

The Great Tech War Of 2012

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<http://www.fastcompany.com/magazine/160/tech-wars-2012-amazon-apple-google-facebook>

Apple, Facebook, Google, and Amazon battle for the future of the innovation economy.



From left: The late Apple cofounder Steve Jobs, Facebook CEO Mark Zuckerberg, Google CEO Larry Page, and Amazon CEO Jeff Bezos. | Photos courtesy of David Paul Morris/Getty Images (Jobs); Justin Sullivan/Getty Images (Zuckerberg); Chip East/Reuters (Page); Mario Tama/Getty Images (Bezos).

Gilbert Wong, the mayor of Cupertino, California, calls his city council to order. "As you know, Cupertino is very famous for Apple Computer, and we're very honored to have Mr. Steve Jobs come here tonight to give a special presentation," the mayor says. "Mr. Jobs?" And there he is, in his black turtleneck and jeans, shuffling to the podium to the kind of uproarious applause absent from most city council meetings. It is a shock to see him here on ground level, a thin man amid other citizens, rather than on stage at San Francisco's Moscone Center with a larger-than-life projection screen behind him. He seems out of place, like a lion ambling through the mall.

"Apple is growing like a weed," Jobs begins, his voice quiet and sometimes shaky. But there's nothing timorous about his plan: Apple, he says, would like to build a gargantuan new campus on a 150-acre parcel of land that it acquired from Hewlett-Packard in 2010. The company has commissioned architects--"some of the best in the world"--to design something extraordinary, a single building that will house 12,000 Apple employees. "It's a pretty amazing building," Jobs says, as he unveils images of the futuristic edifice on the screen. The stunning glass-and-concrete circle looks "a little like a spaceship landed," he opines.

Nobody knew it at the time, but the Cupertino City Council meeting on June 7, 2011, was Jobs's last public appearance before his resignation as Apple's CEO in late August (and his passing in early October). It's a fitting way to go out. When completed in 2015, Apple's new campus will have a footprint slightly smaller than that of the Pentagon; its diameter will exceed the height of the Empire State Building. It will include its own natural-gas power plant and will use the grid only for backup power. This isn't just a new corporate campus but a statement: Apple--which now jockeys daily with

ExxonMobil for the title of the world's most valuable company--plans to become a galactic force for the eons.

And as every sci-fi nerd knows, you totally need a tricked-out battleship if you're about to engage in serious battle.

To state this as clearly as possible: The four American companies that have come to define 21st-century information technology and entertainment are on the verge of war. Over the next two years, Amazon, Apple, Facebook, and Google will increasingly collide in the markets for mobile phones and tablets, mobile apps, social networking, and more. This competition will be intense. Each of the four has shown competitive excellence, strategic genius, and superb execution that have left the rest of the world in the dust. HP, for example, tried to take a run at Apple head-on, with its TouchPad, the product of its \$1.2 billion acquisition of Palm. HP bailed out after an embarrassingly short 49-day run, and it cost CEO Léo Apotheker his job. Microsoft's every move must be viewed as a reaction to the initiatives of these smarter, nimbler, and now, in the case of Apple, richer companies. When a company like Hulu goes on the block, these four companies are immediately seen as possible acquirers, and why not? They have the best weapons--weapons that will now be turned on one another as they seek more room to grow.

There was a time, not long ago, when you could sum up each company quite neatly: Apple made consumer electronics, Google ran a search engine, Amazon was a web store, and Facebook was a social network. How quaint that assessment seems today.

Jeff Bezos, who was ahead of the curve in creating a cloud data service, is pushing Amazon into digital media, book publishing, and, with his highly buzzed-about new line of Kindle tablets, including the \$199 Fire, a direct assault on the iPad. Amazon almost doubled in size from 2008 to 2010, when it hit \$34 billion in annual revenue; analysts expect it to reach \$100 billion in annual revenue by 2015, faster than any company ever.

Remember when Google's goal was to catalog all the world's information? Guess that task was too tiny. In just a few months at the helm, CEO Larry Page has launched a social network (Google+) to challenge Facebook, and acquired Motorola Mobility for \$12.5 billion, in part to compete more ferociously against Apple. Google's YouTube video service is courting producers to make original programming. Page can afford these big swings (and others) in the years ahead, given the way his advertising business just keeps growing. It's on pace to bring in more than \$30 billion this year, almost double 2007's revenue.

