Econsultancy

The Next Revolution of Search

How automation, AI and a narrowing window for advertising will remake marketing

In association with Bing

Microsoft

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The Next Revolution of Search

FOREWORD BY MICROSOFT

Rik van der Kooi

Corporate VP, Microsoft Search Advertising

Chances are, you utilize search advertising as a marketing channel without a second thought. The ability for marketers to reach targeted, relevant and measurable audiences at scale and at low cost shook the industry ten years ago, altering how consumers connect with brands online and offline.

Once again, the industry is transforming. As new devices and habits change consumer behaviors, and as data signals and platform and cloud capabilities grow, search advertising is at the crosshairs of artificial intelligence and audience intelligence. For consumers, "search" becomes more pervasive and natural in how they interact with a world that is ever-connected, providing them answers with more meaning and personalization. And for marketers, the ability to reason, understand and interact with consumers enables stronger relationships with more efficiency and impact.

I'm excited about the future of this industry and the investments our company is making. I hope you will find this research just as interesting and helpful to begin taking actions in reaching your consumers today and tomorrow.

RvdK

2. KEY FINDINGS

A little over twenty years ago, search redefined how we organize and access information. Over the next twenty years, search will be at the center of a second shift that is even more profound; how we manage our relationships with artificial intelligences as people, marketers and businesses.

As in the first digital revolution, marketing will be at the front, learning on the job and advocating for change.

This report is based on more than 25 interviews with futurists, scientists and marketing practitioners, supported by a survey of 2,681 adults in North America.

CONVENIENCE WILL DRIVE THE ADOPTION OF UBIQUITOUS, INTELLIGENT TECH

The brands and tools that make problems go away will win. Complexity and redundancy define most experiences because they're not intelligently connected to an individual's information or context. People crave simplicity, personalization and convenience. In search, consumer expectation is already migrating from the link to the answer. Artificial intelligence will push the next progression from answer to action. Fifty-two percent of survey respondents say it would be "life changing" or "very useful" if their digital assistants would do repetitive shopping for them, such as groceries and home goods. Another 27% think it would be "somewhat useful" and are open to trying features like this.

Search will be everywhere. Intelligent personal assistants are the logical extension of search. They will increasingly develop the awareness of an individual's context to deliver rapid and accurate information and services. Today they are only just maturing from novelty to utility, but they'll grow up quickly. The appetite is there, with nearly 80% of survey respondents saying that it would be "incredibly useful" if a personal digital assistant could help them find the options right for them.

Devices will inexorably give way to services. Our connection to devices will loosen as everything becomes connected. Smartphones will remain the heart of the system only until the assistants themselves become the focus of our attention. They will be distributed across devices and simply "be there" to address queries and commands. Voice recognition and natural language conversation are the keys. Over 80% of US adults with smartphones have used voice to interact with their digital devices or a smart service.

SPECIFIC, RELEVANT AND AUTOMATED – DEFINING MARKETING AND ADVERTISING IN 2020

Search intent and technology will power the consumer experiences and advertising of the future. Brands will move from investing in media to spending on insight, placement and validation. Structuring information for the conversation between brand and machine will be all important and the logical evolution of SEO. Meanwhile, paid search will be defined by the competition for scarce but valuable advertising opportunities.

There will be less advertising and more marketing. Mass media effectiveness will continue to wane, but our appetite for solutions will grow as the capabilities come online to address a wider problem set. "Search" will expand to mean telling our assistants what we want and expecting them to figure out the best answer, action or path to take. Marketing will be effective in relation to its usefulness to the consumer.

Incumbents will reign. Many product categories will be swept up in the larger movement toward automating our lives. Patterns will form quickly and be hard to break. Becoming a default brand for digital assistants will be the new prime shelf space. Branding will be one of the only ways to intrude on automatic buying relationships.

There will be fewer impressions and higher ROI. Search results will narrow with relevance and the consumer's expectation for answers instead of links. Brands may see less traffic because many of the queries they bid on today will not have opportunities for a commercial interaction. However, the return on the ads that do get delivered will rise significantly, with few if any competitors. In the near term, assistants will add to the availability and utility of first-party data, pushing marketing down the path of bidding on known individuals and lookalike characteristics.

Marketing will be a job for machines. There is already more data in search than we can effectively use, and it will multiply as intelligent assistants add to our perspective. The available signals are multiplying far faster than our ability to integrate them into a coherent strategy. We will need machine learning to organize and prioritize these inputs. From the consumer side, personal digital assistants will add to the data palette with the individuals' stated and implicit preferences, situation and historical context.

Search will replace parts of market research. The individual and collective feedback that is available through search will be deeper, faster and more actionable than current methods for understanding real-time market behaviors. An upside to the transfer of control to machines in search will be the ability to process and predict the larger implications of individual behaviors at scale.

IMMEDIATE AND LONG RANGE IMPLICATIONS

To remain viable, companies will have to become adept at creating and sharing data. Relevance will be increasingly determined by the user's specific interactions and profile as seen through the eyes of personal digital assistants. These agents will choose results based on deep information about products and match them with an array of highly individual factors.

Today's bets on marketing technology and data are well placed. Marketing's current emphasis is on collecting data from every possible source and making sense of it. In the future, brands will have to turn outward, exposing any data about their products that might be relevant to the person or machine on the other end of the transaction. This future state requires the brand to meet the agent half way, with their data and offer matching up to consumer needs. Investment in the marketing stack, or partnership to emulate it, is an important step that sets up brands and their partners for this ecosystem.

Budgeting for the future should be guided by developing relevant capabilities and expertise. Although this future will play out over several years, brands can start to experiment and learn. Fortunately, most brands are some way down the path to becoming truly digital marketing organizations, with the data management capabilities that entails.

In the meantime, the oft-cited ratio of 70/20/10 is still useful. That 20% should include experiments in automation for customer service and advancing the search practice for today's leading edge, such as perfecting shopping feeds and integrating the necessary data to calculate and optimize against lifetime value.

The 10% is always hotly contested, but there's nothing more important than developing a strong internal understanding of how artificial intelligence will evolve and apply in a brand's sector. Funding to develop and experiment with smart agents and services for digital assistants should be allotted from this bucket.

Follow the assistant wars. Which search assistant is winning, and with what audiences? As overall usage increases, are today's key players maintaining the majority of ownership? How is share shifting between them? Can ecommerce oriented assistants expand into search and can the general assistants build the skills and networks to remain everything to everyone?

Most importantly, are there indications of a fundamental change in business model? There will come a day when one of the behemoths in the industry moves away from advertising and shifts focus entirely to a service model.. This will force brands into making dramatic changes.

Playing it safe now may have long-term implications. Traditionally, businesses move slower than innovation, delaying risky efforts because they do not have immediate impact. The response to disruption in media has often been to double-down on whatever still works, even if it is clearly not a long-term solution.

Eventually all offers may be open to negotiation between competing artificial intelligences. Speed of delivery, brand, price and other variables will be in the mix as purchases are put out to bid and an individual's assistant looks for the best possible outcome.

Also in The Next Revolution of Search

- Search, AI and marketing: The 10 year timeline
- How intelligent agents will enable values-based purchasing.
- How will we discover products in a post-advertising age?
- Using agents as brand ambassadors
- What is privacy in the age of assistants?

2.1. ABOUT ECONSULTANCY

Econsultancy's mission is to help its customers achieve excellence in digital business, marketing and ecommerce through research, training and events.

Founded in 1999, Econsultancy has offices in New York, London and Singapore.

Econsultancy is used by over 600,000 professionals every month. Subscribers get access to research, market data, best practice guides, case studies and elearning – all focused on helping individuals and enterprises get better at digital.

The subscription is supported by digital transformation services including digital capability programmes, training courses, skills assessments and audits. We train and develop thousands of professionals each year as well as running events and networking that bring the Econsultancy community together around the world.

Subscribe to Econsultancy today to accelerate your journey to digital excellence.

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2.2. AUTHORS

Stefan Tornquist has been at the leading edges of marketing evolution for nearly 20 years. He manages all of Econsultancy's research activities in the Americas and is the primary author of over 100 studies exploring topics in digital marketing, technology and business transformation.

Stefan's work has been featured in the Wall St. Journal, New York Times, USA Today, NPR, CNN, CNBC, Fast Company and AdAge.

Before joining Econsultancy in 2008, Tornquist was the research director for MarketingSherpa. He began his digital career as co-founder of rich media pioneer Bluestreak, now part of Dentsu.

Follow Stefan on Twitter: @SKTornquist

Arliss Coates is an analyst at Econsultancy.

3. INTRODUCTION

This report looks out at the changes to come in the next decade. It's difficult to predict when the waves will hit, but some businesses have already felt the first ripples. Many of the technologies that will upend current models are here in their early stages, or have already disappeared into our routines.

Regardless of when we reach the tipping points in marketing and search, there are opportunities to be had and preparations to make.

> "When something becomes ordinary, we stop calling it artificial intelligence."
>
> ***John Mahaffie, Futurist***

3.1. SEARCH, AI AND THE ASSISTANTS IN OUR POCKETS

Over the next decade, the usefulness and ubiquity of artificial intelligence will grow significantly across many personal and commercial activities. Marketing will experience many practical effects, from having to sell to algorithms to a tech stack that self-integrates new data sources and takes on virtually all media buying and selling.

For consumers, the changes will be equally profound, though they're unlikely to experience watershed moments on a day to day basis. Most of the "capabilities of tomorrow" are already here in some form and they will develop incrementally.

As services built on artificial intelligence improve, today's wild speculation will quietly become normal. Consider that over three billion people carry devices with more processing power than the Deep Blue "supercomputer" that beat the world's chess champion in 1997.[i]

Search will be at the forefront, both as the central activity in consumers' interactions with the digital world and as a marketing platform. Demand for relevant information is only growing and the industry is responding, evolving toward answers first and lists second. Inevitably, this has created a loop, continually redefining "relevant" upward to more exacting specifications.

