

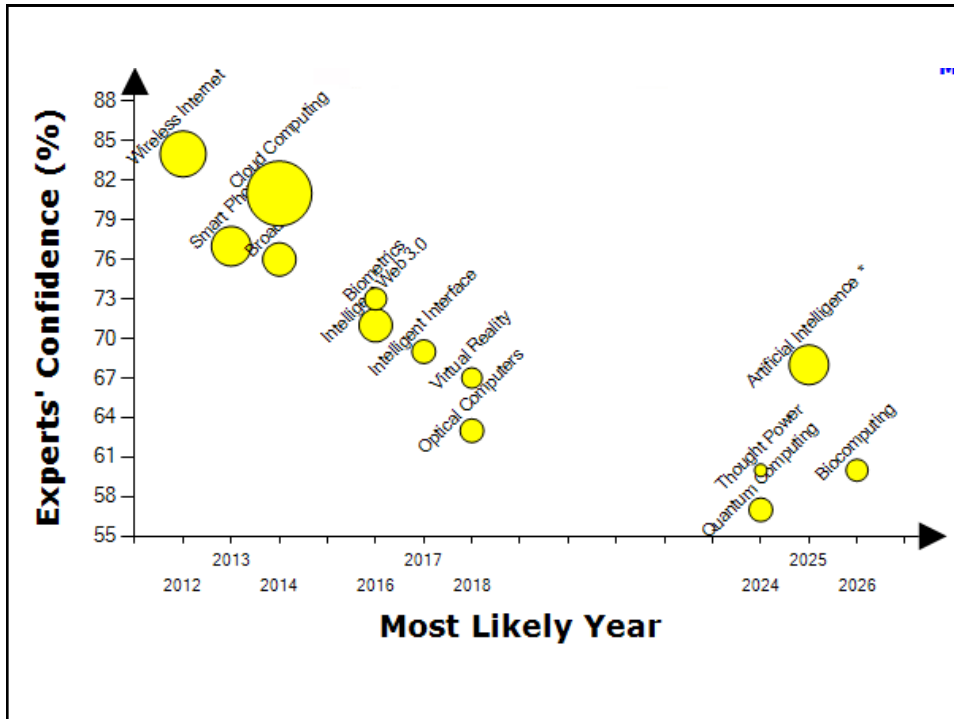
Techcast Forecasts for Information Technology

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General Trends in IT

Information Technologies are now driving some of the most profound changes in the history of human civilization. TechCast IT forecasts tracking these can be organized into a few general macro-trends:

- Computing Power
- IT Infrastructure
- Pervasive Networks
- Human / Machine Interfaces
- AI and the Global Brain



Computing Power Forecasts

Silicon-based computer technology continues to advance in speed and memory density, but several new technologies are on the horizon:

- **Optical Computing**

- Information stored / manipulated via light beams through optical fibers and switches, many devices compatible with current electronic devices

- Forecast: optical computer enters marketplace around 2018 +/- 5, \$400-500 B market size

- **Bio-Computing**

- Information stored / manipulated in the chemical reactions of biological molecules (e.g. DNA)

- Forecast: BioComputers enter the marketplace around 2025 +/- 8, \$400-500 B market size

- **Quantum Computing**

- Information stored/manipulated using quantum mechanical states of atomic particles

- Forecast: Commercial quantum computers enter marketplace 2024 +/- 7, \$400-500 B market

IT Infrastructure Forecasts

IT infrastructure comprised of communication networks, routers, protocols, software tools, etc. increasingly expand and enable the internet and its connected devices:

- **Broadband Communications**

- Broadband loosely refers to high-speed digital access to the internet, via a variety of communication technologies. BB is today considered a key infrastructure in developed nations.

- Forecast: 50% BB penetration across G20 nations around 2013 +/- 3, ~ \$ 500 B market size

- **Cloud Computing**

- Refers to an IT business model whereby companies provide centralized, comprehensive computer storage, processing power, and software tools to customers, accessed via the internet.

- Forecast: Clouds provide 30% of US computing services around 2014 +/- 1, ~ \$ 800 B market size

- **the Intelligent Web**

- Data and information on the WWW is increasingly organized and routed to users by tools that provide semantic context, machine learning, knowledge representation, computational perception

- Forecast: 'Intelligent' responses given to 30% of internet queries by 2015 +/- 3, ~ \$ 250 B market

Pervasive Networks Forecasts

Digital communications and the Internet are expanded to every aspect of life by new technologies for sensing, processing, communicating, and acting

- **Wireless Communications**

- Refers to broadband internet access via mobile devices, such as laptops with WiFi, or cell phones with internet access. Wireless adoption is particularly rapid in developing countries.

- Forecast: Wireless internet access used by 30% of people globally by 2010 +/- 2, \$550 B market size

NOTE: independent sources confirm this forecast has arrived

- **Smart Phones**

- Combine telecomm capabilities of cell phones with power and functionality of laptops.

- Forecast: Smart phones make up 30% of all mobile devices around 2012 +/- 3, \$300 B market

- **Global Access**

- As smart phones, wireless, and broadband access become increasingly cheap and available, most of the world's population will eventually be online

- Forecast: Half the world's population has access to the internet by 2016 +/- 5, \$750 B market

Human/Machine Interface Forecasts

Communicating with computers has always been cumbersome, but a variety of new technologies make it far more natural within the next decade

• Intelligent Interface

- Computer keyboards, the mouse, etc. are replaced by technologies offering natural modes of interaction, such as speech recognition, motion tracking, virtual assistants, and AI
- Forecast: People converse with computers naturally, and the latter perform many routine mental tasks about 2016 +/- 5, \$ 500 B market size

• Virtual Reality

- Digitally simulated virtual environments are increasingly realistic and pervasive
- Forecast: VR environments used by 30% of public by 2018 +/- 4, \$ 450 B market size

• Thought Power

- Several technologies already being demonstrated which can read or couple electromagnetic brain activity to electronic devices, perhaps eventually even transmit 'thoughts' to other people
- Forecast: Brain-computer interfaces are commercially available enabling people to mentally communicate with electronic devices or directly to other people by 2023 +/- 8, \$400 B market

Artificial Intelligence Forecasts

Long a dream, artificial (machine-based) intelligence becomes commonplace as rapid advances are made in computer power, software, robotics, and sensors

• Artificial Intelligence

- Weak AI, namely systems that can learn and perform routine cognitive tasks, are increasingly entering the marketplace, while general (truly intelligent) AI systems may be far off
- Forecast: Intelligent machines replace 30% of routine mental tasks by 2025 +/- 8, \$550 B market

• Toward the Global Brain ?

- The **Global Brain** is a metaphor (Peter Russell) for the worldwide intelligent network formed by people together with the information and communication technologies that connect them into an "organic" whole.
- Increasingly relevant for the business community as **global innovation networks**

Summary

How to survive in the coming Metaverse...

Some things the IT revolution will mean in the future:

- All of your clients / stakeholders / competitors will be increasingly connected and well informed
- You will be increasingly open to global opportunities, as well as *vulnerabilities*
- Take advantage of and tap into the 'global brain', e.g. through crowdsourcing -- your competitors will
- Actions will occur on increasingly short timescales and have increasingly global consequences – be prepared
- A new hierarchy of power centers (e.g. nation states → self-organized groups) will increasingly dominate, you must pay attention to them