Why Apple Will Win

The iPhone, iPad, and iEverything else will keep it merrily rolling along.

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Facebook, meanwhile, is now more than just the world's biggest social network; it is the world's most expansive enabler of human communication. It has changed the ways in which we interact (witness its new Timeline interface); it has redefined the way we share--personal info, pictures (more than 250 million a day), and now news, music, TV, and movies. With access to the "Likes" of more than 800 million people, CEO Mark Zuckerberg has an unequalled trove of data on individual consumer behavior that he can use to personalize both media and advertising.

Amazon, Apple, Facebook, and Google don't recognize any borders; they feel no qualms about marching beyond the walls of tech into retailing, advertising, publishing, movies, TV, communications, and even finance. Across the economy, these four companies are increasingly setting the agenda. Bezos, Jobs, Zuckerberg, and Page look at the business world and justifiably imagine all of it funneling through their servers. Why not go for everything? And in their competition, each combatant is getting stronger, separating the quartet further from the rest of the pack.

Everyone reading this article is a customer of Amazon, Apple, Facebook, or Google, and most probably count on all four. This passion for the Fab Four of business is reflected in the blogosphere's panting coverage of their every move. ExxonMobil may sometimes be the world's most valuable company, but can you name its CEO? Do you scour the Internet for rumors about its next product? As the four companies encroach further and further into one another's space, consumers look forward to cooler and cooler products. The coming years will be fascinating to watch because this is a competition that might reinvent our daily lives even more than the four have changed our habits in the past decade. And that, dear reader, is why you need a program guide to the battle ahead.

1 | The Road Map

Amazon, Apple, Facebook, and Google do not talk about their plans. Coca-Cola would tweet its secret formula before any of them would even hint at what's next. "That is a part of the magic of Apple," says new CEO Tim Cook.

That secrecy only fuels the zeal of those bent on sussing out their next moves. And it is certainly possible to decode the Fab Four's big-picture strategic ambitions: Over the next few years, each will infiltrate, digitize, and revolutionize every corner of your life, taking a slice out of each transaction that results. This is a vision shared by all four, and it hinges on three interrelated ideas.

First, each company has embraced what Jobs has branded the "post-PC world"--a vision of daily life that is enabled by, and comes to depend on, smartphones, tablets, and other small, mobile, easy-to-use computers. Each of these companies has already benefited more than others from this proliferation of mobile, a shift that underlies their extraordinary gains in revenue, cash reserves, and market cap.

The second idea is a function of the fact that these post-PC devices encourage and facilitate consumption, in just about every form. So each of these giants will deepen their efforts to serve up media--books, music, movies, TV shows, games, and anything else that might brighten your lonely hours (they're also socializing everything, so you can enjoy it with friends or meet new ones). But it's not just digital media; they will also make the consumption of everything easier. The new \$79 Kindle, for example, isn't just a better reading device; it integrates Amazon's local-offers product. The Fire will be accompanied by a tablet-friendly redesign of Amazon.com that will make it easier for you to buy the physical goods that the company sells, from pet food to lawn mowers. Wherever and whenever you are online, they want to be there to assist you in your transaction.

All of our activity on these devices produces a wealth of data, which leads to the third big idea underpinning their vision. Data is like mother's milk for Amazon, Apple, Facebook, and Google. Data not only fuels new and better advertising systems (which Google and Facebook depend on) but better insights into what you'd like to buy next (which Amazon and Apple want to know). Data also powers

new inventions: Google's voice-recognition system, its traffic maps, and its spell-checker are all based on large-scale, anonymous customer tracking. These three ideas feed one another in a continuous (and often virtuous) loop. Post-PC devices are intimately connected to individual users. Think of this: You have a family desktop computer, but you probably don't have a family Kindle. E-books are tied to a single Amazon account and can be read by one person at a time. The same for phones and apps. For the Fab Four, this is a beautiful thing because it means that everything done on your phone, tablet, or e-reader can be associated with you. Your likes, dislikes, and preferences feed new products and creative ways to market them to you. Collectively, the Fab Four have all registered credit-card info on a vast cross-section of Americans. They collect payments (Apple through iTunes, Google with Checkout, Amazon with Amazon Payments, Facebook with in-house credits). Both Google and Amazon recently launched Groupon-like daily-deals services, and Facebook is pursuing deals through its check-in service (after publicly retreating from its own offers product).

