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Micro Stories and Mega Stories

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Technology, especially multimedia technology, is changing the way we tell stories. We are all familiar with letters, articles, and books, but new Internet technology has led to two novel forms of storytelling that we call micro stories and mega stories.

Micro stories are the short bits of text and images that we use to tell our friends about our daily life, what we had for lunch, and the funny bits of our day. They are uploaded in the form of text, images, and soon even short videos. All these micro stories represent data that we can then assemble into mega stories about our lives. In addition to the direct data presented, the metadata related to the time, location, user, and the social graph of the creator are all important bits of information that play a key role in these stories. Where are the most popular bars? What are the trending words in our discourse? Where can I find a taxi?

Our use of technology has changed over time. A few decades ago technologists predicted that we would all create our own webpages. When we discovered that HTML was too cumbersome for the average user, the answer became blogs—just start writing. Yet, even short blog postings require significant storytelling ability. Then there were question-answering sites such as Yahoo Answers. Anybody can write a question, and the Web will provide the answer. Now we have services such as Twitter, Facebook, and Instagram that require even less creative effort.

Here we discuss both micro- and mega-story types to see how people are using multimedia to drive these two extreme forms of storytelling.

Micro Stories

People have always—and yes, we mean *always*—told stories, from pictures on cave walls to oral stories, written text, photo albums, movies, and now multimedia. Often these stories span many events and include many people. This requires collecting data related to those events and then editing it for presentation based on the intended audience. Because creating stories takes time, people have usually only done this for important topics. Recently, however, that idea is being challenged.

Current Internet technology makes it easier for people to share small bits of information with others in their (social) network. Three things facilitated this change:

- ubiquitous network connectivity;
- a critical mass—enough people are part of the network that the updates capture the attention of others; and
- new types of devices that make it easy for people to capture content.

We call this new form of blogging a *micro blog*, a repository for a bit of information about different types of events. Figure 1 shows a lighthearted view of the types of text-based micro blogs. Multimedia data is providing even more interesting forms of micro blogging.

The different types of events captured by micro blogs could include an article read or a personal event such as a party, meeting, or anything that happened to the creator/user. Micro blogs became popular because they gave people a mechanism for spontaneously sharing their experiences or opinions. Initially, this was done using text, but new technologies are encouraging people to share media such as photos, videos, and location data.

Micro stories take many forms, ranging from text to audio, visual, location, emotional state, and anything else people consider important. If we think about status updates and the similar types of postings listed in Figure 1, it is clear that people want to share simple events and want to do it spontaneously with the little effort, or using a current popular term, with

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no friction. Status updates and their variants provide early tools for spontaneous micro storytelling related to an event.

The cell phone camera was the first sensor to revolutionize the sharing of micro experiences. Visual stories became popular as photo sharing became a major craze. We can see an increase in the number of photos being uploaded to share events. The rise of Instagram, Path, Tiny Review, Erly, and numerous others—too many to mention—demonstrates that people like to share visual moments. Video is not that popular yet, but it is likely to become more popular as storage and bandwidth become less expensive. (Arguably, picture postcards might have been the first micro stories. Buy a card, scribble a couple of sentences, and send it off. But they are hard to aggregate into a mega story.)

The second sensor to bring a new dimension to storytelling was GPS. Many small, and even some major, companies are involved in micro storytelling using user locations. FourSquare will let you capture your location and share it with your experiences and recommendations. Despite expressed privacy and security concerns, the use of location-based check-ins and services keeps increasing.

A micro story might involve only a single click of the ''like'' button or a camera shutter, but it implies much more than just one bit of information for two reasons: context and human intelligence. Context for this single bit is important because some ''bits'' are more valuable than others. For example, the news that Marc is at Gate 12 is not significant because he practically lives at the airport, travelling frequently. But if Mary announces the same event, we might take notice because she hates to travel. Second, an ensemble of even single bits tells me something about human behavior. For instance, a lot of clapping tells me a song meant something to the audience. This is a human signal that is hard to extract from multimedia content.[1]

For space reasons, we will not discuss any other sensors here, such as those used for healthcare, but just point out an intriguing trend. Early on, we needed to deliberately type (or tap) about 100 times on a mobile phone screen. When cameras became common, we captured much information with a click, and only a few taps were required to share a story. With location-based stories, we can share the story with photos and just a few taps. This data revolution now allows us to tell richer stories using an order of magnitude fewer taps. The data revolution results in users capturing experiential data using sensors, making shared experiences richer while the effort involved in sharing them has decreased significantly.

Social Media Explained

Twitter	I am eating a #donut
Facebook	I like donuts
Foursquare	This is where I eat donuts
Instagram	Here's a vintage photo of a donut
YouTube	Here I am eating a donut
LinkedIn	My skills including donut eating
Pinterest	Here's a donut recipe
Last.fm	Now listening to ''donuts''
G+	I'm a Google employee who eats donuts

Figure 1. A lighthearted view of how people use different kinds of social networking sites. (Originally captured by Doug Ray and posted on http://instagram.com/p/nm695.)