As our tools become more personalized, this loop will tighten. Marketing is already at the edge of human-managed personalization and finds it challenging to make good on the promise of the right thing at the right time. But artificial intelligence is already improving our ability to make sense of huge data sets with multiple variables.

The **personal digital assistant** is how most consumers meet artificial intelligence in a visceral way and advances in these services will dictate how marketing works in the not too distant future.

Not long ago, the assistants that live on our phones and in our speakers were novelties at best. They rarely understood our questions and couldn't do much even if they did.

That changed as the data came pouring in. Mobile operating systems stored hundreds of millions of conversations across the globe, giving deep learning algorithms the tools to radically improve machines' ability to understand human speech.[ii]

Today, voice recognition technologies are fast approaching human equivalence, they're three times faster than typing and nearly 60% of consumers have used voice interaction at least once.[iii]

The tipping point in voice recognition and natural language processing is coming in the next decade – that moment when our queries can be complex, assistants ask smart questions to refine their efforts and the answers they give or actions they take are reliable.

This progress will affect our personal, business and societal productivity. Just as with the best human assistants, routine tasks will disappear or recede into the background, issues will be predicted and distractions will be intercepted.

The assumption of many interviewees, and our conclusion from the research, is that the familiar assistants of today have the inside track.

It also seems likely that, in most cases, we will turn to one entity, rather than assemble a team of assistants, because behind the primary assistant is a growing army of assistive skills, services and bots.

These services are poised to become a primary conduit between people and the digital aspects of their lives.

The reason is simple; these assistants are already integrated into our beloved devices.

However, the development of this marketplace will be affected as much by business decisions and cultural considerations as by technological development.

Major search and ecommerce players are already competing to make the consumer's relationship with their digital assistants fundamental to how they interact with the brand's services.

GLOSSARY

Agents or **bots** - software that performs a function for the user, or another program on behalf of the user, with some degree of autonomy.

Intelligent agents have some level of artificial intelligence

Autonomous agents can modify their behavior to achieve their goals

Mobile agents can move from one environment into another. Ex: Jarvis lives in Iron Man's suit and kitchen.

Multi-agent systems integrate distributed agents to solve problems one can't

Applications - software designed to perform a particular task.

Assistants or **digital assistants** or **intelligent personal *assistants*** are a type of agent designed to serve an individual and their needs

Chatbots are specialty programs that can conduct conversations, attempting to mimic human interaction

Centaurs are mixed teams of humans and AI.

Dedicated circuits are chips built for specific tasks that can greatly increase the speed and efficiency of accomplishing tasks. They're key to expanding artificial intelligence into handhelds.

Deep learning is a branch of machine learning that's focused on modeling complex abstractions based on large, often unstructured data sets.

Knowledge graphs collect and structure a wide variety of information types such as languages or images.

Machine learning includes a variety of techniques that allow machines to learn without being explicitly told what to do.

Natural language processing is part of artificial intelligence concentrated on achieving conversations between machines and human beings.

Neural networks mimic the functioning and structure of the brain.

Reinforcement learning is a method of machine learning where the program is "rewarded" for success and optimizes for increased reward.

Voice recognition is the ability of devices to understand human speech.

Market share for assistants may be the most important business land grab of the next decade, because we expect that relationship to expand into every crevice of digital life. Think of everything that we use phones, computers and tablets to do...more of it will run through assistants every year.

The key to the usefulness of an assistant is the ecosystem of **applications** and **agents** they are connected to.

Consider these scenarios...

You're rushing through the Minneapolis-St. Paul airport, but get a text from your airline that weather at home has canceled your flight.

You quickly do a voice search for airport hotels and see your preferred brand, the Westin. Clicking on the link, you call and after a few minutes moving through the automated system, discover that there are no rooms.

A few more calls and fifteen minutes later, you have a room. It's not as nice as you'd like, nor as close, but it will do.

Here's a similar version, with the addition of external agents and personal context.

You get that text and know that every nearby hotel is getting calls from your fellow passengers and time is of the essence.

"Airport hotels, Minneapolis"

You glance at the results.

"Call the Westin."

"Our Minneapolis location is booked," says a tinny voice, "But there is a room available at our sister hotel, the airport Marriot. It looks like you can stay for free based on your point level. Would you like me to reserve a room for this evening?"

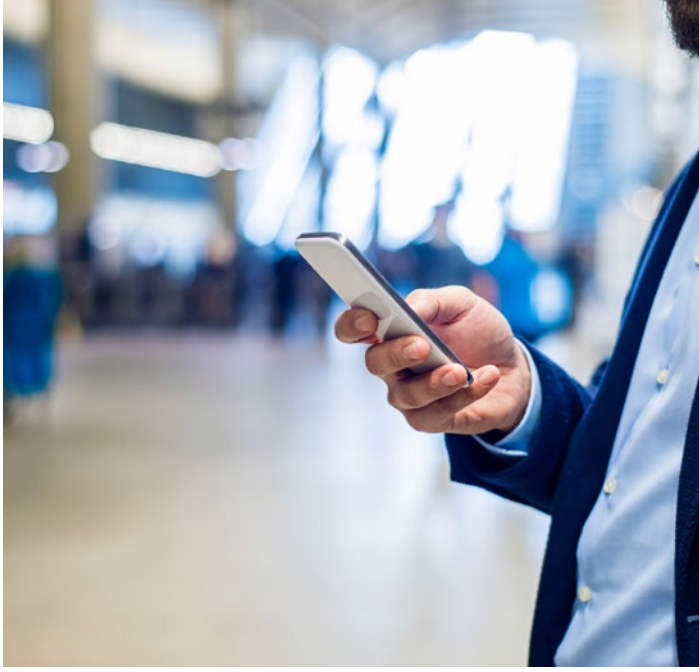
"Yes" you say, heading for the exit.

That mundane but useful interaction could easily involve multiple intelligent agents, recognizing your speech, performing the search, connecting to a travel database, prioritizing based on loyalty programs, reserving the room and directing your call.

We're a long way from the popular idea of an artificial intelligence that chats with us like a friend or colleague, but that doesn't matter. Thanks to progress on a variety of fronts, from the **knowledge graph** to **machine learning** to **natural language processing** the impact of thinking machines will be significant long before they are flirting with self-awareness.

Today, agents are taught and trained to help with a particular problem. This limits the range of activities for which they are deployed and how quickly they improve.

But that's changing. Agents are learning to learn.



"Today we've got systems based on existing databases for weather or taxi locations or movie times... so far we've only worked with a fraction of the virtual tasks. We can't build millions of unique solutions, so we're building a flexible system that learns by interacting with the user… the user will tell it what's right."

Dr. Jianfeng Gao, Partner Research Manager with Microsoft's NLP Unit and Deep Learning Technology Center

There's no one path forward, instead the technologies in development will take them all simultaneously. When AlphaGo made headlines, it combined a variety of techniques to beat the world's Go champion, and it did so about five years ahead of schedule.[iv]

The system began by mimicking great players with a search tree of 30 million moves and **deep learning**. When it gained sufficient competence, it began playing versions of itself using **reinforcement learning**, optimizing against outcomes until it achieved mastery. But in what may be the most comforting prediction in this report, the most successful variation may come from so-called **centaurs** – when humans lend their "feel" for strategy, behavior and emotion to the datasets and processing power of AI.[v]

We will experience these innovations in a variety of ways, but personal digital assistants will be where artificial intelligence meets everyday life. This report explores how they will evolve and in the process, reinvent search and the discipline of marketing.

"The kinds of data available to search are expanding almost as fast as the sheer volume. As our devices increasingly use context - place and user history for example - that gives them an ability to see the data that's already out there in a new light."

Sean Donnelly, Senior Analyst, Econsultancy

3.2. NEW DATA AND THE EXPANDING, EVOLVING PALETTE OF SEARCH

The signals that are available to search engines and marketers have expanded greatly in recent years, and they will continue to multiply. A shift in focus has been from the explicit to the implicit ("Route to 555 Great Jones Street, New York, New York" becomes "Route home") and increasingly, there will be added personal and historical context.

Searches today still rely mainly on **explicit signals** such as query and general location. But over time, we're learning how to use **implicit signals** like previous queries, speed and direction, purchase history, social graph, time of year and life stage.

In marketing, the complexity of using multiple data points limits their use in targeting and personalization. AI offers an opportunity to use these variables in concert, starting with a goal and working from there.

While machines are able to juggle more data, their real skill is identifying the few important variables in any given scenario and, like a good Go player, eliminating 99.9% of the variables because they don't matter.

Throughout this paper, we'll see that the implications for marketing are enormous. The ability (and expectation) to provide a unique, valuable experience in real time will ultimately affect every interaction in the customer experience, and therefore every element of marketing and even the wider business itself.

The next evolution will be for the "always-on" assistant to understand a **wider and deeper context** because it's connected to the larger digital world of beacons and connected devices as well as the individual's personal ecosystem. This includes some or all of their connected devices and services with all of the insights they provide, from their travel patterns to what games they like to play.

As artificial intelligence becomes more adept, this will increasingly include the implications of the things people type and say, not just to their assistants, but within general communication. Today, chatbots intercede when they detect straightforward cues, like "taxi" or "dinner." In five years' time, intelligent tools will be able to understand context with much more nuance and information.

In addition to the widening array of signals available, the **qualities of search** are also expanding.

- **Pervasive** – Today search is more or less locked into screens, although voice recognition is starting to change the idea of where search "lives." As more of our world becomes connected, interactions with technology will be defined by services instead of devices and search will seep into the fabric of life. Whether we're in our homes or cars or offices, we'll be surrounded by the capability to search. Many children born since 2010 already assume they can query the air for information or action, and get an answer back.[vi]

  Search will also be pervasive in the sense that it will include more of our physical world. The knowledge graph already extends to some indoor spaces, images and connected machines. This will extend further, as the technology for recognition proliferates. If something can be tagged, identified or carries a label, it can be integrated into the system.

