MORE is better than less.

Dear Friends:

The Internet of Things revolution has begun, adding even greater complexity to an already complex media environment. In this issue's feature article, we discuss what we can expect to see this year, technology-wise, as "The Age of the Customer" demands more and better from the media industry.

The MFM/BCCA convention last month in Orlando was informative and well-attended, and we enjoyed sponsoring the opening night party. Our late-summer calendar is a busy one, beginning with GABCON (Georgia Association of Broadcasters), August 4-6 on Jekyll Island, where we will sponsor the GABBY awards after-party. We look forward to our annual Szabo Quality Awards Banquet on August 28 in Atlanta; the 2017 Radio Show, September 5-8 in Austin, Texas; Media Outlook 2018, September 12 in New York City; and the IAB MIXX Conference, September 25-28 in New York City.

Best wishes for a wonderful summer,

Robin Szabo, President
Szabo Associates, Inc.

Technology and Change . . .
2017 Predictions for Media

New technology developments are moving forward at a rapid-fire pace, challenging businesses, governments, and all of us to get with the program or get left in the dust. Marketers must integrate marketing technology to engage with customers who expect and demand personal attention. Media must embrace their advertisers' need to enhance the consumer experience with precision targeting of customer-specific messaging. Agencies must adapt to the role of automated systems in marketing decision-making and perhaps create new business models to remain competitive.

The Age of the Customer.
In October, the research and advisory firm Forrester published "Forrester's 2017 Predictions: Dynamics That Will Shape the Future in the Age of the Customer." The report states that virtually all competitive markets—banks, retailers, manufacturers, investment firms, and even utility companies—are on the move to address the consequences of a customer-led, digital-centric market. Forrester predicts that the next wave of technologies poised to remake industries and customer experiences will come in three forms: engagement technologies that will create pro-foundly different virtual, physical, and digital experiences; insight technologies that will convert the promise of personalization and predictive analytics into reality; and supporting technologies that will drive new levels of speed and efficiency.

The Revolution.
Is the Internet of Things (IoT) the next Industrial Revolution? Many industry experts think so. Connectivity is the new way of the world, they assert, fulfilling its promise to greatly transform the way we live, work, and play.

When you think about it, this prediction is not surprising. Be honest now: When was the last time you spent an entire day "unconnected"? Perhaps more importantly, how many minutes or hours do you spend daily on the internet for work, personal business, and entertainment?

The research service at *Business Insider*, BI Intelligence, which has closely monitored the growth of global trends in the IoT and fore-casts the emerging IoT market, projects in its 2017 report that 34 billion devices will be connected to the internet by 2020. The IoT, it predicts, will be the future of the way businesses, governments, and consumers interact with the physical world.

The report states that in the five year period between 2015 and 2020, businesses will be the biggest adopter of IoT solutions (spending $3 billion on 11.2 billion devices) to lower operating costs, increase productivity, expand to new markets, and/or develop new products. Governments, seeking to increase productivity, decrease costs, and improve citizens' quality of life, will be the second largest (spending $2.1 billion on 7.7 billion devices). Consumers, though predicted to lag behind businesses and govern-ments in IoT adoption, will never-theless buy a huge number of devices and spend a significant

amount of money in IoT ecosystems (spending $900 million on 5 billion devices).

Altering our view. Dallas-based IoT market research and consulting firm Parks Associates forecasts that virtual reality (VR) and augmented reality (AR) will gain footholds this year in niche operations and in awareness among early adopters. Even though virtual reality was on the minds of numerous companies back in the 1990s, the efforts of those who attempted it back then failed (remember the Nintendo Virtual Boy?). Augmented reality, in the meantime, gained an edge over VR; however, both are positioned this year to advance technologically and gain territory.

Confusion still persists about the difference between the two. Both have the goal of providing an expanded view of the world, but the methods and experiences are different.

