Tales of the Digital Revolution

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Some say the digital revolution is ending. They are mistaken!

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For Mom

Prologue

For learned people, the 20th century is undoubtedly a century for physics. Humanity gained unprecedented insight into the workings of the very small and very fast. Indeed, modern physics may be regarded as the pinnacle of human intellect. However, the brightest moment for physics so far has already passed. There exist experimental barriers for particle physics. Creatives of the 21st century desperately seek a new domain to thrive.

For some, it's finance, but judging from the early 21st century, the supposed glory of finance is misleading as financial crises ravaged the world. For others, it's life sciences, but we believe humans are still very far from understanding life. For the rest of us, the most obvious conclusion is the digital revolution.

While nobody can say for certain, but there are clues that show the digital revolution may be the defining endeavor of the 21st century. The most conspicuous and grotesque example is Trump, who exploited the digital platform to Presidency. Then there is mass surveillance exposed by Snowden. But, perhaps the most talked about is the iPhone. As AI revolution rages on, it seems there is no end in sight.

This book is for the general public. Through famous tales, we hope to make popular the understanding of the digital technologies at the center of everyday life. There is growing concern that digital technologies may not be a force for good, but we believe Democrat's suppressive approach is misguided. Therefore, we elucidate the essential features of digital technologies so that people may find the right way.

Turing-Completeness

Ever wondered why a single machine can perform so many tasks?

The most astonishing feature of computers is their versatility. We write manuscripts, draw images, and edit videos on the same machine. It's not common in the world of machines. The machines for making shoes and clothes are very different, while computers are remarkably general purpose. The underlying insight that there exists a universal computer that can perform all conceivable computations is called Turing-completeness.

There are trade-offs. A task may perform slower on the universal computer than a computer specifically designed for that purpose, but the lag is not very big for ordinary tasks, so we put CPUs into modern computers. Still, there are situations that extra efficiency is needed, so we also build Neural Engine and Media Engine into SoCs. Notice that specific purpose computing units may also be more power efficient, since there is no simulation.

Alan Turing originally formulated his computing machine as a rule-based device manipulating symbols on a infinite tape. Clearly, no modern computers we use everyday are constructed as such. The reason is that it would be too slow to perform computations of comparable logical depth on tapes than silicon chips, which brings us to transistors.

Transistors

Modern computers are fast!

The transistor revolution enabled logical circuits to be constructed on smaller and smaller scale. Since the travel distance is shorter on smaller circuits, they run faster. Therefore, semiconductor processes aiming for geometric scaling are devised to pack more transistors in given space in order to create more powerful chips.

Sometimes, people may hear the term computational complexity, or time complexity, which actually means logical depth of a computation. It's important not to confuse computational complexity with computation time. While code of lower computational complexity runs faster on the same machine, the conclusion can not be drawn with different machines.

Despite the heavy load of graphics algorithms, modern chips utilizing transistors can provide very good instant display of content for human eyes. Every gamer who traced the development and evolution of 3D games can tell the dramatic improvement of visual quality in last 30 years.

If the world only had ink-and-tape Turing machines, there would be no iPhones, AI would not be practical, and computers would be much less useful. Transistors bring giant leap in speed that makes everyday computations work.

Mobile Computing

Who doesn't want a supercomputer in the pocket?

The success of the iPhone is actually much more than a supercomputer in the pocket. We use Google Maps via the Internet, take photos with camera, and listen to music from CarPlay. A supercomputer in the pocket is impressive enough, but the iPhone exceeds all expectations.

Due to market forces, most observers view iPhone as the flagship product shadowing the iPad and Apple Watch. Our take is more balanced, as the iPhone excels in timeliness, the iPad excels in content, and Apple Watch excels in fitness.

Some people see the iPhone exclusively as a computing gadget, and thus proposed various AI-powered iPhone killers, such as Humane AI Pin and smart glasses. They don't take Steve Jobs seriously, who emphasized iPhone's revolutionary UI. We believe Multi-Touch UI is for the masses, while AI Pin and smart glasses are for niches, and they won't be able to kill the iPhone.

It's gradually clear if the iPhone, iPad, and Apple Watch can all work together, the whole package will be much more powerful. We can view and edit daily tasks on whichever gadget convenient, and they all sync effortlessly. This idea leads to the integration of cloud computing and the mobile-cloud paradigm.

Cloud Computing

There are services better delivered on demand.

Cloud computing was originally conceived as computing on demand, to optimize utilization and address limited local resources on interface devices compared with computer clusters. Since the onset of mobile computing revolution, cloud computing has become a indispensable platform for synchronization, big data, and AI.

Take Google Maps for example. It would be total waste of local storage if the entire app was offline, since people only use a tiny portion of location information. On the other hand, the cloud can instantly deliver updated store status, live traffic, and route navigation.

The cloud is overlooked, but it makes mobile computing much more useful. We call it the mobile-cloud paradigm.

With breakthroughs in AI, the mobile-cloud paradigm is ever more advanced, as people can perform accurate language translations locally and privately, and ask ChatGPT on the cloud whether a media figure is a crook.

Academia mostly focused on AI, but without the mobile-cloud paradigm, AI isn't going to be as widely used as today. There is wisdom both in academia and in industries. Belittling either doesn't help. Cloud mostly works invisibly behind the scene. The public should be aware of its existence.

Artificial Intelligence

It's not natural stupidity.

Talking about AI is actually a bit early, as the development is still in experimental stage. However, its impact is already widespread. ChatGPT stormed the world, as people ask it for advices on essays, historical records for media figures, and whether ink-and-tape Turing machine can be alive, etc.

Whether AI or humans are/will be better at certain tasks is highly controversial, so we won't elaborate this important question here, but offer several AI use cases so that AI haters can be avoided.

AI can detect car crashes and automatically send out rescue signals. AI can parse through huge volume of documents to find relevant information. AI can speed up scientific discovery like protein folding. Possibilities are endless.

Like early personal computing revolution, AI experienced support and denigration from all sorts of people. People ask for regulation or deregulation, but not good regulation. People ask for power or restriction, but not balance and safety. Clearly there is a lot of work to be done if we want to answer these questions wisely.

Yann LeCun believes superhuman AI will arrive in time. We may talk about artificial intelligence and natural stupidity. Societal reorganization is inevitable. Can AI help humans live better?

Unified Scheme for Mobile, Cloud, and AI

Can we go beyond the iPhone?

One of the most challenging tasks is to find out the future of the iPhone. Some believe iPhone killer like Human AI Pin and smart glasses are up to the task. We believe building upon the iPhone is wiser.

The problem of the iPhone is that it's largely a interface device, not a complete platform. Google has mobile, cloud, and AI, but sees them as separate pieces. Our solution is to integrate them together, so that innovative apps can be made possible.

Take postcards for example. Social networks largely killed traditional postcards, but the replacement is very postmodern, rather than personal. With HTML5 postcards, people can shoot videos, choose a template, ask AI for decorative texts and images, send them via the cloud to avoid taking too much space on recipients' mobile gadgets. All can be done with personal taste and subtlety.

AI without mobile-cloud paradigm is much less useful, and mobile-cloud paradigm without AI is shallow. We hope bringing these technologies together will create something new and unify the approach to mobile gadgets. The message is that iPhone can be greater, but not killed.

Algorithms

There is so much more than P versus NP.