  Our expectations are already evolving. Senior citizens are one of the fastest growing categories in users of voice search, while whole households vie for their smart speaker's attention. For younger people, it's simply normal to expect a digitally responsive environment.

"My toddler swipes everything... tables, books, more or less anything flat... with the expectation that it will spring to life like our tablets. She will grow up with that kind of interface as second nature. The generation that's ten years behind her will use speech in the same way, asking questions of the air, and expecting it to answer back."

James Clark, research manager for digital and interactive business, Accenture

- **Progressive** - One of the most intriguing changes for individuals and some brands will be the capability of intelligent assistants to maintain awareness of their users' activity over time. Specialty agents will be developed that add value and specificity to endeavors from losing weight to learning to cook to purchasing a home. An intelligent assistant can maintain that "search" over time and interact with the user in different ways at different stages.

  With exposure, search assistants will add our individual priorities and characteristics to the formula, making progressive searches uniquely our own. This capability will give marketers the ability to understand the customer journey from the inside, with visibility into every step along the way.

- **Personal** - Our individual preferences and information already influence the results we get from traditional search queries. As search assistants and other AI become ubiquitous, they will be able to understand and apply a much deeper dataset to our queries and tasks.

  Consumers understand the exchange of data for value in their digital and commercial relationships. What's been missing, too often, is on the value side of the equation.

  The potential for intelligent assistants to simplify and enhance our lives will require access, sometimes to very **personal** data. But when technology can make good on the promise of true digital security, better health or improved investment performance, consumers will almost certainly allow access.

- **Predictive** - The ability **to predict** what someone needs is a function of knowing them and their circumstances, coupled with the ability to place them in a wider context. In time, deep and reinforcement learning will train our assistants to think ahead based on their access to historical data and ability to compare current situations with millions of similar events.

  Most early "predictive" behavior will likely be based on high repetition. For example, your assistant might alert you that your car's battery is waning as you near the last charging station for fifty miles. Similarly, as specific agents in particular categories gain knowledge, they will be able to predict things that you want to know, monitor, buy, avoid, watch, etc.

- **Powerful** - There's a line where search ends and action begins. Today that line is still clear. Steadily over time, our digital assistants will become more **powerful** as they offer services that are tied to the access we give them. They will be connected, even integrated into, cars, homes and virtual lives.

  Their ability to make decisions and take actions will grow with our trust and their value. At first they will ask our permission, but in many cases, we will grant them autonomy as soon as possible, to save time and because there's no good reason not to. It will begin with reordering lettuce, ordering taxis or turning down the heat, but will advance to making travel arrangements, summoning emergency services or trading a falling stock.

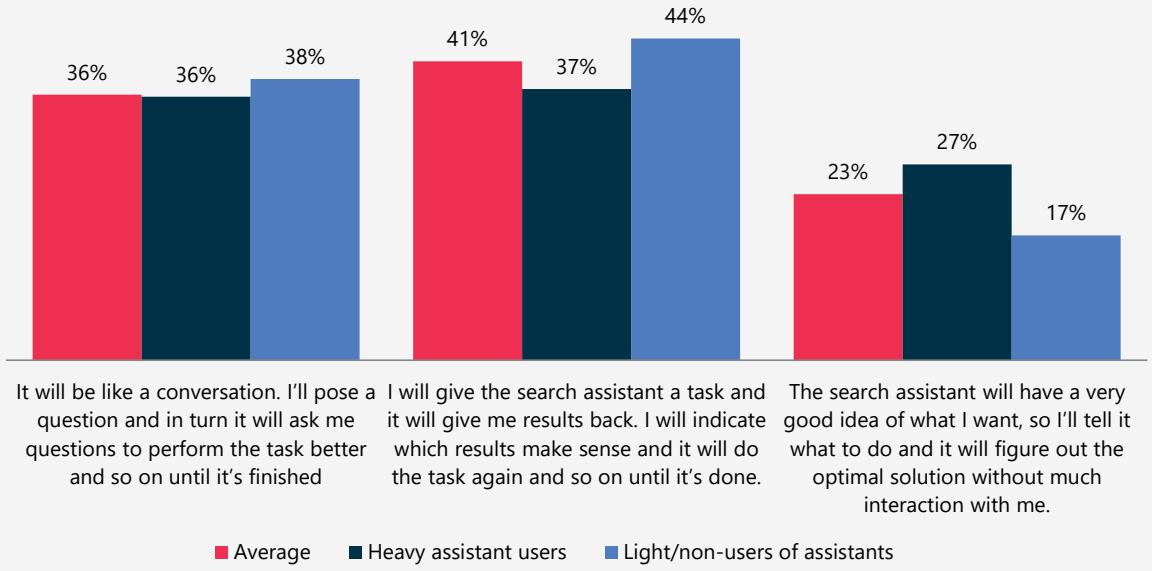
3.3. TEN YEAR TIMELINE OF SEARCH AND TECHNOLOGY

"Everybody worries about how quickly tech is evolving, but we are the single most adaptable intelligence we know, by far… we don't even realize we've adapted to a thing until we're forced to re-experience it. We are so much more adaptable than the technology. We are so flexible that we Tweet with the same OS that picked berries off bushes."

Brad Berens, Senior Fellow at the USC Annenberg Center for the Digital Future

4. SHOPPING, PRIVACY AND HOW WE'LL FEEL ABOUT SEARCH

Figure 1: Thinking about the future, how do you imagine the interaction between you and your digital assistant?



Respondents:2,511

When they imagine interacting with search assistants in the future, nearly 60% of the sample imagines it will resemble a real relationship, with the assistant knowing enough to take part in a conversation about their needs, or even to take action with the knowledge it has of them.

What's particularly intriguing is that responses don't vary significantly between heavy and light assistant users, groups that differ substantially in many respects. How people imagine interaction evolving isn't predictive. It's important because it suggests a degree of trust and openness to a very different mode of interacting with technology.

Consumers are already getting used to having a very intimate relationship with digital devices and the services that reside on them. Studies of smartphone ownership suggest that we develop an emotional, even addictive bond and change our habits significantly in response.[vii]

The chart above tells an interesting story about our expectations and openness to the technology. Over 35% of respondents think that interacting with their assistant "will be like a conversation," while another 23% goes so far as to say that the assistant "will figure out the optimal solution without much interaction with me."

While the latter option may be a long way off, the implications of what these choices suggest about our cultural comfort with the current and future form of search are telling. There's enormous trust implicit in these answers, and throughout the survey responses. That trust is what can unlock the most far reaching possibilities for search.

4.1. THE DEFAULT BRAND: AUTOMATIC AND ASSISTED BUYING

Most household spending repeats, month after month. There might be some variation in the cost, but the products and services are relatively static. Housing, transportation, utilities, food and household goods are all repetitive, along with financial payments and retirement contributions. Put together they represent more than 80% of the average household's annual spending.[viii]

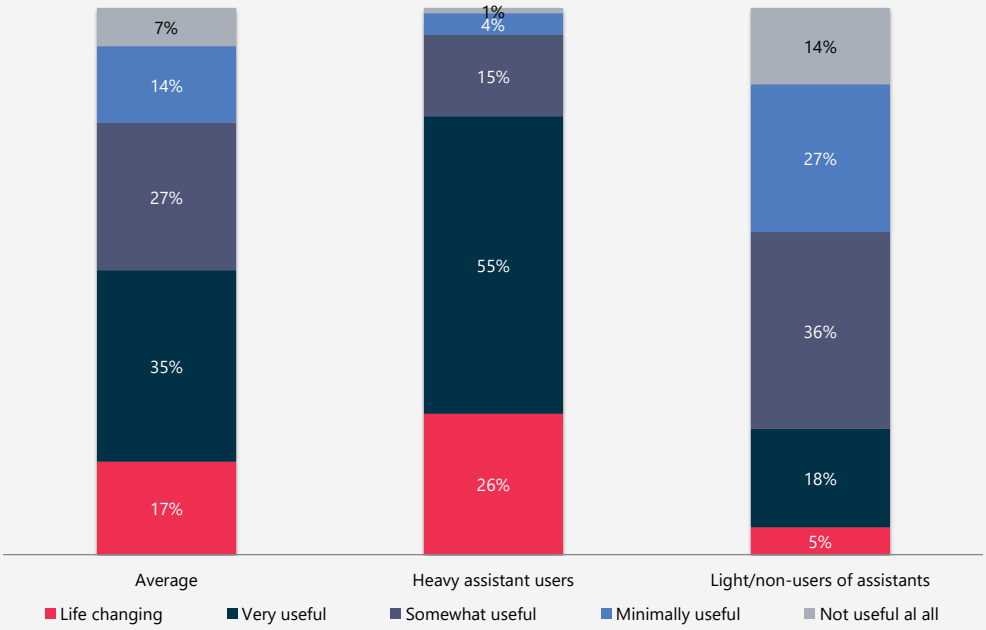
They're all ripe for automation, as our searches for products increasingly become requests for action.

Automatic buying is already a part of many Americans' lives. More than half use online banking in some form and that figure rises to nearly 70% of those under 34 years old and households with incomes over $150k. Of all online bankers, roughly two-thirds pay at least one bill through auto-debit.[ix]

That is just the beginning. When we asked survey respondents about automatic buying using their digital assistants, 75% said that it would be useful to them, and 67% said they would be likely to have products delivered automatically if the price was roughly the same as they pay now. Even among those who are skeptical of such a service, 90% admit that it would make their lives better to have products they use regularly delivered automatically.

The relationship between people and their assistants will naturally lead to a wide expansion of purchases that happen with little or no input from the consumer themselves. Because the factors needed for automatic buying are known in advance, such as price, usage, availability and location, it's a relatively easy activity and the capability should progress quickly.

Figure 2: How useful will [automatic buying] be to you?



Respondents:1,274

Digital tools will make it easy to repurchase products automatically. Example: your assistant will do your grocery and home goods shopping for you, looking for best prices or preferred brands. After it learns your habits, you'll only have to think about basics when you want to make a change.

