The Extrasensory Enterprise

Turning Data Complexity into Advantage

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Too much information, drivin' me insane, the Police once sang.

And that was in the *'80s.*

Today, that popular lyric also describes a problem that is downright dangerous. With the ongoing explosion in connectivity, smart technology, and social media, an ocean of information complexity threatens to swamp us, undermining our personal well-being along with the health, profits, and competitive edge of our companies.

But what if other emerging technologies were to converge into a radical IT game-changer? Could unmanageable zettabytes of information be tamed? And, more important, what if this rising "Wisdom of the Network" were to harness the Data Deluge and create a Data Bonanza, enabling highly evolved firms not just to survive, but to *thrive* in the rising zettaflood?

For many enterprises, this may seem an impossible dream. The annual cost of interruptions is estimated to be $650 billion in the U.S. workplace alone.[1] And that zettawave of distractions is coming from an ever-expanding array of devices, sensors, services, apps, and social networks. The Cisco Internet Business Solutions Group (IBSG) predicts that the number of Internet-connected things will reach 50 billion by 2020,[2] all pulsing with, yes, more information.

Unfortunately, that tsunami of data is far outpacing our capacity for understanding. One energy company, for example, boasts 25,000 data points per second wired into its oil rigs.[3] That sounds like progress—yet the company manages to *process* only 5 percent of that data. Compounding the complexity, companies are trading and partnering in a globalized, hyper-urbanized marketplace, with the added complications of languages, cultures, and time zones.

A daunting situation, certainly. But the Data Bonanza is not a pipe dream. Happily, a potent combination of key processing technologies is maturing right now, promising massive real-time event processing and predictive decision making that borders on precognition. When these technologies are merged correctly, the next-level Wisdom of the Network will transform forward-thinking companies into data-processing juggernauts, in effect creating a new paradigm: *the Extrasensory Enterprise.*

Cisco Internet Business Solutions Group (IBSG)

The Extrasensory Enterprise is an organization that first captures vast oceans of data from myriad sources, then knows precisely how to filter, process, essentialize, and share that information. The Extrasensory Enterprise transforms this data into cogent foresight to instantly anticipate trends, events, and consumer desires ahead of the curve and take action in the moment, all automatically.

The result? Empowered employees, incisive decision making, maximized productivity, and delighted customers.

Still, if the current situation seems dire, that's because it is, leaving enterprises with a stark choice: Adopt the architecture of the Extrasensory Enterprise and thrive from it, or continue to struggle with rising complexity. It may seem ironic, but at a point when *too much* information technology seems to be the problem, more technology, with much greater sophistication, will be the solution. And those firms that take an early lead in adopting that technology will position themselves for future success; those that lag will fall further behind.

Taming the Data Deluge

But how, exactly, will the Extrasensory Enterprise tame the Data Deluge?

Three pillars of emerging technology make it possible:

1. **The Internet of Things.** Next-generation smart and nanotechnologies may soon infuse nearly every object in our lives—from the shoes we walk in to the pills we swallow—with sensors and data points, all linked via cloud-enabled mesh networks. Cisco IBSG predicts these sensors will "collect, transmit, analyze, and distribute data on a massive scale."
2. **Big Data.** That massive scale of data from the Internet of Things, as well as from rich media (especially video) and unstructured media (like social networks), promises data sets that are too large to manage and analyze with traditional IT infrastructure. But Big Data represents a wave of innovation that promises striking advantages for the Extrasensory Enterprise. These include new forms of computing (which bring data closer to processing, ensuring leaps in speed and power); massively parallel high-performance systems (able to crunch multiple problems concurrently); and breakthroughs in the analysis of unstructured and rich media (leaps in image processing, video analytics, and semantic analysis to understand language are occurring daily). The goal is to let computers do what they do best: process massive volumes of high-velocity data and, within that river of information, filter out the proverbial golden nuggets.
3. **Next-Generation Collaboration.** Given the advances in connectivity in recent years, humans have learned to collaborate with one another in striking new ways. Next up are breakthroughs to bring humans and machines more into concert, such as human computing technology,[4] facilitating seamless, ad-hoc interaction between people and computers. Within the next five years, this should also include virtual personas. These are computer-generated avatars with an evolving capacity to understand language and respond to physical environments. Human-to-machine and machine-to-machine collaboration will, in some cases, eliminate the manual link. This could streamline decision making, focusing resources where they are needed—automatically, and in real time—while further freeing people from routine tasks. Thus,

people will be able to focus on what *they* do best: thinking creatively and driving strategy.

In short, the Internet of Things and other rapidly evolving sources feed vast quantities of real-time data to high-performance analytics, which are then matched with human-to-machine and machine-to-machine collaboration. All of this is linked by pervasive networks. The goal is to harness these intelligence technologies to make sense of the avalanche of text, rich data, and sensor information. At the same time, devices and people are connected and informed, allowing them to respond instantly and opportunistically—not just by coping with data, but also by thriving on it.