It would be a mistake to see their ambitions as simply a grab for territory (and money). These four companies firmly believe that they possess the ability to enhance rather than merely replace our current products and services. They want to apply server power and software code to make every transaction more efficient for you and more profitable for them.

2 | The Inevitable War

Hardware. Media. Data. With each company sharing a vision dependent on these three big ideas, conflict over pretty much every strategic move seems guaranteed. Amazon, for example, needs a better media tablet to drive more customers to its Kindle, MP3, and app stores. But how to avoid an HP-like disaster? The Kindle Fire has just a 7-inch screen, rolls up all of Amazon's streaming services, and retails for a mere \$199, thus slotting into a price and feature niche just between an iPhone and an iPad. Who knew there even was a niche there? Apple doesn't believe that niche exists (see the next section), but you can bet it will if the Kindle Fire succeeds.

Why Facebook Will Win

Everything is social--and Zuckerberg hasn't even gone public yet.

[Continue >>](#)

When Google introduced its new social network Google+, it was seen, rightly, as a challenge to Zuckerberg's Facebook. But at its core, Google+, along with +1, Google's version of the like button, should be understood as a product that will generate more data about what users like. Those data improve search algorithms and other existing services, and can even lead to new products. So Google's search for self-improvement is what has brought it into direct competition with Facebook.

Why did Zuckerberg flirt with a "Facebook phone" earlier this year? (HTC released a handset called the Status that included a built-in button that let users post to the social network with one click.) While Facebook is the most-downloaded app on the iPhone and acts as a central contacts repository for millions of Android, Windows, and BlackBerry devices, its rivals all have competing social networks that could siphon away users. Most strikingly, Apple has integrated Twitter throughout iOS 5, letting you tweet from any app, a feature clearly aimed at dulling Facebook's mobile growth. Page now has Google+. Amazon's Kindle has a social network that connects readers of the same book. Zuckerberg

needs to maintain a direct line to the pockets of Facebook members, and that's why you can discount his repeated dismissal of rumors that he'll enter the hardware business.

The torrent of news and rumor surrounding these companies and their initiatives is already overwhelming, and it's only going to grow stronger. But viewing their moves through the lens of hardware, media, and data is the first step toward understanding their strategies.

3 | The Profit Game

Late in 2010, Jobs made a surprise visit to Apple's quarterly earnings call. The purported reason was to celebrate Apple's first \$20 billion quarter, but Jobs clearly had something else on his mind: Android. At the time, Google's free mobile operating system was beginning to eclipse the iPhone's market share, and Jobs was miffed. He launched into a prepared rant about Android's shortcomings. "This is going to be a mess for both users and developers," he said, citing the inevitable complications that arise from the fact that Android phones look and work differently from one another. As for the crop of 7-inch Android tablets being developed to take on the iPad? "DOA--dead on arrival," Jobs asserted. (Jeff Bezos, for one, has ignored Jobs's perspective.)

What Jobs didn't say in his outburst, though, was how little Android's market share matters to Apple. According to Nielsen, Android now powers about 40% of smartphones; 28% run Apple's iOS. But here's the twist: Android could command even 70% of the smartphone business without having a meaningful impact on Apple's finances. Why? Because Apple makes a profit on iOS devices, while Google and many Android handset makers do not. This is part of a major strategic difference between Apple and the other members of the Fab Four. Apple doesn't need a dominant market share to win. Everyone else does. The more people who use Google search or Facebook, the more revenue those companies can generate from ads. Amazon, too, depends on scale; retail is a low-margin business dependent on volume.

Apple, on the other hand, makes a significant profit on every device it sells. Some analysts estimate that it books \$368 on each iPhone. You may pay \$199 for the phone, but that's after a subsidy that the wireless carriers pay Apple. Google, in contrast, makes less than \$10 annually per device for the ads it places on Android phones and tablets. That's because it gives away the OS to phone makers as part of its quest for market share. Google's revenue per phone won't go up after the Motorola purchase closes-- Motorola Mobility's consumer-device division has lost money the past few quarters. So despite Google's market-share lead, Apple is making all the money. By some estimates, it's now sucking up half of all the profits in smartphones.