The chart above compares how today's consumers view the prospect of automatic buying in the context of household essentials – the category where this service is likely to have the most immediate and widespread impact. Across all respondents, over 50% describe this possibility as "very useful" or even "life changing" and that share rises to over 80% among people who are already using digital assistants daily. Conversely, those who have rarely or never used an assistant are more skeptical.

An open question is whether the enthusiastic response from these heavy users is a reflection of their positive experience with the technology or simply their early adopting attitudes in general. The answer is likely a combination of both, but the history of technology suggests that mainstream adoption is simply a question of time and value.

Automatic buying won't apply to everything, but as it becomes more common and capable, consumers will expand their definition of what can be automated.

Usage of automatic services will grow in conjunction with the adoption of smart devices that can identify when a product is running low. Today many people are accustomed to their electronic toll pass refilling itself from a credit card. Tomorrow, the same will be said for cupboards and refrigerators.

From a brand's perspective, automatic payments are highly beneficial to the incumbent, and a threat to survival for the challenger. This will affect certain sectors dramatically and introduce a challenge in fostering product discovery. **See Section 4.5**

For affected lines of business, marketing must adapt. Media spending is targeted at audiences, but automatic buying will mean that large swathes of consumer are no longer in-market because inertia and time savings will encourage a loyalty of convenience.

This extends to purchases that are made by people but intermediated by machines, such as ordering coffee before picking it up, saving a place in line or ordering take-out food. Some choice remains, but the straightest path to convenience is repetition.

Strategies will be built very differently, with high emphasis on those who are about to "age into" a product line, before they've committed to automatic buying, and the rare opportunities for displacing an incumbent. Broadly this might displace brand spending, but in these specific cases, brand will never be more important. **See Section 5.3**

In sectors that are particularly prone to automation, such as grocery, home goods and refills, the primary decision maker may well be another machine. A new kind of marketing, at the intersection of ecommerce and search engine optimization, the practice of targeting and negotiating with buying agents may be the seminal marketing capability for 2025.

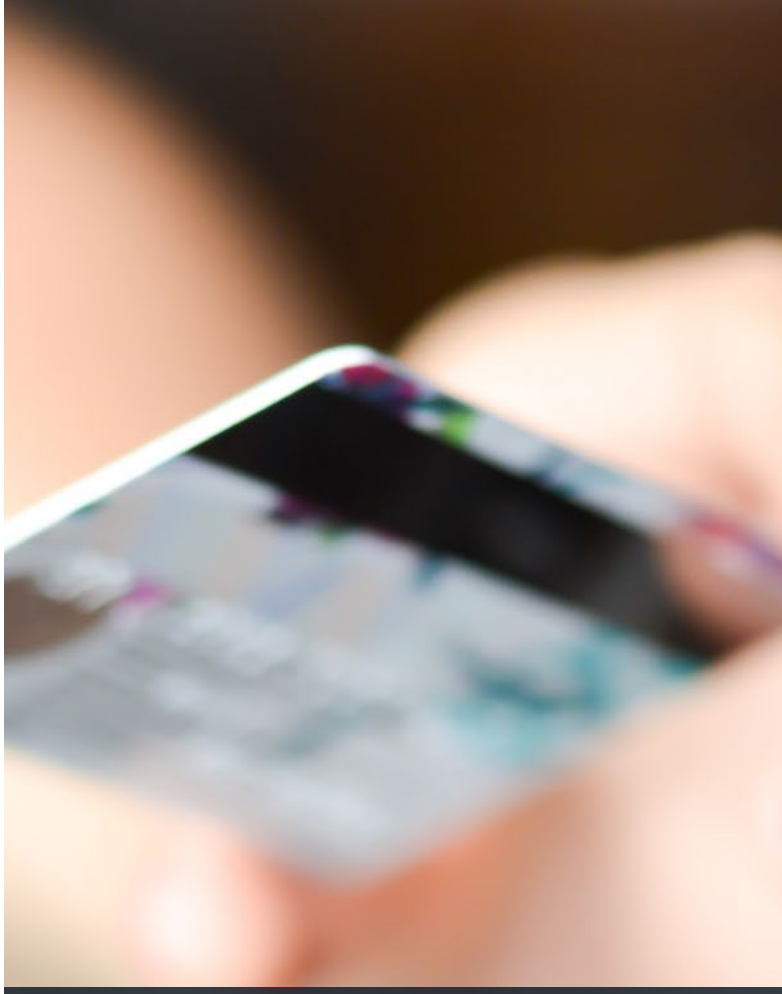
Robot assisted buying won't be limited to staples.

Readers under thirty won't remember the world of limited choice, but not so long ago, consumers outside of major cities were happy to find clothes that fit, or electronics in their price range at their local retailers. Today the problem is reversed. Combining the internet with an efficient global supply chain has led to a superabundance of choice in virtually every category.

Consumers say they could use some help in this regard; over 80% agree that *"There are so many choices today, it would* ***incredibly useful*** *if [technology] could help me easily find the products that are right for me."*

Of course, we want choice at a reasonable price. But more than anything, we want the time to make the choices that matter. The trend of this era isn't the proliferation of choice, but of curation. We want someone or something to help us sift through the possibilities. We want most choices off our shoulders and simply to receive the right wine or cheese or tie or snack or sock pairing at our door.

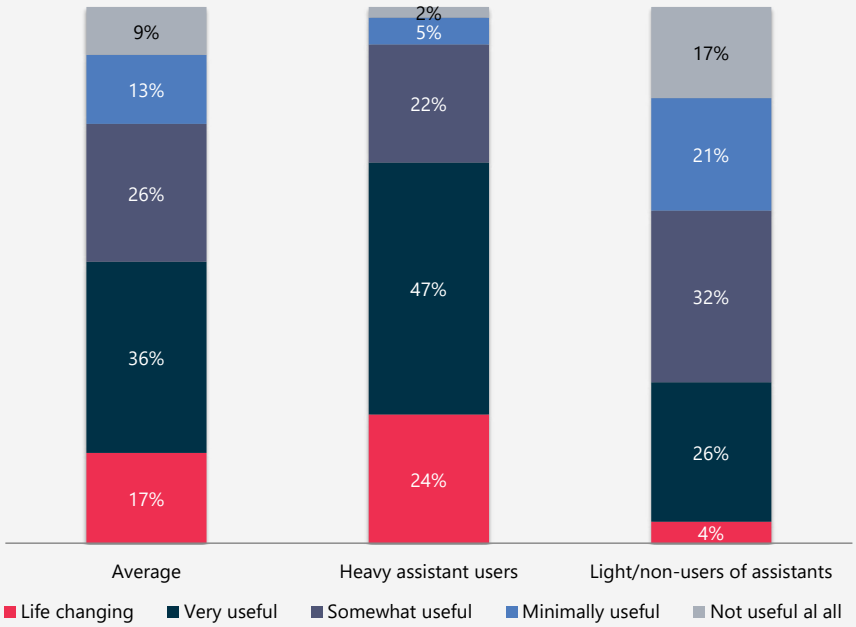
This sort of assisted buying is an evolution of search; we won't try to find the right query to yield the best results, we'll expect the search assistant to do that work for us.



"One of the most striking changes we're seeing is in the sophistication of ecommerce players around shopping search – the advertisers are radically improving their shopping feeds, and understand that their ability to describe products is a competitive advantage. That's only going to become more important as the transactions are influenced by intelligent assistants looking not just for the best price, but location, features, etc. for the individual."

Laetitia Kieffer, Partner and Group Director of MediaCom's Search and Social Division

Figure 3: How useful will [product curation] be to you?



Respondents:1,268

Still thinking about clothing: since your assistant will learn what you like and don't like, it can also help you learn about new products, services or programs you might find interesting. Example: over time it will learn about your clothing preferences like style, color and brands. Your assistant will create a personal fashion line for you from across the internet based on your profile, but narrowing the selection to your tastes.

How will the business model of assisted buying evolve in scenarios like the one above? Brands will desperately want to be in the consideration mix, but the value to the consumer in a digital assistant will be in relevance and trust – how will that tension work within commercial models? The providers of the assistant will risk alienating users with results that don't feel authentic, or risk losing brand dollars.

4.2. VOICE IS GROWING, BUT WON'T ECLIPSE THE KEYBOARD

There's no question that voice search and broader voice-driven interaction are surging. Nearly 25% of survey respondents report using voice to interact with their devices at least daily. Voice and image searches are going to make up at least half of all searches by 2020.[x]

The increase in usage is on a curve that corresponds with utility. Voice recognition has improved dramatically, recently reaching parity with a human transcriptionist in a lab setting.[xi]

The range of interactions between people and their devices is going to become more sophisticated, as those tools understand us better, and have something to say themselves.

"The game playing systems [AlphaGo et al] use point systems to orient and learn. It's incredibly hard to create systems that can do that in a true organic environment. But we're approaching a transformative moment in natural language recognition… five, ten years will see huge shifts."

Dr. Jason Mars, Professor of Computer Science, University of Michigan

Products and services are being rolled out or modified to take advantage of what will only briefly be a unique selling point. For example, third-party voice skills for the Alexa platform grew from 14 to 950 in just the first months of 2016.

Voice queries are different from those that start on a keyboard. They tend to be longer and include richer detail as the searcher thinks through their query.

They are also more likely to offer some context for the query. In text search, we have dropped any pretence of normal speech – we learned the command language long ago. But with search assistants and connected devices, people pose questions. They ask "how late is Dominos open?" instead of simply stating "pizza."

"Voice seems more like a companion activity, not a primary one. You don't do it in all the places you'd search. It's great when cooking or driving…voice searches inside remote control because you're watching TV."

Cindy Krum, CEO of MobileMoxie

In the rush to accommodate the move to voice, marketers should not let enthusiasm blind them to its limitations. There are many categories of search, including many specifically commercial searches that are not well suited to voice interaction. Brands will have to plan for two broad categories of query (voice and text) as well as for how the results are delivered.