Extrasensory Enterprise: Potential Scenarios

Let's envision some real-world scenarios where torrents of data could be harnessed for competitive advantage and hyper-informed, prediction-based decision making:

- **Employee Productivity in the Extrasensory Enterprise.** A product manager launches a new innovation initiative. The network responds by suggesting advisers based on expertise and conversation pattern analysis, while filtering a flood of feeds on the subject. The network is able to find relevant artifacts and knowledge for the repository based on deep understanding of context and awareness of global open innovation. Meeting audio, video, and activities are summarized in the native language of the overseas team so that they continue with follow-the-sun innovation, automating workflow.
- **The Extrasensory Retailer.** Video outside of a supermarket conveys that the parking lot is filling up. Soon after, sensors on the shelves detect that milk is being picked up at an increasing rate, and shopping carts transmit that they are getting heavier. All this points to the prediction that checkout traffic is about to surge, and employees are sent just in time to the counters to avoid bottlenecks and optimize labor.
- **The Extrasensory Manufacturer.** Myriad sources tied to Big Data analytics—including video from traffic lights, consumer tweets, and service-repair records—warn that the new state-of-the-art "Hylectra" sports coupe is plagued with uneven acceleration. But before the car gets labeled a "lemon" by the press and public, the manufacturer knows all about it. The company responds swiftly and "autonomically," convening relevant experts to find solutions based on global collaboration. Knowledge bases and social media are instantly updated.
- **Extrasensory Pharma Company.** Blood pressure and chemical analysis data are transmitted from sensors embedded in pills after the patient swallows them. Amid the vast amounts of data flowing in, Big Data analytics determine a new drug to be twice as effective in patients with high levels of creatine. Quickly, a new topic is added to the innovation pipeline. Meanwhile, social media analysis is already targeting reports of light-headedness in those taking the new drug with coffee. Further analysis reveals a correlation with patients who have a family history of hypertension. An updated dosing instruction brief is automatically proposed and subsequently approved for issuance to providers.
- **Extrasensory Government Agency/National Security.** Intercepted text is decoded via semantic query, suggesting a potential threat originating from a cryptic location. Face-recognition technology is trained on the location and suspects are confirmed

through an intelligence database. Key personnel are notified by the network, security lockdowns implemented, and information is shared with intelligence partners. All evidence is presented in a high-level war room.

Extrasensory Enterprise: Next Steps

Now is the time to consider adopting the infrastructure to make these scenarios and solutions possible. For those who don't, the rising tide of data complexity will become unmanageable. The good news is that the varied technologies that make the Extrasensory Enterprise possible are maturing now: the Internet of Things is reaching a critical mass of data; Big Data technology is on the cusp of a quantum leap in analytical processing speed and sophistication; and human-to-machine and machine-to-human collaboration promise rich, instantaneous interaction at a distance.

But where to begin?

First, companies need to think in terms of architecting the essential capabilities required for the Extrasensory Enterprise, including ubiquitous data collection, interpretation and prescription, and orchestrated action with integrated partners. Relevant, emerging products related to connectivity with the Internet of Things include Cisco Wireless Mesh and Wireless Location Appliance technologies. Big Data systems include high-performance computing and analytics such as Cloudera Hadoop on Cisco UCS®; technology for monitoring and responding to unstructured data and rich media, such as Cisco SocialMiner™, MediaSense, and Pulse Video Analytics; and the Cisco SecureX Architecture™ to secure large tracts of data and make results available on the device of choice wherever needed. Cisco unified communications and collaboration tools connect people and machines to intelligence.

True precognition may never be possible. But what makes these technologies truly revolutionary is that they will give the Extrasensory Enterprise the power to be predictive, proactive, and even self-learning, rather than just reactive. By managing reams of data with an unprecedented level of intelligence, companies can anticipate customer desires or prepare for likely or unexpected events of all kinds.

Another pop song from a bygone era might just offer the right message for those aspiring to the zettabyte-crunching level of the Extrasensory Enterprise: *Don't Stop 'Til You Get Enough*—enough technology, enough data, enough *acute perception* to turn the data deluge into a game-changing advantage.

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Endnotes

1. http://bits.blogs.nytimes.com/2007/12/20/is-information-overload-a-650-billion-drag-on-the-economy/
2. Source: Cisco IBSG, 2011, http://www.cisco.com/web/about/ac79/docs/innov/IoT_IBSG_0411FINAL.pdf
3. "Expand Your Digital Horizon with Big Data," Forrester Research.
4. "Return of the Human Computers", *The Economist,* Dec. 3, 2011.