K2's Tech Update 2023

What About Randy?

- 40+ years of technology experience, top-rated speaker for almost 40 years
- Top 25 Thought Leaders in Accounting 2011-2023
- 2004-2022 Accounting Today 100 Most Influential in Accounting for nineteen years
- Inducted Accounting Hall of Fame, Feb 2011
- Monthly columns on technology in CPAPractice Advisor
- Published author of six books, From Hutchinson, KS
- randy@k2e.com or randyj@nmgi.com
- 620-664-6000 x 112

K2 Enterprises

What About Brian? @BFTCPA

CPA, CITP, CGMA with over 30 years of Accounting and Technology business experience, including public accounting, industry, consulting, media, and education

- Director of Strategic Relationships / Instructor, K2 Enterprises, LLC (2005-present)

- Director of Strategic Relationships / Instructor, Yaeger CPA Review (2017-present)

- Has delivered presentations in 48 US states, Canada, and Bermuda

- Author*, 2014-2021 CPA Firm Operations and Technology Survey*

- Freelance Writer for accounting industry media outlets such as *AccountingWEB* and *The CPA Practice Advisor* (2015-present)

- Publisher, CPATechBlog.com (2004-present)

- Technology Editor, *The CPA Practice Advisor* (2010-2014)

- Selected nine times as a "Top 25 Thought Leader in Public Accounting Technology" by *The CPA Practice Advisor*

What About NMGI?

- NetCare – National CPA support services for total network management

- NetRescue – Backup Appliances and web-based backup

- Boutique Technology and Business Continuity consulting
  - CPA Firm Technology Assessments, Paperless Consulting
  - Accounting Software Selection (ERP, BI, HR, SaaS, CRM)

- Awards - CRN top 100, MSPMentor top 100

About K2 Enterprises

- Provides live and on-demand Continuing Professional Education (CPE) in 48 U.S. states and in Canada

- Largest provider of technology-focused CPE for accountants and financial professionals in North America

- Services Offered
  - Live in-person and online presentations (conferences & seminars)
  - Webinars
  - On-site training
  - On demand self-study materials

- www.k2e.com for more information

K2 Enterprises Web Sites

NO TRACKING!

www.k2e.com - CPE Info

www.CPAFirmTech.com – CPA Firm Info

www.AccountingSoftwareWorld.com – Accounting Software Info

www.TotallyPaperless.com – Paperless Info

https://www.youtube.com/user/K2Enterprises - The K2 Enterprises YouTube channel with over 160 free technology training videos

www.k2e.com/blog - Blog and article posts

https://shop.k2e.com/ - CPE courses on demand

Major Topics

- Hardware and software trends

- Communication and collaboration tools

- Key products to consider for implementation

- Emerging technology in generative AI, accounting automation, metaverse, and blockchain

Learning Objectives

- Create strategic and tactical benefit lists of hardware and software options

- Evaluate current communications choices to improve your efficiency

- Identify key technologies to implement in your business and personal life

- List examples of emerging technologies that will affect the accounting profession

Major Topics

- New Tech
- Personal Tech
- Generative AI
- Microsoft
- Software
  - Single Portal
  - Accounting Software
  - Automation
  - CPA Firm
  - Technology Stacks

- Communications
  - 5G
  - Wi-Fi 6E/7
  - Terahertz
- Computers and Phones
  - Computer Recommendations
  - Processor Chip Table
- Emerging Technology
  - Artificial Intelligence
    - DALL-E
    - ChatGPT
  - Quantum Computing
- Security

Last Year's Recommendations
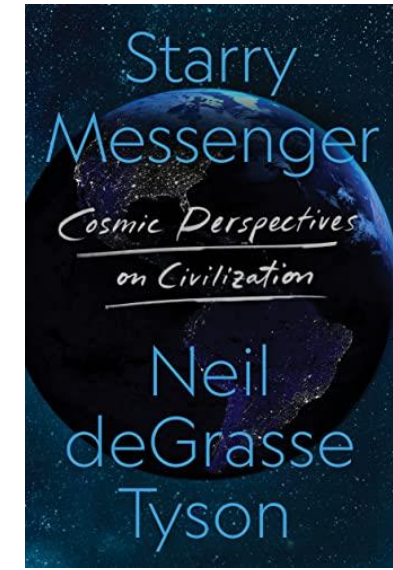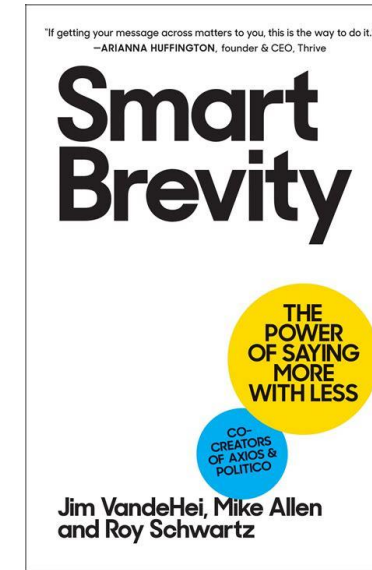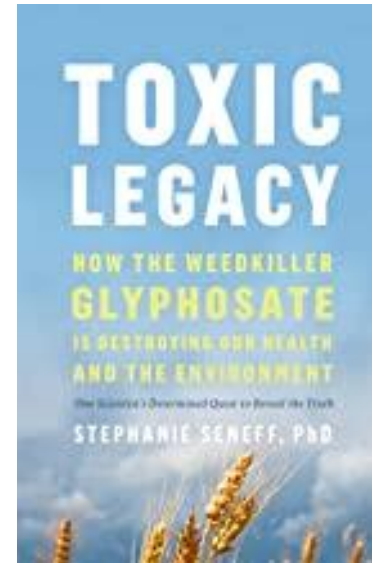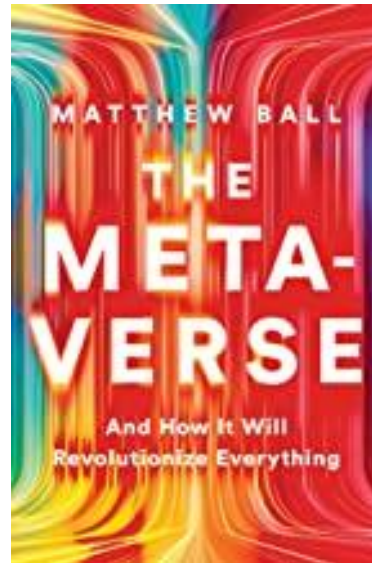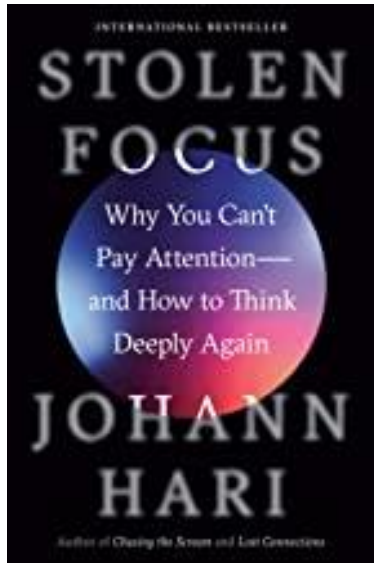
A Few Recommendations
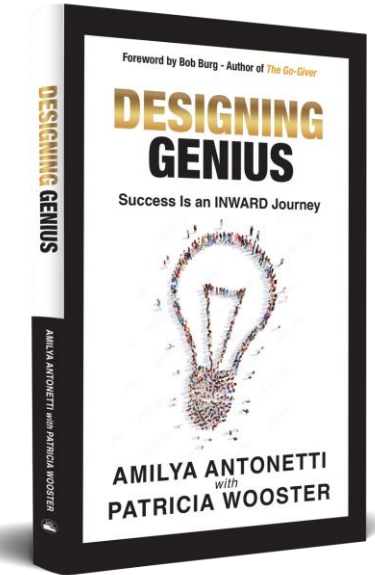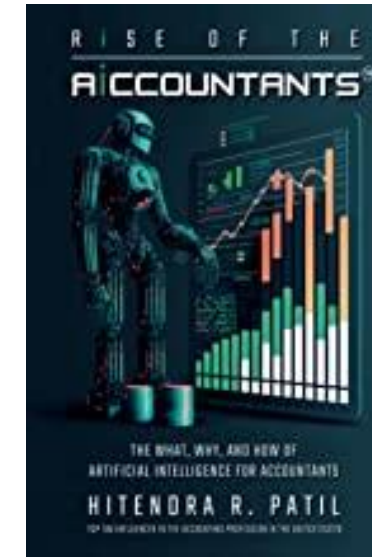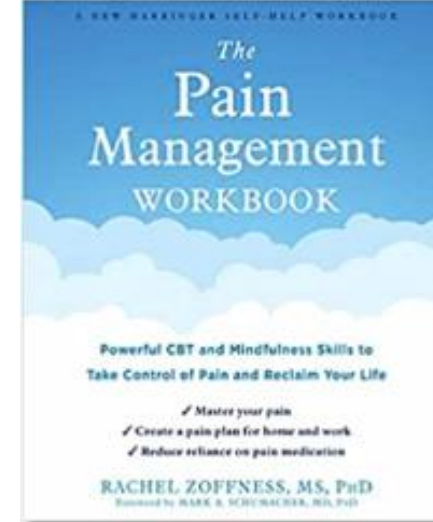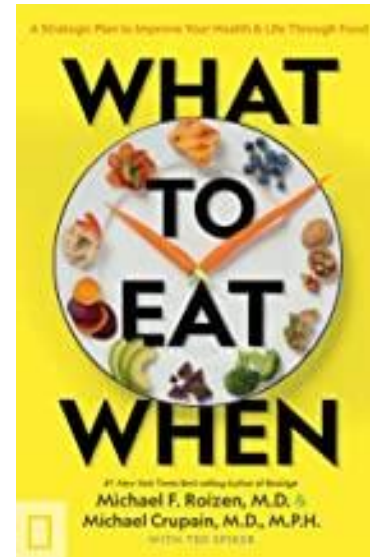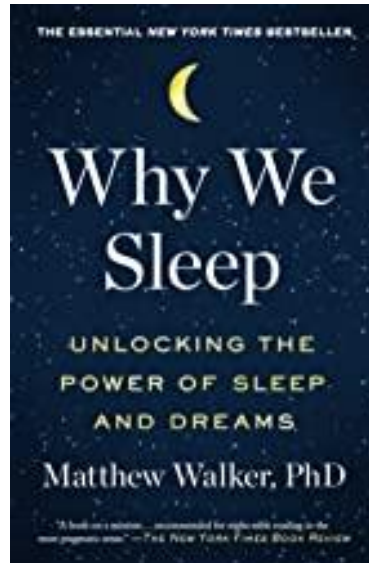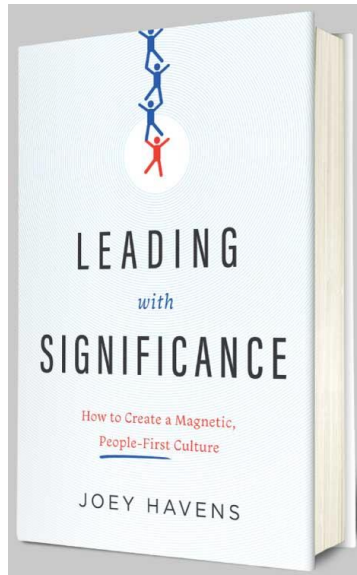
Thoughts On Managing Technology

- Think about what color you get when you mix white & black
- Not black & white, right & wrong, but shades of gray
- You don't have to move everything at once - you can use steps
- Pacing will provide more forward progress (small steps) with positive activity and easier change management
- Listen to the "imagine" ideas, and picture your firm there
- Our recommendations are not mandates but suggestions for you to incorporate into your mix

Landscape Of Online Change

- **TikTok:** a social media platform that allows users to create and share short-form videos. It has become incredibly popular, especially among younger audiences. It has also emerged as a platform for influencers and brands to reach a large audience

- **Web3:** the next generation of the internet, which is focused on decentralization, privacy, and security. It is based on blockchain technology and aims to give users more control over their data and online interactions

- **Metaverse:** a virtual world that is built on top of the internet. It is an immersive experience that combines virtual reality, augmented reality, and other technologies to create a new type of online experience. It has the potential to transform how we interact with each other and with digital content

- **Midjourney (Discord):** a communication platform with a surge in popularity, especially among gamers. It offers voice and video chat, file sharing, and community-building features. It has expanded beyond the gaming community and is now being used by businesses and individuals to communicate with each other. Trials halted from influx of new users March 30

- **ChatGPT:** an artificial intelligence language model developed by OpenAI that can generate human-like responses to natural language queries. It has numerous applications, including customer service chatbots, language translation tools, and virtual assistants

WHAT'S NEW

CES 2023 - Observations

- First time we've been back to CES in person since 2020

- Fewer attendees/exhibitors – 100K attendees in 2023 vs. as high as 180K in the past

- Categories less prominent than last time – cell phones, phone accessories, exercise tech, DSLR cameras, computers

- Much more protection of trade secrets
  - Intel and AMD absent, Qualcomm booth walled off, invitation only

- Technology looking for a problem

- SO. MANY. BATTERIES….

Not Everything At CES Is High-Tech

- Many high-tech items, also some low-tech items
  - Media duplicator
  - Calculator

Interesting Technologies

- Displays: Samsung OLED and 8K, LG OLED Flex, HP Curve 45", ViewSonic mobile OLED displays
- Meeting Room Tools: Dex, Canon
- Keyboards: Kensington, Matias
- Li-Fi Progressing – 20 seconds = 40 GB (320 Gb)

- **Home standards**: Matter, Home Connect, Z-Wave
- Hydrogen: Trucks, fusion
- Big Equipment: CAT, John Deere, Boats, Peterbilt, Palantir
- Gaming Tech, VR Goggles
- **Health Tech**: Teeth, Eyes, CPR, Toilet Seats(!)

