



Podcast

Information Overload? The impact of the expanding digital Universe.

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Umang: Hi, this is Umange Shah and I'm from Xerox Global Services. This podcast is part of an ongoing series; be sure to visit Xerox.com/ThoughtLeadership to download future Podcasts.

Today, I'm joined by Francois Ragnet; Francois is a managing principal for technology innovation within Xerox Global Services. He leads a team charged with transforming novel technologies into mainstream Xerox solution offerings. Francois is based out of Grenoble, France. Hi, Francois.

Francois: Hi, Umang. How are you doing?

Umang: I'm doing well, thank you. Francois, let's start out by just defining some terms. In your view, what is information overload?

Francois: Well, it's a number of colliding things. First, the traditional way of being overwhelmed with information in documents. So we've got paper documents, we've got electronic documents, we've got files all over the place—and you know, that's really where it all started from. We've got too much information coming to us. Now this has become even worse over the last few years with Web 2.0 and all this excellent new technology. We have to become multi-channel, so it's not only the document itself but, you know, you have to deal with Twitter updates, e-mail coming in, IM discussions, phone calls on your mobile, on your land line, and social bookmarking—many different sources of information. It's a problem which has been around for quite a while which is becoming even more problematic in today's information technology.

Umang: That's a great point. I've actually noticed with social media space, it's really becoming overwhelming. How long do you think this digital space has been involved?

Francois: I wouldn't call myself a late comer to that space, but I've really been swamped in it for the last couple years, and that's where it really got pretty overwhelming. But this being said, even before that, all that wealth of information which was out there—corporate repositories or in e-mail boxes and the more traditional ways of receiving information—was quite overwhelming really. So maybe I could just invoke a few facts here. Did you know that knowledge workers spend 40% of their time looking for information in documents, and actually they only find it about half of the time. When I heard this number, I first found it striking, but then looking at my own personal experience, I would say I'm pretty much in those numbers.

Other things like 42% of people say that they use the wrong information at least once per week; 53% say that half of the information they receive is not valuable. So all of these are symptoms of information overload and the digital universe, which is one of its side effects.

Umang: Those numbers are actually quite shocking, but as you said, when you really think about it, it kind of—you can relate to it. I think we're all in that situation. You mentioned the digital universe. What is that?

Francois: This is a concept which was introduced not by Xerox, but by IDC, the consulting firm, and by EMC, the storage-plus-other-things company. And basically they tried to estimate the amount of information—the amount of digital information—which was created and replicated worldwide, and they—obviously, they can't have a very precise measure for it, but their estimate is just staggering. They have a pretty cool ticker which you can find in my blog, which gives you an up-to-date estimate, and it keeps going down. Right now, we are at about 371 exabytes, and it keep growing. Just to give you an order of magnitude, 371 exabytes—that's 371 followed by 18 zeros, or 371 billion billion bytes, and that's really what we've created since the beginning of the year. This is a number which is hard to comprehend really. I looked up on Wikipedia to try to, you know, find any reference point I could find for an exabyte, and an interesting one I could find is a popular expression that claims that all the words that were ever spoken by human beings up to now could be stored in approximately 5 exabytes of data—so we're almost 100 times more created just this year. This is really absolutely staggering and impressive.

Umang: That's amazing; actually, it's kind of hard to understand that concept when you put it that way. It really is amazing. So can I jump back a little bit into the information overload aspect of it? Kind of in our daily lives, can you give us some examples of how information overload affects us?