Making a lot of profit on every device has always been Apple's MO, but in recent years it has added something extra to this plan. In the past, Apple's profit margins were a function of higher prices--the company sold computers at luxury price points and booked luxury profits. But in smartphones and tablets, Apple has managed to match mass-market prices and still make luxury profits. This neat trick is the work of new CEO Cook, who, during his years as COO, mastered the global production cycle. He did so by aggressively using cash to bolster the power of Apple's considerable scale; several times over the past few years, he's dipped into the company's reserves to secure long-term contracts for important components like flash memory and touch screens. Buying up much of the world's supply of these commodities has one convenient added benefit: It makes them more expensive for everyone else.

One of Cook's great challenges will be to maintain this edge. While Amazon will continue to pursue audience at the expense of profit margins, Google (and eventually Facebook) will try to make like Apple and increase profits. When Google's only goal was to proliferate Android software, it could live with that sawbuck per phone, per year. But with Motorola, Google now has a direct stake in the profitability of Android devices. Developing, marketing, and distributing attractive phones and tablets requires a much more substantial investment than selling software. Google has pledged to run Motorola as a separate entity, but its shareholders won't stomach a series of money-losing quarters that could depress Google's earnings or stock. In short, now that Page is in the hardware business, he's going to have to start thinking about phones the way Cook does.

4 | The Dangerous Decoys

For a onetime agricultural hub that's been turned into suburbia, Silicon Valley is home to an awful lot of talk about moats these days. Warren Buffett deserves credit for the metaphor, which describes the companies he's most interested in pursuing--ones with huge revenues (a castle of money) whose businesses are protected by unbeatable competitive advantages (or very wide moats). The Fab Four all have moats to rival those at Angkor Wat.

As a result of these wide moats, these companies generate so much money that they can spend freely on new ventures; and in some cases, they're willing to do so even if the business won't ever bring the kinds of gains they're used to. Look at Apple's efforts in e-books: Does the company really want to overthrow Amazon or is it simply trying to offer one more reason to buy iPhones and iPads and, thus, guard its cash cow? When Google invests billions to build smartphones and a new social network, is it really trying to topple Apple and Facebook--or is it simply building a wider moat to protect its core interest, search revenue? "We don't do things that we don't think will generate really big returns over time," says Larry Page. But if a possibly unprofitable social network beefs up search revenue? That's just fine.

These ventures are decoy threats that tax a rival's resources. Google+ will be hard-pressed to ever match Facebook's global reach, but it will certainly keep Zuckerberg and his engineers on their toes. Indeed, it already has. Facebook has clearly copied the most-lauded Google+ features, such as fine-grained privacy controls and smart groupings, and pushed new ideas such as Timeline and auto-sharing. Zuckerberg has to do this--he simply must eliminate any incentive for leaving Facebook. And Page knows that the more time Zuckerberg worries about Google+, the less time and fewer resources Facebook has to build a search engine that will threaten Google. Such is life in Silicon Valley, especially when companies have money to burn. Every offensive move is also a defensive move--and every move has potential. You never know what's going to hit big in tech. So if you can, why wouldn't you try everything?

5 | The Living Room

In the spring of 2010, Rishi Chandra, a Google product manager, took to the stage at the company's developer conference to announce Google's next victim: the TV business. Chandra described television as the most important mass medium that hadn't yet been breached by the digital world. Four billion people watch TV; in the U.S. alone, the medium generates \$70 billion a year in advertising revenue.

Google, Chandra promised, was going to "change the future of television." He turned on a prototype of Google's new device, a set-top box called Google TV that would bring the web to the tube--and that's when things got awkward. His Bluetooth remote didn't work. Chandra and his team called for the guys backstage, who blamed the problem on all the phone signals floating about the room. Several minutes passed while engineers fiddled furiously with the device, the scene playing out like the worst *Curb Your Enthusiasm* episode ever. Engineers fixed the problem, but like a racehorse stumbling out of the starting gate, Google TV never recovered. Released a few months later, the product was panned and sold quite poorly.

Why Google Will Win

Its CEO is daring, decisive--and willing to wait for his big bets to pay off.

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Each of the Fab Four believes that it can somehow define the future of television, when that flat panel in your living room (and every other device you own) is connected to the web, pulling in the video you want at the moment you want it. With the universe of choice now available, the moribund channel grid will need to be revolutionized with a fresh interface for finding programs. Social signals--such as indications of what shows your friends are watching and hints as to what shows you might like given those friendships--will be part of the mix, as will live conversations with friends watching the same show. And the advertising will be more targeted and relevant. Each of the Fab Four wants a piece of this. The honey pot? Not only that \$70 billion in domestic ad revenue but also \$74 billion in cable-subscriber fees.