Interesting Tech: LIDAR

- LIDAR = Light Detection and Ranging
- Creates a 3D image of a covered area called a "point cloud"
- Used by realtors, contractors, and insurance adjustors to map buildings
- Used in GIS applications to create 3D renderings of buildings – even interiors
- Data is overlayed with radar and video in most self-driving car prototypes
- Has been in Pro iPhones since iPhone 12 ProMax
- App: KIRI Engine (www.kiriengine.app)
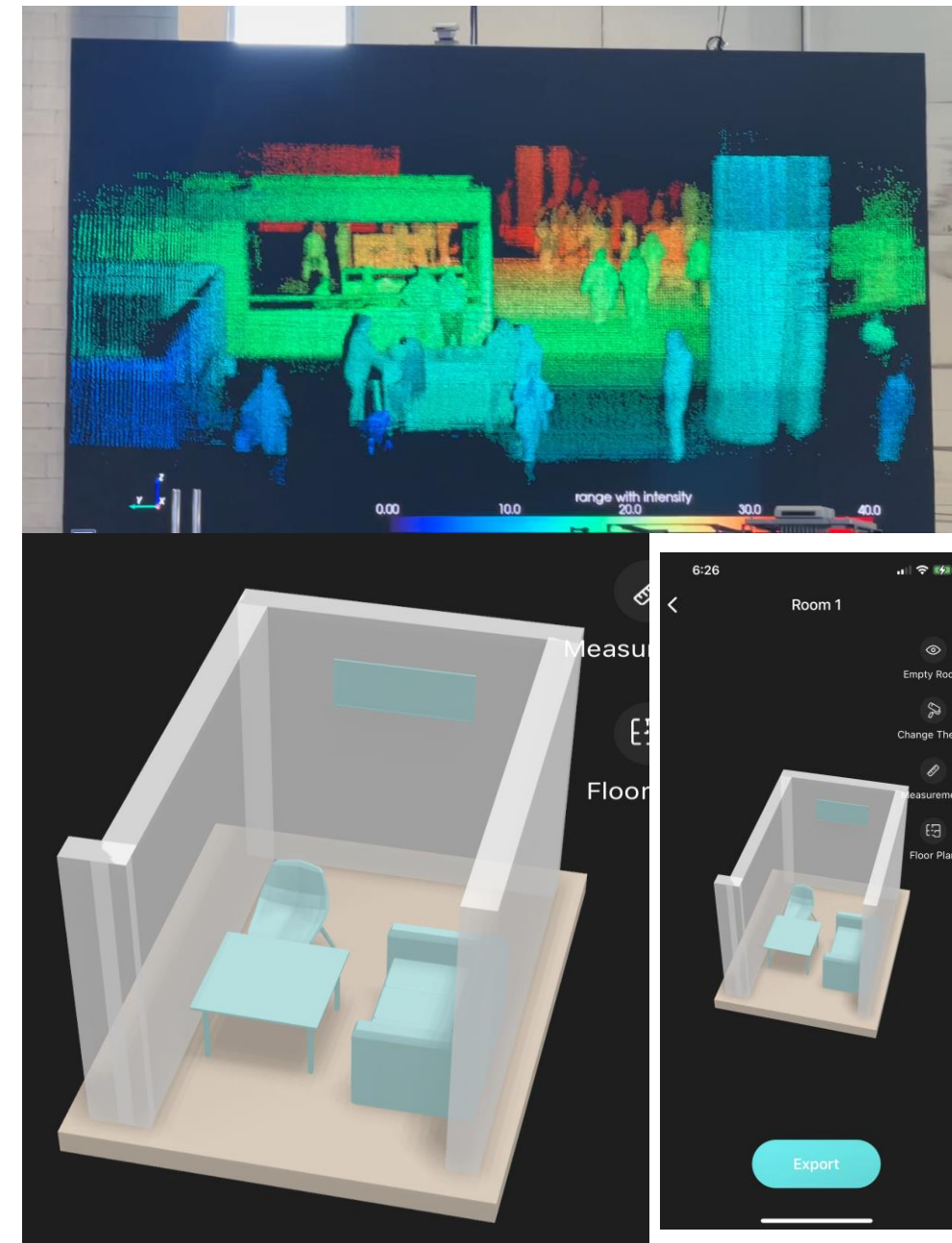
INTERESTING DISPLAYS

Interesting Displays

LG OLED Flex 42LX3QPUA

- Flexible 4K Ultra HD display (3,840 x 2,160) with WebOS 2.2

- 120 Hz, 0.1 ms response time

- Includes Wi-Fi 6, Bluetooth 5, and ATSC/Clear QAM tuner

- Adjustable height, tilt, and bend

- MSRP $2,999

Interesting Displays

HP E45c G5 DQHD Curved Monitor

- Has USB-C hub with two inputs which can connect one mouse/keyboard to two different computers (e.g., PC/Mac)

- Inputs: DisplayPort, HDMI, USB-C

- Resolution: 5120 x 1440 (DQHD)

- Aspect ratio: 32:9

- Brightness: 400 nits

- $1,099

Interesting Displays

ViewSonic VX16-OLED

- 15.6-inch portable monitor with a native 4K(3840x2160) resolution

- 100% sRGB, Adobe RGB and DCI-P3 coverage

- 400nits of brightness, 1ms response time, 60Hz refresh rate

- Connectivity includes: 2x USB Type-C for 2-way charging, mini-HDMI and 3.5mm headphone jack

- Ultra-thin OLED panel design with an adjustable kickstand

- Available: Q3-Q4 2023, price TBD

Interesting Displays

ViewSonic ColorPro VP16-OLED

- - 15.6-inch portable monitor with a native 1080p (1920x1080) resolution

- - 100% DCI-P3 coverage, 400nits of brightness, 1ms response time, 60Hz refresh rate

- - Connectivity includes: 2x USB Type-C for 2-way charging, micro-HDMI and 3.5mm headphone jack

- - OLED panel with highly adjustable stand and built-in hood and cover accessory.

- - Available now for an estimated street price of $399.99* [USD]

Meeting Room Tools: Samsung Dex

- Samsung DEX is built into all Samsung monitors, TVs, and smartphones

- Devices can be used wirelessly with Bluetooth keyboards/mice

- This photo shows a Windows 11 PC connected to a Samsung monitor with a Bluetooth keyboard and mouse

Meeting Room Tools: Samsung Dex

- Samsung DEX is built into all Samsung monitors, TVs, and smartphones
- Samsung Fold phone being used with a Smart Monitor M8 over a wireless Dex connection
- Note the small removable camera on the monitor shown

Meeting Room Tools: Canon CR-N300 and AMLOS Software

- 4K camera which uses innovative AMLOS software to capture people and whiteboards for virtual meetings

- Software uses hand signals to start meetings, end meetings, spotlight a person, and capture the whiteboard

- Everyone can select their view from the buttons at the bottom of the screen

- Camera and PC running AMLOS software is required in the conference room

- Cameras start at $2,500 and software has a monthly subscription

- www.amlosgetcreative.com
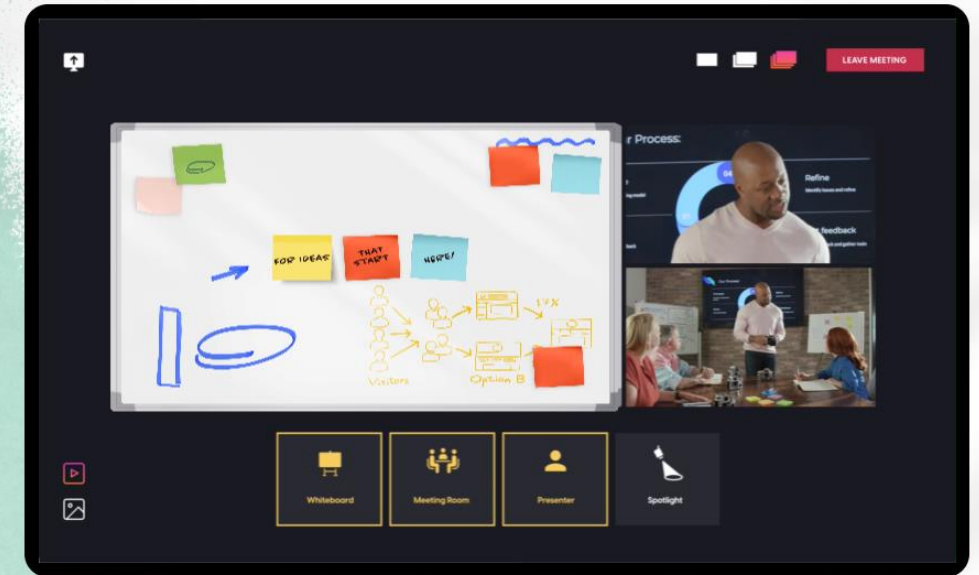
Keyboards And Mice: Kensington

Kensington MK7500F QuietType Pro Silent Mechanical Keyboard

- Allows users to have a backlit keyboard with mechanical keys but also near silent (<55db) operation

- Built-in rechargeable battery

- IPX4-certified spill-proof design

- Built-in camera/mic controls for Microsoft Teams and Zoom

- Available late Q1 2023

Keyboards And Mice: Matias

- PBT Mice ($49)
  - Hard plastic which feels satiny and will not discolor, ergonomic
  - Available in white and black, with wired USB-A or USB-C connector
  - Sturdy aluminum wheel
- RGB Backlit Wired Aluminum Keyboard for PC ($99)
  - Adjustable RGB backlighting
  - Built-in USB 2.0 port
  - Very quiet
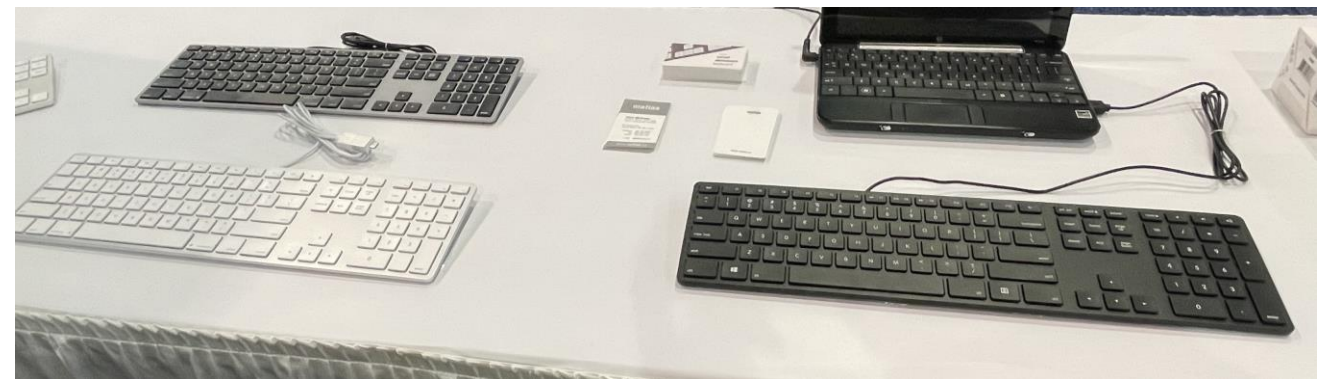
Epson RapidReceipt RR-600W
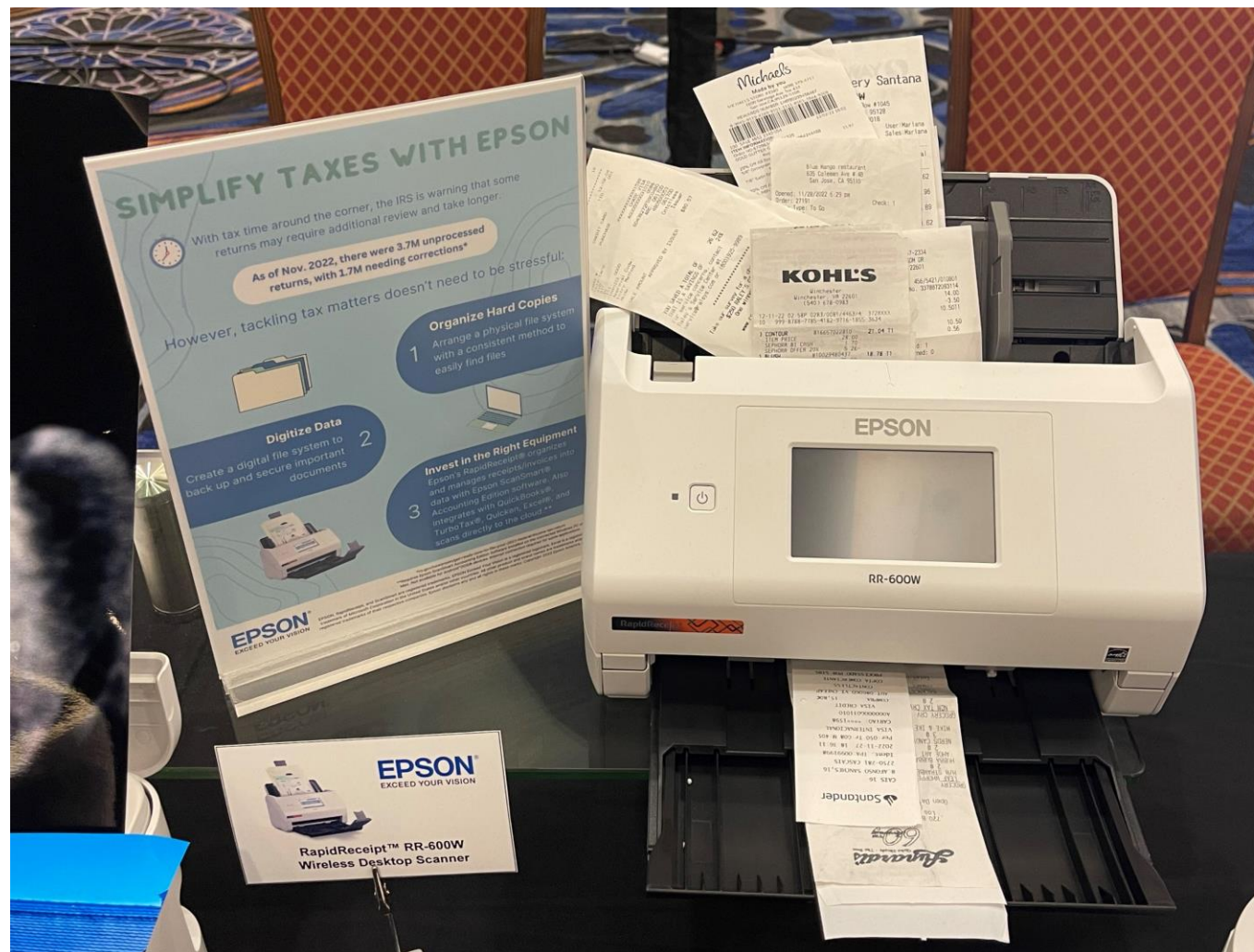
Li-Fi Data Transmission

- Uses flickering of light to transmit data rapidly over a small coverage area
  - The flickering is imperceptible by the human eye
- Currently used in military and large industrial applications where Wi-Fi is ineffective
- Expect consumer/business devices and applications to show up in the future
- Used on one Paris Metro line to transmit 40 GB of CCTV data in a 20-second stop(!)
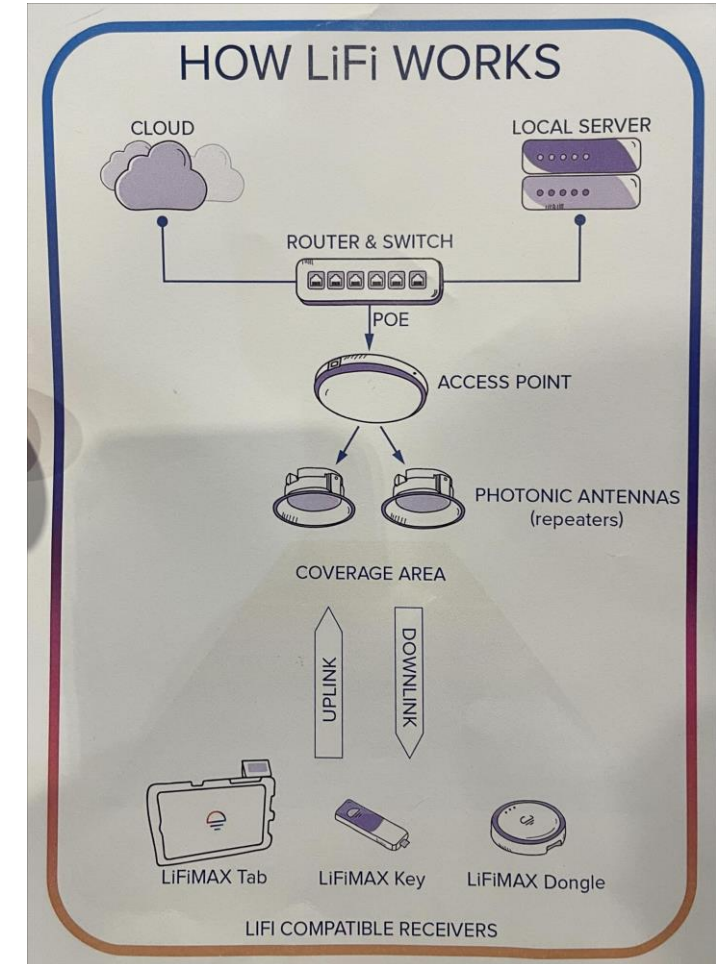
Home Automation Standards

- The Gadget Standard: **Matter**

- The Appliance Standard: **Home Connect**

- The Legacy Standard: **Z-Wave**

Home Automation: Matter ✴ matter

- Created by Connectivity Standards Alliance (formerly Zigbee)
- Founders are Amazon, Apple, Google, Samsung SmartThings, and the Zigbee Alliance
- Goal is to achieve interoperability among smart home and internet of things (IoT) devices from different manufacturers/ different platforms
- V1 of its royalty-free specification released in October 2022, v2 expected in Q2 2024
- Based on internet protocol, and does not require a proprietary hub to communicate with devices
- Video / PcMag Article

Home Automation: Home Connect

- Standard, which creates a single app that can be used with home appliances from multiple manufacturers (FAQ)

- Current members are Bosch, Samsung SmartThings, SideChef, LaMetric, Kitchen Stories, and Enphase

- End users can control devices with the manufacturer's app, the Home Connect app, or another manufacturer's app

- Spec is also integrated with Google Home and Amazon Alexa voice assistants as well as IFTTT, Fitbit, and other platforms

Home Connect

Home Automation: Z-Wave

- Leading wireless technology for legacy IoT devices, with over 20 years in the marketplace and 2,100 certified products
- Requires a Z-Wave hub to communicate with most devices
- Devices create a wireless mesh network to communicate with each other and with the internet
- Uses an ultra low power sub 1 GHz frequency to communicate with devices, so should have good penetration of walls and little interference – they claim a range in clear air of 100 m /328 feet
- Devices are supposed to be interoperable, but cross-compatibility of apps is not guaranteed, and it can be very complex to implement without experience with the devices

Strange But True: Bird Buddy

- Smart bird feeder with a built-in Wi-Fi connected camera
- Captures images of birds when they are eating at your feeder
- Images are uploaded to Bird Buddy's server and birds are recognized using AI
- Mobile app allows you to see pictures of the birds in your yard
- $249 and up, www.mybirdbuddy.com

Strange But True: Fluent Pet

- Created by PhD Candidate in cognitive science at UCSD

- Colored pads with recorded words used to train dogs/cats about the meaning of the words

- The cat/dog can then communicate with you using the pads, with you speaking back to your pet

- The pads can be analog (sound only or digital (sound plus app communication)

- CES Innovation Award Winner

- Randy's experience....

