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"Today is the slowest rate of technological change you will ever experience in your lifetime," wrote Shelly Palmer in his e-book *Data-Driven Thinking* (Digital Living Press, 2016). As one of the world's premier voices on the accelerating pace of digital technology, he is increasingly preoccupied with helping companies and individuals prepare for the dramatic changes he sees coming, particularly in entertainment and media.

Palmer started his career at age 12 as a musician, playing the clarinet, saxophone, and flute in the 1970s in venues around New York. He was also an early experimenter with analog and digital synthesizers. He holds patents for two major interactive television technologies, one of which — a method for syncing broadcast TV with server-based text, known as enhanced television — was adopted by *Monday Night Football* and *Who Wants to Be a Millionaire?* His background also includes writing the theme music for *Spin City* and *Live with Regis and Kathie Lee*, and conducting the London Symphony Orchestra. Currently, he is Fox 5 New York's on-air tech and digital media expert and the proprietor of a popular and prescient email newsletter that covers the impact of technology on media and daily life, with a special focus on smart cars and smart homes.

For the past decade, as a venture capitalist and CEO of his own consulting firm and marketing agency, the Palmer Group, Palmer has focused his attention on the evolution of advertising, marketing, and related businesses, along with leading-edge technologies such as smart home systems and data analytics. We recently talked with Palmer in New York. Conscious of the intertwined trajectories of trends in technology and media, we sought to explore how artificial intelligence (AI) and the churn in business models could affect advertising, media, and related fields over the next few years.

S+B: What prospects do you see for media companies?
PALMER: To be a successful company in entertainment and media — or in most industries, actually — either you need immense scale or

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you need to be tiny, flexible, and independent. Successful media companies today are either really big or really little. That's why you see so many large organizations merging together. Medium-sized companies are really vulnerable today.

Even in technology, there aren't many midsized companies. What's left? Twitter? There are a lot of thriving small companies, but it's hard for them to grow to scale. They're much more likely to get bought first. We've seen a significant increase in [US]$20 million to $30 million "acqu-hires" — the acquirers buying companies only for their teams of brilliant people, as opposed to choosing companies because they are going concerns.

S+B: How do you see media companies monetizing content in this new world?
PALMER: There are only three business models for media: I pay, you pay, or someone else pays. Either I pay the media (with subscription fees or my data), or you as the media pay your costs (because there's value in having me in the audience), or someone else, like an advertiser, pays you for access to me.

The media industry used to be perfectly structured to take advantage of all three models. But today, with quickly changing consumer behaviors, it's getting extremely difficult for many old-fashioned media companies to make money. Add to that the cross-purposes of the three major publicly traded large entities in the advertising-supported media model: ad agencies, media entities, and brands. Each has a different way of creating shareholder value. Agencies need to make a profit. Media companies need to get the highest possible price for each impres-

sion. And brands need to drive velocity. These three goals are not in concert with one another.

And, by the way, consumers don't care about any of this. Consumers want all their media for free, and they want simple, interoperable platforms. It sounds great, but Apple and Google have no interest in interoperability. That would mean having everything work on each other's devices. Facebook has a large group of members who don't use the rest of the Web; they interact only through Facebook. Why would any of these companies want to give up their boundaries? The fact that consumers want something like interoperability does not mean that it is smart for the business to provide it.

The rest of Silicon Valley tends to disrupt traditional business by taking the consumer's side and giving consumers everything they want — free. That's awesome as long as you don't care about making money. At the end of the day, Internet media companies will have to figure out a way to get advertising support, sell subscriptions, sell a service, or use another means to drive velocity for a brand at retail. Otherwise, they'll have no way to make a living. Cash has to change hands.

That said, the financial community will continue to make a fortune financially engineering startups and taking them public. That kind of profit making is not always equally accretive to all of the shareholders, and it does not usually require a sustainable business to emerge.

S+B: What models do you see that will resolve this?
PALMER: As I said, there are only three types of models, and the successful companies seem to combine

them. The cable television industry combines all three, for instance. You pay for cable ostensibly because your antenna's not good enough, and you still have to see ads (except for the premium channels, which you just pay for). And the cable companies take your data as well, and they're monetizing it. They're nowhere near as granular as Facebook or other pure-play digital media, but they have a good-enough data set to drive hundreds of billions of dollars in sales for their clients.

