters the structure by which information flows.

Those who believe in broadcast structures recognize the efficiency of a single, centralized source. There’s some nostalgia here. The image is clear: the 1950s nightly news, with everyone tuning in to receive the same message at the same time. The newspapers, the radio stations, the magazines—all told the same news-y story. Centralized sources of information are powerful because they control the means of distribution. The town gossip, the church, and the

pub too were centralized channels for disseminating information.

Broadcast media structures take one critical thing for granted: attention. There is an assumption that everyone will tune in and give their attention to the broadcast entity. Yet that has never been true. As TV channels and publishing brands have proliferated, we’ve seen that attention can easily be fragmented. Over the last few decades, increasing numbers of entities have been fighting for a smaller and smaller portion of the pie. Even gossip rags started competing for attention.



The opportunities for media creation have been rising for decades, but the Internet provided new mechanisms through which people could make their own content available. From blogging sites to social network sites to media-sharing sites to sites that provide social streams, we are seeing countless ways in which motivated individuals can distribute their personal content. There were always folks willing to share their story, but the Internet gave them a pulpit on which to stand.

Internet technologies are fundamentally dismantling and reworking the structures of distribution. Distribution is a process by which content creators find channels through which they can disseminate their creation. In effect, they’re pushing out the content. In the past, the idea was that with limited channels for distribution, getting access to this limited resource was hard. But that is no longer the case.

Today, as networked technologies proliferate around the world, we can assume that there is a channel of distribution available to everyone and between everyone. In theory, anyone can get content to anyone else. With the barriers to distribution collapsing, what matters is not the act of distribution, but the act of *consumption*. Thus, the power is no longer in the hands of those who control the channels of distribution; the power is now in the hands of those who control the limited resource of attention. This is precisely why *Time* magazine's Person of the Year for 2006 was "You." *Your* attention is precious and valuable. It's no longer about push; it's about pull. And the "Law of Two Feet" is now culturally pervasive.

While we're dismantling traditional structures of distribution, we're also building new forms of information dissemination. Content is no longer being hocked, but links are. People throughout the network are using the attention they receive to traffic in pointers to other content, serving as content mediators. Numerous people have become experts as information networkers.

To many people, this may seem like old news. Isn't this the whole point of

folks are all trying to turn the Internet into a new broadcast channel. Don't worry, they're failing. As a result, we need to talk about these shifts so that we can talk about what innovation needs to happen. If people are going to try to get in flow with information, we must understand how information flows differently today.

Four Core Issues

Four challenges point to where technological hope and reality collide: democratization; stimulation; homophily; and power.

Democratization

Switching from a model of distribution to a model of attention is disruptive, but it is not inherently democratizing. This is a mistake we often make when talking about the value of the Internet. We

to the structures of distribution is not democratizing when distribution is no longer the organizing function.

Some people might immediately think: "Ah, but it's a meritocracy. People will give their attention to what is best!" This too is mistaken logic. What people give their attention to depends on a whole set of factors that have nothing to do with what's best. At the most basic level, consider the role of language.

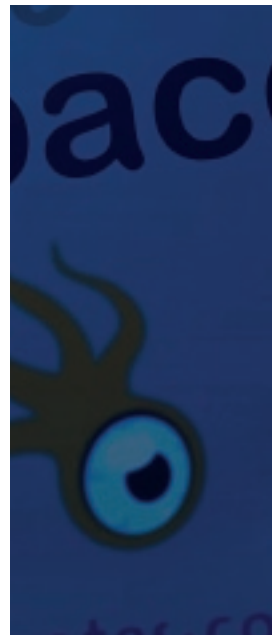
People will pay attention to content that is in their own language, even if they can get access to content in any language. This means that, by the law of numbers, Chinese-language content will soon attract more viewers than English content, and certainly more than Dutch or Hebrew content.

Stimulation

People consume content that stimulates their mind and senses—that which angers, excites, energizes, entertains, or otherwise creates an emotional response. This is not always the "best" or most informative content, but it is the content that triggers a reaction.