- Learn more: https://how.theycantalk.org

- This device: https://fluent.pet/

Heavy Equipment

PERSONAL TECHNOLOGY

The Glasses !!!

Experience: iRoma Scents

- iRomaScents Digital Scent Generator
- Allows cinemas, stores, and home entertainment to engage using odor
- Scent Generator is a personalized physical device with a cartridge of scents that are delivered at precise times
- Companies/producers can use an editor to set up the timing and type of a scent to match key spots in a video using the ScentTrack Editor
- www.iromascents.com

Health Tech: Eye Doctor

- [M2S Eye Doctor](#) and [NeuroSwift](#)

- Performs eye exams and rehabilitation therapy

- Eye exams performed with VR goggles and personal health data

- Can also create and perform tailored therapy for those recovering from eye injuries

Health Tech: SmarTooth

- **SmarTooth ([video](#))**
- Wand uses sound to detect cavities and problems
- Cavity severity is indicated by 1 of 3 sounds
- Results can be plotted in a mobile app and transmitted to a dentist
- Great for people with anxiety
- CES 2023 Innovation Award
- www.smartooth.co
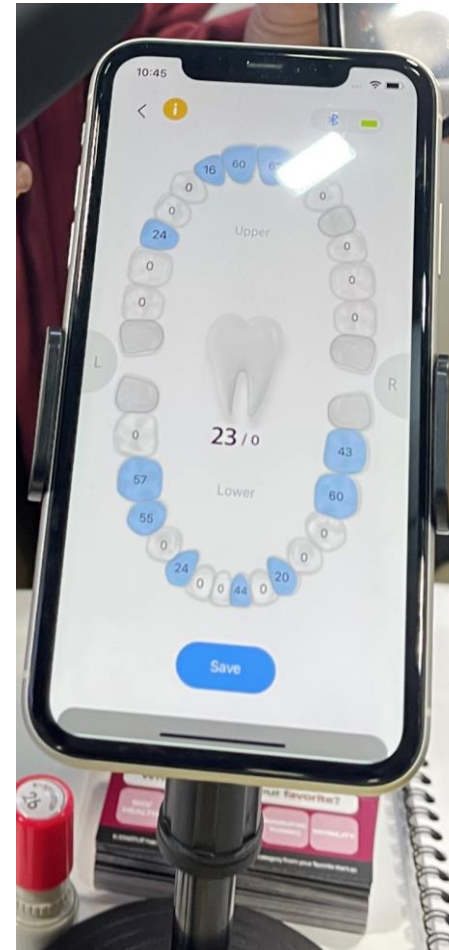
Green (mute) You're in clear!
Light
Sound
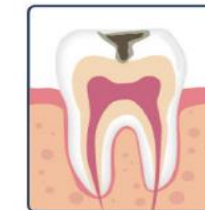
Amber (Slow beeping) Keep an eye on it.
Light
Sound

Red (fast beeping) It's time to see the dentist.
Light
Sound

Health Tech: CPR

- Automated chest compression devices are now available from [Michigan Instruments](), [Stryker](), and others

- Most have a frame which surrounds the patient, and once activated, a cylinder is used to compress the chest and administer automated CPR

Health Tech: Toilet Seat

Casana Heart Seat

- Tracks blood pressure, heart rate and oxygen saturation over an extended period
- Has built in battery
- Connects to cloud data store using Bluetooth LE
- Physicians can be notified when measures are outside a defined normal range
- www.casanacare.com
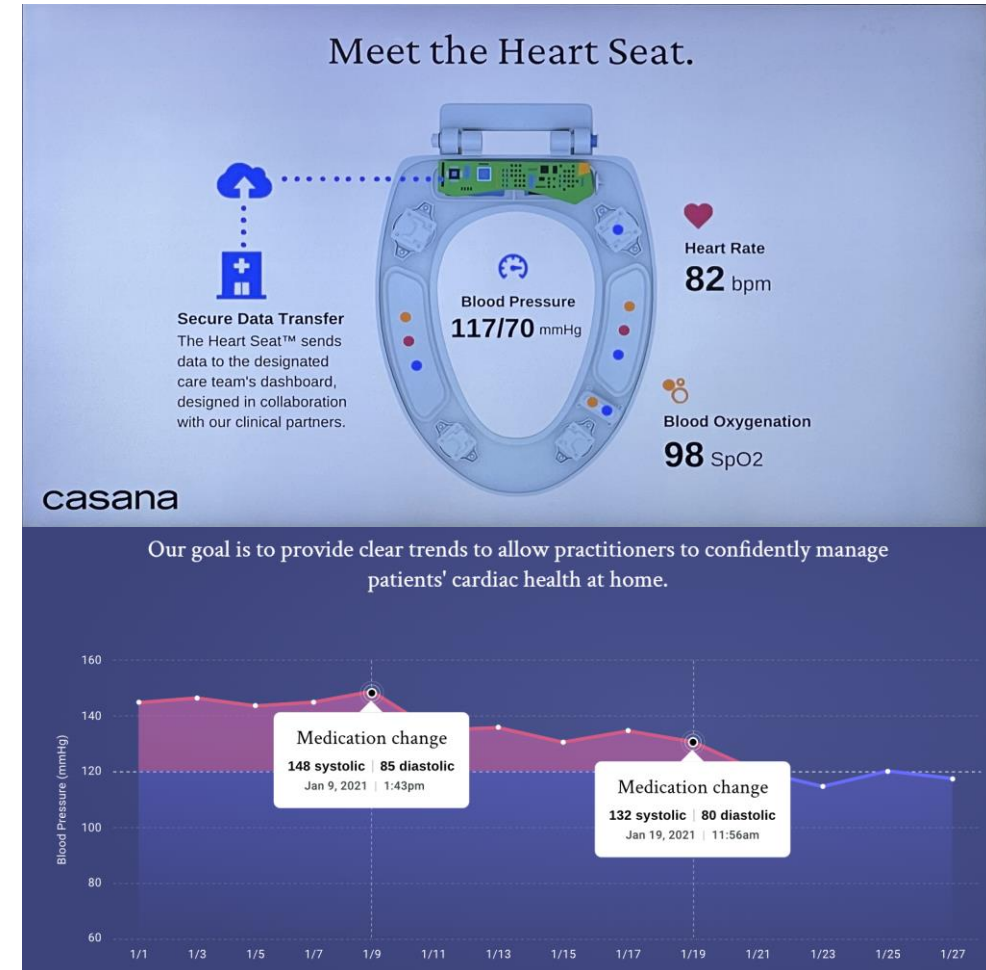
Assistive Standing Device

- Archelis frame is an exoskeleton designed to hold a worker upright when they are in a fixed position without requiring them to use their muscles to remain standing

- This reduces strain on the muscles and joints (especially those in the legs and back) and could help reduce repetitive motion injuries

- en.archelis.com

An overview of the technology and how to use it in firms

GENERATIVE AI – CHATGPT IMPACT, LLM, AND REGULATION
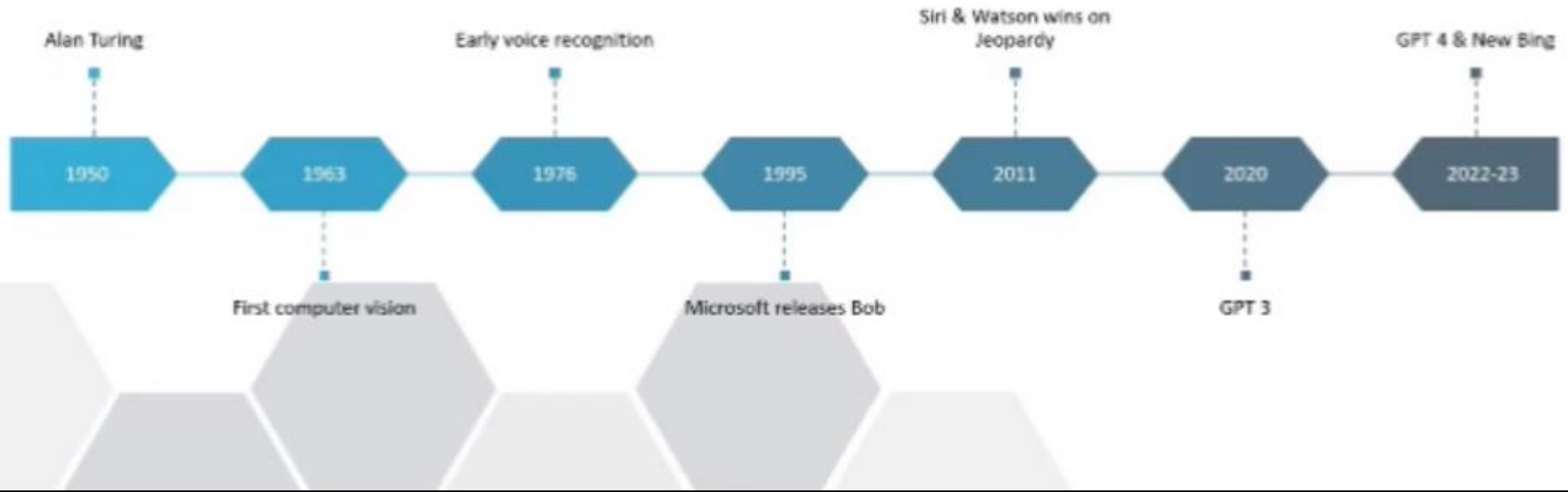
Future of Life Institute, An NGO

- In an open letter, "should we automate away all the jobs, including the fulfilling ones? Should we develop non-human minds that might eventually outnumber, outsmart...and replace us? Should we risk loss of control of our civilization?" calling for a six-month "pause" in the creation of the most advanced forms of artificial intelligence (AI) starting with 100's of signatures and growing to 20,000+

- Italy is the first government to ban ChatGPT as a result of privacy concerns according to the NY Times, 3/31/2023, opened again on May 5

"Large Language Models" (LLMs)

- LLMs—the sort that powers ChatGPT, a chatbot made by OpenAI, a startup—have surprised even their creators with their unexpected talents as they have been scaled up

- Such "emergent" abilities include everything from solving logic puzzles and writing computer code to identifying films from plot summaries written in emoji, passing the bar & USMLE, but failing to pass the CPA Exam

- LLMs can, in effect, be trained on the entire internet—which explains their capabilities, good and bad

AI Could Change Computing, Culture, And The Course of History

- As a way of presenting knowledge, LLMs promise to take both the practical and personal side of books further, in some cases abolishing them altogether

- An obvious application of the technology is to turn bodies of knowledge into subject matter for chatbots. Rather than reading a corpus of text, you will question an entity trained on it and get responses based on what the text says. Why turn pages when you can interrogate a work as a whole?

- Bloomberg, a media company, is working on BloombergGPT, a model for financial information. There are early versions of a QuranGPT and a BibleGPT

Uncanny AI

- Such applications and implications call to mind Sigmund Freud's classic essay on the Unheimliche, or uncanny. Freud takes as his starting point the idea that uncanniness stems from "doubts [as to] whether an apparently animate being is really alive; or conversely, whether a lifeless object might not be in fact animate"

- "There's no 'ultimate theoretical reason' why anything like this should work," Stephen Wolfram, a computer scientist and the creator of Wolfram Alpha, a mathematical search engine, recently concluded in a remarkable (and lengthy) blog post trying to explain the models' inner workings

Where Could This Go?

- This raises two linked but mutually exclusive concerns: that AI's have some sort of internal working which scientists cannot yet perceive; or that it is possible to pass as human in the social world without any sort of inner understanding

- "These models are just representations of the distributions of words in texts that can be used to produce more words," says Emily Bender, a professor at the University of Washington in Seattle

- LLM models are hard to dismiss as "mere babblers", in the words of Blaise Agüera y Arcas, the leader of a group at Alphabet. Behavior believed to be human is not necessarily so

LLMs Transform Lives and Labor

- ChatGPT embodies more knowledge than any human has ever known
- Contemporary explosion of the capabilities of AI software began in the early 2010s, when a software technique called "deep learning" became popular
- Using the magic mix of vast datasets and powerful computers running neural networks on Graphics Processing Units (GPUs), deep learning dramatically improved computers' abilities to recognize images, process audio and play games
- But neural networks tended to be embedded in software with broader functionality, like email clients

LLMs-A Giant Exercise in Statistics

- First, the language of the query is converted from words, which neural networks cannot handle, into a representative set of numbers

- GPT-3, which powered an earlier version of ChatGPT, does this by splitting text into chunks of characters, called tokens, which commonly occur together

- These tokens can be words, like "love" or "are", affixes, like "dis" or "ized", and punctuation, like "?"