Using long-form video and audio to tell stories is difficult, but a short video of the Christmas tree falling on Kent's head is easy to collect and share. Even the background and environmental sounds tell a lot about the location. It is only a matter of time before we have an Instagram for video or people start to tweet videos instead of just links.

Micro stories reflect a person's experience with just one small event—really a moment in the event. In fact, many moments from the same event could be shared in more detail. It then might become a regular event story, rather than a micro story. A micro story, which is related to how important the experiencer considers the experience of a moment and its context, reflects more on the importance we gives to the sharing than the event. In fact, a user may share a micro story with one user and share a much longer event story with another user.

This emerging form of the story is data driven. It uses metadata and data intentionally, consciously captured by a person who might have collected it for personal use but then decided to share the experience with others. Obviously, every story helps share experiences. That means that the storyteller customizes the experiences to be included in the story based on his or her knowledge of the interests of those ''listening.''

Mega Stories

We are now witnessing the ''Rise of Big Data.'' The growth in the rate of data production seems to be only accelerating. What is the

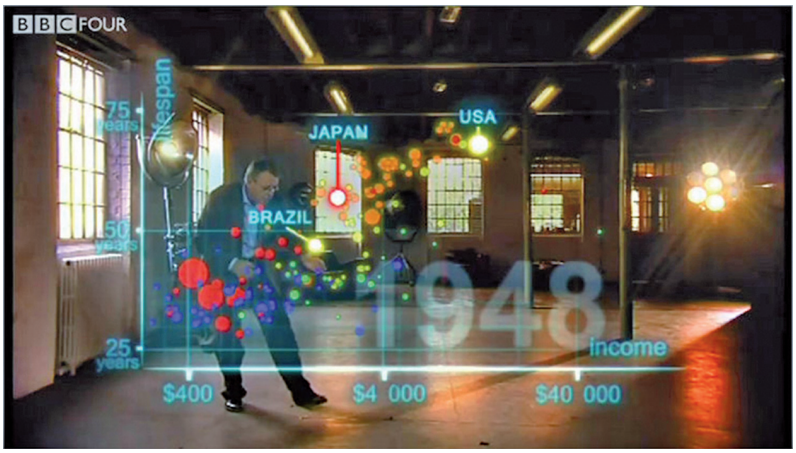

Figure 2. Hans Rosling uses data to explain the correlation between per capita income and life expectancy over time.[2]

source of the big data and how can it be harnessed efficiently?

A major source of this new data comes from micro stories. New events are happening at all levels, and these events result in new data. Just a few years ago , the technology for capturing experiential data related to these events did not exist and the storage costs were too high for people to consider storing it. Now that we have all kinds of sensors, including so-called human sensors, to capture experiential data and the cost to store and distribute this data is relatively low. Thus, big data has arrived, and the number of sensors is likely to continue to rapidly increase so the amount of data being created will also accelerate. Similarly, the number of people using mobile phones and creating information, as a human agent and a human sensor, is rapidly increasing. In early 2012 there were approximately 1.5 billion mobile Internet users. The number is expected to rise to around 5 billion by 2020.

Much of this big data is related to events. Even the knowledge that is extracted from the data is mostly derived through event analysis. In a geeky sense, events are analyzed to extract and communicate ''stories'' related to a specific theme. These themes could include the growth of the economy over the last five years (see Figure 2), improvements in the quality of life in Asian countries in the last 20 years, the causes of global warming, urbanization in China and India, or any other story. The most important thing is that all such analysis is based on the event analytics in big data.

In a practical sense, big data is used to tell mega-stories. At the other extreme from micro stories, mega stories tell a story that could only be created by considering a large volume of relevant events in big data. All these events must be selected and aggregated based on the goal of the storyteller.

When you are given a large number of events, say billions, and you need to tell a story then what would you do? In the good old days, the computational task of ''remembering'' and then selecting the best such events was difficult because people cannot remember many events. The best we could do was to somehow remember the most prominent events and use them in telling stories. Moreover, people only had a vague memory of the event experience so it was important to make those experiences as compelling as possible. Consequently, creativity or imagination is considered one of the most important factors in story creation.

Of course, storytelling also involves conveying the story to the audience, using oral or written mediums. In oral stories, the ability to modulate one's voice to bring in emotions was considered an important talent, whereas the ability to recreate character and place descriptions as well as convey emotions was important in the written medium.

It's no wonder that the tradition of storytelling relied more on one's rendering talents based on partly imaginary memories of an event. An important cultural artifact of the absence of technology to store, organize, and select real-event experiences is that most people expect stories to be, well, just that: stories. We often hear, ''Is this true or is this a story?'' How interesting that the need to hear other people's experiences resulted in such a rich storytelling tradition, but the lack of technology pushed the civilizations to accept fiction as a surrogate for facts.

With advances in technology, things have changed. First, due to recording technology (initially for text, then for sensory information such as photos and audio) people have started capturing event experiences in their original form and then reusing them. Interestingly, these event notes were even used for telling imaginary stories. However, the difference between real and imaginary in storytelling has started to become stronger. Of course, imaginary stories are also now created

more vividly, using the modified capture technology. But all those areas (virtual reality, augmented reality) recognize that reality is different from fiction.

