KEVIN KELLY
Editor-At-Large, Wired; Author, <u>New Rules for the New Economy</u>

A NEW KIND OF MIND

It is hard to imagine anything that would "change everything" as much as a cheap, powerful, ubiquitous artificial intelligence — the kind of synthetic mind that learns and improves itself. A very small amount of real intelligence embedded into an existing process would boost its effectiveness to another level. We could apply mindfulness wherever we now apply electricity. The ensuing change would be hundreds of times more disruptive to our lives than even the transforming power of electrification. We'd use artificial intelligence the same way we've exploited previous powers — by wasting it on seemingly silly things. Of course we'd plan to apply AI to tough research problems like curing cancer, or solving intractable math problems, but the real disruption will come from inserting wily mindfulness into vending machines, our shoes, books, tax returns, automobiles, email, and pulse meters.

This additional intelligence need not be super-human, or even human-like at all. In fact, the greatest benefit of an artificial intelligence would come from a mind that thought differently than humans, since we already have plenty of those around. The game-changer is neither how smart this AI is, nor its variety, but how ubiquitous it is. Alan Kay quips in that humans perspective is worth 80 IQ points. For an artificial intelligence, ubiquity is worth 80 IQ points. A distributed AI, embedded everywhere that electricity goes, becomes ai — a low-level background intelligence that permeates the technium, and trough this saturation morphs it.

Ideally this additional intelligence should not be just cheap, but free. A free ai, like the free commons of the web, would feed commerce and science like no other force I can imagine, and would pay for itself in no time. Until recently, conventional wisdom held that supercomputers would first host this artificial mind, and then perhaps we'd get mini-ones at home, or add them to the heads of our personal robots. They would be bounded entities. We would know where our thoughts ended and theirs began.

However, the snowballing success of Google this past decade suggests the coming AI will not be bounded inside a definable device. It will be on the web, like the web. The more people that use the web, the more it learns. The more it knows, the more we use it. The smarter it gets, the more money it makes, the smarter it will get, the more we will use it. The smartness of the web is on an increasing-returns curve, self-accelerating each time someone clicks on a link or creates a link. Instead of dozens of geniuses trying to program an AI in a university lab, there are billion people training the dim glimmers of intelligence arising between the quadrillion hyperlinks on the web. Long before the computing capacity of a plug-in computer overtakes the supposed computing capacity of a human brain, the web — encompassing all its connected computing chips — will dwarf the brain. In fact it already has.

As more commercial life, science work, and daily play of humanity moves onto the web, the potential and benefits of a web AI compound. The first genuine AI will most likely not be birthed in standalone supercomputer, but in the superorganism of a billion CPUs known as the web. It will be planetary in dimensions, but thin, embedded, and loosely connected. Any device that touches this web AI will share — and contribute to — its intelligence. Therefore all devices and processes will (need to) participate in this web intelligence.

Standalone minds are likely to be viewed as handicapped, a penalty one might pay in order to have mobility in distant places. A truly off-the-grid AI could not learn as fast, as broadly, or as smartly as one plugged into 6 billion human minds, a quintillion online transistors, hundreds of exabytes of real-life data, and the self-correcting feedback loops of the entire civilization.

When this emerging AI, or ai, arrives it won't even be recognized as intelligence at first. Its very ubiquity will hide it. We'll use its growing smartness for all kinds of humdrum chores, including scientific measurements and modeling, but because the smartness lives on thin bits of code spread across the globe in windowless boring warehouses, and it lacks a unified body, it will be faceless. You can reach this distributed intelligence in a million ways, through any digital screen anywhere on earth, so it will be hard to say where it is. And because this synthetic intelligence is a combination of human intelligence (all past human learning, all current humans online) and the coveted zip of fast alien digital memory, it will be difficult to pinpoint what it is as well. Is it our memory, or a consensual agreement? Are we searching it, or is it searching us?

While we will waste the web's ai on trivial pursuits and random acts of entertainment, we'll also use its new kind of intelligence for science. Most importantly, an embedded ai will change how we do science. Really intelligent instruments will speed and alter our measurements; really huge sets of constant real time data will

speed and alter our model making; really smart documents will speed and alter our acceptance of when we "know" something. The scientific method is a way of knowing, but it has been based on how humans know. Once we add a new kind of intelligence into this method, it will have to know differently. At that point everything changes.