Francois: Sure. I could use the good old example of working on a document, receiving new information, switching tasks and being overwhelmed, not being able to keep track with what you have to do. But maybe I should use a more personal experience which happened to me not so long ago, actually, in August during my yearly vacation. I'm a seasonal photographer; I like to take pictures, and I've got actually now two cameras. I started back in 2000. And so what really struck me was the footprint and the amount of digital information, of pictures, that we are creating. Let's take the example of a photo, a digital picture. It's about 4 to 5 megabytes. Now if you look at today's practices, any photographer would have one or two local backups; he might have network storage, he might have one online backup; then he might share that image with friends, send it by e-mail, put it on Flickr, on Picasa. So that 4 to 5 megabytes of actual footprint of the picture actually becomes more like 40 to 50 megabytes when it's spread all over the Web and all over with other people. That's really something which has dramatically changed over the last few years with new cameras which have much higher resolution, which have higher frame

rates, which have multimedia—video is much more powerful than a picture, but it's also much bigger. And so when I started digital photography in 2000, I had a small camera and I went to Australia for three weeks and I had to leave or to keep all my memories on two 64-megabyte CompactFlash cards. And just in these few days that I took back in August, I filled up more than 4.5 gigabytes of pictures. And just my personal experience. Now when I looked around me—you know, back in 2000, I wasn't the only one having a digital camera, but you couldn't see many people having one. Today, everybody and his grandmother has one. So I think this is just another symptom of that digital information.

Now it's having access to all that information and technology at the tip of our fingers is great, but it doesn't necessarily make our lives easier because we need to manage, we need to process, we need to do all this stuff. But it's not bad. At the end of the day, a picture, if you process it well, will be much better with 8 to 12 or 15 megapixels than it was with 1.3 megapixels, but it's just a matter of putting the right technology in place and the right tools in place, and also the right practices actually in place, in order to be able to cope with that information overload.

Umang: It's really valuable to have that kind of technology; it's just about managing it, right?

Francois: Yes. And that's really one of the aspects that Xerox Research has invested in for quite a few years now. I've been with Xerox for over 12 years now and even then, we were working on technologies for finding documents, for automatic classification of documents or of pictures; the concept of semantic documents, self-enriching itself; finding duplicates—you know, do I have that document in two different locations? If so, is that the same one? We've been monitoring that trend for a very long time and we see the document evolving along a path from a very opaque and closed container which we call 'Document 1.0' to a much more advanced form of document—Document 2.0, which is basically social. It's not only this document in isolation; it's actually gonna be mix-and-match of information collected left and right from other documents in order to re-create a view which is suitable for the user. These documents can be kept evergreen because the content can be fetched in real time or just in time as opposed to created once in advance, and it can refresh itself. And these are really some of the topics that we've been exploring with Xerox and which I'm very happy to see start to make it into the mainstream information technology.

Umang: I'm looking forward to it as well. Can I do one more definition with you? We talked about the paper universe before, and we've mentioned how it's under control. Can we start by defining kind of what the 'paper universe' is?

Francois: An analogy to the digital universe, I introduced—I'm not the only one—but the 'paper universe' is the physical counterpart to the digital universe, and that's basically all the paper footprint that we are really creating. It's huge; it's not as huge as the digital universe. But we consulted with many research institutes and the current estimates by Lyra Research is that in 2006, only 15.2 trillion pages were printed worldwide, and as you just said, this is more under control than the digital universe; it doesn't have a two-digit growth rate. It's only growing by 2% to 3% worldwide; actually, in some economies, or in the U.S. actually, this is starting to decline, which is good news, but still, you know, the U.S. should realize that with 5% of the world's population, we consume today 30% of the world's paper—so it's good that we show the way.

Umang: That's actually a huge number. I don't know if everybody quite comprehends that. Can you give us some reference points? What is the impact on our environment by that 30%?

Francois: Well, that's a good question. I did once a quick computation, and roughly imagine you could stack all the documents that were printed worldwide in 2006—so the 15.2 trillion pages—and images, so you could stack them up. Well, they could take you a few times to the moon—probably five times to the moon. So that gives you an order of magnitude of how high that is. Another reference point that might be useful is that the average office worker uses around 10,000 sheets, depending on the geography—10,000 sheets of copy paper each year. So 10,000 sheets is a lot, for sure, but that's also 125 pounds, and that's more than a tree that is used every year.

Umang: I actually knew it was big, but I didn't actually quite realize it was that big. So is it really just about trees and printing?