When academics talk about algorithms, they most certainly mean fast algorithms. Fast algorithms can make a computationally intensive task achievable. However, why not ask for accuracy, rather than speed? The wisdom is that faster algorithms are often more accurate, because there are fewer occasions for rounding errors.

It's a remarkable fact that modern AI progress is largely due to algorithms, with reasonable but modest help from hardware.

Most programmers use algorithms as though they are black boxes. It's not wrong, but understanding algorithms can greatly help judge whether a trade-off should be made between speed and quality, and so on. Therefore, the author is building a digital library for algorithms at spectrum-dev to democratize learning and research.

One of the most contentious issues in algorithms is parallelism. Because improvement via parallel computation is only a constant factor, many professors view it as secondary. However, in practice, parallelism greatly enhanced graphics. How is it possible? The answer is that common tasks are bounded by fixed logical depth, and thus parallelism plays comparable roles along with input sizes. The world of algorithms is full with subtlety worthy of wise judgment.

Human-Computer Interaction

Good UI is respect for users.

When Steve Jobs introduced the iPhone, he emphasized its revolutionary user interface. While we can argue whether UI is the most important feature of the iPhone, there is no doubt the UI makes iPhone much more versatile than feature phones.

UI isn't a hot topic in academia, however. Although the author speculated about modern flat-panel mobile gadgets when he was a undergraduate, there were virtually no academics willing to take it seriously.

The market is wiser than the academia in this case. Somehow economists managed to argue for the superiority of the market, while economics Nobels overwhelmingly went to academics.

Bad UI can destroy a product. Microsoft Windows 8 was so confusing that people are more willing to use Windows 7. Although UI may not be the most important part of a computer, it's how humans use it.

Despite the success of the iPhone, the hottest UI topic in academia is virtual reality. Perhaps they are trying to jump ahead of the time, but it seems that market is the right place for UI engineers. The academia is, well, just the academia.

The Mac

This is where personal computing begins.

Judging from today, the role of the Mac isn't simply another computer. Its development enabled the arrival of the iPhone. While their use cases are very different, they are both personal computing devices that bring computational power to ordinary people.

It doesn't require reading lengthy manuals to operate. There is no need to remember huge amount of commands. Features are discoverable via excellent UI. All of these became the cornerstone of modern Apple technology.

Let's compare the Mac with technical computing platforms like Wolfram Language. Wolfram Language is command-driven, equipped with detailed documentation. Technicians read through scrolls like Gandalf to chain commands together.

We are not belittling Wolfram Language, which is a great tool for science and engineering, but one may see the philosophy difference between personal and technical computing devices.

Consumers love the simplicity of the Mac, suitable for daily tasks. The aesthetics makes operating a computer enjoyable. For academics, it's easy to overlook the Mac in favor of abstract Turing machines, but for the rest of us, the Mac opened the door for real computer applications.

Internet

Economists say it's a disappointment!

The Internet allowed computers to communicate with each other. It may not sound like a great deal. Indeed, economists have been calling the Internet a disappointment. However, it's the backbone of all online digital commerce, cloud AI, and social networks.

With the Internet, lovers far apart see each other via FaceTime. Computing power is greatly enhanced by parallel execution, making fast AI on Big Data practical. Music, movies, apps are distributed over the air without extra storage devices.

Not everything is enjoyable, however. The Internet also enabled the rise of political extremism deeply rooted in human herding nature. Without the Internet, Trump's ascension to power is much more unlikely.

Surveillance is not a blockbuster topic in public discussion, but for power hungry politicians and corporations, Internet surveillance is key to sustaining power. Intelligence and threat management are greatly transformed by the Internet. NSA and CIA just won't tell you what.

The defects of the Internet can be remedied by digital civilization, but we have to start on that path, instead of being drown in destructive deluge of disinformation.

Spatial Computing

We can't have enough debate whether it's the era of spatial computing or AI.

Vision Pro and spatial computing are Apple's answer to post-iPhone era. It's a tremendous challenge, considering the unprecedented success of iPhone. At its launch, media described it as Mac killer, and afterwards, iPad killer. While media can be foolish, there is truth that nobody knows what future awaits Vision Pro.

The technology blends AR and VR very well. It's a wonder to the eye. People may place apps around, and the apps just sit there. It's imaginable that museums and architecture reviews may greatly benefit from digital and physical integration. Jumping from AR to VR is also smooth, so virtual entertainment, like games, is expected to thrive.

Despite the ingenuity behind the gadget and technology, the justification of Apple marketing that we are entering the era of spatial computing is complicated by AI. It's not unreasonable to see AI having much bigger impact than spatial computing.

However, the unified scheme for mobile, cloud, and AI we talked about before can readily integrate spatial computing to receive AR/VR postcards. Therefore, we see spatial computing as a integral component of the scheme, rather than a standalone era.

Social Networks

It's anti-social networks nowadays.

There was a time when friends and lovers far apart see each other only once or twice per year and communicate primarily through letters. Social networks not only changed that, but also reconnected lost friends like Facebook, informed public debates like X/Twitter, and enabled corporate-wide collaboration like Microsoft Teams.

Before the invention of the iPhone, people used social networks on laptops and desktops. It's usable, but very inconvenient. The arrival of the iPhone drastically changed how people use social networks. Now people take photos, apply effects, and share them all together with social networks on smartphones.

The tragedy of personal social networks is that people expect them to be freely available. As a result, in order to generate profits, advertisements began to squeeze content, algorithms began to favor commercial garbage, and cognitive bombardment began to take control. In other words, it's anti-social networks nowadays.

Facebook have the might to do all of these because there are few capable rivals. A notable exception is Apple Messages app that's subsidized by device sales and cloud subscriptions to avoid advertisements. Yet Facebook is undefeated.

Design

Design is how it works!

Most companies take a shallow approach to design. They think it's just cosmetics. Obviously, they've never think of nuclear reactors. Can you imagine living alongside a poorly designed nuclear reactor?

That's extreme, but Steve Jobs is very wise to build design into the very core of every Apple product. It's not just look and feel. If you ever dropped a modern iPhone, you will be surprised how resilient it is. All this is about design.

True, design without technology can not accomplish serious feats, but under current corporate culture, lack of design is the main obstacle to realize capitalism with a human face. The left believes it's lack of competition, but the sad truth is that if they break up Apple, nothing better will appear for very long time.

Perhaps the most dramatic story about design is how Al Gore lost the USA Presidential election simply because of poorly designed ballots in Florida, the ballot design that confused so many people that they voted against themselves. Thereby, history unfolded very differently.

Good design is not that hard, but people have to be considerate. For the same price, why not buy a well-designed product, rather than crap?

TV and Family Computer

I finally cracked it.

Steve Jobs once imagined TV integrated with iCloud under a simple user interface is what TV needed. Since then, most people still view watching movies as the primary purpose of TV. It's very difficult to envisage TV otherwise. It seems hopelessly dumb.

Home automation came. TV became a hub for appliances, but the whole idea is still dumb. What's the problem?

We believe the issue lies with the lack of efforts to build TV as a family computer. It's not just about games, but relationships with people/families.

TV can be home telephone, can help family shopping, can facilitate holiday travel planning, can watch your back while you are not at home. It's just nobody is developing for it.

With proper UI, we may organize a party event on TV, contact all participants, arrange party-time entertainment music, so on and so forth. The advantage of TV is the natural family connection, rather than being solely a personal computing device.