As we look ahead to greater depth and breadth to our interactions with digital assistants, it's easy to imagine our keyboards giving way to a conversational style that would be at home in science fiction. But that's not necessarily how things will play out; speech puts more cognitive demand on us than typing.

"When we speak we're using our short term and working memory because speech is so cognitively demanding. With typing we can parallel process and plan ahead. Speaking is an awkward skill – most people aren't comfortable dictating long passages for example."

Dr. Ben Schneiderman, Distinguished Professor of Computer Science, University of Maryland

Voice results are far less common today, but will grow quickly as a proportion of searches as smart speakers proliferate. Sales of these devices are on par with early iPhone sales; with early estimates suggesting that over 20 million households will be using some version of a smart speaker by 2020.[xii]

While they will represent a much smaller share of overall and voice results than those through assistants, these devices encourage a "screenless lifestyle" where a convenient spoken answer will usually be good enough. Between assistants and various in-home devices, voice results may grow to represent nearly one-third of all results by 2020.[xiii]

Of particular note, this penetration may skew toward families, suggesting that a generation of high-value consumers is growing up with the habit of asking for and receiving answers by voice.

Voice results present marketers with a new set of challenges. In today's search ad model, it's relatively easy to associate ads with similar products or complimentary ideas. What happens when results aren't a list on a page, but a single sentence?

Just as the public is less tolerant of display ads on mobile devices than the desktop, they'll have virtually no patience if their assistant tries to slip an unwanted commercial into their conversation. People will only listen to an ad if it's not an ad...if it's the right answer.

Even when voice searches do yield an interaction, they will present an issue for marketers as they manage customer experience in a mobile-first, potentially voice-first world.

The best customer experience won't map equally to all modes of interaction. For example, a spoken answer about a high consideration, luxury product that benefits from rich information might convert at a lower rate than visual results.

Voice queries	Typed queries
Navigation	Trip planning
In home	In office
Impulse purchases	Considered purchases
Known purchases	Product discovery
	In store
Voice results	**Visual results**
Updates	Rich information
Confirmations	Gray areas
Answers	Research
Progressive search queries	Personal information

4.3. PROGRESSIVE SEARCH

What if a marketing and insight tool was there for the entire customer journey?

One of the most intriguing opportunities for individuals and brands will be the expansion of the capability of intelligent assistants to maintain awareness of a search related task over time.

Searchers who have used assistants are already familiar with this capability in its infancy – a query for Lincoln identifies the president versus the car brand, so that subsequent questions like "how tall was he" doesn't need to specify the historical figure and so on.

Today the reality of always-on search is limited, but it will expand. Agents that assist with long term projects are potentially invaluable tools that would bridge marketing, product development and service.

In most commercial relationships, marketers and product managers get information in limited doses at specific times. The customer journey leads to purchase, but usually goes blind until problems arise or a new product cycle begins. Progressive search is potentially a window into everyday life and long-term aspirations, offering an ongoing and nuanced view of the changing goals and situations products and services are intended to address.

We expect healthcare and fitness to be among the first areas to benefit from progressive search because they benefit from a powerful combination of opportunity and necessity. There is already profound innovation in healthcare related to data collection, monitoring and remote service delivery.

EXAMPLES OF BRAND AGENTS/BOTS

30secondstofly's Claire – B2B Travel Bot
Claire schedules itineraries for groups of users, and, once scheduled, keeps all members of a group apprised of their teammates' movements and schedules.

Burberry Chatbot – Runway ordering service
Burberry had ready a convenient bot designed to facilitate ordering from runway-side during Fashion Week 2016. Users could order preferred outfits at the moment of seeing them exhibited.

CaptionBot – Image identifier
Created to demonstrate the capabilities of Microsoft's cognitive services, Captionbot identifies images without metadata with a high degree of confidence. Because CaptionBot's intelligence is aggregating, it gets more reliable at its job the more it is used.

DoNotPay – Parking ticket litigator
The world's first automated lawyer, DoNotPay began as an efficiency measure for parking ticket disputants hoping to forego the cost of hiring a lawyer to appeal unfair violation fees. DoNotPay's founder Joshua Howder has since expanded the bot to service various other simple legal actions.

GoHero – Chatbot creator
GoHero.ai allows users to create chatbots for a variety of commercial pursuits. Business owners can use GoHero to craft a modern, and cheaper, customer experience, eliminating the need to hire a human to provide mundane and automatable question answering service.

Mastercard's KAI – Spending helper
KAI will allow customers to review their financial histories, check spending levels and receive relevant offers (presumably) containing sound financial advice.

Mastercard's Bot for Merchants – 'KAI,' but for businesses
Mastercard's Bot for Merchants will allow consumers to perform business transactions on a messaging platform, and then finish buying with the Masterpass digital payment system.

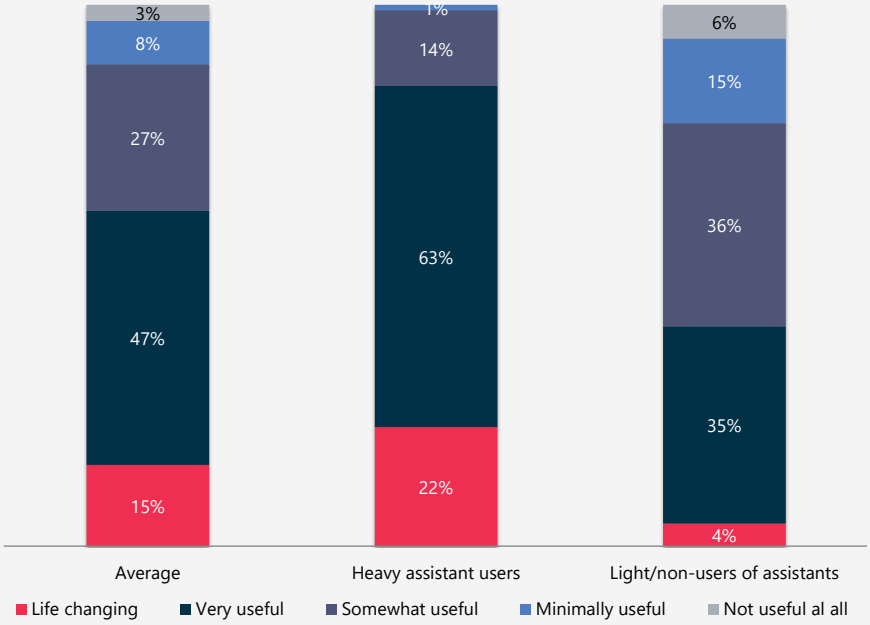
NHS's Babylon Health Bot
The UK's National Health Service is currently experimenting with a bot crafted by Babylon Health, a British AI startup, that aims to automate the Healthcare system's triage service so as to spare the system unnecessary doctor visits and to help patients with ordering over-the-counter medications.

Soul Machines's Nadia – Emotion reading chatbot
Devised as a way of assisting the disabled navigate bureaucratic (health-related) systems - and sponsored by the Australian government - Nadia mimics facial expressions and adjusts her tone (voiced by Cate Blanchett) to put her users at ease.

Wordsmith – Natural Language Generator (NLG)
Wordsmith allows users to turn data (from Excel, for example) into readable text in any language and format.

Xo – AI celebrity
Microsoft's chatbot for WeChat and Weibo that is a simultaneous Turing test, software beta and live experiment in using emotion as a critical variable in communication. The bot has had over 10 billion conversations, averaging over 25 interactions per session.

Figure 4: How useful will [progressive search] be to you?



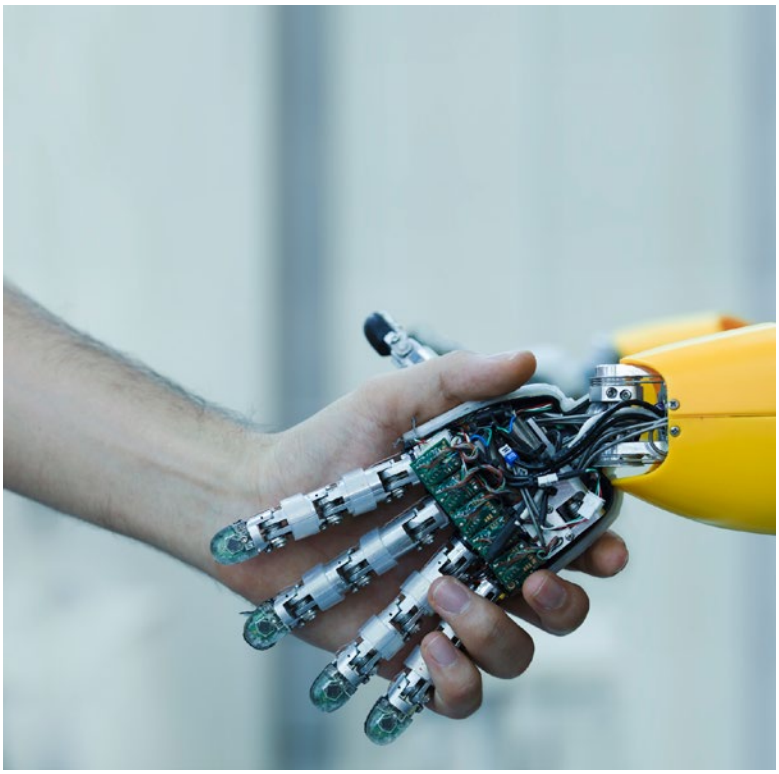
Respondents:1,280

Your digital assistant will participate in long-term projects with you, such as car buying, going to college or planning a trip. It will remember your goals and preferences and be able to offer new, relevant information, keep an eye out for deals and notice if issues arise.

Example: you've narrowed your search for a car to the model you want, but it's too expensive. Your assistant lets you know when the right model turns up a dealership 50 miles away at the price you've targeted.