Virtual reality. VR creates a totally immersive computer-generated environment. Once the user puts on the required VR headset, he or she is disconnected from the outside world. Science journalist Tibi Puiu in his April 2017 article for ZME Science stated that Palmer Luckey is the undisputed father of contemporary VR with his Oculus Rift, which Facebook purchased in 2014. Other popular VR headsets include Samsung Gear VR and Google Cardboard.

According to Chuck Martin in *Media Post IoT Daily,* one of the largest media theater chains in the U.S., Regal Entertainment Group, is creating the opportunity to try virtual reality for themselves while promoting a new movie. Teaming with AMD, Alienware, and Fox, the company is installing Oculus Rift demo kiosks in theater lobbies in 15 cities, where viewers can check out "Alien: Covenant in Utero," a 360-degree VR journey from the perspective of the alien. Martin suggests that the high production quality "may be a precursor of where movie theater experiences are heading."

Augmented Reality. With AR, users experience physical reality from their individual points of view supplemented by computer-generated sensory input, and they can easily distinguish between real and non-real aspects of the experience. Its basic method is to super-impose graphics, audio, and other sensory enhancements on top of a real-world environment in real time. One simple present-day example is the super-imposed first-down line, created by Sportvision, on televised U.S. football games.

The biggest company effort so far to bring AR to mass consumers, according to journalist Puiu, has been Google Glass. Perhaps because people failed to warm up to the somewhat creepy idea of wearing glasses with a camera, the product was discontinued in 2015. AR apps on smartphones have proved to be much more popular, says Puiu. Pokemon Go, which went viral last year, involved using a smartphone to locate pokemons with the help of a map based on the user's real-life GPS signal. More sophisticated examples include Sky Map, a mobile app that lets users point their phones toward the sky to "see" constellations, and Word Lens, a Google app that allows users to point their phones to signs and have them translated instantly into their target languages.

At least at this time, it appears that AR holds the most promise for marketers. In his May 11th article in *Ad Age,* "Could AR be the Unlikely Savior of Print?," Zeda Stone opined that "We're not far from the day when any printed magazine or newspaper will be able to break free from its historic physical limitations by including a dynamic digital layer . . . but it has to be done right." AR content has to offer "must-have" experiences for the reader, who has the freedom to opt out. Free from the bounds of physical limitations, word counts, and two-dimensionality, the medium will have the opportunity to make its audience feel that the story is incomplete without the AR component. Stone imagines incorporating related maps, explanatory 3D videos, and links to related articles and other forms of multimedia.

In their April 5th article published by Deloitte University Press, Ryan Kaiser and David Schatsky state, "Momentum is building for augmented and virtual reality in the enterprise" . . . as "more than 150 companies in multiple industries, including 52 of the Fortune 500, are testing or have deployed AR/VR solutions." They also say that innovative markets are deploying AR/VR technology, particularly in the ad tech, martech, and commerce spaces. Applications typically allow customers to virtually interact with brands to visualize and customize products to their preferences.

Artificial Intelligence. What are the first associations we make when we think about artificial intelligence? The Terminator? Hal in 2001: A Space Odyssey? Present-day tools such as Siri or Alexa? Actually, artificial intelligence, or AI, is moving from the stuff of science fiction and the relatively narrow applications of today's intelligent agents to a burgeoning technology that will change our lives in dramatic ways. To many, the idea of AI is unsettling, a reaction no doubt to fictional portrayals of a dystopian society ruled by the very machines we created to help us. The notion that AI may someday surpass our abilities to understand and control it should not be ignored, nor should the ethics of its many applications. That said, AI holds the promise to solve problems and improve lives.

In her January 31st paper "Age of AI: How Artificial Intelligence is Transforming Organizations," Susan Etlinger, industry analyst at Altimeter, states, "Today, the combination of massive and available datasets, inexpensive parallel computing, and advances in algorithms has made it possible for machines to function in ways that were previously unthinkable." She quotes a Gartner prediction that "by 2020, algorithms will positively alter the behavior of billions of global workers."