That's the idea anyway. So far the Fab Four is the Failed Four when it comes to TV. There are many reasons for this, starting with the fact that they are trying to unseat entrenched players who are fiercely protective of the business model they've relied on for decades. Network execs, for example, had no intention of handing Google the right to give Google TV customers access to the full-length shows that are currently available for streaming only on their own network websites. Not without a lot more money, anyway, given that their online ad revenue is a fraction of their TV take. Google approached its negotiations with the networks with arrogance, and the networks responded by blocking access.

Then there's the fact that none of the Fab Four want to think of itself as being in the TV business--rather, each sees television as a means to an end. For instance, Amazon offers free streaming movies and TV as an incentive to join Prime, a service that offers a year's worth of free two-day shipping (on most purchases) for \$79. Bezos has recently made deals to bolster his video library. He paid CBS a reported \$100 million to offer old *Star Trek* and *Cheers* episodes, among other things, for 18 months. And he made a similar partnership with Fox. "We're just getting started," Bezos said at the Kindle rollout event in late September. But on balance, Prime is not a way to give the people lots of great TV; TV is a way to get people to Prime.

And creating next-generation television hardware has proved difficult. Apple TV, a box that first and foremost connects your iTunes video library to your TV, has been remade several times since its 2007 debut and is still a product for early adopters. Even Jobs and Cook have dismissed it as "a hobby" for the company.

Still, the massive, old, and profitable business of television does seem ripe for disruption, perhaps through the invention of some magical device. Cook had barely erased "interim" from his CEO title before analyst and media speculation began that his first bravura move as CEO would be an honest-to-goodness Apple-branded television set, perhaps as early as Christmas 2012 (cue fanboy swooning). The dreamers note that Apple could create an Internet TV that would merge web services and standard broadcasts; it does, of course, already make the world's best remote controls in the iPhone and iPad.

But don't hold your breath for iTV. Of all four companies, Apple is the one that provokes the most rumors. That's been the case for years; iPhone whispers started around 1999, but the product didn't go on sale until 2007. And selling TV sets is almost a commodity venture, so Cook will either have to master a new supply chain or deliver so much magic that customers will pay a significant premium.

While Apple is the focus of all the next-gen TV rumors, the most interesting player in this space might be the most overlooked: Facebook. CEO Zuckerberg has made deals with several studios to release streaming movies and TV pilots on the site. But Facebook's real strength is in facilitating the conversation surrounding TV. Every show and star has a fan page, and Facebook knows exactly what each of its 800 million users like and don't like. Millions of people watch TV with a computer, tablet, or smartphone beside them, so they can chat with friends around the globe about the show they're watching. At Facebook's f8 developers conference in late September, it integrated Hulu and Netflix (the latter in 44 countries, though not in the U.S.) and made it seamless to share what you're watching. Sure, this will allow Facebook to create an even more engaging experience for its users, but this also taps a new gold mine of data that's invaluable to advertisers and the entertainment studios. Why not make it easy for Facebook users to click like during their favorite moments of a show, and monitor that activity? Nielsen, whose 61-year-old TV ratings are the linchpin of its \$5 billion global research business, is built on extrapolating information from small samples, so what if advertisers and studios could pay to get actual data on actual individuals? With one trivial technological shift, Facebook could remake the TV business without even touching the remote.

6 | The Next Steve Jobs

In 2005, Google bought Android, a tiny company led by Andy Rubin, who at his previous startup created a proto-smartphone that was marketed as the T-Mobile Sidekick. At that point, the Android team had spent two years working on what it thought would be the next killer mobile platform; it spent two more years building out its vision at Google. In 2007, a few images of Android hardware and software leaked online. They landed with a thud. Android's revolutionary phone smacked of a BlackBerry knock-off--hard buttons on the bottom, a small screen on top, ugly all over. There were no touch gestures; to point to something, you used a hardware direction button. There was nothing novel about the on-screen user interface--to choose something, you navigated through nested menus, a concept that harked back to Windows 95. Android circa 2007 is the nightmare vision of tech: It's what smartphones would look like if it weren't for Steve Jobs.

