Digital technologies

Rapid advances in social, mobile, analytics, and cloud technologies take computing to the next level.

Analytics 2020

With unprecedented amounts of new information being created and shared every second, analytics becomes a powerful force transforming data from gigabytes into golden insights. Advanced algorithm design and faster computing, along with a growing cadre of data scientists, unlock value from digital exhaust, influencing decision making by governments, corporations, and individuals alike.

Analytics in 2020

- Crowd-aided analytics taps into the power of crowd in the analysis process, making the process efficient and less prone to error.

- Faster analytics through robust algorithms mitigates the traditional trade-off between accuracy and speed.

- Analytics for all end users allows everyone in the organization to become an analyst, providing workable, data-driven insights.

- Data scientist demand surges as organizations examine complicated data sets to aid business decisions.

- Cloud analytics allows seamless interaction with big analytical and visualization systems in the cloud.

- Advances in natural language processing enable users to analyze the vast array of data from social networks.

In 2020, 450 billion business transactions are performed every day in B2C and B2B markets.

In 2020, 90 zettabytes (trillion gigabytes) of information is created every year, 50 times more than a decade earlier.

The first commercial quantum computer becomes available by 2020.

Cloud computing 2020

Cloud computing takes center stage in 2020, accelerating the capabilities of technologies such as mobile and analytics. Remote computing services allow mass collaboration around huge data sets, bringing affordable scale to computationally intensive problem solving. Cloud computing closes the digital divide by making collaboration across distance and disciplines both possible and cheap. Governments use hybrid clouds to share information while protecting sensitive data, and technology firms provide analytical capabilities through cloud platforms.

Cloud computing in 2020

- **Hybrid cloud computing** helps governments house sensitive data in internal systems and the rest on the cloud, striking a balance between cost and data security.

- **Open clouds** based on open standards allow governments to share valuable data with citizens, ushering in a new era of transparency.

- **Interclouds** enable government departments to cherry-pick cloud components from various companies; they act as a one-stop cloud shop.

- **Modular software development** processes in cloud application allow changes in applications to take place without taking the program offline.

- **Cloud-based analytics** revolutionizes an agency's analytics capabilities by reducing cost dramatically and enabling access to data across government agencies.

By 2020, the use of cloud computing cuts data center energy use by 38 percent.

In 2020, 5,200 GB of digitized data is available per person, 15 percent of which resides in the cloud.

In 2020, the cloud computing market is worth $241 billion, twice the amount China spent on arms in 2011.

Mobile technology 2020

2020 takes the ubiquity of mobile technology to the next level. Mobile devices of all shapes and sizes, including wearables such as watches and glasses, keep millions around the world constantly connected, entertained, and informed. Mobile tools revolutionize health care and education, while mobile payments via near-field communication (NFC) become the norm.

Mobile technology in 2020

- Flexible mobile devices break down physical barriers that traditionally defined and limited communication devices, tablets, and gaming controls.

- Wearable technology in the form of watches and glasses, powered with smart chips, allow users to browse the Internet, view pictures, navigate, and experience augmented reality.

- Mobile wallets, leveraging the advancement in NFC, allow users to make payments directly.

- 5G networks take user experience beyond data transfer speeds to include service quality factors such as lower battery consumption, a larger number of supported devices, and lower latency characteristics.

- Mobile-to-mobile technology redefines heath care, reduces carbon emissions, and helps public services by allowing users to transmit data on the go.

- Real-time speech translations on mobile devices eliminate language barriers and improve one-to-many events such as webinars, training sessions, and conferences.

By 2020, mobile money spreads throughout Africa, allowing some of the 2 billion people without access to financial services to come into the formal system.

Wireless traffic increases 88-fold between 2010 and 2020.

In 2020, the mobile-enabled workforce in the utilities sector doubles to 2.4 million, improving customer service and achieving superior cost efficiencies.

Social media 2020

In 2020, social networks penetrate all realms of life as individuals and governments explore new ways to tap into the power of the crowd. Location data used in conjunction with social networks create hyperlocal social platforms. Niche or specific-interest-based social networks allow people to customize and filter content, while privacy concerns drive the growth of temporary social media platforms. Social media provides a vital stream of data used by governments and corporations for advanced analytics and sentiment analysis.