This is not inherently a good thing. Consider the food equivalent. Our bodies are programmed to consume fat and sugars because they're rare in nature. Thus, when fat and sugars come around, we inherently want to grab them. In the same way, we're biologically programmed to be attentive to things that stimulate: content that is excessive, violent, or sexual and gossip that is humiliating, embarrassing, or offensive. If we're not careful, we're going to develop the psychological equivalent of obesity. We'll find ourselves consuming the content that is least beneficial for ourselves or for society as a whole simply because it's now easy to access.

We are "addicted" to gossip for a



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Web 2.0? Isn't this what the digerati have been living? Sure, of course. But now that Web 2.0 is going mainstream, we're seeing all sorts of folks get into the game. What everyday folks are doing often looks different from what early adopters were doing. And the business

may be democratizing certain types of access, but we're not democratizing attention. Just because we're moving toward a state where anyone has the ability to get information into the stream does not mean that attention will be divided equally. Opening up access

good reason. We want to know what's happening because such information brings us closer to people. When we know something about someone, there's a sense of connection. But the information ecology we live in today has twisted this whole situation upside down. Just because I can follow the details of Angelina Jolie's life doesn't mean she knows I exist. This is what scholars talk about as *parasocial relations*. With Facebook and Twitter, we can turn our closest friends into celebrities—characters we gawk at and obsess over without actually gaining the benefits of social intimacy and bonding.

Although stimulation creates cognitive connections, there can be too much stimulation. We don't want a disconnected, numb society or a society of unequal social connections. So driving toward greater and more intense stimulation may not be ideal.

Of course, there's money in feeding people's desires—whether those desires are healthy or not—and people will try to manipulate this dynamic for their own purposes. There are folks who put out highly stimulating content or spread gossip simply to get attention. Often, they succeed, creating an unhealthy cycle. So we have to start asking ourselves what balance looks like and how we can move toward an environment where there are incentives for consuming healthy content that benefits individuals and society as a whole. Or, at the very least, how we can learn not to feed the trolls.

Homophily

In a networked world, people connect to other people like themselves. What flows across the network flows through edges of similarity. The ability to connect to others like ourselves allows us to flow informa-

tion across space and time in impressively new ways. But there's also a downside.

Prejudice, intolerance, bigotry, and power are all baked into our networks. In a world of networked media, it's easy to avoid perspectives from people who think differently than we do. Information can and does flow in ways that create and reinforce social divides. Democratic philosophy depends on shared informational structures, but the combination of self-segmentation and networked information flow means that we lose the common rhetorical ground through which we can converse.

Throughout my studies of social media, I have been astonished by the people who think that any given website is designed for people like them. I interviewed gay men who thought Friendster was a gay dating site because all they saw were other gay men. I interviewed teens who believed that everyone on MySpace

was Christian because all of the profiles they saw contained biblical quotes. We all live in our own worlds with people who share our values; with networked media, it can be hard to see beyond that if we're not looking.

The one place where I'm finding that people are being forced to think outside their own box is the Trending Topics on Twitter. Consider a topic that trended a while ago: #thingsdarkiessay. Started in South Africa, this topic is fundamentally

Power

When we think about centralized sources of information distribution, it's easy to understand that power is at stake. But networked structures of consumption are also configured by power, and we cannot forget that or assume that access alone is power. Power is about being able to command attention, influence others' attention, and otherwise traffic in information. We give power to people when we give them our

nately, there's an assumption that if we get rid of the limitations to the means of distribution, the power will revert to the creators. This is not what's happening. Distribution today is making people aware that they can come and get something, yet those who actually gain access to people's attention are still a small, privileged few.

Instead, what we're seeing is the emergence of a new type of information broker. These people get credit for

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about language and cultural diversity, but when read in a U.S. context, it reads as racist. Needless to say, this topic blew up, forcing a lot of folks to think about language and cultural differences. Why? Because Trending Topics brings a topic that gained traction in one segment of the network to broader awareness, often out of context. Sadly, it's hard to get meaningful dialogue going once a Trending Topic triggers reactions.