Francois: No, that tree is clearly the tip of the iceberg or the most visible aspect of it because over 40% of the wood pulp production actually goes toward the production of paper. Paper is unfortunately a major contributor to cutting down trees—and replacing them in many cases. But it's—as you just pointed out, it's much more than just about trees; it's also about energy. Did you realize that producing one ton of copy paper uses about 11,000 kilowatt hours? That's about the energy that an average household uses in about 10 months, and that's just the energy required to produce the paper; it doesn't include the energy required for running the printers and copying devices, although this is negligible compared to the production energy.

It's also about chemicals and waste. Creating one ton of copy paper produces about 19,000 gallons of wastewater, over 2,000 pounds of solid waste, and over 5,600 pounds of greenhouse gases. And then you could stack it up; there's also transportation and storage costs because all that paper needs to be taken from point A to point B in trucks, in cars, in planes, etc. They need to be stored in warehouses where you need to put AC to keep it in a controlled environment. But it's also about inefficiencies that it costs your business because that information, once it is on paper, how do you find it? How do I get it back from that paper? How do I get those numbers from that invoice back into my digital systems? So there's lots in paper which is inefficient, I would say, although again, there are many technologies today that help us address this much more efficiently than a few years back.

Umang: You mentioned with the paper universe that our consumption is still growing; this isn't declining, it's actually getting larger. If that's the case, why are we even talking about this concept of the 'less paper office'.

Francois: The less paper office is more of a reference that I introduced to the paperless office, which you've obviously heard of. Looking back at the history of the paperless office is quite funny, I would say, with hindsight because the first prediction of the paperless office was actually introduced back in 1975 in an article in BusinessWeek on the office of the future, and at that time the idea was the personal computer is coming in, you're going to do all of your work electronically; paper will be out in a couple years, etc. And so the paperless office really became a buzzword in the 1980s, and everybody was going paperless and paper only had a few days to live. But it hasn't disappeared; paper is still increasing globally. Now actually there are some regional differences. As I said earlier—actually, I was reading yesterday an article in The Economist which said that the U.S. consumption is starting to decrease, which is a very good sign, although the U.S. is the biggest consumer of paper. On the other side of the spectrum though, the BRIC countries—Brazil, Russia, India, and China—are really demanding more paper as they are growing. Overall, I would say the paper consumption is stable, increasing in some regions, decreasing in other regions, but under control. So the less paper office is really more of a reference to the paperless office, but with the focus of trying to find technologies which can help move or shift some of the paper usage to other technologies when it makes sense.

Umang: When we talk about this, I'm trying to understand kind of what's driving it. I know there's a big sustainability movement, or a green movement. Do you feel that this green awareness is helping to drive it? Are people more concerned about paper?

Francois: Yes, definitely. We conducted recently a survey on the office workers' top ten peeves, and basically we asked them for their top ten list of environmental concerns, and number one—unsurprisingly I should say—mindless printing resulting in increased waste was a concern for 40% of the people that we interviewed. Then on the top ten list, many others dealt with paper. On number seven was coworkers not printing double-sided when they can with 24% of respondents. Number eight was too many over sheets when faxing*printing. Number nine was having to store paper copies of existing and electronic files. So there is definitely these trends, and even the most paper-intensive industries are going toward paperless—even banking, believe it or not, is going toward paperless. Even mortgage processing is going toward paperless. And so there needs to be a change in the practices, and a change in the technology as well, which sort of accompanies this change, and such technologies include e-signatures or making the electronic document have a legal value, which was one of the benefits of paper—but it's definitely coming. And one of the most visible artifacts probably is the resurrection I would say almost of the paperless office, or the less paper office as we call it here, and the number of articles that have been published on the topic over the last couple months.

Umang: Those are great steps. Is there anything simple that we can do about this as individuals?

Francois: Definitely. There's a lot we can do which might sound insignificant, but then if you add it all up, then it becomes really important. I would suggest you start with simple steps; use common sense when printing, so print double-sided; try if possible to remove cover sheets; print pages up; think twice before printing. I mentioned earlier that paper has some impact on trees, but maybe you should be more responsible in the way you choose your paper. Go for recycled paper, although it has lower quality, but then there are some special papers like Xerox high-yield paper which doesn't use any chemicals and has twice the yield of traditional papers, so it uses twice less trees, if you will, to produce the same amount of paper.