In 2017, the Asia-Pacific region accounts for approximately half of social media users worldwide.	In 2017, marketers spend more than $11 billion on advertising on social media in the United States.	By 2020, over 5 billion people use social networks, about two-thirds of the world's population.

Social media in 2020

- Social goes hyperlocal with the interplay between social and geolocation technologies, allowing consumers, businesses, and governments to connect and share on local issues.

- Temporary social media, where interactions are deleted after a specified time, becomes mainstream, thus enhancing user privacy.

- Social networks enable public safety by offering platforms that track individuals "marked" as possible convicts by national security agencies.

- Niche social networks emerge, connecting users with specific interests, leading to market fragmentation.

- Social TV allows content creators and providers to deliver customized content based on users' social media activity.

Sources - Analytics

Deloitte deeper dives
John Lucker, Jerry O'Dwyer, and Ryan Renner, The scale paradox, Deloitte University Press, March 19, 2013, http://dupress.com/articles/the-scale-paradox/.

Mike Brown and Doug Krauss, "In-memory revolution," Tech Trends 2014, Deloitte University Press, February 21, 2014, http://dupress.com/articles/2014-tech-trends-in-memory-revolution/.

Thomas Davenport, Telling a story with data: Communicating effectively with analytics, Deloitte University Press, January 31, 2013, http://dupress.com/articles/telling-a-story-with-data/.

Other sources
Cynthia Giles, "Analytics 2020: What will data analytics look like in a decade?" Spotfire, September 10, 2010, http://spotfire.tibco.com/blog/?p=3362.

Dave Evans, "Top 25 technology predictions," Cisco, 2009, http://www.cisco.com/web/about/ac79/docs/Top_25_Predictions_121409rev.pdf.

Joe McKendrick, "Where cloud will pay off: Predicting the future," Forbes, November 14, 2013, http://www.forbes.com/sites/joemckendrick/2013/11/14/where-cloud-will-pay-off-predicting-the-future/.

John Edwards, "The rise of the data scientist," Teradata Magazine, 2012, http://www.teradatamagazine.com/v12n03/Features/The-Rise-of-the-Data-Scientist/.

John Rehling, "How natural language processing helps uncover social media sentiment," Mashable, November 8, 2011, http://mashable.com/2011/11/08/natural-language-processing-social-media/.

Kurzweil, "RIKEN to develop exascale supercomputer by 2020," Accelerating Intelligence, December 30, 2013, http://www.kurzweilai.net/riken-to-develop-exascale-supercomputer-by-2020.

Lucas Mearian, "World's data will grow by 50X in next decade, IDC study predicts," Computerworld, June 28, 2011, http://www.computerworld.com/s/article/9217988/World_s_data_will_grow_by_50X_in_next_decade_IDC_study_predicts.

MarketsandMarkets, "Healthcare analytics market worth $21.3 billion by 2020," http://www.marketsandmarkets.com/PressReleases/healthcare-data-analytics.asp, accessed February 27, 2014.

Netbase, "Sentiment analysis with NLP leads to more accurate understanding," http://www.netbase.com/social-media-analytics/nlp-advantage/, accessed February 27, 2014.

National Research Council of the National Academies, "Frontiers in massive data analysis" (prepublication draft), January 1, 2013, http://bigdatawg.nist.gov/FrontiersInMassiveDataAnalysisPrepub.pdf.

Wikibon, "A comprehensive list of big data statistics," August 1, 2012, http://wikibon.org/blog/big-data-statistics/.

Sources - Cloud Computing

Deloitte deeper dives
Andrew Hill et al., "Race to the cloud," Human Capital Trends 2014, Deloitte University Press, March 7, 2014, http://dupress.com/articles/hc-trends-2014-race-to-the-cloud/.

Andy Main and John Peto, "Cloud orchestration," Tech Trends 2014, Deloitte University Press, February 20, 2014, http://dupress.com/articles/2014-tech-trends-cloud-orchestration/.

Other sources
Alexandre Pascal Calderon Asselin, "The future of cloud computing," Sitepoint, August 7, 2013, http://www.sitepoint.com/the-future-of-cloud-computing/.

CIO Systems, "Cloud computing market will top $241 billion in 2020," December 9, 2012, http://www.ciosystems.com/cloud-computing-market-will-top-241-billion-in-2020/.

Derrick Harris, "Will the government push open clouds over the goal line?" Gigaom, April 15, 2011, http://gigaom.com/2011/04/15/will-the-government-push-open-clouds-over-the-goal-line/.