As Apple released Vision Pro, TV's status as the superior home entertainment gadget is utterly shattered. Without family computing, will it be shadowed indefinitely?

Creative Destruction

Karl Marx is a great observer.

As companies behind the digital revolution can not escape the logic of capitalism, the process of creative destruction has to be discussed. Everybody knows HTML5 killed Flash, but Apple's invisible hand is much more subtle than betting on future technology.

Although we believe the decision to develop HTML5 and to abandon Flash is very wise, as RWD fits a wide variety of screen sizes, Apple's public statement is very unconvincing. Almost everybody thought Apple wanted to kill Flash. We don't know the truth, but developers shifted to HTML5 because it's universally supported, rather than being technically superior.

Such is the way of creative destruction in the Silicon Valley. Technology is important, but manipulation is all over the place. Should we regulate manipulation in favor of technological progress? But, who decides banning Flash is unfair? Retrospectively, it's actually remarkably wise to abandon Flash!

Economists tend to overlook the complexity of capitalism and markets. There is no surprise politicians educated by economists often offer terrible regulation proposals. We leave the deep question to the reader.

Finance

Banking is just bits and bytes.

As Schumpeter noticed, purchasing power can be created in thin air. Modern banking is extremely powerful because money can be accounted for just by double-entry bookkeeping. By issuing assets, capitalism produces net money in addition to central banks.

All these traits invited digitization of banking. Transactions are carried out online in databases. Records are kept for reference for very long time. Surveillance became convenient, giving Washington the power to monitor global financial activities.

Most people's attention is on Apple Pay, LINE points, stock purchases, etc. This leaves huge democratic gap in digital finance. Few care about how to tame the monster reasonably, only to be shocked by Bitcoin volatility.

When finance goes wrong, the damage is much greater than consumer welfare loss due to digital oligopoly. Politicians' drive to pursue antitrust against Apple is purely cynical. They should shift their focus to regulate banking very carefully.

Digital finance and the data empire behind it are comparatively invisible to ordinary voters. With the introduction of mobile gadgets, their power only increased exponentially. If you don't own it, you are the product.

App Store

There is an app for that.

Most of the time, when we are using computers, we are using apps. Apps are organization of computer programs for specific purposes, like typesetting, calculation, or reading.

In the early days, Internet was slow, and apps were distributed via CDs. As Internet speed increased, online app distribution became popular. Naturally, the App Store arrived.

It may sound strange, but the App Store was first implemented on the iPhone, rather than Macs. Regardless, the philosophy behind the App Store is to offer a convenient distribution channel for developers and to protect consumers from malicious apps.

Obviously, there are people who don't agree with App Store's terms. On Macs, they may install whatever they want. On the iPhone, they persuaded EU to demand mandatory sideloading. While sideloading may satisfy power users, it's a security headache for ordinary people. Daring Fireball didn't say it, but we believe it shouldn't be mandatory. The choice to turn sideloading off should be implemented. Otherwise, DMA isn't pro-choice, but a restriction on Apple design.

There is much emotion about the design of the App Store, but taking away Apple's ability to safeguard ordinary users is imprudent. Can we find balance?

Sustainable Development

Can we go negative?

Extreme weather and climate are one of the most important issues of our time. It's a global problem. While companies like Apple are pursuing carbon neutrality, some physicists thought we might need to go negative, because it's already too high.

The technology to avert unpleasant consequences of excessive GHG emissions is readily available, but the problem is that people educated by disinformation on the Internet don't want it.

First, there is the unfortunate choice of words, like global warming and climate change. Although average temperature is higher and higher, it doesn't rule out cold winters. Trump used it to refute global warming, and people didn't realize it's merely a choice of words. Tragedy. Not to mention climate obviously can change over time.

Second, people who want to address extreme weather and climate don't tolerate the use of effective means they don't like, like safer nuclear power. Gradually, they refocused on the promotion of EVs, which is unfortunately a insufficient solution.

There is much work to be done. Physicists are smart to consider carbon negative technologies. We wish humanity can follow suit.

Blogs

We've decided that the world has moved on from blogs.

There was a time when blogs informed public debates. Following the 2008 financial crisis, countless pieces were written to address economics, finance, and politics. Unfortunately, people's attention span got shorter and shorter. Blogs are now a weird existence.

The virtue of blogs is balance of timeliness and information. X/Twitter debates are instantaneous, but there is too much bullshit. Books are informative, but most people are not parsing machines. Blogs help people communicate technical materials efficiently.

Several blogs like Daring Fireball persisted, others went to Substack or Medium. Although blogs played a far less significant role than before, they still provide valuable supplement to mainstream media. If people are foolish, there is at least some light in the darkness.

New York Times used to run a host of spectacular blogs. People may disagree with Krugman, but there is no doubt his blog helped to get the idea out. Nowadays NYT locked Krugman behind paywall. His power is greatly reduced. Obviously Krugman wanted to stop Trump, but can he do it behind NYT paywall?

Legacy Accounts

In the long run we are all dead.

X/Twitter announced that unused handles will be recycled. While many accounts are not of historical importance, there should be a way to preserve important legacy accounts. Edward Witten stopped posting on X/Twitter long ago, but should his account be recycled in the future?

The obvious question of death led to measures like legacy contacts to provide some degree of continuation. However, without legacy accounts, important materials are subject to the whim of successors. People should be able to make purchases to ensure permanent availability of records.

This used to be a privilege of the rich, who can afford to establish foundations to preserve their own life accomplishments. But, wouldn't it be nice if we can reference to debates over 2008 financial crisis, if tragedy happens again? There is much wisdom too valuable to be lost.

Currently, Internet Archive provided partial solution to link rot. Backing up the entire Internet history is foolish, but Internet Archive seems insufficient. The challenge to determine which material is worth preserving is hard, but people who are willing to pay should be allowed to maintain presence, say, newspaper articles. Elon Musk vowed to bring power to the people through subscriptions. Can X/Twitter lead the way?

Video Culture

Watch Apple Keynotes.

People crave videos. Compared with texts, videos are much more direct and impactful. Needless to say, companies seeking customer engagement spend big on videos to impress viewers. Just watch Apple Keynotes.

However, while video culture has its merits, we fear it has gone too far that people began to deprecate texts. Mobile gadgets and TV enabled online streaming services like Netflix, which many people live within, no time to read.

For most part, wisdom is still recorded in texts. And a good portion of it can not be made into well-formed video clips. Cat videos dominate social networks. People don't care about the empire.

It's with the irony of relative unpopularity of books that this book is written. We feel video can not concisely capture the diverse reality of the digital revolution.

The most obvious failure of video culture is political debate, where showmanship greatly outweighs good judgment. See, people care about whose force is strong, but not the surveillance bill.

Certainly, complaint is close to useless. Our hope is that people will learn how to properly watch videos. Sound like a joke, but can we afford political Star Wars?

Bullshit

The amount of energy needed to refute bullshit is an order of magnitude bigger than that needed to produce it.

The Internet didn't make people wiser, not because there is no wisdom in it, but because there is too much bullshit. Indeed, arguing against bullshit is incredibly difficult on the Internet. People seldom read comments. Although X/Twitter implemented community notes, few people have the energy and time to check everything they read.