- GPT-3's dictionary contains details of 50,257 tokens

- GPT-3 vs. GPT-4 has 175 billion parameters vs. 100 trillion

LLMs-Four Key Steps

Tokenization   **Embedding**

The promise of large language models is that they _

aptitude   talent
potentiality ability
potential capability
promise capacity

vocabulary
tongue **language**
speech

massive
vast   huge   great
enourmous   big
large

facsimile
model replica
imitation duplicate
representation
lookalike

LLMs-Four Key Steps

Attention

Completion

The	22%	The
promise	20%	promise
of	18%	of
large	8%	large
language	12%	language
models	3%	models
is	9%	is
that	5%	that
they	2%	they
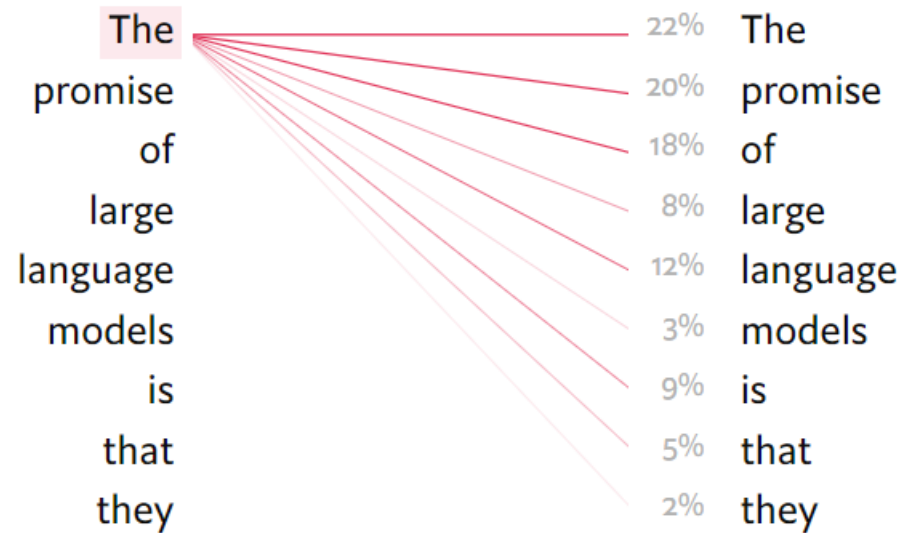
The promise of large language models is that they __

can	62%
will	11%
are	7%
capture	2%
could	2%

LLMs-Token Processing

- GPT-3 can process a maximum of 2,048 tokens at a time, which is around the length of a long article

- GPT-4, by contrast, can handle inputs up to 32,000 tokens long—a novella

- The tokens are then **assigned the equivalent of definitions** by placing them into a "meaning space" where words that have similar meanings are located in nearby areas

LLMs-Attention Network

- An LLM then deploys its "attention network" to make connections between different parts of the prompt. Someone reading our prompt, "the promise of large language models is that they…", would know how English grammar works and understand the concepts behind the words in the sentence. It would be obvious to them which words relate to each other

- An LLM, however, must learn these associations from scratch during its training phase—over billions of training runs, its attention network slowly encodes the structure of the language it sees as numbers (called "weights") within its neural network

LLMs-Generate Words "Responses"

- Once the prompt has been processed, the LLM initiates a response. At this point, for each of the tokens in the model's vocabulary, the attention network has produced a probability of that token being the most appropriate one to use next in the sentence it is generating. The token with the highest probability score is not always the one chosen for the response—how the LLM makes this choice depends on how creative the model has been told to be by its operators

- The LLM generates a word and then feeds the result back into itself. The first word is generated based on the prompt alone. The second word is generated by including the first word in the response, then the third word by including the first two generated words, and so on. This process—called autoregression—repeats until the LLM has finished

LLMs-Not Always Predictable

- Jason Wei, a researcher at OpenAI, has counted 137 so-called "emergent" abilities across a variety of different LLMs

- The abilities that emerge are not magic—they are all represented in some form within the LLMs' training data (or the prompts they are given) but they do not become apparent until the LLMs cross a certain, very large, threshold in their size

- Jonas Degrave, an engineer at DeepMind, an AI research company owned by Alphabet, has shown that ChatGPT can be convinced to act like the command line terminal of a computer, appearing to compile and run programs accurately. Just a little bigger, goes the thinking, and the models may suddenly be able to do all manner of useful new things

LLMs-Training And Compute

- GPT-3 was trained on several sources of data, but the bulk of it comes from snapshots of the entire internet between 2016 and 2019 taken from a database called Common Crawl of 45TB reduced to 570GB of quality text

- By comparison AlexNet, a neural network that reignited image-processing excitement in the 2010s, was trained on a dataset of 1.2m labelled images, a total of 126 gigabytes—less than a tenth of the size of GPT-4's likely dataset

Faster, higher, more calculations
Computing power used in training AI systems
Selected systems, floating-point operations, log scale

● Industry ● Academia ● Research consortium
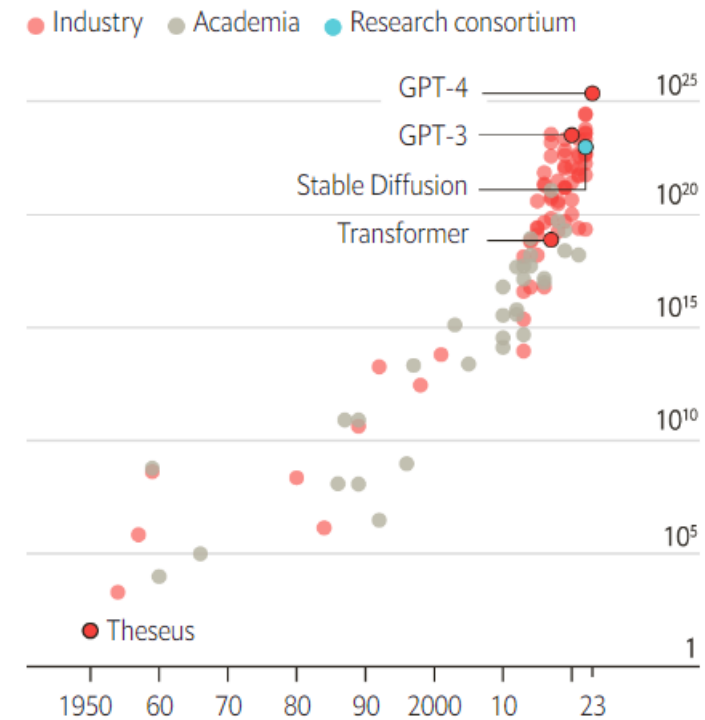
Sources: Sevilla et al., 2023; Our World in Data

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LLMs-Attention And Scaling

- "Without attention, the scaling would not be computationally tractable," says Yoshua Bengio, scientific director of Mila, a prominent AI research institute in Quebec

- GPT-3 has hundreds of layers, billions of weights, and was trained on hundreds of billions of words. By contrast, the first version of GPT, created five years ago, was just one ten-thousandth of the size

- Training GPT-3, for example, used 1.3 gigawatt-hours of electricity (enough to power 121 homes in America for a year), and cost OpenAI an estimated $4.6m. GPT-4, which is a much larger model, will have cost disproportionately more (in the realm of $100m) to train
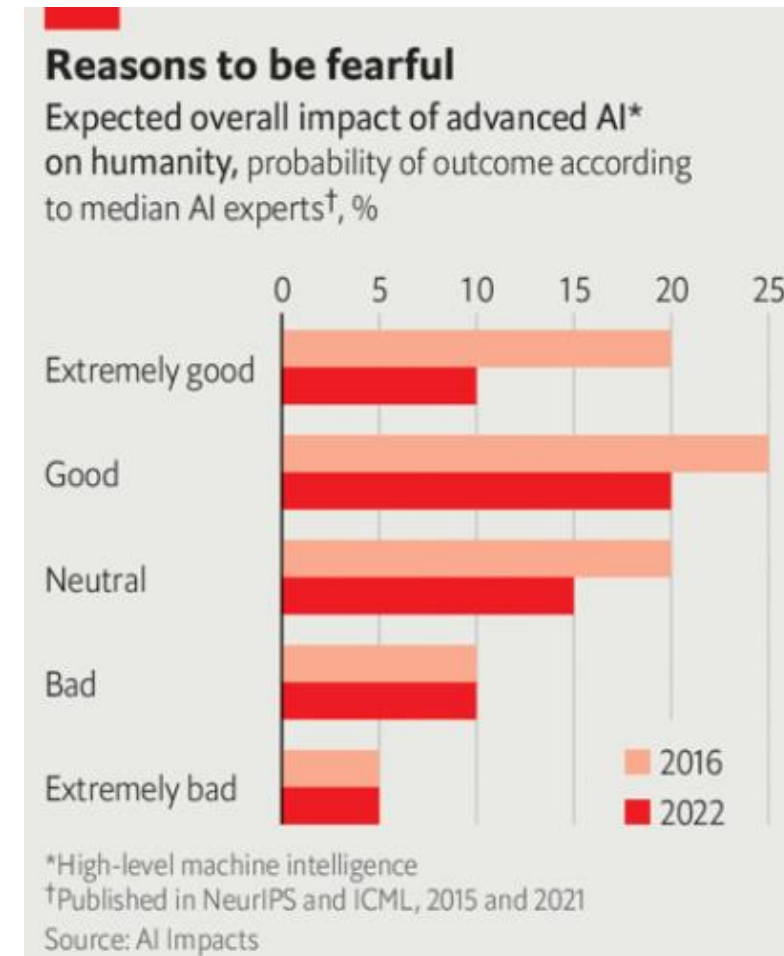
How Generative AI Could Go Wrong

- In 1960 Norbert Wiener published a prescient essay. In it, the father of cybernetics worried about a world in which "machines learn" and "develop unforeseen strategies at rates that baffle their programmers." Such strategies, he thought, might involve actions that those programmers did not "really desire" and were instead "merely colorful imitation[s] of it."

- Wiener illustrated his point with the German poet Goethe's fable, "The Sorcerer's Apprentice", in which a trainee magician enchants a broom to fetch water to fill his master's bath. But the trainee is unable to stop the broom when its task is complete. It eventually brings so much water that it floods the room, having lacked the common sense to know when to stop

K2 Enterprises

How Generative AI Could Go Wrong

- In August 2022, AI Impacts, an American research group, published a survey that asked more than 700 machine-learning researchers about their predictions for both progress in AI and the risks the technology might pose.

- The typical respondent reckoned there was a 5% probability of advanced AI causing an "extremely bad" outcome, such as human extinction (see chart)

- Fei-Fei Li, an AI luminary at Stanford University, talks of a "civilizational moment" for AI

- Asked by an American TV network if AI could wipe out humanity, Geoff Hinton of the University of Toronto, another AI bigwig, replied that it was "not inconceivable"

Reasons to be fearful

Expected overall impact of advanced AI* on humanity, probability of outcome according to median AI experts†, %

| | 0 | 5 | 10 | 15 | 20 | 25 |

Extremely good
Good
Neutral
Bad
Extremely bad

- 2016
- 2022

*High-level machine intelligence
†Published in NeurIPS and ICML, 2015 and 2021
Source: AI Impacts

Human Quality Writing?

- Robert Trager of the Centre for Governance on AI explains, one risk is of such software "making it easier to do lots of things—and thus allowing more people to do them."

- A text-generation engine that can convincingly imitate a variety of styles is ideal for spreading misinformation, scamming people out of their money or convincing employees to click on dodgy links in emails, infecting their company's computers with malware

- Chatbots have also been used to cheat at school

- In April, a Pakistani court used GPT-4 to help make a decision on granting bail—it even included a transcript of a conversation with GPT-4 in its judgment

What Are Real Concerns?

- Hallucinations – making things up

- "Alignment problems", the technical name for the concern raised by Wiener in his essay. An AI might single-mindedly pursue a goal set by a user

- "Reinforcement learning from human feedback" (RLHF). Described in a paper published in 2017, RLHF asks humans to provide feedback on whether a model's response to a prompt was appropriate

- Another approach, borrowed from war-gaming, is called "red-teaming". OpenAI worked with the Alignment Research Centre (ARC), a non-profit, to put its model through a battery of tests. The red-teamer's job was to "attack" the model by getting it to do something it should not, in the hope of anticipating mischief in the real world

Is It Fixable?

- Sam Bowman of New York University and also of Anthropic, an AI firm, thinks that pre-launch screening "is going to get harder as systems get better"

- Another risk is that AI models learn to game the tests, says Holden Karnofsky, an adviser to ARC and former board member of OpenAI

- Another idea is to use AI to police AI. Dr Bowman has written papers on techniques like "Constitutional AI", in which a secondary AI model is asked to assess whether output from the main model adheres to certain "constitutional principles"

International Agency For AI?

- In the past year alone 37 regulations mentioning AI were passed around the globe

- A poll by the Centre for the Governance of AI found that 91% of a representative sample of 13,000 people across 11 countries agreed that AI needs to be carefully managed

- Call for a global, neutral, non-profit International Agency for AI (IAAI) by Gary Marcus and Anka Reuel

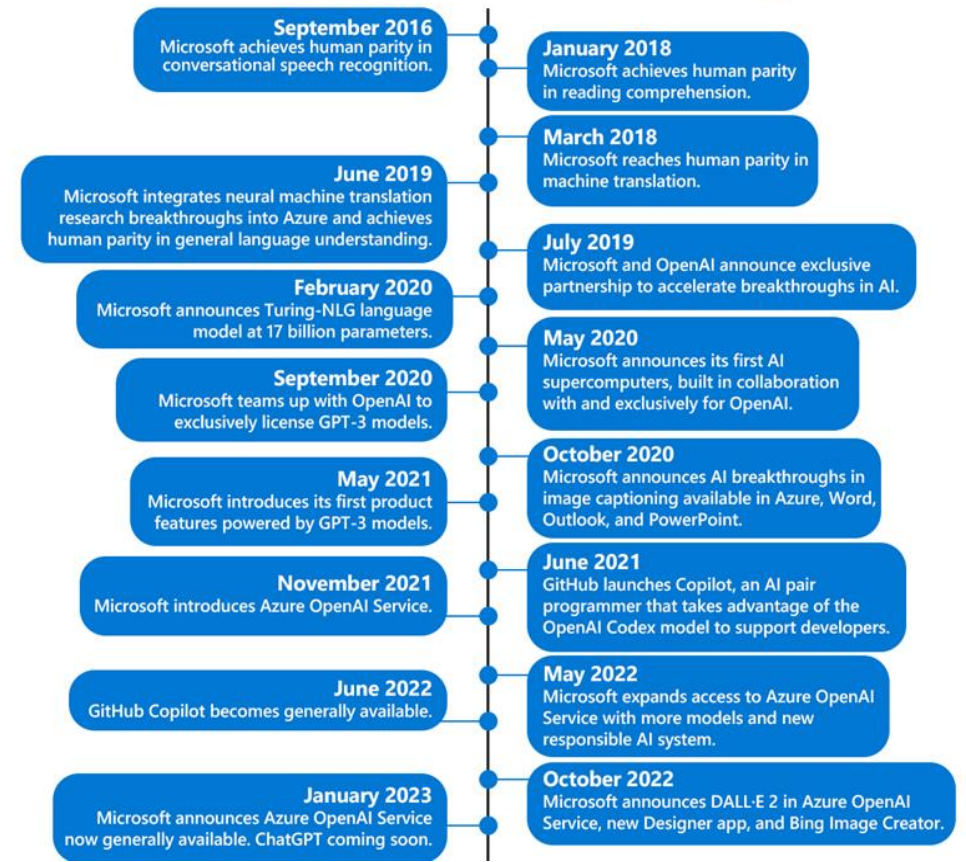- Interpretability requirements of the AI Bill of Rights proposed by the Biden administration

Changes in Security, Server Operating Systems, Windows, and Microsoft Office
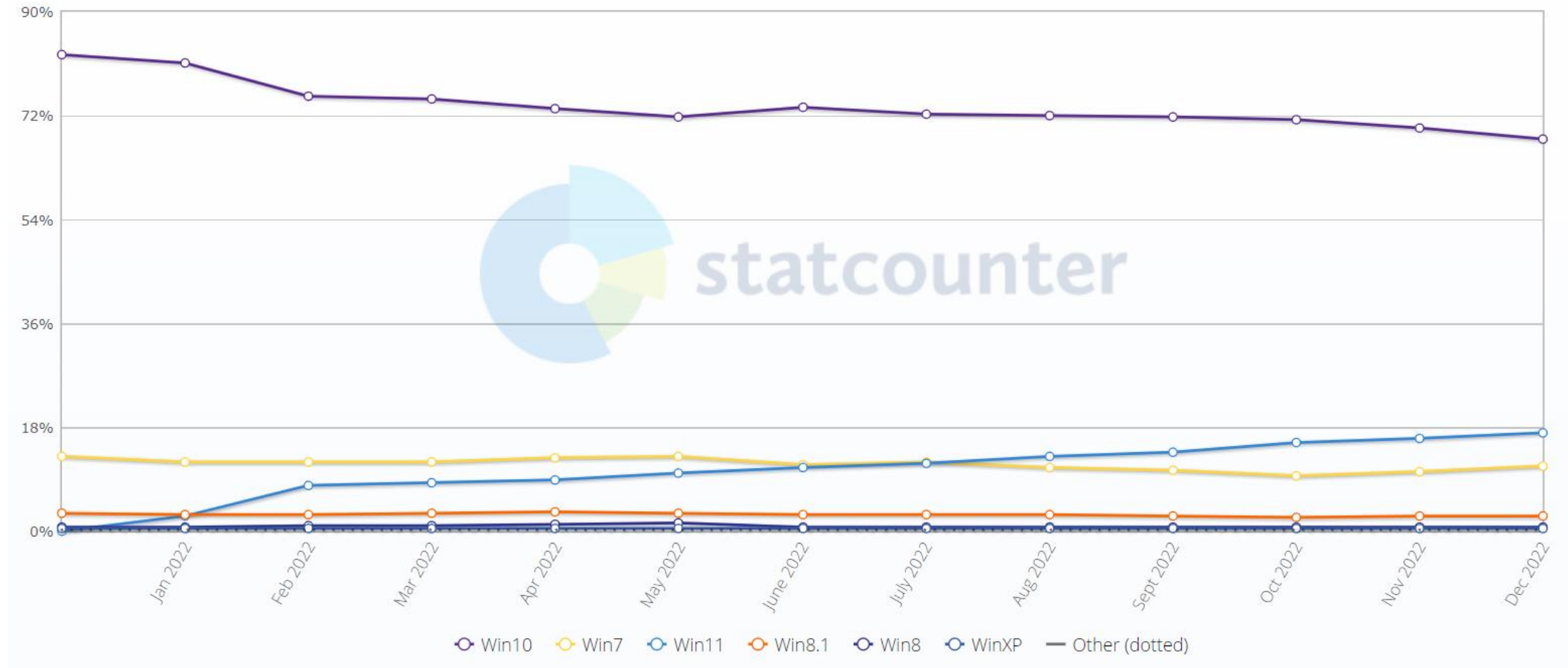
MICROSOFT UPDATES

- Microsoft has made three significant investments in a partnership with OpenAI since 2019 totaling tens of billions of dollars driven by CTO Kevin Scott
- Azure is OpenAI's exclusive cloud provider and MS/OpenAI have collaborated to create a top 5 supercomputer running on Azure in 2020
- Microsoft and OpenAI have deployed GitHub Copilot, DALL·E 2 and ChatGPT on Azure

Timeline of key Microsoft AI breakthroughs

September 2016 Microsoft achieves human parity in conversational speech recognition.