Storytelling is changing because many stories that were based on partial knowledge of a few events and the recreation of those events can now be told using captured experiences over a long period of time. The data exists to tell a bigger story with more fidelity. This can lead to both good behavior (to find missing people) and to bad behavior (tweeting the name of the wrong perpetuator of a recent sex scandal) and then to corrections (self-correcting tweet storms.)

Examples

We would like to highlight several mega-story examples. Simple examples of mega stories are the zeitgeist or trending searches that large search engines highlight. Users can see new movie stars or significant events enter the world's consciousness as they are used in more search queries. Another example is a multimedia sports-summarization system that simply looks for a large amount of crowd noise to identify the most important parts of a sports video. Likewise, tweets can serve the same purpose.[3] Twitter clouds based on common words show the collective sense of the Twitter world and, thus, perhaps the real world.

Three more significant examples are related to averaging user data and learning to tell stories from data. CabSpotting is an art exhibit that summarizes the location of GPS-equipped taxi cabs in a large city.[4] The activity patterns tell us a lot about how the city is organized, major streets, and the flow in and out of different districts. This is only possible when we aggregate a lot of little bits of information (taxicab locations) into a mega story (see Figure 3).

More interestingly, the short cell phone videos that people capture at a concert can be aggregated into a larger story about the entire concert. With fingerprint matching, the audio data can be used as a time stamp, and with GPS we know where the video was shot. We can even count the number of videos of the stage as a measure of song popularity, utilizing crowd sourcing.[5]

On the other hand, new services such as Narrative Science learn from large quantities of quantitative data and craft customized stories to better explain it. Such a system doesn't know that the star pitcher's arm has just healed but still can convey the unique aspects of a game given the information it has from game statistics. ''Wow, that was a blowout.''

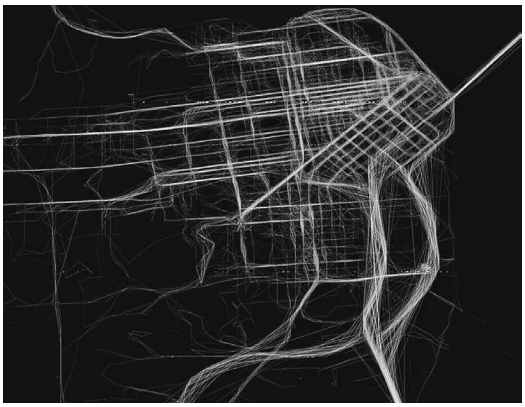

Figure 3. The CabSpotting project tells a story with micro events. This image shows an aggregation of taxi GSP data in San Francisco. Major routes around the city are easy to see. (Image courtesy of Scott Snibbe and the CabSpotting project; see www.snibbe.com/projects/interactive/cabspotting for more details.[4])

Conclusions

Given the status of technology today, it is easy to capture experiential data, such as photos, for events and even organize them. That means that one can now easily store experiential data and use it to tell stories. Thus, stories can have more real data associated with them. In this respect, the art of storytelling is getting closer to reporting.

It might appear that we will lose some important story features in the process of capturing and gathering such mega stories. Stories based on captured experiences will definitely be different from those that were based on recreating experiences using only text. For one thing, stories are becoming more data driven. For example, many stories on Facebook are being told by posting photos and albums, and stories Pinterest on are being told by collecting appropriate pictures from different sources.

Thus, it is okay to share micro stories, but what will happen when you want to tell ''real'' stories that unfold over time? Say you want to share the experience about what

Current technology is changing the nature of stories, but it is not going to make us all a Mark Twain or Steven Spielberg.

happened in 2011, or how your relationship unfolded with Tom, or how did you build a team?

Well, stories are made of micro stories. We need ''glue'' to pull moments together and make them complete story. It is possible that you are living those moments and not capturing them using your phone. Ultimately, all these stories represent selecting those moments, making them concrete by using appropriate experiential data, and then providing all necessary glue. Remember a beautiful building is made of raw material that was originally just piled in a warehouse. By selecting appropriate components from different piles and putting it together, an architect and a builder converted it to a beautiful and useful place. A storyteller must select experiential data of all available moments and put it together to tell a story. Just a collection of data from moments is only as much a story as putting together all the photos from the year in random order is the story of that year. Even a simple organization, like putting them in chronological order, makes them more interesting. By adding metadata to each picture, we start providing more components of the story.

Technology has given us the tools to effortlessly collect all this data. We also have tools to store and organize this data so we can easily pull out what we need. But selecting appropriate data from relevant moments is a more difficult problem. Rendering it in a compelling order is the art of storytelling. Current technology is changing the nature of stories—by making them more data driven—but it is not going to make us all a Mark Twain or Steven Spielberg. It is helps reduce the effort to collect experiences that were previous impossible or difficult to collect. This in turn will result in making stories closer to facts than fiction. The fiction component will be the glue to make stories more interesting and compelling.

How do you create your micro stories, and how will you put many of them together to create a mega story? It's up to you. **MM**

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