Calling out bullshit is risky. There are countless zealots that may attack you, which makes bullshit removal much harder than production.

High level bullshit is extremely dangerous, because people have limited intelligence to identify it. Trump is considered low level, but even Krugman can propose inflation to save Euro.

There is a great deal of wisdom on the Internet, but as we've seen, facts about extreme weather and climate are no match for people's arbitrary preference. Search engines and GenAI companies fear political retribution and dare not label bullshit as such. Perhaps it's wise for Apple not to build a chatbot. Integrity is better than market share.

Wireless

The appliances of 2014 will have no electric cords, of course.

In the middle of the 20th century, Isaac Asimov predicted our wireless world today. Wireless is much more than removing the cord. It enabled the development of mobile technologies, like Apple Pay.

If electricity and communications were only available when plugged in, the mobile world would be impossible. Isaac Asimov was prescient. Not only so, he also predicted features like location services will be available on these gadgets.

As wireless communication speed increased, people began to stream videos online with mobile gadgets, rather than download. Thereby, subscriptions overpowered isolated purchases, and we have Apple One.

While speed increase in wireless is great, labeling it as a era seems overly simplistic. Remember those who said 5G would kick off a industrial revolution? Now people seldom talk about 5G.

Key to wireless technology is batteries, but some gadgets like mouses resisted all these transformations. Perhaps there is wisdom in corded mouses. Anyway, at least we get the Apple Pencil.

Music

Your favorite song you're going to listen to a thousand times in your life.

Before the iPod and iTunes, there was a time that purchasing music was largely a fashion. The arrival of iTunes allowed people to listen to large library of music clips before purchase, and take purchased music with them everywhere with the iPod. The music revolution began.

It's important to recognize the digital nature of the music revolution. Digital technologies not only captured music with remarkable quality, but allowed lossless copies being transferred.

Moreover, the creation of music was greatly empowered by the possibility of editing digital music on GarageBand and Logic Pro. Complex layers and layers of soundtracks can be accurately manipulated to produce the final masterpiece.

With the addition of AI, not only machine-created music became possible, but with component analysis, recovery of the last song of the Beatles, Now and Then, was made possible by isolating sound produced by different instruments.

People love music, and it's one of the most significant benefits of the mobile-cloud paradigm to bring large collections of music to everyone. Stay tuned!

Hive Mind

When wireless is perfectly applied the whole earth will be converted into a huge brain.

As the Internet developed, collective intelligence became more and more important. Because nobody knows everything, the aggregation of intelligence and wisdom can greatly outsmart a ordinary individual.

Wikipedia is a good resource to start learning, say, history. History as taught in school is filled with political manipulation, economic prejudices, and ideological propaganda. Wikipedia offers diverse points of view, so that one may arrive at more reasonable conclusions.

On Stack Exchange, people ask questions to get expert feedback. In the old days, college homework can be intimidating. Now with the help of collective intelligence, there is much less frustration.

It should be noted that quality of hive mind generally degrades as the topic goes more and more specialized. College homework is one thing. Research problem is another. There is no incentive to answer open problems without credit.

Search and GenAI can be employed on hive mind to efficiently respond to users' queries. Some worry that this decreases organic traffic, so integration between AI and content pool is recommended.

Meditation

Meditation is the ultimate mobile device; you can use it anywhere, anytime, unobtrusively.

We often encounter creative blocks. A way to generate ideas is to meditate so that the nature of things emerges by itself. It may sound mythical, but there is evidence that creative ideas may strike from the sky.

With mobile gadgets, meditation became more advanced, as people can meditate in front of the iPad. Get references via search. Write down ideas in Notes. Be inspired viewing others' work.

With Apple Watch, one may use the Mindfulness app to stay mentally healthy. During daily walks, ideas arising from the deep may be conveniently recorded in voice memo. As people exercise, they also have the opportunity to clear their minds.

Meditation is one of the most underrated features of mobile gadgets, because the primary faculty is the brain, rather than the machine.

Sometimes, meditation means thinking hard. There is no easy recipe to solve truly hard problems. Mobile gadgets act as bicycle of the mind, to explore possible routes, and to organize the journey. Take a mental hike!

Search

Google contends its dominant market share is the result of a superior product.

Although Daring Fireball may disagree, but we feel Google has pretty good performance for some useful searches. Study a book. Do exercises. Chances are, solution to exercises can be found via Google Search.

Let's face it. It's unreasonable and too time consuming to ask for extensive work on exercises. Sometimes we just need answers. Then we move on to deeper or more important subject matter.

Google dramatically reduced the entry barrier to many technical fields, including programming. We find useful references on the web, FAQs on Stack Exchange, as well as how-tos on YouTube.

Certainly Google isn't perfect. There are criticisms. The ranking of search results is often highly contentious. Filter bubble hides useful information in the name of personalization. Advertisements receive first-class treatment, not results.

But, Google is undefeated. It's a very serious question whether regulators should bring down Google in favor of competitors. However, as regulators don't understand search engine technicals, how do we trust they will make sound judgment?

UI for Apps

I have a confession: I hate apps.

I loved apps, but there are plenty of people who hate them. The development of conversational AI nourished a lot of media commentators so that they believed AI is finally going to kill apps.

If so, then clearly App Store regulation is just a piece of historical document. Fortunately or unfortunately, apps are likely going to stay with us, not because of regulation, but because of UI.

The power of conversational AI is no doubt a great addition, but it lacks certainty. To illustrate the point, consider writing a book. People can tell AI what to write, but how about edits here and there? Isn't Pages much more friendly? At least I'm certain what the edits are.

From our point of view, AI is much like a infrastructure project to make apps more powerful, rather than a replacement.

People edit videos in Final Cut Pro and use AI to remove backgrounds. There is precision from start to finish. However, if one can only use conversational AI to ask for video edits, productivity is likely to drop.

Apps are not only a computing workload, but also a user interface. Before we can figure out better UI, AI isn't going to replace the role of apps.

Digital Hub

Digital hub (center of our universe) is moving from PC to cloud.

Apple's strategy to counter Microsoft dominance in the corporate world was to go elsewhere. Long before the iPhone revolution, Apple began to build around the idea of digital lifestyle. The iLife apps helped ordinary people record, edit, and manage multimedia files like wedding photos, child birth videos, and music creations.

After the iPhone revolution, consumer digital cameras and camcorders no longer serve the masses, and people use the mobile-cloud paradigm for digital lifestyle. Think of it. Taking high resolution photos with iPhone, syncing with iCloud, applying enhancements with Lightroom on Macs are all very convenient.

Apple's digital hub strategy didn't stop here. Today, people use social networks to discover events, order food with Uber Eats, and manage finances with Numbers. Together with the App Store, digital lifestyle is indeed a great innovation of our time.

Compared with Google's AI first strategy, digital hub may sound modest, but we should make AI work for humanity, not reverse. For a good start, AI can bring sophistication to reading. Digital lifestyle is about to get much more advanced.

Office

A computer on every desk, and in every home, running Microsoft software.

We believe Microsoft Office contributed a lot to Microsoft monopoly. By making Office for Mac a little bit incompatible with Windows versions, Microsoft forced corporations to stick with Microsoft Windows for office work.

Office is a piece of powerful software. You may embed documents within documents. It's not a joke. Corporations do this all the time. Apple iWork's beautiful templates are no match for embedded documents.