January 2018 Microsoft achieves human parity in reading comprehension.

March 2018 Microsoft reaches human parity in machine translation.

June 2019 Microsoft integrates neural machine translation research breakthroughs into Azure and achieves human parity in general language understanding.

July 2019 Microsoft and OpenAI announce exclusive partnership to accelerate breakthroughs in AI.

February 2020 Microsoft announces Turing-NLG language model at 17 billion parameters.

May 2020 Microsoft announces its first AI supercomputers, built in collaboration with and exclusively for OpenAI.

September 2020 Microsoft teams up with OpenAI to exclusively license GPT-3 models.

October 2020 Microsoft announces AI breakthroughs in image captioning available in Azure, Word, Outlook, and PowerPoint.

May 2021 Microsoft introduces its first product features powered by GPT-3 models.

June 2021 GitHub launches Copilot, an AI pair programmer that takes advantage of the OpenAI Codex model to support developers.

November 2021 Microsoft introduces Azure OpenAI Service.

May 2022 Microsoft expands access to Azure OpenAI Service with more models and new responsible AI system.

June 2022 GitHub Copilot becomes generally available.

October 2022 Microsoft announces DALL·E 2 in Azure OpenAI Service, new Designer app, and Bing Image Creator.

January 2023 Microsoft announces Azure OpenAI Service now generally available. ChatGPT coming soon.

Windows 11 Adoption – Last 12 Months

Microsoft Teams Premium

- <u>New features</u>:
  - **Meeting Guides**: Meant to help users pick the right meeting experience (client call, brainstorming meeting, help desk support, etc.). IT admins will be able to customize and manage this feature so that options will be preset for particular meeting types
  - **Branding**: Teams users can brand meeting experiences with custom logos, backgrounds for the Teams lobby, and custom scenes for Together Mode
  - **Intelligent recap**: Users will get personalized highlights from Teams meetings
  - **AI-generated tasks**: Action items are automatically assigned from meetings
  - **Personalized insights**: Callouts for times in a meeting when a user's name was mentioned, screens are shared, and when people join and leave.
  - **Intelligent search**: Search for transcripts will get more features like suggested speakers to help find specific points for reference

Microsoft Teams Premium

- New features (continued):
  - **Live translations for captions:** Available in 40 spoken languages
  - **Advanced meeting protection:** Users will get tools for better securing confidential meetings, such as board meetings, financial discussions, or product launch plans. This will include watermarking to deter leaks, limiting who can record, and more. Microsoft 365 E5 customers will be able to leverage existing Microsoft Purview Information Protection sensitivity labels to apply relevant meeting protection options automatically
  - **Advanced webinars:** Will include features like registration waitlist and manual approvals, automated reminder emails, a virtual green room for hosts and presenters, and the ability to manage what attendees see
  - **Advanced virtual appointments:** Extra features include pre-appointment SMS reminders, a branded lobby experience, and post-appointment follow-ups
- $10/user/month

Microsoft Places

- Helps staff schedule when in/out of office, coordinate meetings
- Includes booking of meeting rooms/spaces which match mix of in person/virtual attendees
- Hot desk booking (think audit staff room)
- Facilitates impromptu "serendipitous meet-ups"
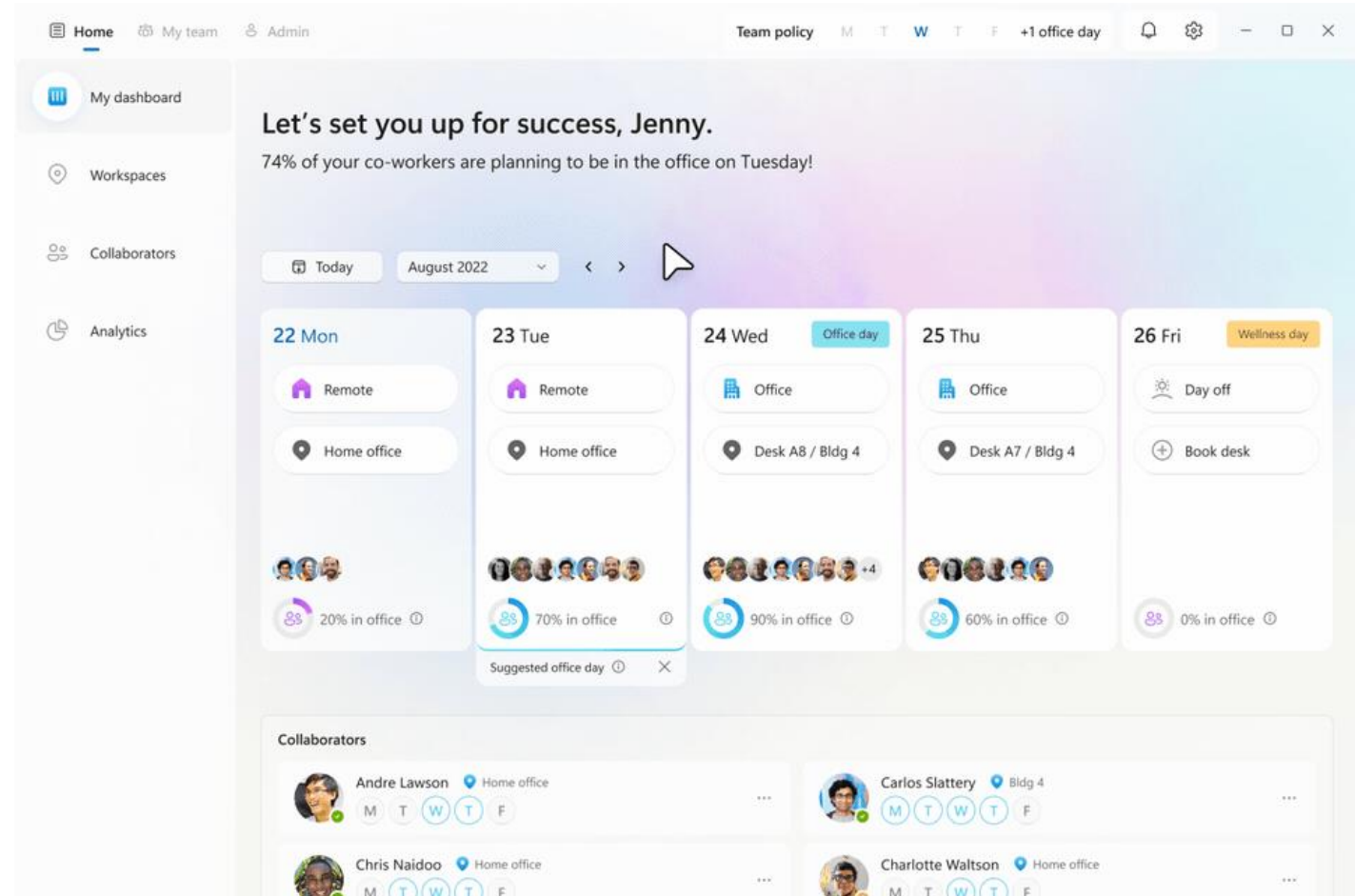
Microsoft Places

- Leverages [Teams Rooms](#) (Teams Rooms are free for up to 25 rooms, $40/room/mo for premium features)
  - [Supported devices list](#)
  - [Plans and pricing](#)
- Reporting on space utilization
- Recommendations for energy savings on days when floors/spaces are not needed
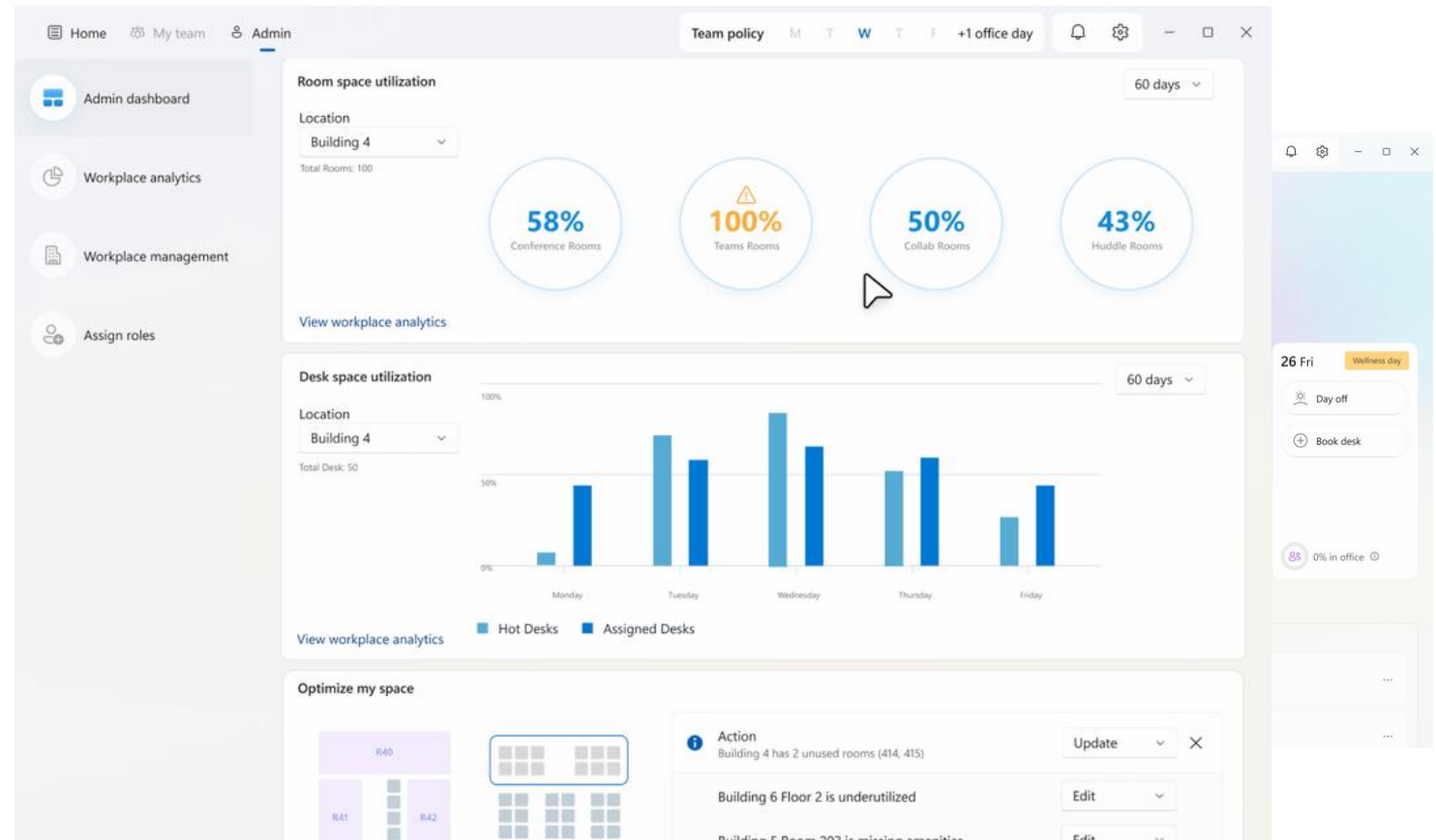
Microsoft Places

New Outlook Features For Hybrid

- Adding support for working hours and locations to simplify meeting planning

- New Meeting Recap feature coming, which summarizes all meeting info and links to the recordings, if available

- Outlook on MacOS is getting support for focused profiles and MacOS filters
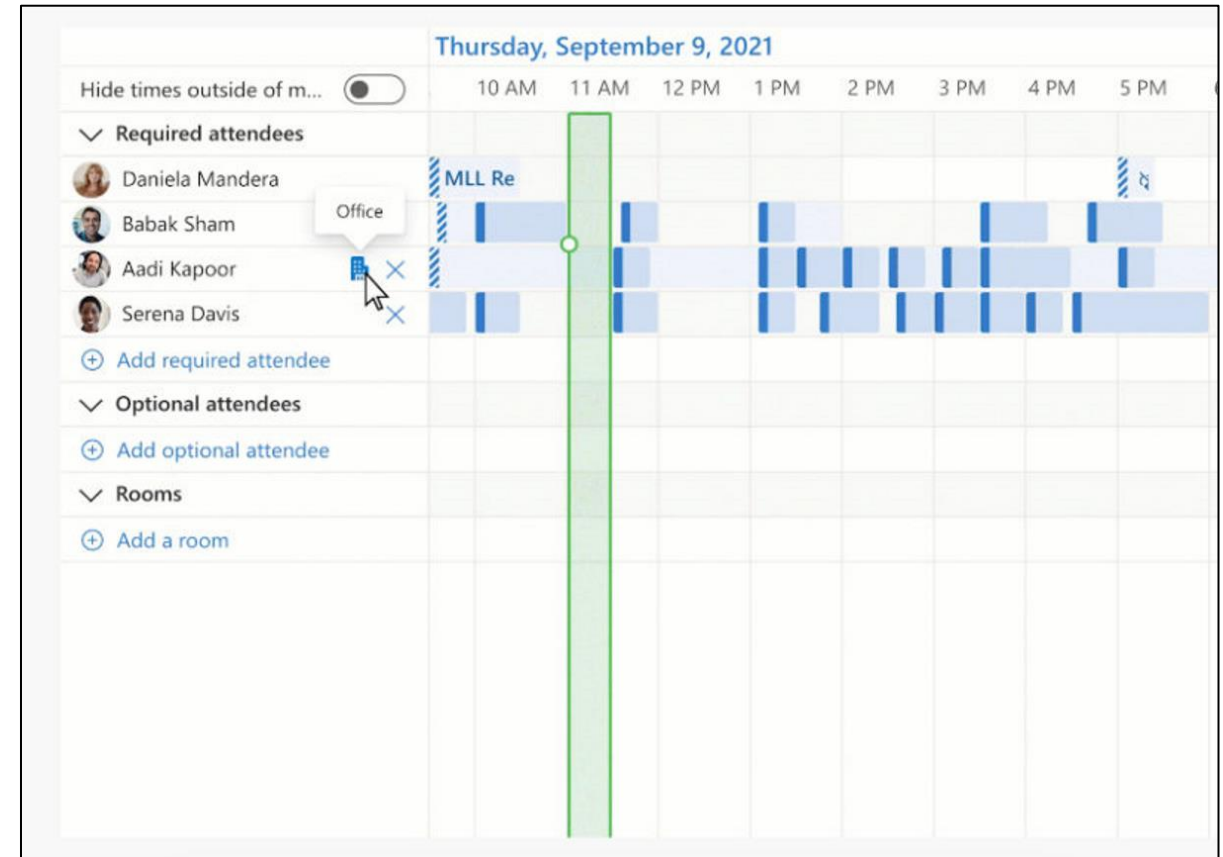
Teams and Avatars May Launch