How much value could an agent designed for diabetes sufferers provide, given access to personal data and vast medical resources? Could it help keep diet and sugar under control, ameliorate long term effects and speed emergency response? Quite possibly.[xiv]

Inevitably, these services will start out as shopping tools, membership and loyalty schemes. But in time they may be deeply helpful to the user in ways we haven't yet conceived. Meanwhile, they will generate the most accurate, meaningful data about how long cycle purchases are progressing that marketers have ever had.



4.4. PRODUCT DISCOVERY

Product discovery will be increasingly led by the consumer. As advertising opportunities diminish and relevance increases, brands' opportunities to put new products in front of consumers will wane in every "push" channel.

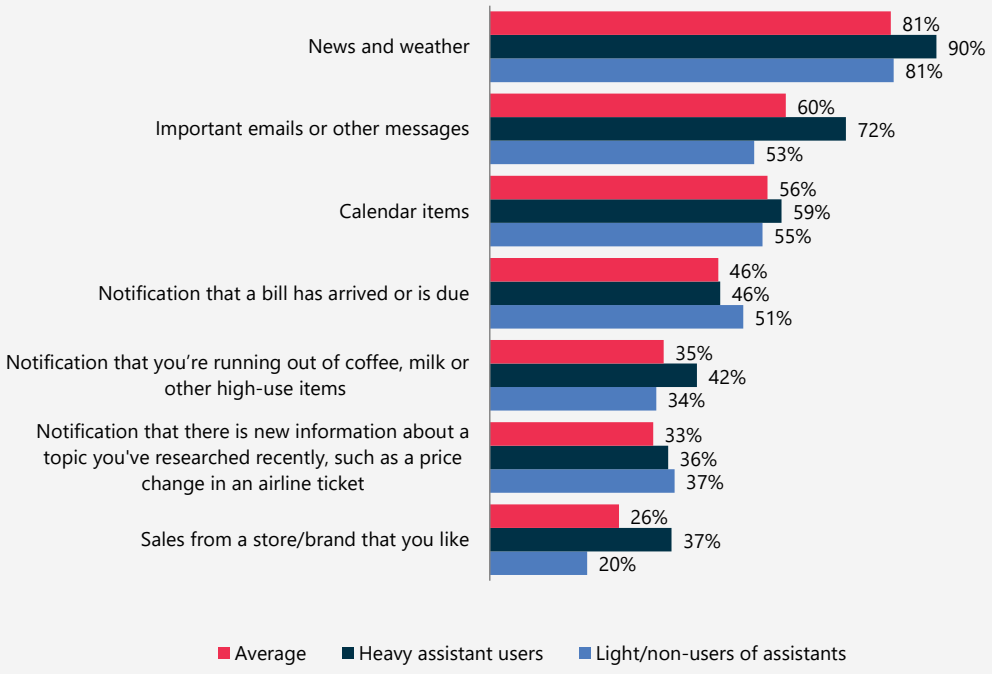
Discovery will be a function of how the individual wants to interact with the commercial world in different product categories. As we have greater control over the intrusion of advertising, our preferences and interests will dictate a greater share of the inbound messaging we receive.

Fortunately, while the dynamic that emerges will encourage repeat buying, human nature does demand change, at least in some product categories.

"There is a human need for discovery/exploration and it will remain. Yes, the opportunity may narrow in the traditional environments for discovery… but there will be a remarkable new opportunity for digital agents to learn about their users."

Raj Kapoor, Senior Director of Search Monetization Products & Personalization Platform at Microsoft

Figure 5: If you were to tell your digital assistant what you wanted to hear about in the morning, on your commute or another time, what kinds of information would you choose?



Respondents:1,510

One option for approaching commercial messaging and new products is what is termed the "proactive canvas" – the media, notifications and widgets that are driven by search assistants. Today, this canvas is limited to the screens of mobile devices, but will inevitably expand into a mix of spoken and visual results.

An important new venue for the proactive canvas will be in the updates we choose to receive from our digital assistants. 54% of consumers say it would be useful to receive verbal updates containing relevant information. Another 37% say they might use such a service depending on the circumstances. While news, weather and personal updates dominate, commercial messaging has a place, when it's relevant.

4.5. PRIVACY OR SECURITY?

Artificial intelligence, in general, and specifically the intelligent assistant, will present important questions in privacy. How data is gathered, shared and, most importantly, used will be scrutinized by all sides.

There's no question that the curves of value and intrusion rise together; digital assistants become more valuable as they learn about the user and access information about them. In some areas an assistant might well know more about an individual than they know themselves.

It's fair to assume that the inner workings of the ecosystem will be largely hidden from our view. People aren't any more likely to monitor the interactions between intelligent agents working on their behalf (or at least the behalf of a company they're doing business with) than they are to read a contract's Terms and Conditions.

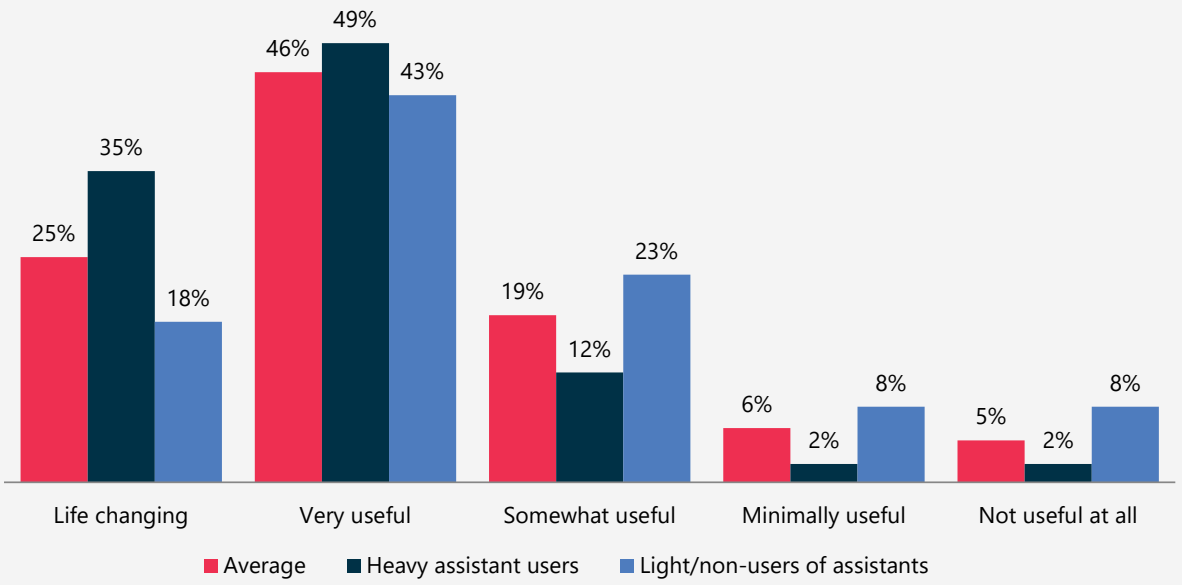
Equally likely is that if the intelligent agents are as useful as they can be, people will accept some intrusion into their lives and data, knowing that some of it will be shared, if not quite knowing with whom.

However, as the assistant sits at the center of someone's personal digital domain, there may well be products that give the individual practical control over their privacy levels, applying rules in ways that are too time consuming and byzantine today.

The scenario below takes that idea a step further, suggesting that artificial intelligence may reduce our privacy, but that it has the potential to increase our security.

Over 70% of all respondents describe the possibility of having their intelligent assistant act as a "digital security guard" as "very useful" or even "life changing." In subsequent questions, more than two-thirds of respondents said that they valued the service enough that the necessary data exchange was worth it, or taking the view that "they've already got my data, so I might as well get something in return."

Figure 6: How useful will [digital security] be to you?



Respondents:1,280

Your digital assistant will act as a digital security guard, monitoring your finances and online security at all times. Example: someone applies for a credit card using your personal information, but your assistant flags the activity and alerts authorities automatically, keeping your identity secure.

4.6. HUMAN NATURE AND THE PROGRESSION OF SEARCH

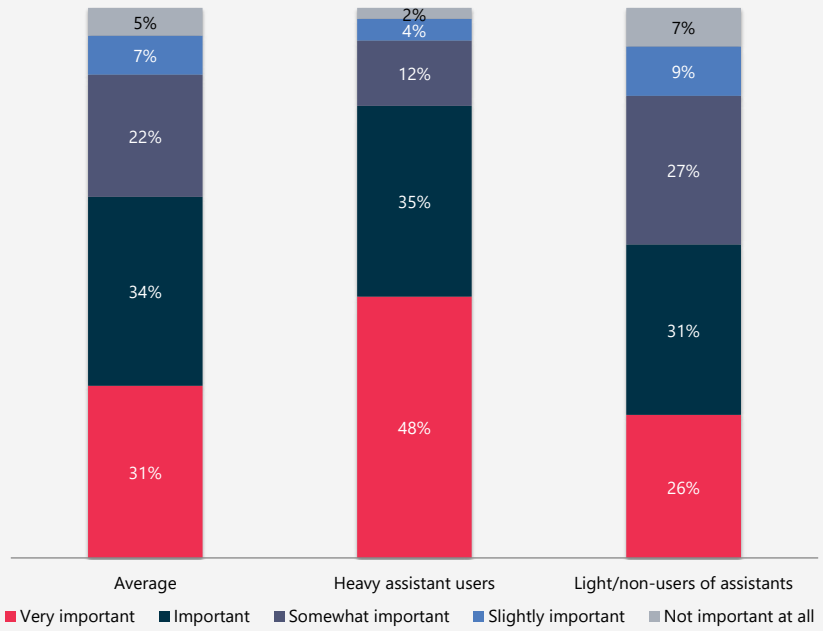
We are just starting to contend with the moral, emotional and psychological aspects of artificial intelligence. In the way that manufacturers of self driving technologies are grappling with legal and ethical quandaries that didn't exist a decade ago, these inventions are going to push individuals, businesses and governments into new territories.