So what exactly is AI? Today, according to Etlinger, AI commonly refers to systems that employ machine learning to collect and process signals via sensors or other methods; classify, learn, reason, and predict possible outcomes; and interact with people or other machines. Most employ three specific types of intelligence: visual/spacial, auditory/linguistic, and motor intelligence. To enable computers to reason and react, they need to be able to learn

without being explicitly programmed. In other words, they must be "trained" using large amounts of data. "The value of systems based on machine learning," says Etlinger, is based on their ability to sense, communicate, learn, act, and adapt over time and to connect with other systems that do the same so that they can anticipate and act on a range of needs—be they related to medicine, commerce, service and support, or customer experience."

The most conspicuous examples of AI technology are chatbots and intelligent agents, terms often used interchangeably, according to Etlinger. They are not, however, the same. The former is a program designed to simulate conversation with human users, especially over the internet. An intelligent agent is software that assists people and acts on their behalf. Chatbots are generally used for narrow tasks and may be integrated within intelligent assistants, such as Siri, to provide more generalized functionality. Additionally, the bot or agent may be "bound," or tied to a particular device (Siri to iPhone, Alexa to Amazon Echo), or "unbound," tied to a person.

Marketers and technology firms are developing ways to use chatbots to provide customer service, sales

support, and other commercial functions. For example, Facebook recently launched a full chatbot Application API (application program interface) that allows businesses to create interactions with customers within its Facebook Messenger app. Bots developed by news organizations such as CNN or the *Wall Street Journal* deliver news links to a Messenger conversation that reflect the user's personal interests or questions. Also, users can place orders for products or search directly for additional bots in the "To:" field in the Messenger app.

At Google's annual developers bazaar last month, Google introduced new artificial intelligence features for its intelligent assistant, Google Assistant, and smart speaker, Google Home. The company announced that Google Assistant will soon have the ability to complete transactions and provide information about real-world objects when users point their smartphone cameras at them.

Ingrid Lunden at Tech Crunch reported last month that Apple has acquired a company, Lattice Data, to fill out its own capabilities in machine learning and artificial intelligence. Lattice Data applies an AI-enabled inference engine to take unstructured, or "dark" data, and turn it into structured data, making it

usable for processing and analytics. Lunden cites numerous applications of the systems, including international policing and crime solving, medical research, and training AI systems by creating more useful data feeds.

Cloud computing. One of the most exciting and disruptive forces in the tech market in the past decade has been cloud computing, according to Forrester. In simplest terms, cloud computing means storing and accessing data and programs over the internet rather than on your computer's hard drive, which is the way the computer operated for decades. Most of Google's services—Gmail, Google, Calendar, Google Maps, etc.—are examples of cloud computing.

Businesses can employ a more complex form of cloud computing than individuals. They may subscribe to Software-as-a-Service (SaaS), an application it accesses over the internet; Platform-as-a-Service (PaaS), which allows it to create custom applications for employee use;, or Infrastructure-as-a-Service (IaaS), where tech giants such as IBM, HP, Microsoft, Google, and Amazon essentially "rent out" their cloud services to others.

Cloud applications are now able to power a full spectrum of digital capabilities, from the core enterprise systems powering the back office to the mobile apps delivering new customer experiences. Among Forrester's 2017 predictions is the acceleration of the cloud market as CIOs orchestrate cloud ecosystems that connect employees, customers, partners, vendors, and devices to meet rising customer expectations. Some companies will even shift from being cloud adopters to being cloud companies themselves, becoming stewards of their own client and product ecosystems.