- Teams will make a user's Meta avatar available in Teams
- This is designed to be a substitute for a camera-on meeting
- Immersive Teams meeting experience with Meta Quest VR headsets

K2 Enterprises
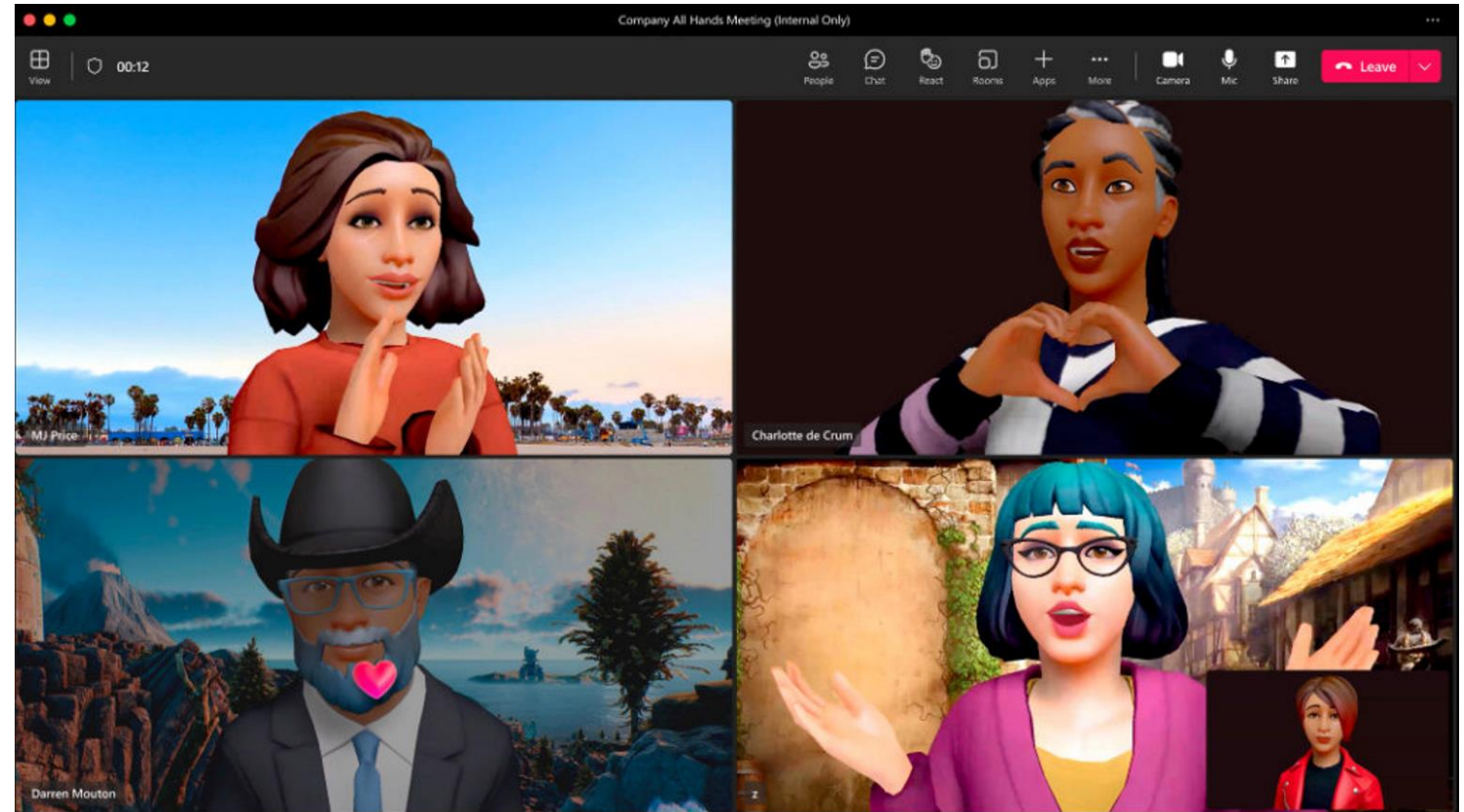
Other Microsoft Topics

- Kaizala group-messaging service (SMS) to be discontinued in 8/2023, replaced with Teams
- Office 2016/2019 users may experience issues when using MS 365 back-end services in 2023, [but will not be blocked from using those services](#)
- Generative AI dubbed Microsoft 365 Copilot for Work
    - Turn a Word document into an animated PowerPoint presentation, complete with speaker notes
    - Most people, for example, only use about 10% of PowerPoint's capabilities; the company sees AI as an easier way to access the other 90%
    - Viva Sales and other virtual support agents
- New discover button in Edge with the chat, compose and insights tabs. ChatGPT4 also incorporated in Bing
- On September 30, 2024, the ability to manage authentication methods in the legacy multifactor authentication (MFA) and self-service password reset (SSPR) policies will be retired. Migrate Authentication to Azure Active Directory
- Windows 11's MyPhone app will support sending and receiving Apple iMessage text messages starting in mid-May 2023 (available to Windows Insiders now)
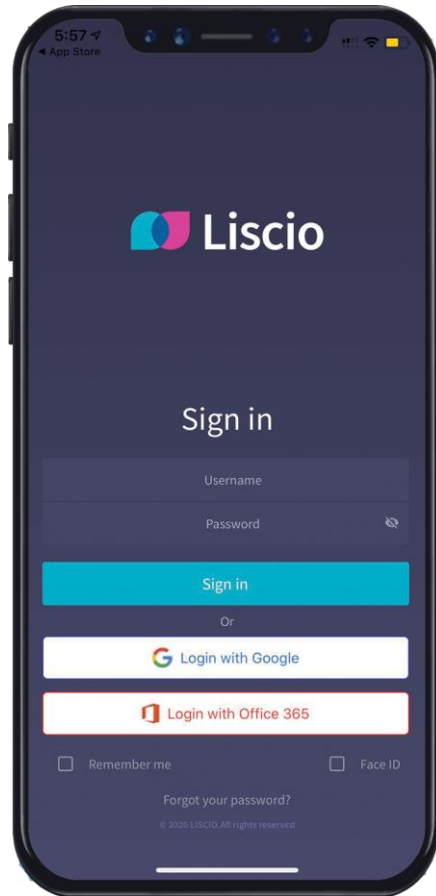
New and Updated Products

SOFTWARE SOLUTIONS

K2 Enterprises

Single Portal Collaboration Benefits

- **Streamlined Access**: A single portal can provide employees with streamlined access to all the applications and tools they need to perform their job functions without having to navigate multiple systems

- **Improved Efficiency**: By having everything in one place, employees can work more efficiently, reducing the time spent switching between different systems and tools

- **Enhanced Security**: A single portal can provide enhanced security by centralizing access control and authentication, reducing the risk of security breaches and unauthorized access

- **Simplified Management**: A single portal can simplify management by providing a single point of control for IT administrators, reducing the complexity and cost of managing multiple systems

- **Better User Experience**: A single portal can improve the user experience by providing a unified and consistent interface for employees, reducing confusion and improving adoption

- **Cost Savings**: By consolidating multiple systems into a single portal, businesses can reduce the cost of licensing, maintenance, and support for multiple systems

Liscio Client Collaboration=Client Experience 2.0

Suralink

Enterprise-grade security and compliance

SECURITY

- Multi-factor authentication
- Inactivity time-out
- Encrypted third-party access
- Access restriction by role or engagement
- SSL AES 256-bit encryption
- SSAE16 Type II SOC1, SOC2 compliant data centers
- Recovery, backup, audit logs

COMPLIANCE

- SOC2
- GDPR
- CCPA

ISO 27001 **ISO 9001** **ISO 14001** **OHSAS 18001**

Request & Receive
Sensitive Information

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SmartVault - Built With Security

- One Central Document Storage for All Client & Practice Docs
  - A core system to maintain compliance and workflow efficiency for the modern bookkeeping, tax, and accounting practice

Integrated Platform

One place to securely store, manage and share all your files. Integrated with apps you love.
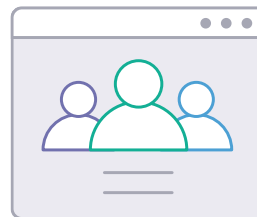
Branded Client Portals

Give your clients a secure, easy, and professional way to collaborate with you in the cloud.

Streamlined Workflow

Reduce time spent on repetitive tasks and focus on activities that bring more value to your business

Accounting Software

Small Business

- Accounting Power
- AccountingSuite
- QuickBooks
- Spire Systems
- Xero
- Zoho Books

Mid-Market

- Acumatica
- Dynamics 365
- NetSuite
- Sage Intacct
- SAP Business One
- Many more…

Automation Software

- **Zoho Expense:** an expense management software that OCR's documents, matches expenses with credit cards, and allocates expenses against jobs

- **Bill.com**: an accounting automation software that automates the accounts payable and accounts receivable processes, including invoice management, payment processing, and approval workflows

- **Expensify**: automates the expense reporting process, including receipt capture, expense tracking, and reimbursement processing

- **Hubdoc**: an automated data capture and document management platform that extracts data from bills, receipts, and other financial documents and automatically imports the data into accounting software

- **Zapier**: an automation tool that allows users to connect multiple applications and automate workflows between them, including accounting software

- **Botkeeper:** an AI-powered bookkeeping and accounting automation platform that automates tasks such as bank reconciliation, data entry, and reporting

- **KashFlow:** a cloud-based accounting software that automates tasks such as invoicing, payment processing, and bank reconciliation

- **Acuity Scheduling:** a scheduling automation software that integrates with accounting software to automate billing and invoicing for services

- **Dext:** an accounting automation software that automates data entry and receipt capture and integrates with accounting software such as QuickBooks and Xero

CPA Firm Software

- **Thomson Reuters CS Professional Suite**: an integrated suite of accounting software programs that offers a range of features, including tax preparation, audit management, and practice management. Thomson is building toward the ONVIO platform

- **CCH Axcess**: a cloud-based software program that offers a range of features, including tax preparation, audit management, and practice management

- **Intuit ProConnect Tax Online**: a cloud-based tax preparation software that is designed for tax professionals. It offers features such as e-filing, electronic signature, and document management

- **Drake Tax**: a desktop-based tax preparation software that offers a range of features, including e-filing, client management, and report generation

- **Xero Practice Manager**: a cloud-based practice management software that is designed for accountants. It offers features such as time tracking, client management, and project management

- **IRIS**:
  - Doc.It
  - iChannel
  - AccountantsWorld
  - Practice Engine
  - STAR Practice Management
  - Apex HR
  - MyPay (formerly owned by Thomson Reuters)

Enterprise Technology Stacks

- **Salesforce Stack**: includes various Salesforce applications such as Sales Cloud, Service Cloud, and Marketing Cloud. It is used to manage customer interactions and sales processes and is popular among businesses of all sizes

- **Microsoft Office 365 Stack**: includes various Microsoft applications such as Word, Excel, and PowerPoint. It is used for document creation, collaboration, and communication and is popular among businesses of all sizes

- **Oracle Stack**: includes various Oracle applications such as Oracle E-Business Suite, Oracle Fusion Middleware, and Oracle Database. It is used for enterprise resource planning (ERP), human capital management (HCM), and customer relationship management (CRM) and is popular among large enterprises

- **SAP Stack**: includes various SAP applications such as SAP ERP, SAP BusinessObjects, and SAP HANA. It is used for ERP, CRM, and supply chain management and is popular among large enterprises

- **IBM Stack**: includes various IBM applications such as IBM Watson, IBM Cloud, and IBM Security. It is used for artificial intelligence (AI), cloud computing, and cybersecurity and is popular among large enterprises

Small & Mid Technology Stacks

- **Adobe Stack**: includes various Adobe applications such as Adobe Creative Cloud, Adobe Marketing Cloud, and Adobe Document Cloud. It is used for digital media, marketing, and document management and is popular among businesses of all sizes

- **Google Workspace Stack**: includes various Google applications such as Gmail, Google Drive, and Google Docs. It is used for communication, document creation, and collaboration and is popular among businesses of all sizes

- **Zoho One Stack**: includes various Zoho applications such as Books, Zoho Drive, and CRM. The capabilities in 50+ modules and the attractive pricing makes Zoho popular among businesses of all sizes

- **Dropbox Stack**: includes various Dropbox applications such as Dropbox Business, Dropbox Paper, and Dropbox Showcase. It is used for file storage, sharing, and collaboration and is popular among businesses of all sizes

- **Zoom Stack**: includes various Zoom applications such as Zoom Meetings, Zoom Webinars, and Zoom Phone. It is used for remote communication and collaboration and is popular among businesses of all sizes

- **Atlassian Stack**: includes various Atlassian applications such as Jira, Confluence, and Trello. It is used for project management, collaboration, and issue tracking and is popular among businesses of all sizes

Adobe Changes

- Price increase of 40% in July 2023, Adobe Connect down 20%
- Firefly-infused Photoshop Generative Fill AI
- Adobe aims to prevent deep fakes, theft of intellectual property
- Try for free for 7 days, then $21/mo. Photoshop, $55/mo. suite
- Ashley Still, Sr VP of Digital Media says Adobe has "built in an array of guard rails to make sure people don't use Firefly AI to create deep fakes...like a nutrition label for content"
  - Isolate an image, like a deer, generate deer in a wet alley at night
  - Embedded metadata includes attribution, provenance, role of AI
  - Adobe Content Authenticity Initiative
  - Models train only on IP with explicit license to use
  - Compensation model to be released

COMMUNICATIONS AND COLLABORATION

New And Improved Standards

- More routers with >1 GB ethernet
    - 2.5 Gb ethernet is a short-term solution, avoid
    - 10 Gb is coming soon to support 8K
- HDMI 3 – 80 Gbps
    - Standard not yet ratified, but manufacturers/chipmakers already gearing up for this new standard
- Wi-Fi 7: What's New
- DOCSIS 4: The 10 Gb future

Wi-Fi 7: What's New

- Newest Wi-Fi standard now out (802.11be)
- Speeds up to 46 Gbps
  - Unless using for mesh, need ethernet speeds above 1 Gbps
- Uses same frequencies as Wi-Fi 6E, but allows for channels of up to 320 Mhz vs. 160 Mhz for 6/6E
- All three standards use WPA 3, which encrypts all data between the access point and devices
- The first devices are available from TP-Link now

	Wi-Fi 6	Wi-Fi 6E	Wi-Fi 7
IEEE Standard	802.11ax	802.11ax	**802.11be**
Frequencies used (GHz)	2.4, 5	2.4, 5, **6**	2.4, 5, 6
MIMO Streams	8	8	16
Channel Width	20, 40, 80, 80+80, 160MHz	20, 40 , 80, 80+80, 160MHz	20, 40 , 80, 80+80, 160, 320MHz
Max speed	9.6 Gbps	9.6 Gbps	**46 Gbps**
WPA Standard	WPA 3	WPA 3	WPA 3

Wi-Fi 7: Technical Considerations

- Wi-Fi 7 includes 320 MHz Channels & 4K QAM (**Quadrature Amplitude Modulation**), providing more densely packed channels and more data density.