Speaking of data-driven companies, Amazon is about as "data rich" a company as you are likely to find. It probably owns the greatest database of consumer consumption on the planet. Amazon is legendarily protective of its data, and almost every manufacturer complains about Amazon's "walled garden." But it hasn't stopped very many companies from selling on the platform. I'm fascinated by one twist: A search on Amazon is more valuable to many advertisers than a search on Google because consumers are more likely to buy there. Consumers have been trained: If you want to buy something, go to Amazon first, look it over, and "add to cart."

YouTube is another good example for content owners because of its ability to aggregate hyper-targeted audiences at scale. A few weeks ago, a friend of mine came over to jam and wanted to play some bebop. It was super fun, but after the session, I felt like I could use some remediation around the bebop melodic minor scale. So I went on YouTube to look for some drills that wouldn't bore me to tears. If you type "bebop melodic minor scale" in the YouTube search bar, you get thousands of videos. You might never live long enough to watch

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them all. Some were mind-blowingly good. The two musicians I liked the most made money by selling transcriptions of famous solos and giving private music lessons over Skype or FaceTime. Others offered paid subscriptions to their newsletters or sold lesson books. And that's just one field in an almost infinite list. I typed in "quilting," just to see what would happen, and I got a very similar result.

The downside of these models is very serious. They hyper-fragment the audience and encourage people to filter out anything that feels uncomfortable to them. There's a very strong confirmation bias for all content today, regardless of whether it's entertainment, news, or just information. It will grow even stronger as technology improves. As content distributors, we are fighting the hardest fight ever: getting through the personal filters of people who have opted into their own world view. Many have no interest in getting out of it.

I think this will be a huge problem going forward and I don't know what will break the cycle. Back in a simpler time, you could read your favorite newspaper and occasionally discover new things. Sure, it had a bias. You understood what that bias

was, and you also understood the difference between news and opinion. That's over. Today, you get what an algorithm "thinks" you're most likely to engage with, and everything it serves up is designed to elicit a specific response from you. The free and open Internet has made people more local, more tribal, and more susceptible to confirmation bias than anything in the history of humankind. I wrote an essay titled "Your Comfort Zone May Destroy the World," which explores this thesis.

Learning to Be Data-Driven

S+B: You have written that advertising will "evolve into a data-driven, value-centric game of 'capture the consumer.'" What do you mean?
PALMER: For a message to have the best chance of success, it must be delivered to the right person at the right place at the right time. The best way to lead this process is to encourage data-driven thinking across the enterprise. In most cases, this requires a modification in corporate culture. In our work with clients at the Palmer Group, we've found that few enterprises fully recognize the value of data, data governance, and data hygiene. Data is cash, and it

should be treated like cash. You need a data P&L.

S+B: How does this work in practice?
PALMER: There are really three kinds of data. First-party data is your own company's asset, which you are directly responsible for collecting. It may be from cookies, email subscriptions, orders, or sales receipts. Or it may be generated by customer behavior, such as a propensity to click a particular button or visit a location.

Second-party data is simply someone else's first-party data.

Third-party data is collected by outside companies. Companies like Acxiom and Experian acquire and aggregate data on customers from many different places, and they analyze and index it until they have complete profiles on everybody. I think Acxiom tracks almost 4,000 propensities. You can ask, for example, for lists of people who are 150 percent over-indexed on luxury automobiles and 200 percent over-indexed on craft beer, and geofence them. Button press, boom, here are the people. All the best-practice purveyors of third-party data do their best to verify it, but it's still third-party data, and thus less accurate

than first- or second-party.

When you operate with a data P&L, you tend to favor deals that leverage your data by combining it with first-party data from other organizations. This will almost always create additional value, because data is more powerful in the presence of other data.

S+B: Why does data become more powerful when you share it?
PALMER: If I know your name and email address from first-party data, I have the beginning of a profile. Add your Social Security number from second-party data, and I can go to

that I can sell a full-price barbecue grill at the Home Depot in Danbury, Connecticut?" To answer it, you would use a variety of data: parking lot density, same-store sales, predicted weather patterns, inventory levels, and so on. The right answer could significantly increase margins. You could save on advertising; you could save by shipping unsold units to stores in warmer climates. If you really knew that these grills had to get moved, then you could put them on a mostly empty truck headed to another location. You could decide to run a sale. There are a million things you could do as

people who wrote it would occasionally be scratching their heads, because, as with automatic stock trading, at a certain point the algorithms are so large and so complex that you can't autopilot them anymore. [See "A Strategist's Guide to Artificial Intelligence," by Anand Rao, page 46.]