One near term question is to what degree an increasingly personalized digital experience will play to individual values. In the media sector, the breakup of the public into ever-smaller niche audiences has been in process for nearly two decades, but in most industries, playing to customer values is a minor concern, except for brands that specifically play to them.

In a future that's custom-tailored, values may play a significant role in marketing across a much wider set of companies, because it will be much easier for consumers to align their shopping with their beliefs.

Most people connect their values as an individual and as a consumer; 84% of survey respondents say that it's at least "somewhat important" that companies align with their values. But most of the time, the origin and background of products and services are hidden, murky or complex and there's simply not enough time to worry about the behavior of every brand.

Figure 7: How important is it for you to do business with companies that align with your values, such as whether they have a strong environmental record or that their products are built in the U.S.A?



Respondents:2,075

Values are tricky to gauge in terms of their impact on behavior. We all aspire to be better people, although our definitions vary enormously. As a result, survey questions about intent or values tend to overestimate reality. For example, the share of people who intend to live healthier next year is invariably higher than those who follow through. But what if aligning shopping with values becomes as easy as mentioning it to a personal digital assistant?

Unless there's a news event that highlights a particular brand, most of us ignore the issue and/or use proxies for our values, like the word "organic" on the label or branding that suits our cultural orientation.

The impact of personal values on shopping behavior, however, may dramatically increase as personal digital assistants become more powerful and personalized. Broadly, values are a measurable variable, like price or shipping times. An assistant can notice if you intentionally purchase organic products and ask about other purchases that align with that type of buying preference. Or you can tell it to "buy American" whenever that's possible and cost effective. For the assistant's search curation and shopping behavior, these are just more inputs into the formula. For brands, these may be new or lost customers.

The speed to adoption of personal digital assistants and other connected devices will vary by age group and other known factors, but demographics alone may not give an accurate view. **See Section 5.5**

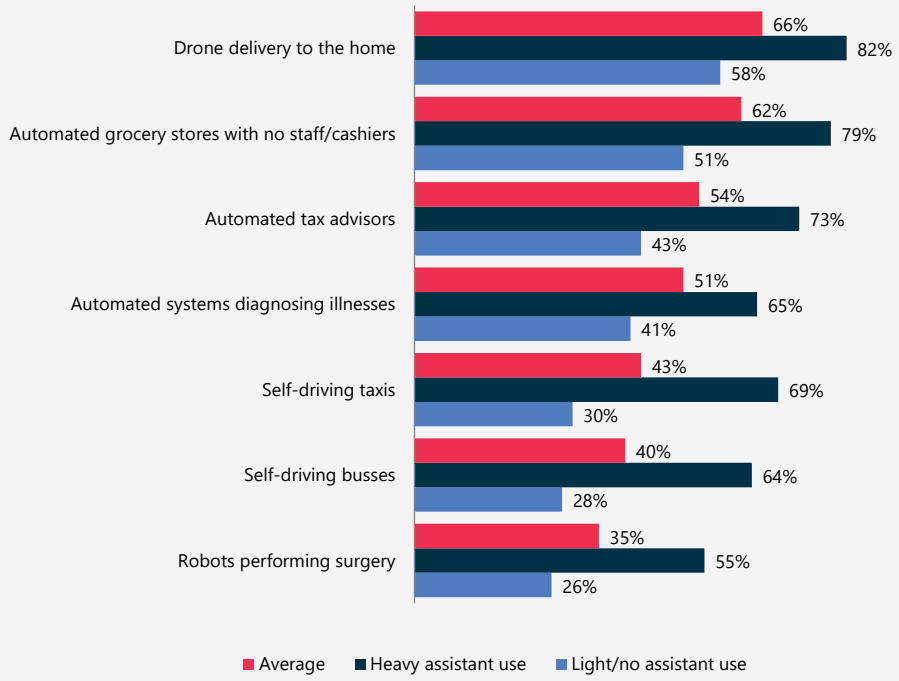
Attitudes toward technology will become an important lens through which to view customers and prospects, at least in the interim while adoption varies by audience type.

Early adopters may want seamless processes that remove human elements, but for more reticent consumers, capabilities powered by artificial intelligence may be seen as intrusive, not as features. Studies suggest that older people, for example, simply prefer interactions with bank tellers, retail clerks and other human service workers.[xv]

The "futuristic" options above all exist in some form today, but they are in their infancy. Some may never become commonplace, but the general direction that seems inevitable; we're going to automate where we can, to save money, to improve outcomes and to maximize convenience.

Automation promises to be highly disruptive, on the scale of the industrial revolution, electrification or the assembly line automobile. A significant portion of the population is uncomfortable with aspects of this collectively imagined future, and it will affect their personal pace of change and brand choices along the way.

Figure 8: Thinking ahead to the future, how comfortable would you feel about these possible uses for automation?



Respondents:2,090

Assumptions based on demographics can be misleading. For example, it's interesting to look beneath the surface of the attitudes of the generally skeptical group of non/light users of assistants, who skew somewhat older and more rural than the average population. This group is roughly 50% less likely to feel comfortable with these possibilities when they're aggregated, but that leaves one-third to one-half of this population saying they're comfortable with ideas that are, today, far reaching and abstract.

Throughout the survey we see openness, or at least resignation, toward change among audiences generally considered traditional in their views on change, commercial innovation and technology. In specific cases when they see value, their numbers begin to look like early adopting urbanites.

5. THE FUTURE OF SEARCH + MARKETING

The future of search is arguably the future of marketing, perhaps all commerce. As consumers and business people, our interaction with the digital and offline worlds will be increasingly assisted and intermediated by personal assistants.

Their utility is based in combining the capabilities of machine learning, the wider context of the knowledge graph and personal knowledge of the user.

5.1. LESS TOLERANCE, LESS REAL ESTATE AND A NEW MODEL

The **window for advertising is getting smaller**, figuratively and literally. Just as our screens themselves are shrinking, so too are the opportunities for brands to reach consumers.

From the adoption of online ad blockers to a movement toward subscription content, audiences are going out of their way to avoid traditional advertising. Seventy-eight percent of consumers in our study said that they would find it useful if their smart devices acted as gate keepers, restricting commercial messages and only allowing those that are relevant to current purchases. The more valuable the audience in terms of their education, household income or location, the more pronounced this trend becomes.

For now, search is the exception – its value is even increased by advertising for many queries. But this will change as intelligent assistants increasingly intermediate our digital experiences. As search agents get smarter and more familiar with the individual, consumer expectations for relevance can only continue to grow. The value in a search result may be ease of use and brevity, price or curated discovery, depending on the individual, the query and the circumstances.

This shift will affect consumer behavior, brand strategy and inevitably, the business model for search itself. Models that try to force commercial results into unrelated queries or sponsored, non-optimal results for commercial queries will fail, especially with high value consumers.

While the search experience for the consumer will narrow in terms of the number of responses, the role of search in their lives will expand.

> "We're thinking about a fundamental expansion in the role of search. Historically it's been a bottom of the funnel activity – the last step to a sale. But our ability to search is radical shifting from the desktop to mobile and connected devices and services of all kinds. We'll be searching from wearables, smart speakers, the AI in your car or home or the AI at a parts store that guides you to Aisle 7. Then add to that how assistants will have a memory… that we're thinking about buying a car or that we like the fish special at a local restaurant… and search really starts at the top of the funnel because it's pervasive in your life."
>
> ***Christi Olson, Senior Marcom Manager for Bing Ads***

Highly relevant, user-led search is the ultimate state of the consumer-driven relationship. Options to avoid advertising or unwanted media will proliferate. Successful models for the future must reflect this, and focus tightly on delivering valuable, relevant and desirable interactions.

"Search works well today because it's intent based and highly relevant. But we also have the luxury of a lot of real estate to cover multiple intents that can be expressed in the same query. As it narrows, there's a fundamental issue with real estate limitation… you lose a lot of opportunity to monetize on a click model. From a personal perspective as your personal agent knows you more… you get more relevant results, but it challenges parts of the existing model. As we move away from lists to options for actions – "Buy some flowers for my sister's birthday" – we may add an affiliate-like or paid action model."

Shawn Mohamed, Director of Search Advertising Strategy, Competitive Intelligence and Marketing Research at Microsoft

5.2. VOLUME DECREASES, INSIGHTS MULTIPLY

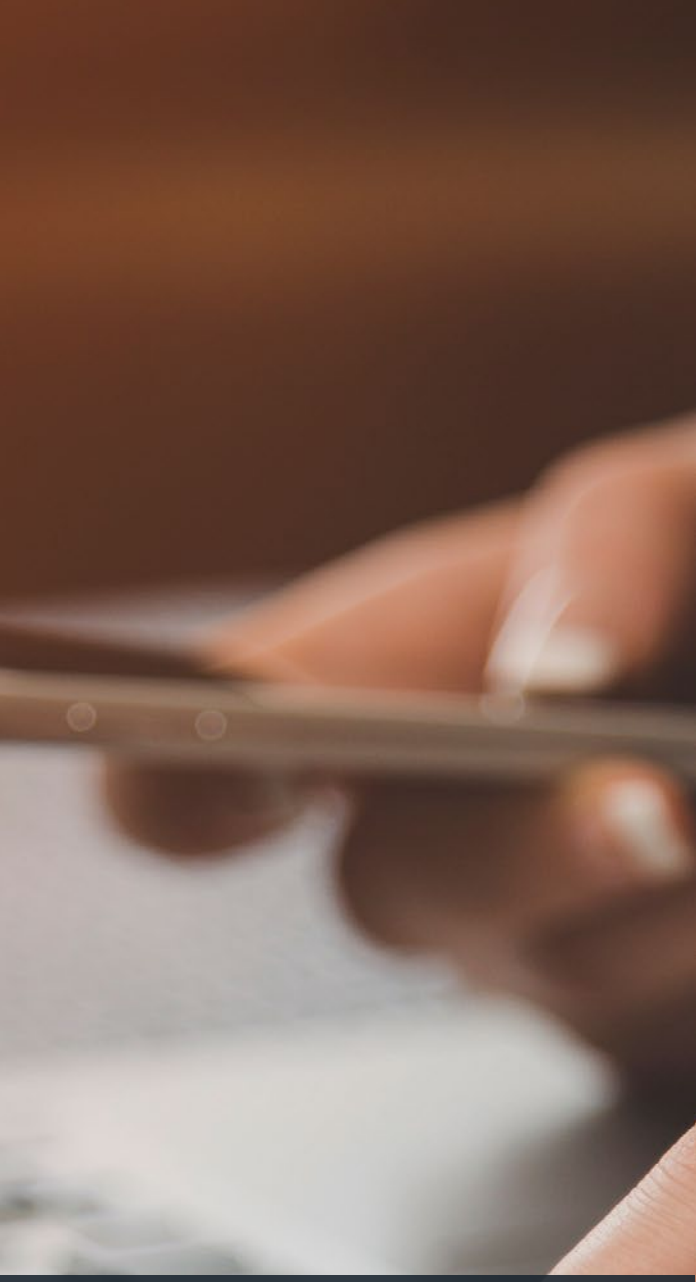
Over the next decade, the individual's experience of search will become increasingly narrow and well-defined. They won't expect a page of results on a screen, but a specific answer, a short list of choices or, increasingly, an action. That's the inevitable outcome when artificial intelligence and personalized filtering are applied to information.