Today's Android--the touch gesture, app-enabled operating system that's helped make smartphones the majority of all new phones sold in the United States--is testament to Google's engineering prowess and marketing acumen. But it is also, obviously, a direct descendant of the iPhone. After Rubin and his team saw what Jobs had cooked up, they remade Android in Apple's image. And they weren't alone: Almost

every smartphone that's come along since borrows major and minor features from Apple. (Ironically, the most original mobile platform is the one developed by Microsoft, of all companies--Windows Phone.) Apple's brilliant reinvention of the cell phone, and its equally brilliant invention of the modern tablet, are the reasons Amazon built an app store, the reasons Facebook is rumored to be flirting with making a smartphone, the only reason that any company is competing in those particular hardware businesses. This is what has been amazing about Steve Jobs: Nurturing the next great thing in tech wasn't simply the most important thing for Apple. It has been the most important thing for the entire tech industry.

And that is why the industry's next Steve Jobs is . . . Steve Jobs. Thanks to its founder, Apple has a long-term product road map in place--keep making better iOS products, keep bringing innovations it discovered in the mobile world to the Mac--and you can bet that Cook and his rivals will follow Jobs's path for the foreseeable future. We know Cook is an operational genius. Anyone who claims to know if he is a visionary is lying.

Over the next two years, Bezos, Page, and Zuckerberg will gingerly start to vie for Jobs's innovator-in-chief mantle. (One way to consider this battle among the Fab Four is as a fight for this honor.) Of them, Bezos has the best record with new products. Amazon Web Services and the Kindle were true innovations that changed and inspired the rest of the industry. (According to some reports, even Apple relies in part on Amazon's cloud infrastructure for its iCloud service.) Bezos also seems the most temperamentally attuned to the creation of Next Big Things. "A big piece of the story we tell ourselves about who we are is that we are willing to invent," he told investors at Amazon's annual meeting this summer. "We are willing to think long-term. We start with the customer and work backward. And, very importantly, we are willing to be misunderstood for long periods of time."

Page, too, has the "think different" gene, and his CEO stint has been characterized by swift, decisive action to reinvigorate the company. He has impressively bet on Android, YouTube, and Chrome, and "we have some new businesses--Google+, Commerce, and Local--that we are really excited about and are pretty early stage," Page told analysts over the summer. There is another way of looking at this, though--as an example of Page's reactive streak. In the past, when Google offered a new take on an old thing--see Gmail or Google Maps--the search company's version was so radically novel that it instantly rendered the incumbents obsolete. That's not true of Google+, for example. Google's social network has earned praise for an elegant interface and some innovative features, but it clearly mimics Facebook and Twitter, rather than offering something wholly new. Page has tied every Googler's bonus, even those not working on social, to Google's ability to beat Facebook. So while the Google CEO can be seen as making big, bold moves, he might also appear to be spending an awful lot of time fretting about beating something old.

As for Zuckerberg . . .

7 | The Age Of Zuck

In some ways, it's unfair to compare Facebook to Amazon, Apple, and Google. While Facebook's growth is impressive, its actual numbers barely register next to the other three: Facebook is reported to have made \$1.6 billion during the first half of 2011 (about double what it made in the first half of 2010), but Apple makes that much in nine days. Facebook's only direct competition with these companies is Google in the global \$24 billion online display-advertising business, an arena that Google believes will

be a \$200-billion-a-year market in the next few years. As a private company, Facebook can shield itself from scrutiny (an advantage that Bezos, Cook, and Page would dearly love), but being private has also hampered Facebook. It lacks the capital the others have to make major strategic acquisitions, or to finance the production of factories that would make a Facebook device.

Why Amazon Will Win

Its retail engine keeps humming, and its ambitions feed the beast.

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Zuckerberg's ambitions will only be fully realized after Facebook goes public. Its path will then likely mirror Google's post-IPO trajectory--it will evolve from a company with one product into a many-tentacled beast that uses its newfound capital to disrupt all of its rivals. Zuckerberg isn't given to Jobsian rants, but when he discusses how the web will shift over the next few years, he can sound like a hoodie-burning revolutionary. "Just like Intel with Moore's law, our development is guided by the idea that every year, the amount that people want to add, share, and express is increasing," he proclaimed at f8 in late September. "We can look into the future and we can see what might exist--and it's going to be really, really good." Zuckerberg is even maturing into a capable presenter. Compared to Bezos, Cook, and Page, he's most adept at mimicking Jobs's singular skills, and comes off as infectiously visionary when unveiling a new product.