S+B: You mean there are too many layers of cognitive thinking to be able to understand its reasoning.
PALMER: That's right. People think of algorithms as decision making on autopilot. But that's the worst metaphor ever. With actual autopilot, the person flying the plane watches the controls and can always take over if something goes wrong. That's not possible with a complex algorithm. If the program misbehaves, the only way to fix it is to stop it, take the whole system down, recalibrate it, and then test it to see if the outcomes are better or worse.

"Few enterprises fully recognize the value of data. Data is cash, and it should be treated like cash."

Experian and find out about your mortgage from third-party data. Now I know not only exactly where you live, but how much discretionary spending money you might have. The more complete the profile, the better and more complicated the questions I can ask. Interestingly, although many executives have significant experience working with numbers and making decisions, very few have been trained to make decisions using data. To get the most out of an algorithm, you must ask the right questions.

S+B: For example?
PALMER: "How do we increase sales?" is not a data-driven question. It may sound like one, but it isn't. A better question from a marketer who had access to a purpose-built data management platform might be "What's the last day of the year

a marketer if you asked the right question of the data sets.

S+B: Wouldn't it be better to ask, "Given everything we're doing, where are the Danburys with the best hidden opportunities?"
PALMER: That's a fabulous question to ask. But your ability to answer it depends on the level of technology you have deployed. If you've got an appropriate data set and someone at your disposal who knows enough data science to create the pattern-matching tools you need, you're golden.

Cognitive computing is still in its infancy, so if you needed to do this today, you'd have to write a pretty sophisticated algorithm to accomplish the task. It would probably take thousands of lines of code, and only a couple of people in the world would know how it was written. Even the

S+B: But if the algorithm is too complex to be controlled, what qualifies a human being to judge the outcomes correctly?
PALMER: This scares me to death! I call it "digital monoculturalism." If you have only five cognitive clouds — Microsoft, Google, Amazon, IBM, and Apple — each one will have some bias inherent in its programming, invisible to outsiders and inevitable. These five highly biased tool sets will make decisions for thousands of executives around the world. And who programs those?

Automating the Media Enterprise

S+B: In the past, you've said that machines will eventually be able to do everything that human beings can do now. How do you see this today?

PALMER: I said they would do *almost* everything. But that's not the story. There are four general types of tasks: manual repetitive (predictable), manual nonrepetitive (not predictable), cognitive repetitive (predictable), and cognitive nonrepetitive (not predictable). An assembly line worker performs mostly manual repetitive tasks, which, depending on complexity and a cost-benefit analysis, can be automated. A CEO of a major multinational conglomerate performs mostly cognitive nonrepetitive tasks, which are much harder to automate.

The rapid advances in machine learning systems are allowing us to automate the low end of the cognitive nonrepetitive task spectrum, which was previously thought to be the sole bastion of human beings.

The last white-collar jobs to go will be preschool and elementary school teachers, professional athletes, politicians, judges, and mental health professionals. Also, the very few creative artists who are truly innovative geniuses. These are jobs that when performed well require humanity; they are incredibly safe until the machines actually rule the world.

S+B: How will AI affect people in media enterprises — particularly creative people?
PALMER: That's a loaded question. If you can have artificial intelligence, you probably can have artificial creativity. In many ways it would be indistinguishable from average human creativity.

There's a great line in the movie *I, Robot*. Detective Spooner, played

time for many years. A lot of the background music I used to write — for advertising, long-form industrial films, and documentaries — could easily be created by AI. My job didn't call for brilliance every day. I needed to be consistently good and occasionally brilliant. Music is an emotionally communicative language, and proficiency in it is rare, but it is possible for machines to be consistently good at it. It won't work for every client or in every use case, but it will work for enough clients to put a huge dent in the business.

The same is true for basic expository writing. The questions your seventh-grade English teacher taught you to answer — who, what, when, where, why, and how — are an algorithm. Of course machine learning systems can be trained to write that prose. And they will.

"If you can have artificial intelligence, you can have artificial creativity...indistinguishable from average human creativity."

For example, machine learning systems can learn to drive. So the trucking and taxi industries are in for a big shakeup; C-suite corporate management, at the higher end of the cognitive nonrepetitive spectrum, not so much.