- The benefit of a typical Wi-Fi 7 laptop is a potential maximum data rate of almost 5.8 Gbps. This is 2.4X faster than the 2.4 Gbps possible with Wi-Fi 6/6E and could easily enable high-quality 8K video streaming. In addition, it could reduce the time for a 15 GB file download to roughly 25 seconds vs. the one minute it would take with the best legacy Wi-Fi technology.

- With MLO (**Multi-Link Operation**), Wi-Fi 7 devices can simultaneously connect on two bands. This enables faster speeds through aggregation. Or, both bands can be used concurrently to share redundant/unique data for improved reliability with ultra-low and precise latencies.

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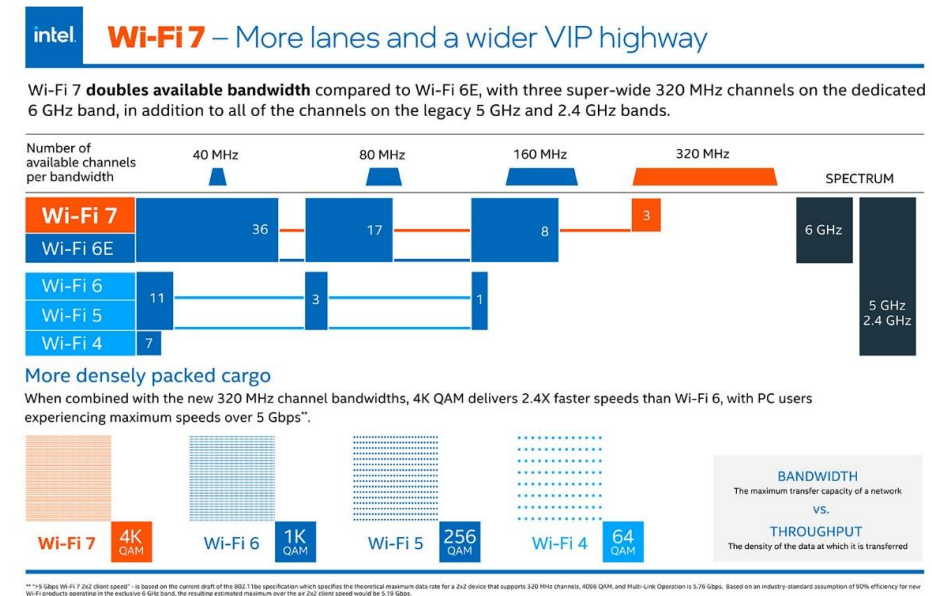
DOCSIS 4.0 – The 10 Gb Future

- Ratified in 2019, standard is for coax networks (cable internet)
- Requires a major network component refresh
- Speeds cable internet up to 10 Gbps down, 6 Gbps up
- Some routers starting to have 2.5 Gb, even 10 Gb ethernet

DOCSIS 2.0-4.0 Comparison	DOCSIS 2.0	DOCSIS 3.0	DOCSIS 3.1	DOCSIS 4.0
Downstream capacity	40 Mbps	1 Gbps	10 Gbps	10 Gbps
Upstream capacity	30 Mbps	200 Mbps	1-2 Gbps	6 Gbps
Date issued	2001	2006	2013	2019

5G Works, So What Is C-Band?

- It's a set of radio airwaves operating at a frequency range between 3.7 and 3.98GHz. That frequency falls under what is known as midband spectrum
- AT&T and Verizon have deployed 5G mainly on low-band spectrum or high-band millimeter wave
  - Low-band has excellent coverage, but its speeds are often equivalent to those of 4G LTE
  - Millimeter-wave has excellent performance, but its coverage is often limited to just a handful of blocks in certain cities or in parts of an arena, stadium or airport

mmWave
Ultra-Short Range
24-86 GHz

Mid-Range – includes C-Band
2-6 GHz

Long-Range
Includes 4G and traditional cellular frequencies
600-700 MHz

5G Frequencies
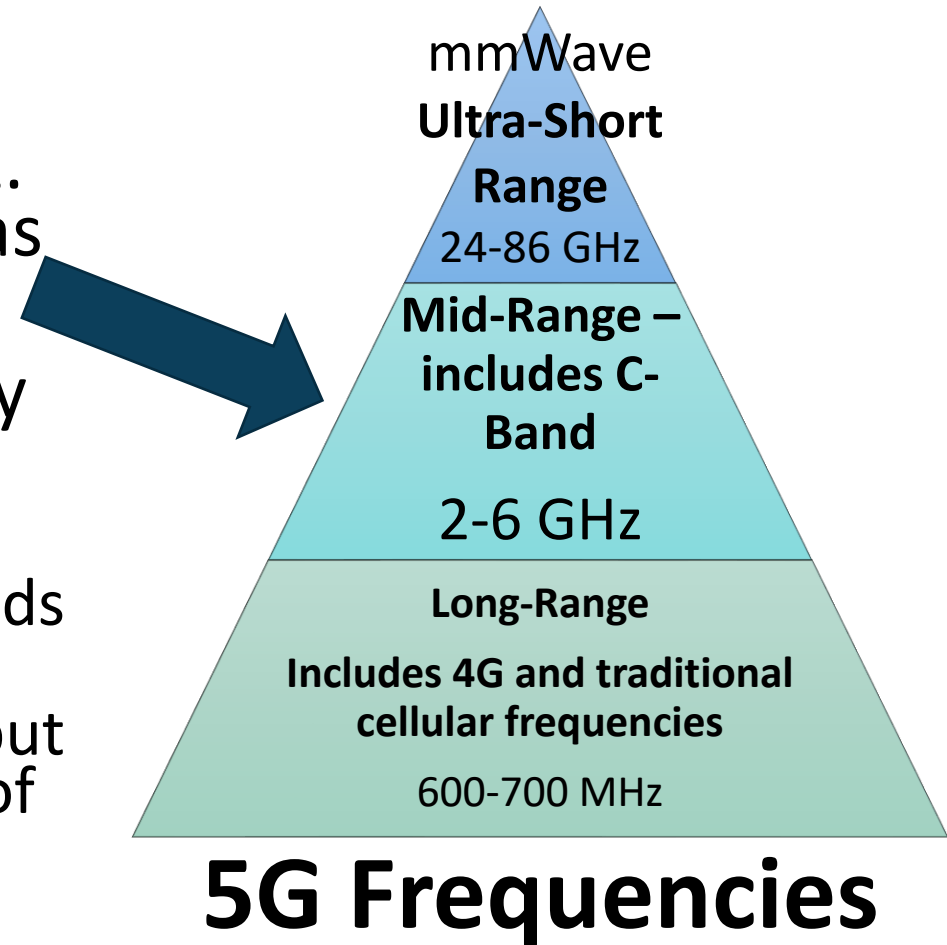
Terahertz

- Terahertz (THz) communications refer to a type of wireless communication technology that uses the electromagnetic spectrum in the terahertz frequency range (100 GHz to 10 THz) to transmit data wirelessly. THz communication technology is being explored as a potential solution for the growing demand for **high-speed data transfer**, especially in applications such as high-definition video streaming, virtual reality, and augmented reality

- THz waves have several unique properties that make them attractive for high-speed communication. For example, THz waves have a higher frequency than microwaves used in current communication technologies, meaning they **can carry more information in a shorter time**. Additionally, THz waves **can penetrate non-conductive materials such as plastics**, which can enable new types of wireless communication and sensing applications

- However, THz communication technology is still in the early stages of development, and several technical challenges need to be addressed before it can be widely adopted. For example, THz waves are **highly absorbed by water vapor and other atmospheric gases**, limiting the range of THz communication. Researchers are currently exploring new techniques for improving the range and reliability of THz communication, such as using multiple antennas and signal processing techniques

- NOT the collective frequency of DNA and proteins that stimulate circulation and metabolism!

COMPUTE AND PHONE

Hardware Choices

- Desktop vs. laptop
- Large monitors 27-49"
- Workgroup scanners

- Smartphone
- Tablet?
- Docking station?
- External keyboard & mice

Computer Recommendations

PC Buyer

- Windows 11, Microsoft 365

- Intel Core i5-i9, AMD Ryzen 5-9

- Dedicated GPU (ARC, Radeon)

- 16-32GB of RAM, DDR5

- PCIe Gen 4 128GB-1TB of NVM Express Solid-State drive (NVMe)

- Thunderbolt 4, for HDMI/USB

Mac Buyer

- MacOS, Microsoft 365

- M2 PRO/MAX ARM

- Dedicated ProRes graphics

- 8-64GB of RAM (DDR5 Unified)

- PCIe Gen 4 128GB-2TB of NVM Express Solid-State drive (NVMe)
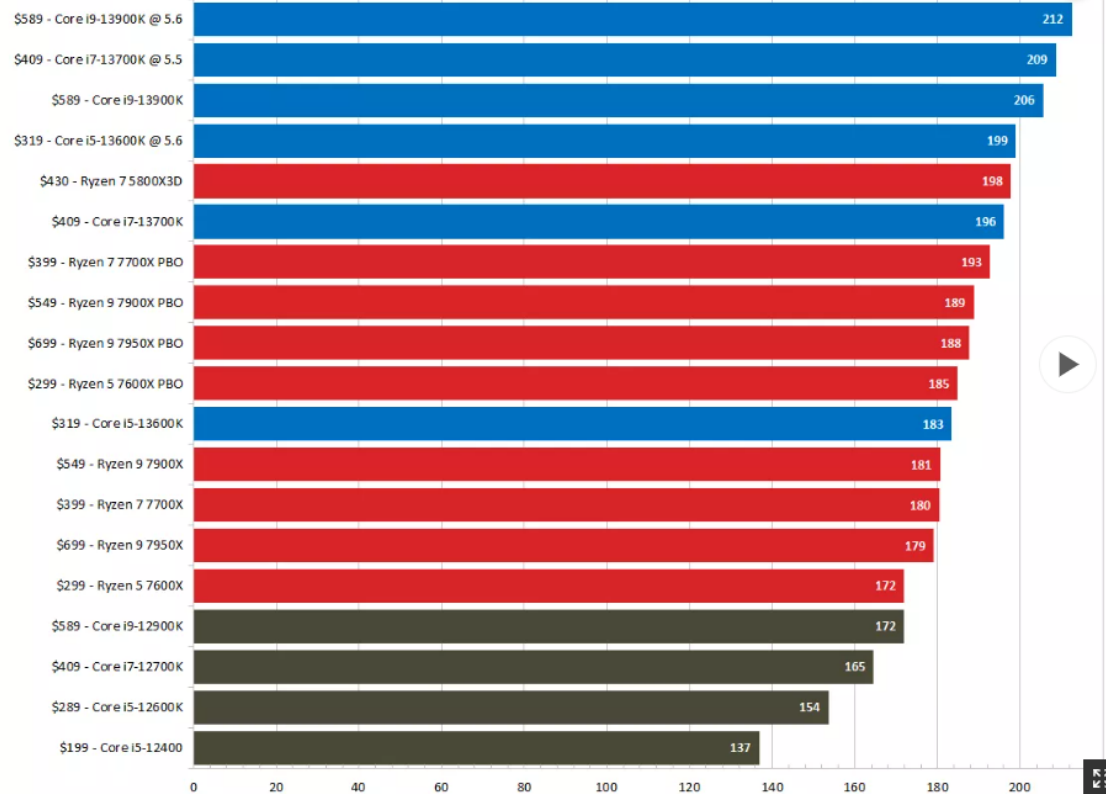
- Thunderbolt 4, for HDMI/USB

Computer Processor Chips

Intel

Average FPS (Geomean), Entire Test Suite 1080p - Windows 11
Nvidia RTX 4090 1920x1080 - PBO = Overclocked AMD

AMD

AMD VS INTEL PRODUCTIVITY AND CONTENT CREATION PERFORMANCE

Multi-Threaded Performance Ranking - Windows 11
Geomean - nT Cinebench, POV-ray, vray, Blender, Handbrake, y-cruncher
Higher is Better
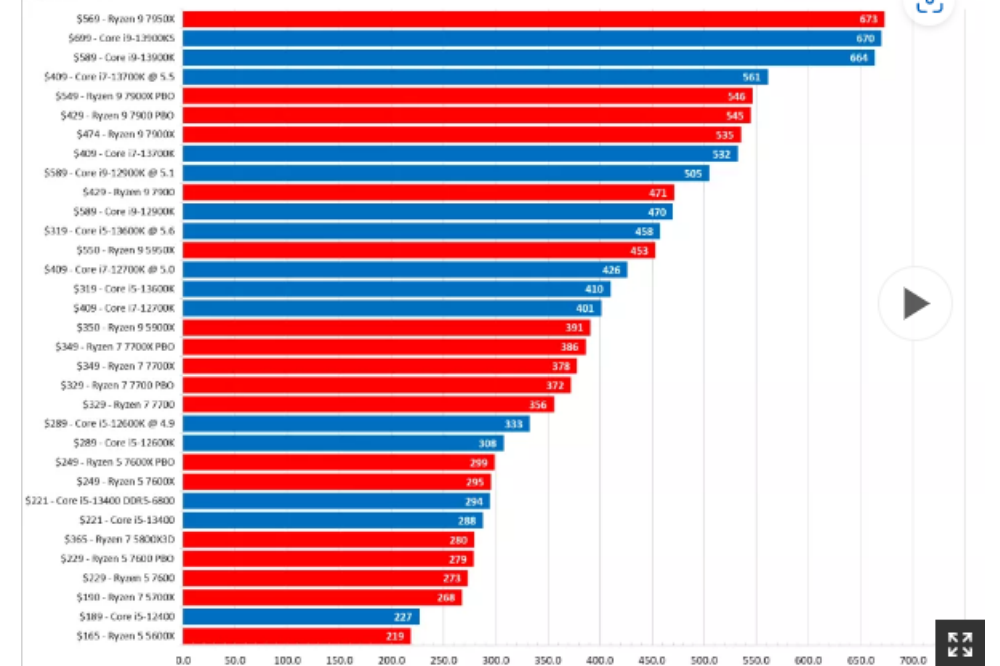
HP Dragonfly G4 Specifications

- CPU - 13th Gen Intel Core processor
- GPU - Intel integrated
- RAM - Up to 32 GB
- Storage - Up to 2 TB
- Display - 13.5-inch, 3:2, 3K2K OLED
- Camera - 5MP
- Audio - Bang & Olufsen, dual mics
- Ports - 2x Thunderbolt 4 with USB C, 2x SuperSpeed USB Type-A, HDMI 2.0, Nano-SIM, Audio jack
- Connectivity - Wi-Fi 6E, Bluetooth 5.3, 4G LTE or 5G (optional)
- Dimensions - 12.39 in x 8.78 in x 0.72 in
- Weight - Starting at 2.98 lbs.

Apple MacBook Pro Specifications

- CPU – M2 Pro or Max

- GPU – 16, 19, 30, or 38 Cores, 16-core Neural Engine

- RAM - Up to 96 GB

- Magic Keyboard with Touch ID, Force Touch trackpad

- Storage - Up to 8 TB

- Display – 13, 14, 16" Liquid Retina XDR display[2]

- Camera - 1080p FaceTime HD camera

- Audio - High-fidelity six-speaker sound system with force-cancelling woofers

- Ports - Three Thunderbolt 4 ports, HDMI port, SDXC card slot, headphone jack, MagSafe 3 port

- Connectivity - Wi-Fi 6E, Bluetooth 5.3

- Dimensions - 12.31 in x 8.71 in x 0.61 in

- Weight - Starting at 3.6 lbs.