The only serious challenge came from the cloud. As Microsoft moved slowly in web-based Office, Google quietly integrated Gmail, Google Drive, together with Google Docs. But, as Google didn't release native versions of Google Docs, Microsoft's reign can not be shattered.

I respect Microsoft, not for its monopoly, but for its tactics. Although politicians picked up a fight with Internet Explorer, Microsoft did very good damage control and maintained market leadership. No politicians filed antitrust against Office.

We will talk about the excellent iWork elsewhere, as it doesn't quite suit office, but support personal creativity. Microsoft Office really is a legend.

Stores

Location, Location, Location.

There are always stores popping up that demand my visit on weekend. Market is a wonderful place. From food to books, there is always something new to try.

Before the Internet age, places I can discover are very much limited by chances. Now with Google Maps and Search, interesting stores can be found all over the place.

Like gardening? No problem. Google Maps can provide store overview, hours, and updates. If there is a web site, detailed information can be obtained. People can search on the web to get reviews and criticisms.

For store owners, online presence is increasingly critical. People leave reviews and ratings on Google Maps. Bad reputation can cost a business.

In order to survive, restaurants invite bloggers to popularize their food. Food blogging has become a serious enterprise, with professional photography and commentary. Almost everyday, there are new dishes to recommend.

Of course, there are more intrusive forms of marketing such as emails and advertisements, but I find most small businesses are quite tasteful and won't abuse the liberty.

The decision to have a online store is not a easy one, which we will talk about in time. Having store information published on the Internet is already a great start.

Periodicals

Democracy only exists when there is a free and open media.

People read news. People hate news. We get news for government announcements from New York Times, and get upset when the news hurts. Steve Jobs employed Reality Distortion Field in good ways, but media often did it in bad faith. People paid for it.

Reading periodicals on the iPad is a pleasure. I still remember when Nature had a app for that. Apple News+ is a great selection of materials and a bargain. However, there is no doubt the impact of social media has greatly changed the landscape for publications.

As much as there is correction to newspaper articles on X/Twitter, there is also bullshit and fake news spreading. Freedom and openness of the press can not be undermined, but how to do it right? The answer certainly isn't as simple as Apple subscription.

Many people read periodicals because they are seeking opinion leaders to follow. But, like it or not, can a sound democracy be built upon herding? Criticism of democracy is taboo these days. Any criticism is regarded as anti-democratic. Yet the profound question of the fate of USA government remains. Can we debate democracy?

Typography

It was beautiful, historical, artistically subtle in a way that science can't capture.

One of the most critical components of modern GUI is invisible to laymen, that is typography. Most of the time, typography on iPhone, iPad, and Macs is such that people recognize content without being bothered by the aesthetics of font choices.

One exception is the Apple Watch. Due to small screen size, it's impossible to do everything right. Either the font size is too small, or arrangement becomes a problem.

Nonetheless, with the arrival of Retina Display, we no longer have to deal with blurred edges and pixelation. Typefaces on modern screens are pretty readable.

The world owes Steve Jobs a lot for bringing typography to personal computing revolution. Such attention to detail is one of the core principles of Apple design.

However, we find that EPUBs in Apple Books lack the quality standard typical to Apple products. The format is significantly inferior to PDF, but the latter isn't designed for text reflows.

A better designed ebook format with sophisticated typography is needed. Otherwise, people will continue to publish books on the web with HTML5 or PDF, with EPUB as a alternative.

Fashion

You either know fashion or you don't.

Honestly, I don’t know fashion. What I do know is how fashion in the computer industry can ruin design. Apple is typically praised for good design, but they also managed to ship crappy Safari tab bar.

Good design gets better and better. Fashion only changes. Of course, we are not talking about clothes and sunglasses, where fashion is tremendously critical to demonstrate one’s aesthetics and class. We are talking about UI trends.

One of the most notorious example of fashion ruining design was the removal of MagSafe charging from MacBook Pro. I understand people use Windows laptop without MagSafe charging, but it’s still a mystery why Apple removed it, and a relief it does make a comeback.

Perhaps I don’t understand, but weird stuff happens more and more often these days. A menu for restart/shutdown/sleep replaced buttons in macOS Sonoma. Why opt for 2-clicks when you can do a 1-click? The menu is so tiny that classic buttons are less prone to mistakes.

On iPhone, the UI is more satisfactory. However, it’s not without controversy that skeuomorphism is dropped. One still questions whether it’s aesthetics or simply fashion. I think modern UI is fine, but skeuomorphism is pretty impressive. Please do it for good reason.

Challenges for AI

Darth Plagueis was a Sith Lord.

Star Wars fans know life can be created. Contrary to biologists' conventional wisdom, it's a real possibility. I know it's taboo to discuss alternatives to natural selection, as current life on Earth likely descended from Darwinism, but can we be smarter than that and create life?

This is a task with great complexity. Thus, it's a suitable challenge for AI.

Other challenges include how to make a good poet out of AI, how to derive deep theorems with AI, how to understand beauty through AI, etc. Properly addressing one of these questions would result in revolution.

Modern AI relies on data and algorithms. As data are merely pointers to evidences, it's desirable to build AI to directly handle evidences, rather than data, the success of which depends very much on probability and statistics.

We believe AI is still in experimental stage. Great revolutions are yet to come. However, there is a trend to do away probability with symbolics. It's a deep misunderstanding, for symbolics are for stuff that's probability 1, rather than arbitrary probability in general. The future is uncertain. There has to be a place for uncertainty.

Finally, we may not be as wise as a great Sith Lord, but can we at least be wise with the help of AI?

Existence

Existence is a mystery, not to be confused with existentialism.

The existence of the iPhone is a great mystery. It's not predicted by physics, as one can readily see that its existence and non-existence are both consistent with the Standard Model. Although the construction of the iPhone used a lot of physics, its invention is a upset to Dawkins.

People like Dawkins invented lousy philosophy trying to reduce the world to physics, but can not see logic.

More importantly, the existence of the iPhone greatly transformed human existence. It's really a extension of man. Our mind and action depend on it. For better or worse, we get instant emergency notifications, and fewer close friends than before.

The profound question is how to live a better life with it, and technology in general. As we have seen, the availability of smartphones in classrooms resulted in educational degradation. We should fix it, instead of trying to get rid of smartphones.

With the advance of AI, the situation gets more severe, as intelligence caught people unprepared. The proliferation of scams, and the threat posed by evil in general, are not properly addressed, as politicians only know antitrust. It's a familiar story, but don't make the same mistake again.

Workflow

Like, one day every six months.

The author of The Art of Computer Programming, Donald Knuth, has a amazing workflow. He stopped using emails long ago, and processed postal mails in batch mode. The book series is produced on his own legendary TeX typesetting system. It's a ultra-productive life.

Of course, everybody has his/her own workflow. The productivity enthusiasm sparked by the arrival of iPad Pro invited people to shift from laptops to tablets. The result wasn't rosy and prominent media figures began to demand Apple to put macOS on iPad Pro.

It's likely the wrong way to address productivity on tablets. However, tablet workflow definitely needs to be redesigned. With multitasking, Stage Manager, and all sorts of input methods including keyboard, trackpad, and Apple Pencil, iPad Pro has become a mess.

Currently, the hottest topic is AI workflow. As Adobe Firefly enters graphic design toolkit, artists can fill in blank space magically to finish production. The result is often more satisfactory than artists' skills.