From search to ads to phones to tablets to TV to games, Facebook aims to be in everything. In some cases, as with music or gaming, it will partner with others to serve its massive audience. But over time, look for Zuckerberg to build his own products. Search is the most provocative example. Facebook's partnership with Bing already shows off links that your friends liked; Facebook Search could go even deeper, sorting the web according to your social interactions. It would use everything it knows about you to decipher your queries in a way that Google can't muster. Type in "jobs" and FB Search would know you're looking for news on the Apple founder and not employment. (It knows you have a job; it even knows how often you goof off there.)

Zuckerberg's app strategy is also ambitious and intriguing. At f8, he debuted a new class of Facebook media apps that let Facebook users read, watch, and listen to content without ever leaving the site--and share it seamlessly. He's lured impressive media partners such as *The Wall Street Journal*, Spotify, and Netflix. If Zuckerberg can bring those apps to the social network's mobile product, he'll have a winner on his hands: an app ecosystem that works on every phone and tablet, rather than on just one company's devices, and one that captures the next generation of mobile developers (not to mention all those Facebook credits). Watch out, Apple: Zuck is coming for you.

8 | The Phone Barrier

One industry stands directly between the Fab Four and global domination. It's an industry that frustrates you every day, one that consistently ranks at the bottom of consumer satisfaction surveys, that poster child for stifling innovation and creativity: your phone carrier. And your cable or DSL firm. For Amazon, Apple, Facebook, and Google, the world's wireless and broadband companies are a blessing and a curse. By investing in the infrastructure that powers the Internet, they've made the four firms' services possible. But the telcos and cable companies are also gatekeepers to customers, and Amazon,

Apple, Google, and Facebook would love to cut them out of the equation. In the long run, they actually stand a shot at doing so.

While Google has historically had a difficult relationship with the telcos, that will have to change as the company keeps pushing Android into the market. That leaves Apple as the thorn in the carriers' side. Before the iPhone, carriers routinely prevented smartphone users from installing their own apps, and they regularly disabled hardware features that competed with their revenue streams. (Verizon once crippled BlackBerry's GPS system because the carrier sold its own subscription location plan.) The iPhone forever changed this culture: It conditioned phone users to expect to download any apps they choose (actually, any app approved of by Apple). Carriers can no longer tell you that you can't run, say, Skype, or an app that gives you free text messages. Buy a smartphone, and you've earned that right. Apple's move to expand its carrier lineup in the U.S. is the next great front in the battle with communications companies. Now that you can get the iPhone on AT&T, Verizon, and Sprint, carriers will be forced to compete with one another on network speed, price, and customer service. This will be a first: Back in 2009, when Apple unveiled "iPhone tethering"--the ability to use your phone's network connection to surf the web on your computer--AT&T took a year to implement the service, while other carriers around the world launched it instantly. But if AT&T dithers now, you can go somewhere else.

That's small potatoes compared to some potential breakthroughs. All but Amazon have a videophone service: Apple's FaceTime, Google+ Hangouts, and Facebook's Skype integration. Apple's iMessage and Facebook's Messenger, which offer text, photo, video, and group messaging, intend to get people to route all of their communications through the Internet rather than the carriers. If either takes off--and, given that iMessage will be built into the next iPhone and Messenger will be available to every Facebook user on iPhone and Android, they both seem sure to be hits--they'll stand a good chance at replacing SMS, which is highly lucrative for carriers, as the standard for mobile conversations.

In a larger sense, all these companies have devalued the idea of talking on the phone; paying for minutes is passé when you can text, IM, and video chat instead. Now we all just pay for data, delivered via high-speed networks that might be built around and between what the carriers offer. (Of course, the Fab Four seems to assume retailers and municipalities will build those networks to enable their vision--anyone but them.) Verizon is a \$100 billion company built on dumb pipes, and dumb pipes may not make for a smart business model for the long run.

9 | The Bank Heist

The other outfit standing between you and the Fab Four is one that barely registers: your credit-card company. When you buy something through iTunes, the Android Market, Amazon, or Facebook, the credit-card company gets a small cut of your payment. To these giants, the cut represents a terrible inefficiency--why surrender all that cash to an interloper? And not just any interloper, but an inefficient, unfriendly one that rarely innovates for its consumers. These credit-card giants seem ripe for the picking.

