

Cloud Intelligence

Explore Human Nature, Envision Human Future

David Sasaki, Isaac Mao

The whole world is now facing a crossroads. It seems as if everything around us is either shaking or, to phrase it optimistically, re-shaping, which triggers more reflection on our own human nature.

The problems we face today come from human nature—and it is mainly egotism that is to blame. Sharing, the driving force behind our evolution, is being ignored. We are losing the ability to open up, to engage in conversation and to prevent harm from spreading around the world. What's the best way to deal with large-scale problems like global warming, financial crises, international conflicts and potential risks to all human beings? These problems all remain unsolved.

Luckily, we didn't miss the chance of grasping the Internet as the last nerve God left us. After 40 years of evolution, the Internet now gives more social meaning to human beings. Based on a foundation of openness, linking and connecting, we now see the emergence of a new Cloud epoch.

The Cloud includes Cloud Computing, Cloud Activism and Cloud Intelligence as three layers, but these layers support each other. Cloud Computing upgrades the Internet infrastructure to a new level to enable global roaming as digital nomads. Cloud Activism improves how people collaborate and take action to change the world. Then we have Cloud Intelligence from persistent connections between people and the information they generate every second. The Social Brain, with billions of social neurons and exponentially more connections, emerges as a new type of singularity.

We have experienced a whole new adventure traveling around the world, in an 80+1-day manner. However, 80+1 means more than this. In 80+1 minutes, you can publish a new article to your blog before sleeping and wake up to new comments from readers living in other time zones. In 80+1 seconds, your new meme published to a micro-blogging tool may have traveled around the world from network to network of followers. In 80+1 milliseconds, one new idea could pop up in your working memory to make you feel very excited.

Time matters because crises spread quickly and social intelligence is required to match the speed. If technology continues its evolution along the path of Cloud

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Computing, we can see that almost all people have the chance to connect to a social pipeline in the coming 30 years. The boom of digital communities and social networks play an increasingly important role. Economic, political and social norms will change dramatically. It might even take 80+1 years.

Cloud Computing: Enabling

A little over fifty years ago, Thomas Watson from IBM said that he could foresee a need for perhaps five computers worldwide, and we now know that that figure was wrong, because he overestimated by four. (Clay Shirky, Napster Speech 2) The term cloud is used as a metaphor for the Internet, based on how the Internet is depicted in computer network diagrams and is an abstraction for the complex infrastructure it conceals. (Wikipedia)

Whether you speak in terms of clouds, streams, or waves (the modern internet sounds like a naturalist's dreamscape), the preview of Google Wave is indicative of a fundamental change that has transformed how we interact with the Internet and how the Internet enables us to interact with one another.

The modern web was developed in order to enable academics and scientists to share their research with one another. This was done primarily via email, but also via static (and often ugly) web pages. The second chapter began in the 1990's when, during a bubble of investment, web programmers developed new technologies that made websites more dynamic by using databases, and more interactive thanks to JavaScript and Flash. The investment bubble burst, but those same technologies were implemented to create the tools that make up the Internet as we know it today: wikis, blogs, RSS readers, YouTube, Flickr, MySpace, Twitter and Facebook.

We have now come to the third chapter of the Internet. The "cloud" refers to all those servers based around the world that store our personal data, but which we rarely ever think about. If you are a Gmail user, then your emails live "in the cloud", on a server at one of Google's many server farms. Our daily thoughts, in the form of Twitter messages, live in the cloud, as does our search history, our Facebook activity, all of the pictures we publish on Flickr and Picasa.

Just two years ago I stored all of my text documents on my own computer and would send them via email to anyone who showed interest. If they made edits to my documents, then I would need to update my own local copy. Today my documents are stored "in the cloud", on Google Docs, where they can be instantly accessed by trusted friends and colleagues. At any time I can access the most recent copy of any document on my computer or mobile phone. Today we don't just

publish information to the Internet; we actually create it online and then download it to our computers and cell phones when we need it.

The meaning of cloud computing is not only distributing the computing power to different places, but also giving individuals the power to share information around the world. The speed of spreading that information is dramatically increased as it passed through different social media tools. New symbols (e.g. "RT" in Twitter) and processes (e.g. "Shift+S" means "share" in Google Reader) were invented to enable people to relay information through six degrees of separation to any connected corner of the world.

The Cloud is growing exponentially. Every day more and more of us spend a small percentage of our cognitive energy to add value to the Cloud. And as we do so, the cloud itself becomes more intelligent, a vast social brain in which every Internet user is a metaphorical neuron. In fact, the structure of the Internet and the processes it depends on are similar to those of the human brain.

Cloud Activism: the power we need

Every morning we—all seven billion of us—wake up with a certain amount of cognitive energy, our mental fuel tank for the day to come. We use up this cognitive energy every time our brain has to process information and apply knowledge. This includes tasks as seemingly mundane as packing a school lunch for our children, and as complex as understanding the fundamentals of quantum mechanics.