In an era of networked media, we need to recognize that networks are homophilous and operate accordingly. Technology does not inherently disintegrate social divisions. In fact, more often than not, it reinforces them. Only a small percentage of people are inclined to seek out opinions and ideas from cultures other than their own. These people are and should be highly valued in society. Still, just because people *can* be what Ethan Zuckerman calls "xenophiles" doesn't mean they automatically will be simply because the technology to do so is available.

attention, and people gain power when they bridge between different worlds and determine what information can and will flow across the network.

In a networked society, there is also power in being the person spreading the content. When Scott Golder and I were examining retweets in Twitter, we saw something fascinating: a tension between citationality and attribution. In short, should you give credit to the author of the content or acknowledge the person through whom you learned of the information? Instinctually, many might believe that the author is the most important person to credit. But few ideas are truly the product of just one individual. So why not credit the messenger who is helping the content flow? We found that reasonable people disagreed about which accreditation method was best.

In a broadcast model, those who control the distribution channels often profit more than the creators. Think of Clear Channel Communications, record labels, TV producers, etc. Unfortu-

their structural position. Although the monetary benefits are indirect, countless consulting gigs have arisen for folks based on their power as information brokers. The old controllers of information are losing their stature (and are not happy about it). What is emerging is not inherently the power of the creators but, rather, the power of the modern-day information brokers.

Making It Work

As our information ecosystem evolves, we will see some radical changes take place. First, I believe that information spaces will increasingly move into niche markets. We see evidence of this in the ways that people direct their attention and also in the types of new enterprises that are succeeding. Successful businesses will not be everything to everyone; that's the broadcast mentality. Instead, successful businesses will play a meaningful role to a cohort of committed consumers who pay attention to them because of their relevance.

To be relevant today requires understanding context, popularity, and reputation. In the broadcast era, we assumed the disseminators organized information because they were a destination. In a networked era, there will be no destination but, rather, a network of content and people. We cannot assume that content will be organized around topics or that people will want to consume content organized as such. We're already seeing this in streams-based



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media consumption. When consuming information through social media tools, people consume social gossip alongside productive content, news alongside status updates. Right now, it's one big mess. But the key is not going to be to create distinct destinations organized around topics; the key will be to find ways in which content can be surfaced in context, regardless of where it resides.

Making content work in a networked era is going to be about living in the streams, consuming and producing alongside "customers"—consuming to understand, producing to be relevant. Content creators are not going to be able to dictate the cultural norms just because they can make their content available; they are still accountable to those who are trafficking the content.

We need technological innovations. For example, we need tools that allow people to more easily contextualize relevant content regardless of where they are and what they are doing, and we need tools that allow people to slice

and dice content so as to not reach information overload. This is not simply about aggregating or curating content to create personalized destination sites. Frankly, I don't think this will work. Instead, the tools that consumers need are those that allow them to get in flow, that allow them to live inside information structures wherever they are and whatever they're doing. They need tools that allow them to easily grab what they want and to stay peripherally aware without feeling overwhelmed.

Finally, we need to rethink our business plans. Frankly, I doubt the cultural shift we're witnessing will be paid for by better advertising models. Advertising is based on capturing attention, typically by interrupting the broadcast message or by being inserted into the content itself. Being in flow with information is not about being interrupted. Advertising does work when it's part of the flow itself. Ads are great when they provide a desirable answer to a search query or when they appear at

the moment of purchase. But when the information being shared is social in nature and when attention is what's being brokered, advertising is fundamentally a disruption.

Figuring out how to monetize sociality is a problem, and it's not one that's new to the Internet. Think about how we monetize sociality in physical spaces. The most common model involves second-order consumption of calories. Venues provide a space for social interaction to occur, and we are expected to consume to pay rent. Restaurants, bars, cafes—they all survive on this model. But we have yet to find the digital equivalent of alcohol.

As we continue to move from a broadcast model of information to a networked one, we will continue to see a reworking of the information landscape. Some of what is unfolding is exciting; some is terrifying. The key is not to be all utopian or all dystopian but to recognize what will change and what will stay the same. The future of Web 2.0 is about streams of content. If we want to help people, we need to help them be attentively aligned—"in flow"—with these information streams. ■

Note

This article is based on a talk I gave at O'Reilly's Web 2.0 Expo on November 17, 2009. This could not have been written if it weren't for an inspiring conversation with Dan Gillmor.

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