'Internet of Things' seen as tech industry's next big driver

January 8 2014, by Steve Johnson

Billions of ordinary things - from farm cows and factory gear to pollution monitors and prescription-drug bottles - are being outfitted with microchips and linked by online networks in a technological transformation that some experts predict will be as profound as the Industrial Revolution.

The payoff of this so-called "Internet of Things" could be staggering, especially for tech companies, which already are jockeying to cash in on the trend. Research firm IDC predicts this shift will generate nearly $9 trillion in annual sales by 2020. By comparison, the total annual sales of the San Francisco Bay Area's 150 biggest technology companies in 2012 was $677 billion.

"This will be potentially the biggest business opportunity in the history of people," said Janusz Bryzek, a vice president at San Jose, Calif.-based Fairchild Semiconductor International Inc., who helped organize a gathering of international experts at Stanford in October to discuss the subject. "We are changing the Earth."

Indeed, the implications could be extraordinary and wide-ranging, affecting almost everyone on the planet in ways both big and small.

By outfitting the globe with billions of connected gadgets, experts foresee a world in which:

-More elderly people survive once-life-threatening accidents, since

doctors and emergency responders will be alerted the moment their patients fall;

-Fewer planes will crash, because every part on every aircraft will be electronically monitored so they can be quickly replaced at the slightest sign of failure;

-And wines will get better, as vineyard operators will know precisely when their grapes have the perfect sugar concentrations for picking.

All this promises a huge windfall for tech corporations, especially those in three key areas.

Because microchips are essential for smart gadgets, for example, a number of companies that make the circuits are expected to profit enormously.

In November, Santa Clara, Calif., chipmaker Intel Corp. formed an Internet of Things Solutions Group to focus on the growing market. Other chipmakers considered well positioned to take advantage of the trend are Atmel Corp. and Linear Technology Corp.. At a San Jose, Calif., conference in October to discuss those semiconductor opportunities, Jim Tully of research firm Gartner told attendees, "We're going to see massive growth all over the place."

Another key area is computer networking gear, such as the routers, switches and other equipment sold by giant Cisco Systems Inc. The San Jose corporation recently created an Internet of Things unit similar to Intel's, and the new group's managing director, Joseph Bradley, termed the booming business "immensely important to us."

Software companies also are expected to benefit, because their coded instructions are essential for telling computerized gadgets what to do and

making sense of the vast trove of data they'll generate. Insurance companies, for instance, are using data gathered by automobile sensors to identify high-risk motorists and adjust their rates accordingly, "based on the amount of driving they do, their driving habits, and even where they drive and park," noted Hewlett-Packard Co., one of the companies hoping for a big payoff from this trend.

Other companies angling for a share of this business are Oracle Corp. of Redwood City, Calif., and San Francisco-based Splunk Inc.

At least 10 billion devices - many of them phones - already are tied to the Internet, up from 200 million in 2000, according to Cisco. They range from smart cars to pill-bottle caps that alert doctors if patients don't take their medicine to thermostats that switch off when no one is around.

In addition, cows in England are being connected to the Internet to track their movements. And thousands of smart trash cans in use at the University of California-San Diego and other places let waste-management officials check online to see how much garbage has piled up in each container.

Even our daily cup of coffee will be affected. In October, Starbucks unveiled plans to double the number of its Internet-linked coffee brewers, which track customer preferences, and said it may hook up its refrigerators to the Web, so the machines can order new supplies when needed.

But that's just the start. Driven by cheaper chips and smarter software to run the Internet, IDC estimates that the population of Web-connected things will grow to 212 billion by 2020, with about 30 billion devices smart enough to operate without human control.

Predictions about how much of an economic boost the Internet of Things will generate vary widely, too. Although Gartner puts the figure at $1.9 trillion in annual sales and cost savings by 2020, IDC believes it will total $8.9 trillion in global revenue alone that year.

Another study by General Electric Co. concluded the Internet of Things in the next 20 years could add as much as $15 trillion to global GDP, which it noted is roughly "the size of today's U.S. economy."

Calling the trend "much like the industrial revolution" of the 18th and 19th centuries - when mechanized manufacturing made mass-produced goods possible and rural residents flooded into cities - GE's study added, "We are at the cusp of another wave of innovation that promises to change the way we do business and interact with the world of industrial machines."

Every facet of society is expected to be transformed by the Internet of Things, from our ability to better protect the environment, boost farm production and get early warnings of structural weaknesses in bridges and dams to enabling people to remotely control their lights, sprinkler systems, washing machines and scores of other gadgets at home.

Noting that "the potential is huge" for businesses, Morgan Stanley analysts concluded in a recent report that consumers also will benefit from having billions of connected gadgets "making our lives easier."

But not everyone is so sanguine. Besides the potential privacy and security implications of all these devices shuttling information about people and businesses across the Internet, another concern is what might happen if the machines fail to function properly.

Warning of the potential for glitches, a study by the Oxford Internet Institute contemplated whimsically that someone might find themselves

"repeatedly telephoned by a public lavatory that has run out of supplies and has been programmed with the wrong number to contact the supplier."