The digital revolution transformed workflow in countless ways. The joke of a ChatGPT programmer may one day become serious business. While the benefits of LLM is limited, the AI revolution is still long, so let's see.

Trivialities

There is a wide gap between The Verge and the Silicon Valley.

In contrast with the vivid development in the Silicon Valley and academia, the press is filled with trivialities like Apple leaks, wealth numbers, and gossips. To some, it's not serious, but the lack of a proper press to inform the public left the Silicon Valley defenseless against political manipulation.

People don't understand, why experts revolt against backdoors in encryption. Isn't the government's demand of online safety and secure encryption compatible? To experts, the answer is clearly no, but to the public, who voted for politicians responsible for regulation, the answer is ambiguous.

The Silicon Valley can complain about politicians' ignorance, but if voters do not know better, can we really expect good regulation? The Verge clearly falls short. The Silicon Valley's unwillingness to tell truth to the public is making it worse.

People view information from the Valley as well as the government as power plays to assert dominance. They rarely see beyond the reality distortion field. In Apple's case, I'm afraid Daring Fireball doesn't help much in DMA and antitrust issues. You really can't blame voters.

Journey

You can't connect the dots looking forward; you can only connect them looking backwards.

Life is a journey. Some look over the horizons while others are attracted to flowers on the road. For many people, the most cherished functionality of mobile gadgets is the recording of the journey.

I use the Journal app on iPhone for little more than food photos, but I can imagine a lot of people take photos of birthday parties, record videos of Halloween adventures, and write about their memories of close friends all the time.

The digital revolution helped connecting the dots as one looked back.

Perhaps more importantly, the digital revolution also provides possibilities for the future. Nobody has a ton of great ideas, but one often stumbles upon others' shared vision of the future on the Internet and gets inspired.

Whether it's a YouTube video by CERN, or a piece of writing on Project Gutenberg, the Internet can be enormous enlightenment for the explorer. Indeed, Turing Award winners debating about AI on X/Twitter can be as exciting as Star Wars.

But be warned, there are also dangers we can not tell you here. Be cautious and embrace the journey.

Accessories

We're delighted to hear about creative uses for AirTags.

There is the iPhone and there is personalization. The beloved mobile gadget lets you set wallpapers and widgets, but people give it character with skins, cases, stickers, etc. Accessories are fine details worth discussing.

While being functional is important, the most intimate facet of accessories is personal. Some choose cartoons to illustrate their taste. Some use logos to show affiliation. Some even design bags to give proper impression.

Apple has its own taste, but to impose it on the public would be unsatisfactory. Accessories provide remedy for most people to express themselves.

On the functional side, Apple Pencil enabled creativity for artists, AirTag lowered anxiety over possessions, and of course, we must mention selfie sticks for selfie. Accessories make the product much better.

There is a subtle point, that accessories should be accessories, not necessities. We have seen all sorts of dongles and converters. In the early days, it makes sense to use a Wireless dongle, but today, the existence of so many poorly designed products requiring dongles for compatibility is absurd. Yes, identity verification system is a thing.

Privacy

Privacy means people know what they're signing up for, in plain English, and repeatedly.

As macOS Sequoia Beta frequently and repeatedly asked user for permission regarding screen recording apps, it's good time to talk about privacy.

While Apple's approach may be overly cautious, privacy is a big issue in modern digital life. The reader may wonder why Facebook wanted to collect private information for targeted ads. While printed newspapers serve broad-based ads, many advertisers can not afford platform-wide ads on Facebook. The natural approach is to offer these ads to restricted audiences.

And it's not limited to Facebook. Washington wanted to monitor global financial transactions. Despite Apple's efforts to preserve privacy with on-device processing, Private Cloud Compute, and encryption, surveillance is still prevalent, especially in finance. Just ask the bank about your financial history.

Striking balance is difficult, but essential for personal protection. You wouldn't want to lose all the wealth because the bank can not keep a record, would you?

For extremely sensitive data, Knuth's approach is highly recommended. He only stores his crown jewels in a isolated computer running open source software.

Events

Find tickets to your next unforgettable experience.

These days, people can discover all sorts of local activities on Facebook. Workshops, tours, and concerts are everywhere. Although not all events are created equal, they are much easier to navigate than in the past.

That said, as the reader may notice, there are subtleties that limit the functionality of these apps. Facebook has to make a profit. If it made event discovery too easy, people would not pay for event advertising. And Facebook wanted to get paid.

So, what we have is a compromise. While posting events is easy, hosts had better spend some fortune reaching for participants. There are countless events that nobody attended. Sound cynical?

Of course, this does not apply to Taylor Swift, whose concert tickets are regularly sold out really quick. Again, think of it, it's the digital technology that powered ticket sales. Or just see Apple WWDC.

So far, event navigation is based on search. With the advance of AI, apps should be able to understand users' queries for specific types of events and make recommendations.

Families should be able to host private events easily, but it has yet to be done. See our take on TV.

Upgrade

Backup your data.

A few years ago, when the mobile-cloud paradigm was just beginning, upgrading iPhone or iPad was a pain. To move everything from the old to the new is too dirty. To setup a completely new device means losing local data.

Mobile-cloud paradigm changed all that. Nowadays local data synced with the cloud can be made available on every device, old or new. Every time I upgrade a iPhone or iPad, there is no need to move data. Just do a fresh setup and sync.

There are exceptions, like LINE, which makes significant use of local storage with limited cloud history. These apps require user to backup their data before upgrading. Still, it's cleaner than moving everything over.

In the age of Time Machine for Macs, local backups are always available. The fear of losing precious data is minimal. In mobile-cloud paradigm, however, if you are locked out of Apple ID, you lose everything. There should be a remedy that goes beyond protection against theft. It should be possible to redeem valuable data with people's true identity, provided that they made the association.

Some connected devices, like Apple Watch, require special attention during iPhone upgrades. Unpair and repair. These are inconveniences due to Apple Watch's small screen size, but surely mobile-cloud paradigm can make it easier?

Noise

Noise is the curse of information age.

The innovation of the Internet is the beginning of free exchange of noise, whether it's bullshit, conspiracy, or fake news. Since few people other than experts can check the information they receive from the Internet, noise poisons people's minds and drives irrational movements.

In daily life, we receive contradictory advices regarding diet and health. Yet some people still take them seriously. The rule of journalism requires people to treat them as low quality information, which is the antidote many ignored.

The deluge of noise is a curse for search engines like Google. With AI for Search, Google not only didn't filter out noise in search results, but also made summaries based on pure noise. Glue your pizza.

The curse is deep. People wanted to build knowledge engines without noise, but always ended up with something far less powerful than ordinary search engines. Perhaps there is hope, but there are plausible reasons that knowledge engine just can be that useful. Much wisdom isn't knowledge.

Noise even made economists like Krugman constantly change positions in order to fit the daily fashion. Inflation is short transitory, non-transitory, and then long transitory. You call it. People's memory is short, but the Brownian motion does real harm.

Books

Almost all books have a half-life between 2 and 6 months.

The first stage of digital revolution in books is Amazon. The second is the unified scheme for mobile, cloud, and AI. Amazon revolutionized book delivery, and our scheme will revolutionize how people read books.

Digitized books may sound very little, but considering trees fallen for print and most books undeserving, the digital platform is actually a graceful solution for our planet.

