

THE EVOLUTION OF SOFTWARE

FROM RARE TO EVERYWHERE

In less than a century, software has evolved from a mathematical theory into a daily reality that operates billions and billions of things. From cars and phones to banking and baby monitors, we depend on software throughout our daily lives and that dependence is only growing.

THE RISE OF CODE

Software has grown past traditional computers and can now be found in our daily lives running everything from toys and watches to refrigerators and our commercial transactions.

SMARTPHONE USERS IN THE U.S.



WORLDWIDE



CONNECTED WEARABLE DEVICES WORLDWIDE



AUTOMOBILE PRODUCTION

In 1981, GM used about 50,000 lines of code across its entire domestic passenger car production.



SMART SPEAKERS



In 2014, Amazon debuts Echo, the first digital assistant smart speaker for the home.

In 2018, approximately 1,900,000 U.S. homes have a smart speaker like Echo or Google Home.

TRADE AMOUNT COMPARISON BITCOIN



Bitcoin price in 2017 was \$19,000 at its peak in December, compared to \$0.30 in 2011, just two years after its debut.

Gold price in 2017 was \$1,300 per ounce, compared to \$1,400 per ounce in 2011.

TOMORROWLAND

In the near future, software will continue to evolve and operate even more of our daily lives, including transportation, commerce, and currency. Here are just a few predictions:

- BY 2019**, the cryptocurrency market valuation will reach \$1 trillion.
- Almost 70% of consumers will have a **connected thermostat** in their homes, and more than 60% will have a smart security system.
- BY 2020**, there will be more than **200 billion things connected online**, equaling roughly 26 smart objects for every person on the planet.
- BY 2021**, people will wear **929 million connected wearable devices worldwide** — meaning 1 in 8 people will be connected by what they wear.
- There will be **11.6 billion mobile-connected devices**, exceeding the world's projected population at that time (7.8 billion people).
- BY 2022**, the price of **Bitcoin** will reach as high as \$250,000.
- The first **3-D printed car** will be in production.
- BY 2023**, 10% of **reading glasses** will be connected to the Internet.
- 80% of people on the planet will have a **digital presence** online.
- BY 2024**, more than 50% of Internet traffic to homes will be from **appliances and home automation devices**.
- The first transplant of a **3-D printed liver** will occur.
- BY 2025**, the first **implantable mobile phone** will become commercially available.
- BY 2026**, the first **AI machine** will join a corporate board of directors.

A BRIEF HISTORY OF FIRSTS

- 1843:** Ada Lovelace creates the first known computer program.
- 1945:** Work begins on the first algorithmic programming language, Plankalkül (Plan Calculus).
- 1948:** "The Mathematical Theory of Communication" establishes a "bit" as the basic unit of computation.
- 1952:** A-0 allows users to give computers instructions with English-like words instead of numbers.
- 1957:** IBM develops FORTRAN, the most often-used language for scientific and technical computing.
- 1959:** Bank of America's ERMA digitizes checking with a computer-readable font.
- 1960:** Programming language COBOL is designed for business use.
- 1961:** MIT's Computation Center demonstrates CTSS (Compatible Time-Sharing System).
- 1963:** ASCII is established, with code consisting of 128 unique strings of ones and zeros.
- 1964:** Thomas Kurtz and John Kemeny create BASIC programming language for their students at Dartmouth.
- 1969:** AT&T Bell Labs programmers Kenneth Thompson and Dennis Ritchie develop the UNIX operating system.
- 1970:** The Pascal programming language is introduced by Professor Niklaus Wirth.
- 1972:** Dennis Ritchie and his team create the C programming language.
- 1981:** Microsoft's MS-DOS is released as the basic software for the IBM PC.
- 1982:** Mitch Kapor develops Lotus 1-2-3, a software suite for the IBM PC.
- 1983:** Microsoft introduces Word.
- 1985:** Aldus launches the desktop publishing revolution with the release of PageMaker.
- 1987:** Larry Wall writes the programming language Perl, which will later be known as "the duct tape of the Internet."
- 1987:** Apple engineer William Atkinson designs HyperCard to simplify development of in-house applications.
- 1990:** Microsoft ships Windows 3.0.
- 1990:** Brothers John & Thomas Knoll create Photoshop.
- 1990:** Tim Berners-Lee proposes the "http" system.
- 1992:** Finnish university student Linus Torvalds releases the Linux kernel.
- 1993:** FreeBSD launches and quickly becomes the most widely-used open-source BSD variant.
- 1994:** The first credited "smartphone" — IBM's Simon — goes on sale.
- 1995:** Sun Microsystems launches Java 1.0, while Netscape develops JavaScript.
- 1997:** Microsoft introduces Visual Studio, allowing programmers to develop software using visuals instead of text.
- 2000:** Global fears over the Y2K bug prove unfounded.
- 2001:** Peer-to-peer file sharing service BitTorrent launches.
- 2004:** Google launches Gmail.
- 2005:** Hadoop is developed.
- 2007:** Scratch is publicly released.
- 2009:** World's first decentralized currency, Bitcoin is released by Satoshi Nakamoto.
- 2010:** Reports of the Stuxnet virus surface due to attacks on Iran's uranium centrifuges.
- 2014:** The Heartbleed Bug is discovered.
- 2015:** Amazon releases Echo, its voice-command smart speaker.