IDC, "Cloud computing in 2020," December 1, 2012, http://www.emc.com/leadership/digital-universe/iview/cloud-computing-in-2020.htm.

"Email and collaboration will be mostly cloudy by 2020," Information Age, September 20, 2011, http://www.information-age.com/technology/cloud-and-virtualisation/1656358/email-and-collaboration-will-be-mostly-cloudy-by-2020.

Jack Clark, "Cloud computing: 10 ways it will change by 2020," ZDNet, July 31, 2012, http://www.zdnet.com/cloud-computing-10-ways-it-will-change-by-2020-7000001808/.

Jim Foley, "Survey reports growth in IaaS, hybrid cloud is the future," Flexiant, June 19, 2013, http://www.flexiant.com/2013/06/19/survey-reports-growth-in-iaas-hybrid-cloud-is-the-future/.

Joe Weinman, "What's next for the cloud? The intercloud," Forbes, October 8, 2013, http://www.forbes.com/sites/joeweinman/2013/10/08/whats-next-for-the-cloud-the-intercloud-2/.

Lucas Mearian, "By 2020, there will be 5,200 GB of data for every person on Earth," CIO, December 10, 2012, http://www.cio.co.nz/article/466764/by_2020_there_will_5_200_gb_data_every_person_earth/.

Michelle Rudnicki, "Open clouds are key for sharing a wealth of government data," Govloop, March 14, 2013, http://www.govloop.com/profiles/blogs/open-clouds-are-key-for-sharing-a-wealth-of-government-data.

Olafur Ingthorsson, "Current cloud computing trends and the future forecast," Cloud Computing Topics, October 21, 2013, http://cloudcomputingtopics.com/2013/10/current-cloud-computing-trends-and-the-future-forecast/.

Sources - Mobile Technology

Deloitte deeper dives
Bill Briggs et al., Tech Trends 2014, Deloitte University Press, February 21, 2014, http://dupress.com/articles/2014-tech-trends-introduction/.

Scott Wilson, Open mobile: The growth era accelerates, Deloitte University Press, January 1, 2012, http://dupress.com/articles/open-mobile-a-survey-of-u-s-mobile-industry-executives/.

Scott Wilson, Rising tide: Exploring pathways to growth in the mobile semiconductor industry, Deloitte University Press, November 16, 2013, http://dupress.com/articles/rising-tide-exploring-pathways-to-growth-in-the-mobile-semiconductor-industry/.

Shehryar Khan and Evangeline Marzec, "Wearables," Tech Trends 2014, Deloitte University Press, February 21, 2014, http://dupress.com/articles/2014-tech-trends-wearables/.

Val Srinivas, Sam Freidman, and Jim Eckenrode, Mobile financial services: Raising the bar on customer engagement, Deloitte University Press, May 19, 2014, http://dupress.com/articles/mobile-financial-services/.

William D. Eggers and Joshua Jaffe, Gov on the Go, Deloitte University Press, February 1, 2013, http://dupress.com/articles/gov-on-the-go/.

Other sources
Amar Toor, "Shapeshifters: Phones of the future could morph on demand," Verge, May 1, 2013, http://www.theverge.com/2013/5/1/4283050/morphees-prototype-smartphone-display-changes-shape-on-demand.

Anita Campbell, "Swipeless payments using NFC technology: What you need to know," Small Business Trends, December 2, 2013, http://smallbiztrends.com/2013/12/swipeless-payments-using-nfc-technology.html.

AppleInsider, "Samsung testing 5G wireless technology that can download entire movies in seconds," May 13, 2013, http://appleinsider.com/articles/13/05/13/samsung-testing-5g-wireless-technology-that-can-download-entire-movies-in-seconds.

Dave Evans, "Top 25 technology predictions," Cisco, December 2009, http://www.cisco.com/web/about/ac79/docs/Top_25_Predictions_121409rev.pdf.

"8 unexpected ways technology will change the world by 2020," Fast Company, January 16, 2014, http://www.fastcoexist.com/3024455/futurist-forum/8-unexpected-ways-technology-will-change-the-world-by-2020.

Kevin Kwang, "Samsung wants to bring 5G online by 2020," ZDNet, May 13, 2013, http://www.zdnet.com/samsung-wants-to-bring-5g-online-by-2020-7000015243/.