On the one hand, today's competitive knowledge economy is requiring a larger percentage of the world's population to expend more cognitive energy than human beings have ever done in the past. Software programmers, for example, often spend 60 hours a week thinking about the logical rules behind the applications on our computers and cell phones. The need to make a day's worth of cognition as efficient as possible has led to a whole industry of productivity gurus, and to a market of "neuro-enhancing drugs."

On the other hand, the efficiency of the modern global economy means that many individuals in the developed world are working far fewer hours than ever before. Tim Ferriss has recruited a large following on the Internet by recommending a four-hour work week. Even those who aren't able to heed Ferriss' call to abandon the 9 to 5 office life still spend an average of two office hours per day (one-fourth of their working time) surfing the web for personal use. Salary.com estimated that those 2.09 hours of "wasted time" per 8-hour workday add up to \$759 billion per year that employers in the United States spent on salaries "for which real work was expected, but not actually performed."

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In terms of discussing cloud intelligence, however, corporate America's economic loss is far less interesting than what those millions of office employees are doing with their two hours of personal Internet use every day.

Cognitive Surplus and The New Socialism

Starting with the Second World War a whole series of things happened—rising GDP per capita, rising educational attainment, rising life expectancy and, critically, a rising number of people who were working five-day weeks. For the first time, society forced onto an enormous number of its citizens the requirement to manage something they had never had to manage before—free time. And what did we do with that free time? Well, mostly we spent it watching TV. (Clay Shirky, *Gin, Television, and Social Surplus*)

In fact, Clay Shirky points out that in the United States we still spend an average of 100 million hours every single weekend just watching advertisements. What else can you do with 100 million hours? According to Shirky, it took roughly 100 million “thought hours” to build Wikipedia, the largest encyclopedia ever assembled and the most popular general reference work on the Internet.

It would be wrong to overstate Shirky's argument that all of human society is waking from a sitcom-watching slumber to become active producers of online content; after all, most young people today who give up their expensive cable packages for slightly less expensive Internet connections are now watching those same sitcoms on their laptops, clips from American Idol dominate YouTube, and the vast majority of the most popular daily search terms on Google are related to celebrity news. The passive consumption, which defined decades of television watching, is also a mainstay of today's connected generation.

Still, even if only an estimated ten percent of Internet users actively contribute content, they have already constructed a vast online repository of culture, knowledge and tools. And we are just at the beginning of what's to come.

Kevin Kelly calls Wikipedia, Flickr, and Twitter the “vanguard of a cultural movement”, an emerging “global collectivist society.” Amateur photographers, he reminds us, have published over three billion photographs on Flickr. Six billion videos are uploaded to YouTube every month. The blog search engine Technorati tracks over a million blog posts published every single day. Apple's pervasive iTunes media player serves over 125,000 podcasts, including more than 25,000 video podcasts.

The small minority of Internet users who actively contribute content sure do contribute a lot of it. They review restaurants and businesses on Yelp. They fulfill the role of editors by recommending content on Delicious, StumbleUpon, Digg and Reddit. They share their medical history on Patients Like Me and Google Health. They create high quality maps of their communities on OpenStreetMap and design 3D models of buildings, monuments, and landmarks using Google's free SketchUp software. They report news just like traditional journalists. On Flickr they help the United States' Library of Congress describe and contextualize the photographs in their collection. They translate blog posts, articles, magazines, and videos into different languages.

What is even more incredible is that they do this all for free, without receiving any economic compensation whatsoever. Hundreds of millions of Internet users are spending a small amount of their day's cognitive energy not on the work that they are paid to do, but rather on the online projects and forms of self-expression that interest them. Kevin Kelly calls it a "New Socialism", while Isaac Mao calls it Sharism, based on sharing and community, but not limited by political ideology. (The most active contributors of free content are as likely to idolize Adam Smith as Karl Marx.)

In China, we see a growing movement trying to disrupt the censorship system. The openness of the modern economy leaves more and more space for free thinking, however, the political system and ruling party still keep an old-fashioned mentality that created the national censorship system—Great Firewall(GFW) and the newly mandatory Green Dam software. Since the beginning of 2009, an online meme called "Caonima"(Grass-mud Horse) which uses the alpaca as a symbol, has been giving China's censors a headache. A cartoon mashup animation suddenly spread over the Internet, not only in China, but all around the world. Along with the previous creation of the "River Crab", which pokes fun at censorship, Xiao Qiang from the University of Berkeley, called Caonima "the most vicious crackdown in years.". He added, "Where there is river crab, there must be Caonima".

The Chinese blogosphere is not alone. In Iran, the green revolution adopted new media technologies from the Cloud to garner support from around the world. Neda Agha Soltan, the 26-year-old girl who was shot to death in Tehran, has become a symbol and 'martyr', whose death moved not only Iran, but the whole world. She died with her eyes wide open, and her last moments transcended citizen media to mainstream media, reaching millions of people.

Cloud Activism gives us hopes and spawns changes. We see it's dispersing everywhere around the world, from the United States to the Middle East, from China to the Pacific Islands, from the Earth to the International Space Station.