SIDE EFFECTS OF SOFTWARE

As the presence of software in our lives grows, so, too, do the risks and threats. Cybercriminals attack unsecure software, giving them access to a wealth of personal and private information.

GLOBAL BUSINESS CYBERCRIME COSTS



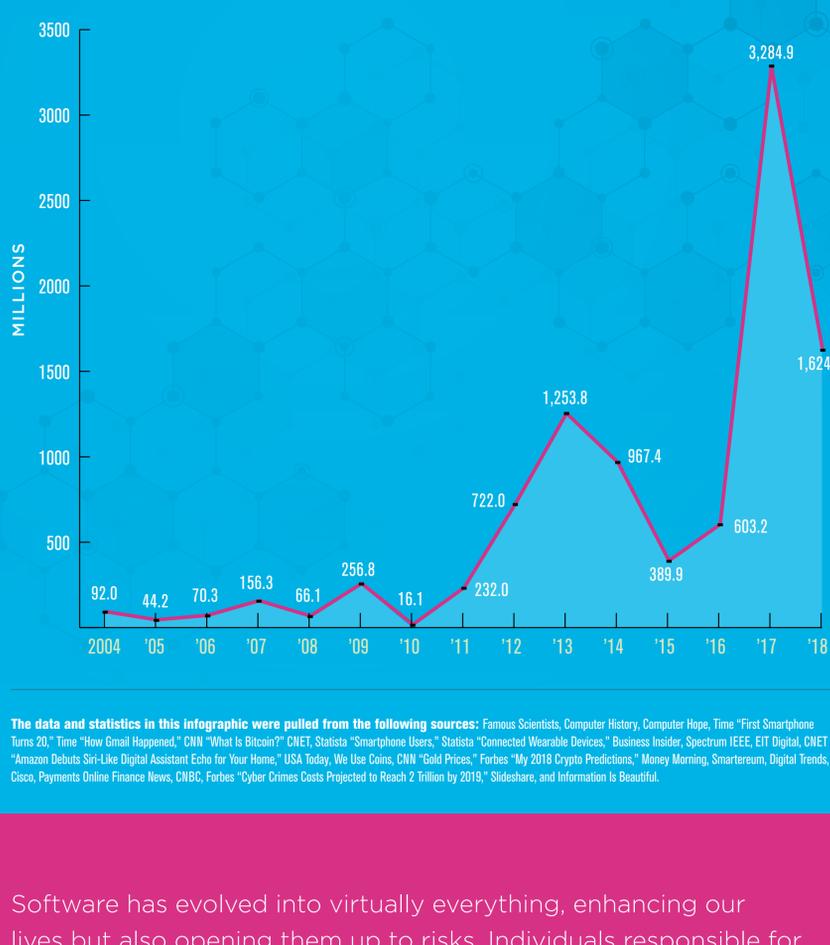
PREDICTED DATA BREACH COSTS



Cyberattacks occur across the entire global marketplace, and no industry is spared from its costs:



From 2004 to 2018, 10.5 billion records have been reported stolen through major data hacks and breaches.



The data and statistics in this infographic were pulled from the following sources: Famous Scientists, Computer History, Computer Hope, Time "First Smartphone Turns 20," Time "How Gmail Happened," CNN "What Is Bitcoin?" CNET, Statista "Smartphone Users," Statista "Connected Wearable Devices," Business Insider, Spectrum IEEE, EIT Digital, CNET "Amazon Debuts Siri-Like Digital Assistant Echo for Your Home," USA Today, We Use Coins, CNN "Gold Prices," Forbes "My 2018 Crypto Predictions," Money Morning, Smartreum, Digital Trends, Cisco, Payments Online Finance News, CNBC, Forbes "Cyber Crimes Costs Projected to Reach 2 Trillion by 2019," Slideshare, and Information Is Beautiful.

Software has evolved into virtually everything, enhancing our lives but also opening them up to risks. Individuals responsible for developing software applications must understand the risks and how to ensure application security through every stage of development.

Learn more about what developers don't know about security but should.