Traditionally, people read books and absorb content. As most books are mediocre, the value of reading is not very high. Unified scheme for mobile, cloud, and AI is about to change that.

Not only the mobile-cloud paradigm provides easy access to content anytime anywhere, but AI will respond to your questions so that exploration and understanding no longer pose a problem.

Currently, the disdain for digital books is due to aesthetics. EPUB files are terrible for reading. PDF isn't flexible. No major corporations try to develop a new format. Print is far from dead, but in our opinion, hindering the digital revolution in books is no good.

If you are a traveler, you know what I mean. Some books like The Rising Sea are better read digital.

Library

Oh, neoliberalism.

The early stage of the digital revolution took place during the age of neoliberalism. Freedom allowed Silicon Valley revolutionary companies to realize their dreams. However, the public sector was tragically ignored.

Taiwan made a small step toward building a digital library app called iLib Reader. Although the interface isn't good, the books not many, there is huge value in making libraries digital.

Poor people can not afford to buy the books. People live in rural areas have limited access to physical libraries. Digital libraries funded by public spending help bring equal opportunity to everyone.

There is a small problem. As I browse book collections in iLib Reader, many are about the metaverse. Guess what, Taiwan government is pouring national resources into a speculative initiative! We need to avoid abusing public fund, but not curb public spending on people's welfare.

It's imaginable that USA may be able to do much more than Taiwan. However, the economic profession is dominated by neoliberals, industrialists, and the radical left. There is limited willingness to help people. Can we listen to economists less and listen to people more?

Business

Sell everything.

When I was a kid, department stores were a wonder. As I grew up, Amazon and online stores began to play a major role in my digital life, but I never gave up on retail stores. However, even I understand Amazon has far better collection of goods at better prices.

Many people try out stuff in retail stores and then buy on Amazon. For workers, Amazon shopping is much more convenient than store shopping.

The technology is not simply bringing stores online. ERP and databases introduced global consistency, operation optimization lowered costs, and gadgets provided direct contact with consumers.

Traditional scholars tried to bring down Amazon, thinking monopolies maximize profit, but then figured it's better to charge Amazon with low prices. As the reader might see, the intention is to hurt Amazon, rather than help people. Such is the antitrust culture from the radical left.

Can we regulate Amazon better? Sure, like labor protection. But, we have to be willing to see beyond cynical antitrust. Consumer welfare gain is a problem, loss is a problem. You see the pattern of antitrust advocates. More importantly, digital technologies produce black swans. It's better not to ruin giants.

Publishing

Give me 26 lead soldiers and I will conquer the world.

The personal computing revolution made independent publishing, like this book, possible. While I definitely have no desire to conquer the world, many people do. I can't speak for Taleb, but his free PDF on fat tails really is a hit.

Without digital technology, making books widely available for free is very costly. Now individuals enjoy press freedom like never before. Naturally, governments wanted to control publications, bringing many to demise.

Perhaps I'm silly, but the fight for press freedom is a major issue of our time. It's not obvious, but a free press may not serve the common good, neither does government suppression. Can we approach it with more wisdom?

Turn our attention to tools. While Adobe copied the print paradigm, there is no reason not to establish a digital enterprise, like databases. Imagine we can read all past papers freely and publishers only charge for copyrighted content. It's only the beginning.

Personally, I appreciate iWork very much. Ordinary people like me can publish a book with ease. Not only so, the apps are so inspiring that the production experience is full of new discoveries. What a beautiful age we live in.

Friendship

We are not talking about love.

According to some studies, we are having fewer close friends than before. It's depressing. Some blame it on digital technology, but we believe it's about people's use. If people are satisfied with online friends, clearly there is no problem. If not, there are many ways to socialize. Host a event and gather new friends together. Find a cafe and share knowledge about coffee with owners. Start a business and meet customers.

There are countless ways to get in touch with people via digital technology. One just has to be imaginative and reach out. It's not as easy as school classmates, but building friendship should not be a issue.

In business, I've met with many freelancers. Due to my interest in studying people, I had lengthy discussions with some, about life, work, and wisdom. Although not all of us get along, there is always something to learn.

The real problem is some people are helpless using Facebook or X/Twitter and don't know how to socialize. There should be classes teaching kids how to properly use technology, rather than trashing it. Certainly, there is danger in online socializing that must be addressed, but if you are wary, you can always attend credible public events and do it in person.

Hardware

Everyone who is serious about software should make their own hardware.

In order to make MacBook Air thinner, Apple sacrificed keyboard in the beginning, before finally solved it with M2 SoC without fans. Hardware is that hard.

We didn't mention a ton about hardware, not because it's uninteresting, but because hardware is really a advanced piece of technology few can fully fathom.

The chassis of M2 MacBook Air is so light and robust. The camera of iPhone 16 Pro has so good frame rate. The sound of HomePod is so powerful. All these are the shallower part of Apple hardware experience.

The deep part? Just see how iPhone 16 Pro was engineered and made. I understand little, but clearly sophistication is achieved.

There is good reason why hardware is obscure. There are few books about it. Companies keep industrial secrets. People take it for granted. Only in failures we see how hard hardware is.

Due to physical limitations, sometimes amazing hardware engineering can only provide a small step forward, but there are people out there who appreciate M2 Ultra, I'm sure.

Podcasts

Not a minute less, not a minute more.

When Apple released iPod and iTunes, the primary purpose was to enjoy music. However, people soon began to distribute episodic audio content for iPod. Thus, podcasts were born.

Today, podcasts have evolved into video format, but the original audio format is still popular.

Many podcasts consist of dialogues. As one might expect, editing plays no small role. In fact, it can become a reality distortion field. I would say the conventional wisdom that states trust but verify is too naive. Don't trust the host's intention, as materials edited out might be vastly more informative.

News makes popular podcast material as radio is too inflexible. People download news podcasts to listen to via CarPlay.

Till this day, Apple still dedicated a app to podcasts, while Google made a move to combine podcasts into YouTube Music. Such is the style difference, but podcasts are mostly not music, of course.

Contrary to many AI supporters, I regarded AI-generated podcasts as speculative material. As people lack powerful means to verify facts, AI generation isn't going to help us against disinformation much.

Collaboration

The best ideas have to win.

Digital technologies like the Internet enabled collaboration beyond geographic boundaries. But people should remind themselves that the purpose of collaboration is to do better. All too often, trolls and hypocrites use collaboration as a means to elevate their own status. Collaboration with these people can lead to ruin.

I'm old school in collaboration. Instant brainstorming via Freeform with online collaborators doesn't work for me. However, a combination of social networks, documents, and of course, Freeform can deliver magical results. It just requires a lot of back and forth, not all that instant.

The use of Freeform is to provide a good interface for review. Suppose we are designing a poster. Freeform can conveniently record visual feedback when texts tend to be ambiguous.

For corporations, online meetings have become a norm. While many are still using projectors, TVs are increasingly popular for collaboration as the size and quality improve. Recordings are easily made.

During pandemic years, online collaboration has demonstrated the resilience of digital technologies. Students take lessons as usual. Businesses continue with work from home. It's valuable, so don't ruin it.

School

Trump has become the 47th President of the United States of America.

The school is a surprisingly controversial place. As education is largely normative, vested interests seek to embody favorable mindset into future generations. How should schools teach the return of Trump?