The first white-collar jobs that machines will take are those of middle managers, commodity salespeople, report writers, accountants, bookkeepers, journeyman creative people (graphic artists, background music composers, artists who paint pictures used to decorate hotel rooms), and some doctors who do things like pathology and radiology.

by Will Smith, is questioning Sonny, the main character robot, about a murder. "Can a robot write a symphony?" asks Spooner. "Can a robot turn a canvas into a beautiful masterpiece?" Sonny looks him in the eye and asks, "Can you?" The average person is not Chaucer, Shakespeare, David Mamet, or Lin-Manuel Miranda — or Mozart, the Beatles, or Madonna. Only a tiny handful of human beings in each generation exceed all expectations of creativity.

That leaves journeyman creative activity, which absolutely can be done by AI. I wrote music full

S+B: Then how does a creative person get the experience needed to develop into, say, a Billy Joel or an Elton John?
PALMER: There couldn't be a Billy Joel or an Elton John today. They are both super talented, but neither was a superstar out of the gate. They had record labels that believed in them and gave them time to pay their dues and develop. That doesn't happen today.

Of course, that's commercial intellectual property, which has very little to do with artistry and creativity at a world-class level. AI doesn't change things for artists who are willing to starve for their art. A dancer will still make crazy sacrifices to keep dancing every day. Nor does AI change the prospects of the very largest companies. But it completely devastates the middle of the business, the rote creative work.

A lot of what marketing people

do is at risk. If you're a marketer, you build content pillars that support the brand, mission, and vision of the company. You have boxes to check — the piece will be knowing, educational, cheerful, whatever it is — and if the piece of copy doesn't meet all criteria, you rewrite it until it does. If that's not an algorithm, I don't know what an algorithm is. And that's how you get 3,000 marketers who all think for themselves to put out messages with a unified voice. If you're telling me I can't automate some of that, then you don't understand automation.

Even if just 20 percent of white-collar jobs are automated, the ramifications for media companies will be immense. For example, suppose I could get a machine to create and produce an invitation to a gala event, with a Chagall-style visual and drop shadow behind a font that evokes my brand. You might argue that doing this would increase the productivity of my art director, and that would be the main effect.

But there were 10 art directors in the department before; we just sent at least two of them packing. And there probably will be more laid off over time, in all categories of corporate employee, because every CEO knows that the company's competitors are also taking cost out of the system this way.

Along the way, we'll see enormous and unprecedented productivity advances. One small example: The Palmer Group has 5,000 old videotapes in temperature-controlled storage. They need to be transferred to digital, but we've been putting it off because nobody, including me, wanted to spend the money to have an army of library science majors go through and metatag the clips. Recently, we did an experi-ment. We put a few videos through an open source video recognition software tool set, and with very little effort, the system could metatag the content as well as a human intern would. It may actually be better than what a person would do, because even when the AI system tags something incorrectly, it is more likely to be consistently incorrect. So we're about to do this for thousands of old videos. It will become part of a body of knowledge we didn't have before. Only one aspect of this isn't beautiful: No people are involved in doing it.

S+B: How does the digital shift affect the way you look for talent in your own organization?
PALMER: We believe in the gig economy; on any given day, our staff expands to fit the needs of our business. We use flexible shared office space organizations like WeWork. I recently read an article saying that the gig economy is over and people are returning to sustainable full-time jobs. Our experience is different. Every super-skilled technology person available to us is looking for the next opportunity at a higher price, and they don't want to be tied down in a full-time job.

We try to recruit people by building a yellow brick road to the Palmer Group — to show that we're the elites in the field and they'll be in great company by working with us, working on very cool projects. We host meetups and events on key technology topics. We also ask the coders who work with us to spend an hour or two each night contributing to open source projects. We stole that idea from Facebook, which has its own scripting language called React. Its software developers make some of their code available on GitHub, people start to contribute and share notes, and suddenly Facebook has a recruiting and training program for coders, without paying a nickel for it. And who doesn't want to impress the people at Facebook?

S+B: Do you recruit your content professionals the same way?
PALMER: No, because the talent pool for creatives is so vast. We know many people because of, for example, my background in TV. It's harder to find programmers, because companies are competing so heavily for them right now.

S+B: You make it sound like the most important thing — the making of content — will not change much at all in the future.
PALMER: There's a 40,800-year-old cave painting in El Castillo, Spain, that is said to be one of the oldest known. The artist created that content for one purpose and one purpose only: to be seen. The artist felt something or needed to explain something and created the work to communicate it. Today, a television commercial is there to be seen; a book is to be read; a song is to be heard. If you don't have a point to get across, you don't need the television, the printing press, or a stream on the Internet. And if you do have something powerful to say, your job is to get it across, no matter what technology you use or business model you work under. That hasn't changed, and it probably never will. ✚

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