Cloud Intelligence: Envisioning the Future

The human brain is by far the most complex organ that three to four billion years of natural selection on this planet have been able to produce. It consists of roughly 100 billion neurons, each linked to 10,000 synaptic connections. Information travels across the brain via small electrical impulses that are transmitted from neuron to neuron, much in the same way that information travels across the Internet. Right now, while you're reading this, billions of small electrical impulses are firing away in your brain as you parse the information, store it in your memory, and apply your own knowledge to add context and challenge what we write. In comparison, the Internet is a decidedly less complex and less evolved organ. Internet World Stats estimates that there are 1.6 billion Internet users, or "social neurons". According to one study, the average Facebook user is connected to 164 "friends", a far cry from the 10,000 synaptic connections between our 100 billion brain cells. In other words, while the Internet could one day become self-aware, it is still in the earliest chapters of its evolution. Yet, already there are several examples that reveal how the Internet is rapidly becoming humanity's social nervous system. Joshua-Michele Ross points to the emergency response following the Mumbai terrorist attacks, Obama's "Project Houdini", and Google's global virus forecasting as three manifestations of the networked social brain. The human brain formed its present structure over 10,000 years ago when our ancestors encountered environments that required the type of advanced reasoning only provided by a larger brain. With a larger brain came moral reasoning, consciousness and, most importantly, language, without which we could not transmit culture and knowledge across generations. The organ we each carry around in our skulls today, however, has evolved little in the past 10,000 years. It formed when our ancestors lived in tribes of roughly 150 people, not mega-cities filled with millions, and personal address books filled with thousands of contacts.

As the cloud continues to expand exponentially with more information, more social neurons, and more connections between them, our own humble human brains will need to adapt in order to make the most effective use of the cloud without succumbing to lifetimes of mere "continuous partial attention."

No matter how actively or passively we spend our time online, what we can all be sure of is that one day sooner or later our brain will stop functioning and our stay here on planet Earth will conclude. We will remain, of course, in the memories of our friends and family, and also in the bits and bytes of digital footprints that we leave in the cloud for the generations that follow. What they do with the information we leave behind—or, indeed, what the cloud itself does with the information—will depend on a new type of networked evolution that values sharing and community over proprietary protection.

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The Intelligence We Need

We need new intelligence that requires new science to envision, new art to imagine, new spirit to participate and new technologies to implement. With more and more people affected by commercial globalization, new technologies like social networking can help people share sentiments around common challenges.

We employ the concept of “Cloud” because both problems and solutions are becoming more and more connected, as is global society. For Ars Electronica, 30 years of exploration has earned it a world reputation and it is now moving on from the existing milestones to a new era with new paradigms. The next 30 years may even be more promising than its splendid legacies to date.

“Cloud Intelligence” is more than a singularity. We have just invented a word, but you will define its meaning. From technical advancement to global actions, the long trail of information with new identities will dramatically boost the thinking speed of the entire society. It raises challenges and, at the same time, it fosters hopes for all of us. If we could really collect such intelligence, we could evolve as human beings to a new level of order. Or maybe even become the new sacred as Stuart Kauffman suggests.

Curators 09: Isaac Mao (CN) & David Sasaki (US)

Isaac Mao (CN) is a software architect, entrepreneur and researcher specializing in learning technology and social technology. Isaac’s primary fields of endeavor are R&D, social work, business and technology. He is currently the director of or a consultant to a few non-profit programs and several for-profit enterprises in China.

David Sasaki (US) is the director of Rising Voices, the worldwide “citizen media” contact initiative of Global Voices Online. He’s in charge of a portfolio of smaller projects in the Third World that are utilizing citizen media to implement social change. Prior to focusing his efforts on outreach activities, he was Global Voices’ regional editor for Latin America—monitoring the Latin American blogosphere, identifying important content, and translating the selected material from Spanish into English. Sasaki made the transition to online journalism after having worked as a freelance Web developer and English teacher in Monterrey, Mexico. He divides his time between domiciles in North and South America, and is a frequent contributor to Rising Voices and Global Voices in addition to maintaining his own weblog.

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Schedule

10:30 AM - 11:00 AM	David Sasaki	Introduction to cloud computing and brief mention of cloud intelligence
11:00 AM - 1:00 PM	Cloud Intelligence “Those enable us and encourage us”	
	Stephen Downes	Cloud Intelligence (Encouraging collaboration)
	Ethan Zuckerman	Cloud Cartography (Mapping the flow of information and interaction)
	Anders Sandberg	Distributed superintelligence
2:00 PM - 5:50 PM	Cloud Activism “What should we do”	
	Isaac Mao	Introduction to cloud activism
	Hamid Tehrani	Review of Iran protests
	Xiao Qiang	Activism without organization
	Evgeny Morozov	Activism, not Slacktivism
	Kristen Taylor	The social future of food
	Teddy Ruge	Diaspora-based development
	Pablo Flores	Enabling cloud education
	Andrés Monroy-Hernández	Cloud programming for children
	Juliana Rotich	Cloud environmentalism in Africa
	Round table: Q&A with speakers around “constructing alternatives”	
	Isaac Mao	Looking toward the future

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