New products. There has been much discussion in recent months about the current state of U.S. manufacturing. Most has been focused on either the idea of reviving existing industries or the idea we are entering a new "post-manufacturing" era. In his February 6th *Wall Street Journal* opinion piece, "Tomorrow's Manufacturing Revolution," Manhattan Institute Senior Fellow
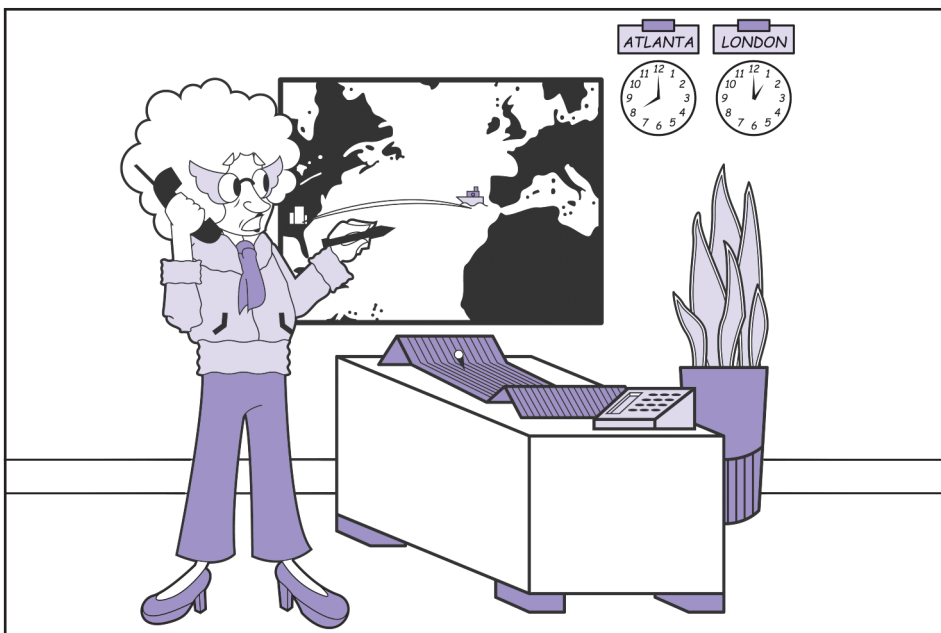
"Boss, I figure Mr. Cooper is gonna be 900 hours late for his appointment. His voice-operated self-driving car mistook 'Atlanta' for 'Atlantis.' When he woke up he was on a barge somewhere near the Strait of Gibraltar."

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Mark Mills opines that the next tech evolution is on its way, stating that "the combination of the internet of things with analytics-based supply chains, machine intelligence and three-dimensional printing will usher in a new world of manufacturing as profound as the advent of mass production: effectively, manufacturing as a service." Mills cites three transformational examples of what is to come: bioelectronics, biocompatible microchips and sensors allowing computing devices to be worn or implanted into living tissue or widely distributed into the environment; transient electronics, digital devices that disappear on a schedule or are consumable, allowing new ways to sense the environment and deliver new kinds of therapeutics with hyperprecision; and electroceuticals, microscopic wireless sensors that target nerves, areas of the brain and other human tissue to treat an array of medical conditions.

Big Data. Clearly, the competitive advantage in today's marketplace is data, Big Data. Etlinger states, "Just as the Industrial Revolution relied on access to coal, data is the fuel that enables machines to learn, act, and learn again." She quotes Intel's Director Data Science and Analytics, Melvin Greer, on the subject: "Hyperrelevant data is becoming the new currency and the most coveted strategic asset." Etlinger asserts that "the convergence of machine intelligence with Big Data, Internet of Things, cloud computing, augmented reality, virtual reality, and other technologies yet to be invented will disrupt our device-centric, brand-centric, and internet-centric expectations . . . Rather than using devices and/or the internet, we will experience machine intelligence organically; it will accompany us, learn from us, and eventually become our digital double as we navigate through an increasingly virtual world."

The Implications.
The IoT revolution has indeed begun, and its increasing complexity can overwhelm those who fail to keep up. What does this mean for marketers, media, agencies and, indeed, everyone in all industries interested in advancing their organizations and maintaining a competitive edge? More specifically, what should you do?

Pay attention to technological advances, even if you believe they have little applicability to your organization. If they do not now, they will later, and staying abreast is easier than playing catch-up. Stay active in industry organizations, one of the best ways to understand where media is going and what the competition is up to. Observe how your customers' industries are changing to meet new demands for organizational efficiency and customer satisfaction. And finally, understand the role of new players as well as the evolving role that agencies must assume in The Age of the Customer. ♦