Mark Raby, "Pew Internet study: Mobile payments will be ubiquitous in 2020," Pew, April 17, 2012, http://www.slashgear.com/pew-internet-study-mobile-payments-will-be-ubiquitous-in-2020-17223324/.

PRWeb, "Real-time speech translation in 23 languages for business," September 26, 2013, http://www.prweb.com/releases/2013/9/prweb11159534.htm.

Stephen Lawson, "Networks in 2020: More traffic, less energy," PCWorld, May 13, 2013, http://www.pcworld.com/article/2038602/networks-in-2020-more-traffic-less-energy.html.

Tech Crunch, "Wearable tech," http://techcrunch.com/tag/wearable-tech/, accessed March 4, 2014.

Thomas Melville, "Global utility mobile workforce to double by 2020," EnergyDigital, January 4, 2014, http://www.energydigital.com/green_technology/global-utility-mobile-workforce-to-double-by-2020.

Vince Font, "5G is coming, but not soon," Brighthand, December 9, 2012, http://www.brighthand.com/default.asp?newsID=19499&news=5G+Networks.

Sources - Social Media

Deloitte deeper dives

Dave Hanley and Alicia Hatch, "Social activation," Tech Trends 2014, Deloitte University Press, February 21, 2014, http://dupress.com/articles/2014-tech-trends-social-activation/.

Eric Openshaw, John Hagel, and John Seely Brown, From invisible to visible . . . to measurable, Deloitte University Press, March 10, 2014, http://dupress.com/articles/from-invisible-to-visible/.

Other sources

Amit Misra, "Social Media Growth 2013–2017: Every forth person on planet use social media," DazeInfo, June 20, 2013, http://www.dazeinfo.com/2013/06/20/social-media-growth-2013-2017-every-forth-person-on-planet-use-social-media-study/.

Customer Respect, "A breath of fresh air: Can niche social networks cut through the social smog?" http://customerrespect.com/blog/blogexplosion/a-breathe-of-fresh-air-can-niche-social-networks-cut-through-the-social-smog/, accessed February 19, 2014.

Hunter Schwarz, "Turns out the government has been monitoring our social networks too," BuzzFeed, September 28, 2013, http://www.buzzfeed.com/hunter-schwarz/turns-out-the-government-has-been-monitoring-our-social-netw.

Jason Koebler, "FBI wants to monitor social media for 'emerging threats,'" US News, January 27, 2012, http://www.usnews.com/news/articles/2012/01/27/fbi-wants-to-monitor-social-media-for-emerging-threats.

Johan Attby, "The time is ripe for a new wave of niche social networks," Pando, October 16, 2013, http://pando.com/2013/10/16/the-time-is-ripe-for-a-new-wave-of-niche-social-networks/.

K. C. Jones, "Wireless social networking to generate $2.5 trillion by 2020," InformationWeek, June 5, 2008, http://www.informationweek.com/mobile/wireless-social-networking-to-generate-$25-trillion-by-2020/d/d-id/1068573.

Liat Clark, "Social networks will become ubiquitous, niche and funded by micropayments," Wired, October 17, 2012, http://www.wired.co.uk/news/archive/2012-10/17/the-ubiquitous-social-network.

MacKenzie Lovings, Eileen Pacheco, and Robert Udowitz, "BIA/Kelsey forecasts U.S. social media ad spending to reach $9.8 billion by 2016," BIAKelsey, May 15, 2012, http://www.biakelsey.com/Company/Press-Releases/120515-U.S.-Social-Media-Ad-Spending-to-Reach-$9.8-Billion-by-2016.asp.

Olena Ursu, "Can hyperlocal social networks help a municipality to provide better services?" Voices from Asia, United Nations Development Programme, September 3, 2013, http://europeandcis.undp.org/blog/2013/09/03/can-hyperlocal-social-networks-help-a-municipality-to-provide-better-services/.

Sara Roncero-Menendez, "Mobile advertising projected to increase 64% in 2014," Mashable, January 3, 2014, http://mashable.com/2014/01/03/native-mobile-advertising/.

William M. Bulkeley, "10 breakthrough technologies 2010," Technology Review, June 2010, http://www2.technologyreview.com/article/418541/tr10-social-tv/.

"What will social media look like in 2020?" Wall Street Journal video, 3:35, http://www.youtube.com/watch?v=k-9bzC8u8NE, posted March 4, 2013.