There is obviously some times where you need to print a document, and that's good, but then think of ways you can make your document more effective. Use color, use high quality paper—again, glossy paper. That will make your documents much more effective and you might end up printing much less, but more quality, less quantity, which is good for the environment. And that's actually one trend that we see emerging, which is called 'transpromo documents'. Basically, a transpromo document is the combination of a promotional document and a transactional document, so think of a bank statement which also has some cross-selling or up-selling opportunities which are really customized for you—so offers for new services, offers for new products from your bank, printing in color with your name with your consideration, your expectations, or your needs taken into account. That's really the concept of transpromo documents. And basically with transpromo, instead of sending the same documents over to a hundred persons, you get a much better return rate if you send it only to ten people but have it much more focused and much more personalized.

And printing is one thing, but obviously it's important to think of the other way around—scanning your documents rather than sending them by internal mail or rather than copying and distributing a copy to somebody else. Scanning to e-mail, to a repository or scanning to a business process, can save a lot of trees, can save a lot of energy and transportation, and can be automated and made much more efficient through some of the latest technologies that automate basically document processing.

Umang: I can see how these types of things can help us reduce paper. We're not necessarily suggesting that we're going to completely eliminate paper, but do you actually see paper disappearing anytime? Obviously not soon, but do you see that?

Francois: That's a good question, and I don't have a crystal ball to answer you. It might be on the 12th of December 2023, but it might be a couple days later.

More seriously now, we've been monitoring those trends and we strongly believe that paper will not disappear overnight, but it's true that the paperless office, or the less paper office, is coming back. And also one of the reasons why the paperless

office failed in the first place is because we couldn't find a replacement for paper. Paper has this interface; it's lightweight, it's foldable, it's high contrast, doesn't require any energy. You can take it anywhere with you; you can collaborate with a friend, mark it, etc. These are all features that we've been trying to mimic in the electronic world, until now with relatively marginal success, I should say. But it's true that we now see appearing a few technologies that will have, we believe, a strong effect on the use of paper. One of them is e-paper and e-readers. So e-paper actually was invented back in the 1980s at the PARC—the Palo Alto Research Center from Xerox—and it sort of went down, but it's finally coming back with a vengeance, especially with the Kindle, the Amazon book reader, and a few other very cool e-papers or e-readers. That's all slowly getting to replicate the capabilities of paper, so they will become color, they will become foldable and notable, etc. So that's definitely something that we need to take a look at.

Another usage that will be an easy replacement for paper, or should be an easy replacement for paper, are what we call 'transient documents', and these are typically the documents that we print and that we discard almost right away, and these are e-mails, these are cover sheets, these are articles that we want to read back on the plane. And so for these kind of documents, there are a few technologies appearing, like one which we call transient paper, which is basically a kind of paper that you can print or image where the printing will disappear after a few hours—so in a sense, you can rewrite that same sheet of paper over and over again. So typically for cover sheets, for e-mail readings, etc.—even though paper is still convenient, you will be able to reuse the same sheet of paper over and over again. And now there are maybe other technologies like virtual books, virtual documents, the annotation capabilities which are afforded by Web 2.0, new devices for reading. Maybe there'll be also a generational effect as generation Y is coming into active life; they have been used during university—they are not so used to the paper document, they are more used to the electronic world, so that might also play a disruptive role. But I wouldn't say that paper will disappear in the next few years, and I wouldn't be surprised if it would still be there one or two decades away from us.

Umang: That makes sense. Some of those technologies sound extremely exciting. They're actually kind of sci-fi, which I'm looking forward to. Francois, unfortunately we've come to the end of our time. Thank you so much; it's been great talking to you.

Francois: Thank you.

Umang: If you'd like to learn more about information overload or Office 2.0 and other important topics, join us at Xerox.com/ThoughtLeadership. I'm Umange Shah; on behalf of Xerox Global Services, thank you for listening.

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