We won't answer the question here, but with the availability of digital technologies, at least students should be proficient in assessing viewpoints.

On the other hand, science and technology education can greatly benefit from dynamic content made possible by computers like Macs, iPads, and Vision Pros. It's good to learn molecular biology with 3D DNA models.

Teaching music can be a lot of fun. With GarageBand, students can experiment with music creation. Powered by AI, recordings can be enhanced in subtle ways. Of course, we can all listen to them on the iPhone.

Apple is a leader in education markets. Schools buy lots of notebooks and iPads, but we believe the transformation of education is just beginning, that students can actively learn, rather than passively absorb.

As everybody has his/her own opinion, tolerance is critical especially in the digital age. We've seen too much indoctrination that ruins the benefits of digital technologies.

Marketing

Think Different.

Digital marketing is a shadowy subject. As marketing can come from values as well as deception. The successful marketing of subprime mortgage led to people losing their homes.

On the bright side, Apple successfully communicated their values through marketing campaigns. They are not just fancy, but represents core values like privacy. And Apple delivered.

There are countless tricks to increase consumer engagement. Some even extensively collect consumer data to better price differentiate between groups. The problem of privacy is serious.

Although Google Ads dominated digital advertising, I found the effectiveness questionable as Google directed much exposure to content, rather than search. Supposedly, people watching YouTube videos just want to skip the ads, while companies searching for suppliers are the ones to target. But, Google did reverse to swallow your money.

Facebook and Instagram are great places for companies to push marketing campaigns, but clearly Maps integration can improve discoverability. Bloggers help restaurants a lot, and in return, they get free meals. X/Twitter is becoming more and more political, but we still find product reviews there.

Navigation

We are doing everything we can to make Maps better.

Apple introduced Column View in Finder and Spotlight to help users navigate the file system, but my favorite is Time Machine. Although iCloud kind of breaks it, Time Machine interface is amazing for navigating backups.

As the volume of data and documents grows, people inevitably seek better ways to navigate information. We have Search, Maps, and recently, AI. Imagine you are evaluating whether a public figure is a bullshitter. You can ask ChatGPT about his/her past positions on certain topics, which is incredibly difficult for humans to parse through.

People also use mobile gadgets to navigate the outside world. Routes and directions are basic stuff, but even the visually impaired can use the iPhone to understand their surroundings to reach destinations.

With the arrival of self-driving cars and spatial computing, the technology of navigation is under dramatic development. Presumably, with the help of AI, Vision Pro can quickly find out relevant information about outside world in AR.

The reader should be reminded that navigation is a hard problem, as Google Maps may direct people toward a cliff. When in doubt, be sure to check and verify.

Photography

I don't trust words.

Digital manipulation of photographs these days has destroyed our trust in plain eyesight, but photography still survives for aesthetic reasons. Many people feel capturing a instant in life can express love. Whether it's love for humanity, nature, or technology, photography can make a moment eternity.

The introduction of social networks on mobile gadgets revolutionized how people take and share photographs. In a sense, it's the continuation of Apple's digital hub strategy. The difference is that now we don't have good aesthetics like well-designed print albums on digital devices. It's imaginable digital albums can develop unique aesthetics beyond a collection of squares in Photos app.

Recently, the iconic photograph of Trump surviving assassination symbolized the currents of our time. You may love Trump, you may hate Trump, but you can not deny the photograph is historic.

NYT claimed USA culture is photographic rather than video-centric. From their opinions, you can also guess why they tried to downplay Biden's disastrous performance in live debate by elevating photography. Don't take me wrong. I love photography, but ruining it with politics is distasteful.

Multimedia

I'm just asking for your attention.

The ability of modern gadgets to render multimedia makes these devices addictive. People spend hours and hours on X/Twitter, YouTube, Instagram, etc. Although there is nothing intrinsically wrong with multimedia, companies often conduct cognitive bombardment instead of providing genuine content to viewers.

Look at X/Twitter. You see Xvideos. Look at YouTube. You see countless pseudoscience. Look at Instagram. You see countless ads.

OK. Of course, to make services freely available, there got to be some cost, but the point is the cost is often unnecessary. Why does X/Twitter recommendation algorithm constantly prioritize pornography? Do they think it's fun to embarrass the user on metro?

Honestly, you should be hesitant to use X/Twitter in public.

The damages of cognitive bombardment go much further. Your memory is stuffed with so much junk that you may not recognize the important stuff in your life. Many people wasted their life away.

There are much more positive uses of multimedia, like engaging educational content. People need to prefer wisdom over bullshit.

Styles

AGI: All Ghibli Images.

Recently, ChatGPT became very good at generating images in specific styles, which sparked a wave of Ghibli-style images on social networks.

The attention to style is best illustrated by Aqua GUI. It's so stunning that so many people pirate it so that Apple had to drop it to differentiate against the status quo.

With the introduction of AI, writing styles and image styles can all be manipulated to suit specific needs. Formal, casual, punk, classic, you name it. It's largely a good thing. People can now express themselves more appropriately.

But styles are extremely hard. It's one thing to come up with a Ghibli-style image. It's another to establish a new style. The real challenge for AI lies in the ability to explore new styles beyond imitation.

At times, there are more subtle approaches to styles. Apple used AI to learn from users' writing to make it more consistent and retain the original style. It's not revolutionary, but good for taking notes.

There are dangers, of course. As AI learn form writing, speech, and manners, deepfakes can fool us into disasters. How do I know if it's really my doctor who called me or malicious AI?

Products

Make something wonderful and put it out there.

Due to human irrationality, companies may survive by delivering subpar products. A exception is Steve Jobs, who believed in excellence. That's what sets Apple apart, and their products reflect the love of humanity.

It's not easy to achieve. As sophistication requires a ton of care, lesser companies opt for shadowy marketing aiming at manipulating buyers' minds, rather than letting the products speak for themselves.

Therefore, we see carelessness everywhere. Just observe how many private records hacked.

For great products to win, it's non-trivial. Apple's iPod+iTunes strategy is a success. As nobody integrated entire music listening experience together, Apple not only provided convenience, but more importantly, quality. Apple's iPod and iTunes complemented each other really well, driving out inferior competitors.

It's sad that Apple faced antitrust threats for making great products, while companies making crap thrived. Many prominent antitrust scholars urged the reverse, but so far nobody listened. All I can say is that one day we will all remember Apple's genius, but possibly only fraudulent politicians' ass.

Hype

We are past the event horizon.

Most people have negative opinion regarding hype. Indeed, Eric Schmidt had to justify AI development by claiming it's under-hyped. However, there are technologies that only become much more powerful when scaled up, taking advantage of network effects, like telephones. Hype is a way to get there.

Thus, although hype may create bubbles, like dot-com boom, it also accelerated the adoption of Internet so that the Silicon Valley can step up onto world stage.

The real problem with hype is driving out proper concerns regarding dangers posed by technology. AI hype often argued against safety, rather than pointed out doomers' failure to establish safety by design.

AI safety is a important topic. Yet we are governed by extremes either favoring unlimited power, or spelling doom. Indeed, techniques like reinforcement learning may help with safety by design, but few are paying attention.

Another use of hype is to aid corporate competition. Everybody is talking about singularity, without knowing what singularity is. The point is that under-hyped companies may indeed go extinct, thanks to human irrationality. You got to embrace some degree of hype.

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