While this attack is less mapped out than the one on your phone and cable company, here's how the scenario would play out. The first step is getting consumers used to the idea of paying by phone. The second step is to encourage consumers to link their bank accounts directly to their devices, thus

eliminating the credit-card middleman. For example, Google just launched Wallet, a service that allows you to pay for purchases by waving your phone at a merchant paypad. Google is not billing the system as a credit-card killer; in fact, it's partnering with MasterCard and Citi on Wallet. But if customers embrace Wallet to make payments, Google could add services that make it the central repository of all our coupons and other special deals, taking a bite out of the likes of Groupon and LivingSocial (in which Amazon is a major investor). The move is so ambitious that it's already rattled the leader in online payments: PayPal sued Google just hours after the Wallet announcement, back in May, claiming that Google stole its intellectual property when it poached Osama Bedier, a former exec who now runs Google's payment project.

Both Amazon and Facebook could transform their online-payments services into similar walletlike mobile apps, while Facebook could create a significant PayPal rival in web commerce if it rolled out payments as part of Facebook Connect. Apple has a very different, but potentially more disruptive, shot at this market. The company has long been rumored to add near-field-communication chips--which allow for waving your phone to pay--into its phones. If it does, an Apple payments system would have two advantages over everyone else. First, the iTunes database of customers is huge. Second, there's the iPad, which is fast gaining traction as a next-gen cash register in small businesses around the country. This sets up Apple to own both sides of potentially millions of transactions: Go to your coffee shop, wave your iPhone against the cashier's iPad, and voilà, you're done. Multiply that by every hipster in America and you see the scale of Apple's ambition.

10| The Hit Men

So who could derail these best-laid plans? Well, let's start with the lawyers, of course. Over the past year, the tech industry has become an increasingly ugly place, with Apple, Google, Microsoft, Amazon, and just about every handset maker joining a legal scrum over patents. Everyone is suing everyone else, while the government, spurred on by the likes of, yes, Microsoft, is considering an antitrust suit against Google. None of this bodes well. Over the summer, Apple succeeded in getting Samsung's Galaxy tablet (which runs Android) banned from release in Germany and delayed its launch in Australia. This is part of a global fight about design and Android, complicated by the fact that Samsung is Apple's largest component supplier.

The Samsung suits were also the most significant sign that Google may have a problem with the intellectual property underpinning Android, since its "free and open" operating system is forcing its device makers into expensive courtroom battles over their Android phones and tablets. This, in turn, has set off a buying frenzy of global patents that might have anything to do with transmitting mobile data. A coalition that included Apple and Microsoft spent \$4.5 billion to outbid Google for a stash of 6,000 mobile-related patents from Nortel. Google responded by spending \$12.5 billion for Motorola and its slug of 17,000 patents, and by then making two deals with IBM for more than 2,000 patents in all (the purchase price was not disclosed).

All these patent suits could stifle innovation. Most new devices are so complicated--touching on so many specialized areas, from intricate chip design to battery placement to touch-screen dynamics--that it's impossible for any company's devices to be wholly original. Tech companies used to let minor patent violations slide, but the rise of patent-hording trolls has changed this. Now everyone's instinct is to sue.

It's almost as if they'd never studied Microsoft's decline in relevance. The software giant never resumed its place as an agenda setter after its antitrust trial in the late 1990s. The suit consumed so much time and brainpower that the company fell behind on a decade's worth of trends. That's the risk in today's patent wars: The more time Page spends defending Android, the less effort he puts into making sure Google is actually inventing new stuff.

Tech companies are ephemeral enterprises, with a built-in obsolescence much like their products. The best firms stay at their peak for a decade tops; most get snuffed out before anyone even notices them. Amazon, Apple, Facebook, and Google have the potential to be exceptions to this rule. Their CEOs are driven, disciplined, and relatively young (Cook, the oldest, will be 51 in November). All but Cook are founders, and their personalities are such that they seem unlikely to get tired or bored by their empire building. Their market caps and strong revenue growth should allow them to neutralize other would-be rivals--witness Bezos acquiring Zappos and Quidisi (Diapers.com) before either could become a threat.

As our modern oligarchy, and as individual companies, Amazon, Apple, Facebook, and Google will not last forever. But despite this oncoming war, in which attacking one another becomes standard operating practice, their inevitable slide into irrelevancy likely won't be at the hands of one of their fellow rivals. As always, the real future of tech belongs to some smart-ass kid in a Palo Alto garage.