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In the year 2025, if man is still alive, he may find...

The Internet's Next 10 Years

In the quarter-century since the Web was born, it's completely transformed our world. In the space of a single generation, the Internet evolved from a tool known only to geeks to a vital medium on which the whole planet depends to stay connected.

The Internet is in the process of transforming all previous forms of communication. Having devoured mail and the telegraph, it's gobbling up telephone, film, radio, television, and all kinds of print. But in historical terms, the Net is still barely out of its infancy. What will it be like in just a decade from now?

A lot of very smart people have been thinking about that, because the Internet's transformative power is only growing. The future of civilization largely hinges on what it becomes. But *how* the Net evolves is partly up to us, and how we react to the forces it unleashes.

Nobody knows what will happen. But people like Sir Tim Berners-Lee, the creator of the Web, have some interesting ideas, and the **Pew Research Center** has recently **polled** over 25,000 tech experts on their views too. This issue is about how these trends will reshape our world over the next decade.

The experts who participated in the latest Pew Research survey were all generally optimistic, but significantly less so than in **previous surveys**. It is clear that **revelations** over the last year have greatly altered their perception of the Net. Issues of government surveillance and privacy, hackers and security, now loom much more ominously than ever before.

Basically, Pew respondents generally agreed that the Net will grow into an all-pervasive information environment where Internet access is as effortless as it is universal and constant. It will fade seamlessly into the background of life, a **utility** "like electricity." The question, of course, is what people will do with it.

History teaches that it's what *cannot* be foreseen that triggers the most drastic changes. The revolutionary aspect of Sir Tim's first server sharing experimental results was not its potential for science, but its *adaptability* for other uses that led to the modern Web. Even so, no one could have predicted social media, streaming video, online commerce, and cyberwar.

Immersed in information

The first major trend is the so-called "**Internet of Things**". It refers to the interconnection of embedded smart devices within the existing Net structure. This includes everything from pacemakers implanted in heart patients to cars with sensors, smart thermostats and refrigerators – in short, *everything*.

This envisages a world where physical objects down to one's clothes and own body contain connected electronics. It would allow you to make your home cozy before you got there, doctors to know your heart problems before you felt anything, cars that would tell you about traffic jams, and so on. The resulting environment might seem almost magical.

The **benefits** are undoubtedly huge, with perhaps *30 billion* devices online by 2020, relying on **IPv6**'s nearly infinite addressing. Unfortunately, security and updating issues of these devices have not been worked out. Both **medical equipment** and houses can be easily hacked. Game systems and some TVs can already be used to snoop. In fact, former CIA director David Petraeus went **on record** years ago anticipating the possibilities they present for spying.

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But the physical world merging with cyberspace is just part of the story. Other trends are working alongside the Internet of Things to create **Web 3.0**.

Chief among these is an older concept by the inventor of the Web that is slowly now gaining traction. It calls for smarter applications to create a "**semantic Web**." "Semantics" refers to *meaning* in language; as applied to the Web by Sir Tim, it's about how the Net as a whole can become more intelligent and intuitive in meeting a user's needs by adding more meaning.

One place where it is easy to see what this entails is in searching for images, which can be highly frustrating and usually churns up far more false leads than good results. This is because no machine is yet sophisticated enough to translate visual images into words.

For instance, if you're googling for the Mona Lisa, typing "Italian woman portrait sitting" will only bring up a picture of her if those words are associated with her portrait on a webpage or other users' searches. With a semantically-enabled search, the information would be associated with the image itself, in a form that's machine-readable and useable, too.

Much of the semantic Web's power will come from people, such as developers and collaborators adding self-descriptions and crowd-sourcing as well as machine metadata stored in huge, smart arrays of servers. Instead of mashing up webpages, mash-ups of data from many places, with guiding overlays, will be created as entire custom packages on the fly.

The possibilities, here too, are immense. Machines could become smart enough to act as personal advisors. Those long-predicted **avatars**, intelligent programs acting as personal secretaries, could finally come about as our dedicated online assistants.

Shadows and SixthSense

The rise of artificially intelligent systems has already transformed industries, sucked away jobs, and will continue to do so even for the higher-paying professions. Smart systems are already **advising doctors**. Even lawyers might soon find themselves on the endangered list, as one recent **report** predicts a "structural collapse" of law firms by 2030, due to AI.

The **Pew report** paid little attention to these issues beyond noting the "disruption of business models." Many experts clung to positive views, that the spread of the Internet will "enhance glabal connectivity" making us all more united, smarter, and responsible. Personal health will be revolutionized by augmented reality and wearable medical devices.

Politically, the optimists predict more "**Arab Spring**" type events, the decline of national borders, and new social alignments based on shared interests. The revolution in education will spread more opportunities with less investment in facilities and teachers. The Internet itself will mutate into many small internets.

Yet some saw the same trends with a less rosy view. The Internet could fracture into firewalled fortresses as countries build things like the **Great Firewall of China** to keep out foreign ideas. The Net might increase the growing divisions between rich and poor. Vice and abuse could scale up with new tools. It could become a wasted battlefield between hackers.

After all, criminals are becoming more sophisticated; distinctions between hackers and cyberwarriors are fast blurring. Sony's recent hack was likely committed by **North Korea** as revenge, so anything's possible

Some feared human society might not respond quickly or intelligently enough to the problems presented. Most people don't notice the transforming effects technology has already had. How will they react when it becomes even more profound?

One amazing technology, Pranav Mistry's revolutionary **SixthSense** user interface, shown in 2009, still languishes. It wowed the tech world with its ability to access data from the Net, project it onto any surface, and interact with it by gestures. Like a Hollywood sci-fi movie computer become real, SixthSense is a beautifully elegant example of the Internet of Things and the semantic Web powerfully working together.

Sixth Sense and his **invisible mouse** bridge the gap between cyberspace and the real world. They are as big a leap over current methods as the mouse and graphic interface were over punching holes in cards. A homemade, open-sourced set can be made for $350. Be patient; though **little** has been done with it yet, adopting the **GUI** took 20 years – and Steve Jobs.

Will we have a world where your smart fridge and medicine cabinet conspire to make you healthier? Or one darker, where they are hacked to kill you? The Pew Center's last bit of wisdom should give hope: "*The best way to predict the future is to invent it.*"

Stay tuned. We live in amazing times, and our informed choices matter more than ever.

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