Lenovo Yoga Book 9i Specifications

- CPU – 13th Gen Intel Core i7-U15

- GPU – Intel Iris® X e

- RAM - Up to 16 GB

- Storage - PCIe SSD Gen4: 512G/1T

- Display – two 13.3-inch 2.8K OLED PureSight displays with 100% DCI-P3 color accuracy and Dolby Vision® HDR

- Camera - FHD IR+RGB (5M USB) Webcam with Privacy Shutter

- Audio - 360° sound bar and Bowers and Wilkins speakers

- Ports - 3 x USB Type-C (all full function and Thunderbolt™4.0)

- Connectivity - Wi-Fi 6E, HW Support Bluetooth 5.2, OS Just support Bluetooth 5.1

- Dimensions - 11.78 in x 8.03 in x 0.63 in

- Weight - Starting at 3.04 lbs.

Kensington Docking Station

- **SD5700T Thunderbolt™ 4 Dual 4K Docking Station with 90W PD**

- Βackward compatibility with Thunderbolt™ 3, USB4, and USB-C devices running Windows 10 or later, or macOS 11 or later.

- Thunderbolt™ 4 Technology can connect up to three additional Thunderbolt devices directly (up to five in total) while providing transfer speeds up to 40Gbps, up to Dual 4K video output, and audio

- Single 8K or Dual 4K Video Output for Thunderbolt™ 4-Enabled Devices

- 90W Power Delivery

- 11-Ports of connectivity

- $369.99

Apple iPhone 15 Rumored Specs

- **A17 Bionic chipset**

- **Solid-state volume and power buttons**

- **New camera technology, Dual 48MP cameras**

- **Testing the integration of 8K video recording technology for the main camera**

- **6.7-inch Retina IPS LCD, resolution of 1080 x 2340 pixels**

- **6GB of RAM and 128GB/ 256GB/ 512GB/ 1TB of storage**

- **4,500mAh energy cell**

- **Dynamic Island for all models**

- **Periscope zoom lens**

- **USB-C port**

- **Qualcomm modem chip**

- **USB-C, not Lightning connector! Possible special cable**

- **September 2023**

K2 Enterprises

Apple Vision Pro "Spatial Computing"

- M2 and brand new R1 chips for the sensor inputs, 12ms

- Twin 4K displays inside the headset for HDR picture quality. For glasses you'll need custom ZEISS inserts

- EyeSight uses a front display to show others that you are engaging with them or are immersed in the headset

- visionOS allows for 3D experiences native to the Vision Pro. iOS and iPadOS apps will be available in a Vision Pro App Store along with visionOS apps

- The crown on the top of the headset allows you to control how immersed in the headset you are, from augmented reality to virtual reality.

- No controllers needed — the headset relies on eye and hand tracking in addition to voice commands

- $3,499, costing $1,509 to build

- Early 2024

Google Pixel 8 Rumored Specs

- **ARMV8.5+ or ARMV9 CPUs using Advanced Memory Protection with Memory Tagging Extension (MTE)**

- **Tensor G3 "Zuma"**

- **50MP Isocell GN2 using staggered HDR technology**

- **Pixel 8 will have a 2,268 x 1,080 display while the Pixel 8 Pro will pack a 2,822 x 1,344 screen**

- **5,000mAh energy cell**

- **162.6 x 76.5 x 8.7mm – very close to Pixel 7**

- **October 2023**

Galaxy S24/S24 Plus Rumored Specs

- **50MP wide angle and a 12MP ultraWide angle. The phones may also feature a 10MP short lens**

- **128GB, 256Gb, and 512GB storage**

- **AMOLED displays, higher refresh rate**

- **4,700mAh energy cell**

- **January 2024**

New and Updated Products

EMERGING TECHNOLOGY

Predictive Analytics

- **Fraud Detection**: identify unusual patterns and outliers in financial transactions that may indicate fraudulent activity. By analyzing historical data, predictive analytics models can identify the risk of fraud in real-time, allowing accountants to act before any damage is done

- **Revenue Forecasting**: forecast future revenues by analyzing past sales data, customer behavior, and market trends. This information can help businesses plan and make strategic decisions based on accurate projections

- **Budgeting and Planning**: used to optimize budgeting and planning by analyzing historical data and identifying patterns in spending and revenue. By using this information, businesses can better forecast future costs and revenue and make more informed decisions about budget allocation

- **Cash Flow Management**: used to manage cash flow by analyzing trends in cash inflows and outflows and identifying potential shortfalls before they occur. This information can help businesses make informed decisions about financing and investment opportunities

- **Financial Statement Analysis**: used to analyze financial statements and identify key financial indicators, such as profitability, liquidity, and solvency. This information can help businesses assess their financial health and identify areas for improvement

- **Tax Planning**: used to optimize tax planning by analyzing historical tax data and identifying potential tax deductions and credits. This information can help businesses minimize their tax liability and make more informed decisions about tax planning strategies
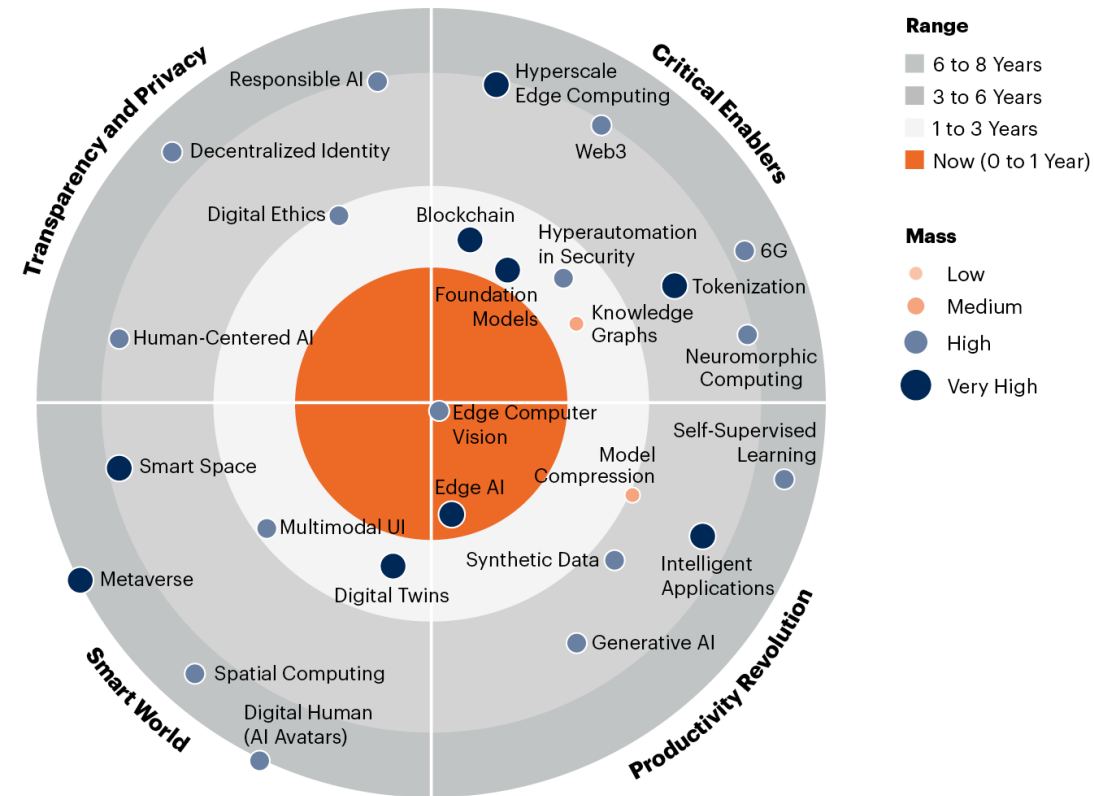
Gartner Emerging Tech Radar

Smart World

Productivity Revolution

Critical Enablers

Transparency and Privacy

2023 Gartner Emerging Technologies and Trends Impact Radar

gartner.com

Note: Range measures number of years it will take the technology/trend to cross over from early adopter to early majority adoption. Mass indicates how substantial the impact of the technology or trend will be on existing products and markets.

Source: Gartner
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K2 Enterprises

Artificial Intelligence - ChatGPT

- **Responding to General Accounting Queries**: can be trained to respond to general accounting queries, such as how to record a certain type of transaction, what accounting standards to follow, or how to generate financial reports

- **Customer Support**: can be used to provide customer support to clients by answering their questions about accounting practices, software, or financial statements

- **Automating Data Entry**: can be used to automate data entry by extracting information from financial documents such as invoices, receipts, and bank statements and entering it into accounting software

- **Streamlining Workflow**: can be used to streamline workflow by automating repetitive tasks such as data entry, record keeping, and report generation

- **Budgeting and Forecasting**: can be used to assist in budgeting and forecasting by analyzing financial data and providing insights into future financial performance

- **Financial Analysis**: can be used to perform financial analysis by analyzing data and providing insights into financial trends and patterns

- Passed the bar exam, and no restrictions on competitors – think bad actors and propaganda

Artificial Intelligence - Competitors

- Three of the world's largest search engines unveiled new artificial intelligence tools
  - Microsoft Bing allowed users to tell its ChatGPT-powered search engine to create images on demand using the DALL·E model
  - Google's Bard, which had a rocky start in February when it spat out falsehoods during a demo, was released to a limited user base: It's fast and fluid, reviews said, but limited
  - China's Baidu released Ernie Bot, but it faces what one reviewer described as "a huge gap" with its U.S. rivals
  - Open Source – Stanford Alpaca
- Meanwhile, Adobe released an image-generator AI trained on its own image library, and says it will compensate artists whose work it uses, although how that will work is unclear
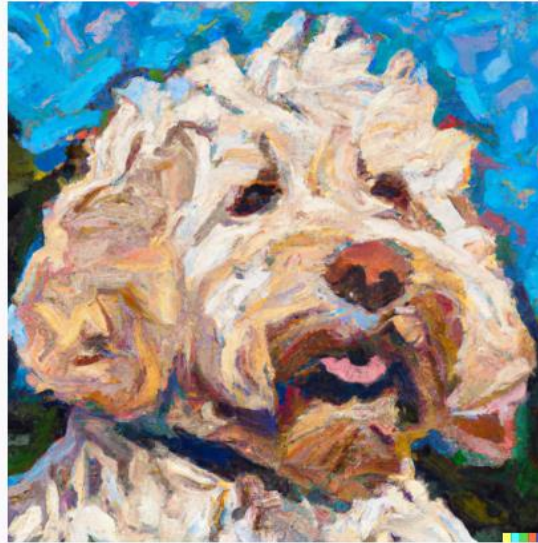
DALL-E's "A Van Gogh Painting Of A White Golden Doodle Dog"

Facial Recognition In Accounting

- **Security**: enhance security by allowing accountants to verify the identity of clients and employees. This can help prevent fraud and improve overall security measures

- **Client Verification**: streamline client verification by automating the process of verifying their identity. This can help reduce the time and effort required to verify client information and improve the overall customer experience

- **Customer Experience**: enhance the customer experience by providing personalized service and improving customer satisfaction. For example, facial recognition can be used to identify customers when they enter an accounting firm's office and provide personalized greetings and recommendations

- **Time and Attendance**: automate time and attendance tracking, making it easier for accountants to track employee hours and manage payroll. This can help reduce administrative tasks and improve overall efficiency

- **Compliance**: ensure compliance with regulations such as KYC (Know Your Customer) and AML (Anti-Money Laundering). By verifying the identity of clients, facial recognition can help ensure compliance with these regulations and prevent fraudulent activity

Metaverse Uses In Accounting

- **Virtual Collaboration**: facilitate virtual collaboration among accountants and clients. For example, accountants can use virtual reality (VR) to create a shared workspace where they can collaborate on projects and share data in real-time

- **Virtual Events**: host virtual events such as conferences and seminars, providing opportunities for accountants to network, share ideas, and learn about new accounting practices

- **Virtual Showrooms**: create virtual showrooms where accountants can showcase their products and services, providing new revenue streams and improving customer experience

- **Virtual Tours**: create virtual tours of accounting firms, allowing potential clients to explore their facilities and meet their staff in a virtual environment

- **Virtual Training**: provide virtual training for accountants and clients, enabling them to learn about new accounting practices and technologies in an immersive and engaging way

Quantum Computers & Encryption

- Y2Q (sometimes called Q-Day) – when Quantum Computers break encryption. Spy agencies and bad actors are warehousing data to be decrypted; that is quantum hacking

- Biden administration deadline for new encryption is 2035, but Shor's algorithm could break decryption by 2029

- NIST has announced four quantum-resistant algorithms after a six-year competition: CRYSTALS-Kyber, CRYSTALS-Dilithium, FALCON and SPHINCS+

- Intel Tunnel Falls – 12 qubits, Google's Bristlecone has 72 qubits

Quantum Computers In Accounting

- **Optimization Problems**: solve problems critical to accounting, such as portfolio optimization, risk management, and supply chain management. By analyzing vast amounts of data and running complex algorithms, quantum computers can help accountants make more informed decisions and improve overall business performance

- **Large Data Sets**: analyze large data sets that are difficult or impossible to analyze with classical computers. By analyzing vast amounts of financial data, quantum computers can help accountants uncover hidden patterns and insights that can inform business decisions and improve financial performance

- **Fraud Detection**: enhance fraud detection by analyzing large data sets and identifying unusual patterns or anomalies that may indicate fraudulent activity. By detecting fraudulent activity early on, quantum computers can help accountants prevent financial losses and protect their clients' assets

- **Cryptography**: enhance the security of financial transactions by breaking existing encryption codes and developing new ones resistant to quantum attacks. This can help accountants protect sensitive financial information and improve overall cybersecurity

- **Tax Optimization**: optimize tax strategies by analyzing large data sets and identifying potential tax deductions and credits. By optimizing tax strategies, quantum computers can help accountants minimize tax liability and improve overall financial performance

- Consider **Fraud Creation** with AI advancements

Breaches of Note, Other Items for Action

SECURITY ISSUES/PATCHES

Security Risks In Accounting

- **Phishing and Social Engineering**: are commonly used to trick accountants and employees into divulging sensitive information such as login credentials or financial data. These attacks can come in the form of emails, phone calls, or text messages that appear to be from a legitimate source

- **Malware and Ransomware**: are common in accounting and can result in data breaches and loss of critical data. These attacks can occur through email attachments or links, malicious websites, or infected USB drives

- **Weak Passwords and Authentication**: can make accounting systems vulnerable to attacks. Employees may use weak passwords that are easily guessable or reuse the same password across multiple systems, making it easier for cybercriminals to gain access to sensitive information

- **Insider Threats**: are a significant risk in accounting, as employees may have access to sensitive financial information and may intentionally or unintentionally disclose or misuse it. This can include employees with malicious intent or employees who fall victim to phishing attacks or social engineering tactics

- **Unsecured Networks and Devices**: can make accounting systems vulnerable to attacks, particularly if employees use public Wi-Fi networks or personal devices to access accounting systems. These networks and devices may not have the same level of security controls as company-owned devices and networks, making them more vulnerable to attacks

GoTo's Stolen Backups

- In November 2022, PCWorld reported that GoTo reported a hack- [user data for some of its security and access-focused products was stolen](#) (including LastPass) ([blog post](#))
  - [PCWorld's guide to leaving LastPass](#)
- On [1/25/2023, GoTo reported data from many of its other properties](#), including usernames and passwords (including salted passwords) Central, Pro, join.me, Hamachi, and RemotelyAnywhere were stolen

PCWorld
NEWS

LastPass owner GoTo says hackers stole encrypted backups and keys

The latest breach in November was already pretty bad — turns out it was much worse.

By Michael Crider
Staff Writer, PCWorld | JAN 25, 2023 8:05 AM PST

Ways To Improve Security

- Get personal use off business computers PERIOD
- Exclusive use of company email and collaboration
- Everyone has a smartphone or home computer for personal use
- Most fraud and bad actors enter via personal use at a very high percentage!

Summary

- Hardware and software options continue to expand at an ever-increasing pace

- Communications speed and reliability are improving

- Lines continue to blur with technologies that can be used in both business and personal life

- Emerging technologies that seemed futuristic like artificial intelligence and machine learning will affect the accounting profession in the near term, providing leverage for people