"Search has avoided the plague of impressions because of the nature of its marketplace. Ultimately actions will matter more and clicks will matter less… geography [and other implicit signals] will also matter… we will know more about what you do, physically, after seeing an ad. Different pricing models may emerge for the actions taken."

Andrew Ruegger, Senior Partner, Head of Data Science, Catalyst

In response, brands approach to search will evolve. Fewer searches will have commercial opportunity. Today, a search for "how to fix sheetrock" will return a combination of results that mix DIY information with related offers. In the near future, the result will be limited to the best of the "how-to" results, and may be read out loud or turned into a to-do and shopping list by the search assistant. The immediate commercial opportunity disappears, though in some cases a future possibility will open up. **See Section 4.3**

The value of commercial inquiries will go up as the volume drops. A search with one result is highly likely to convert if it's relevant. In this regard, the model will be familiar and "clicks" will be expensive. The cost will logically rise with the ROI or the commercial promise. For example, if a query implies that the searcher wants to find a new brand of a product that they've had on automatic (*Find me a new brand of organic milk*) the lifetime value potential is high, and the model will price in the value of these pivotal moments.



"In the old days of CPG you could fix a bad product through distribution and advertising… that's not working. Television was a successful driver of illogical purchases… but now instead of 16 weak SKUs you'll have one or two that people want to buy."

Tom Cunniff, Founder, Cunniff Consulting

Search has always been a valuable source of information for marketers, giving them a clear view into what customers want and the messages they respond to. This value of search will grow in importance, as it increasingly becomes a source for highly valuable, highly personal insights into individual customers and broader customer trends. Search will evolve into brands' ultimate research and product management tool.

The applications of this data will also broaden from defining media strategy and messaging;

- There will be a new depth of information about why people make the choices they do. The nature of voice search today, and digitally assisted search tomorrow, will offer strong indicators of intent and circumstances.

- Products are likely to become more personalized, as artificial intelligence allows companies to create custom products economically, and add unique value to commodities. Some of this customization will be in response to explicit instructions from individuals (and eventually their assistants) but will also reflect implicit signals from their searches and circumstances.

  For example, kitchen appliances will be shaped to fit the kitchen at prices that make it viable for the high end of the mainstream market. Similarly, clothing will be offered pre-tailored at a mass scale.[xvi]

  Offering personalized digital components to products and services will also become more common and more useful. A near-term example might be airline mobile apps that reconfigure themselves to suit the flyer's situation, frequent actions and award status.

- Search providers will have to rethink the information they make available to brands, because there will be more detail and more attributes required to compete for a match. As the universe of searches grows, the specific sessions that apply to that brand will narrow. But there will also be new potential for feedback from search assistants and automated agents behind the scenes. Analytics from providers may expand to include insights into why some brands or products are, or aren't, showing up in certain situations.

- For the new model of assisted search to thrive, it must reward transparency and customer satisfaction. This will affect companies on a variety of levels, from what they produce to how they produce it, and how they behave as an organization. **See Section 4.7**

  Some types of manufacturer may choose to narrow their product sets in response. In mass consumer goods, for example, we may see 20 choices in flavors reduce to the 5 best sellers, allowing the manufacturer to focus on quality and distribution for that more limited, but more successful product set.

5.3. THE REBIRTH OF BRAND?

Imagine yourself in five year's time. You are becoming used to driverless cars, though you probably still own one that wants your hands on the wheel, at least some of the time. Depending on where you live, you've probably had a drone delivery to your home and your neighbors are comfortable with that.

When it comes to shopping, you depend on online services to keep the fridge stocked and laundry detergent on the shelves. You manage them through a personal digital assistant, which is a more powerful version of one of the search assistants we know today. You also access your personal and work communications, media, smart devices and just about everything else in your digital life through this interface, at least some of the time.

You're not in stores as often as you used to be. There isn't as much reason to be, as the technologies to view and "experience" products have made it easy to shop for almost anything without holding it in your hand. There also aren't as many physical locations as there used to be and they're not as big and expansive.

Thanks to increased network speed and processing power, you're watching and listening to more mobile media than you are today, but a growing share is commercial-free via subscription, so you're not exposed to new brands and products in the same ways. In fact, for things like household staples, you've probably been buying the same brand or generics since you flipped the switch on automatic repurchasing.

For marketers, one of the great challenges of the coming years will be getting noticed. It's already a problem, as a growing share of consumers is going out of its way (and spending money) to avoid advertising.[xvii] Today there are many ways to discover products that will be on the wane in coming years.

Growth in ecommerce and automated purchasing will decrease the time we spend in stores. Impulse buying is easier in offline environments, where shopping itself is part of the experience versus the product-centric act of online purchasing. The impulse purchases that do take place online are also likely to be closely aligned with the initial purchase thanks to targeted recommendations, making it difficult to introduce an unassociated product.

Search and social already have a symbiotic role in product discovery that will grow as other opportunities diminish. The visual, contextual nature of social experiences fits well with targeted and native advertising that introduces new products or services, but doesn't always inspire direct purchase because people are in a social, not buying mode. Search and digital assistants provide the fulfillment component, making it easy to research, order and pay for newly discovered products.

The twin desires to save time and avoid advertising won't abate in the future. Our demand for greater ease of use and speed can only rise with automation and as the current emphasis on customer experience contributes to a cycle of ever greater convenience.

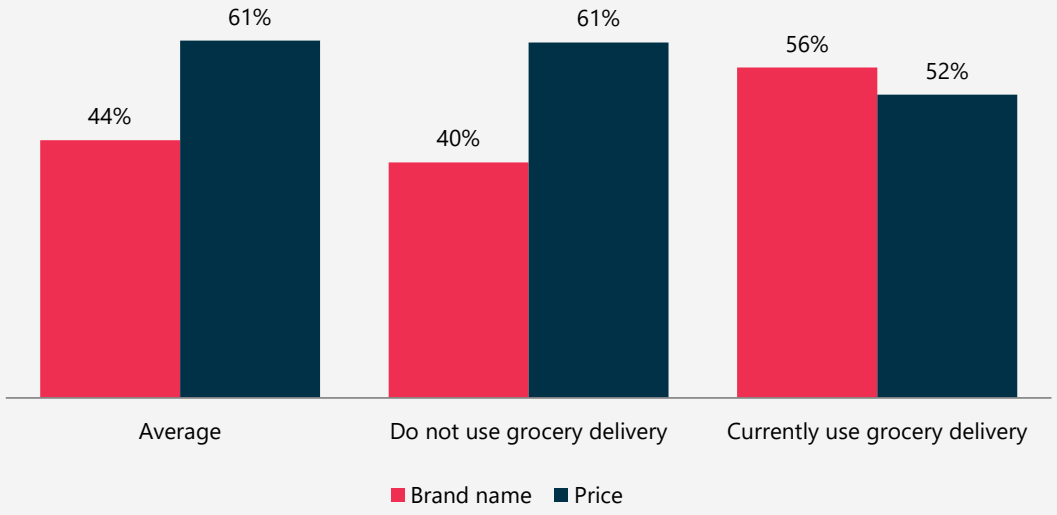
Building brand may become more important, especially in categories particularly vulnerable to automatic buying. Incumbency will be worth more ,as breaking patterns becomes more difficult – brands will have to invest heavily for the unique ability of brand to attract buyers new to a space or to encourage an experimental purchase.

Historically, brands could buy the shelf space and advertising to keep them in the minds of consumers, consciously and otherwise. Even now that's much less true than in the past, and the trend will continue.

"Customers will not want to have their patterns broken/disturbed. You'd better have a damn good reason to ask for someone to change. I can imagine a future in which one machine tells another 'That's not a good enough reason for me to bother the person I serve. You'll have to be at least X% better on these dimensions.'"

Tom Cunniff, Founder, Cunniff Consulting

Figure 9: If my digital assistant were repurchasing toilet paper, cleaning fluid, light bulbs, etc., I would want to confirm [brand / price] to feel comfortable. Please check all that apply.



Respondents:2,521

Even when it comes to staples, brand matters. When asked about the elements they'd like to confirm before allowing a digital assistant to repurchase products, 40% cited brand, second only to price. Of note, those respondents already using online grocery ordering/ delivery value brand significantly higher in this scenario than the average or those who don't use such services. That may simply reflect the values of these relative early adopters or tie into their experience with these services, but it raises the possibility that once in the mode of automatic buying, price and convenience become "standard" and brand is the only variable of interest.

Brands that want to break the cycle will have opportunities, but they won't be easy or cheap;

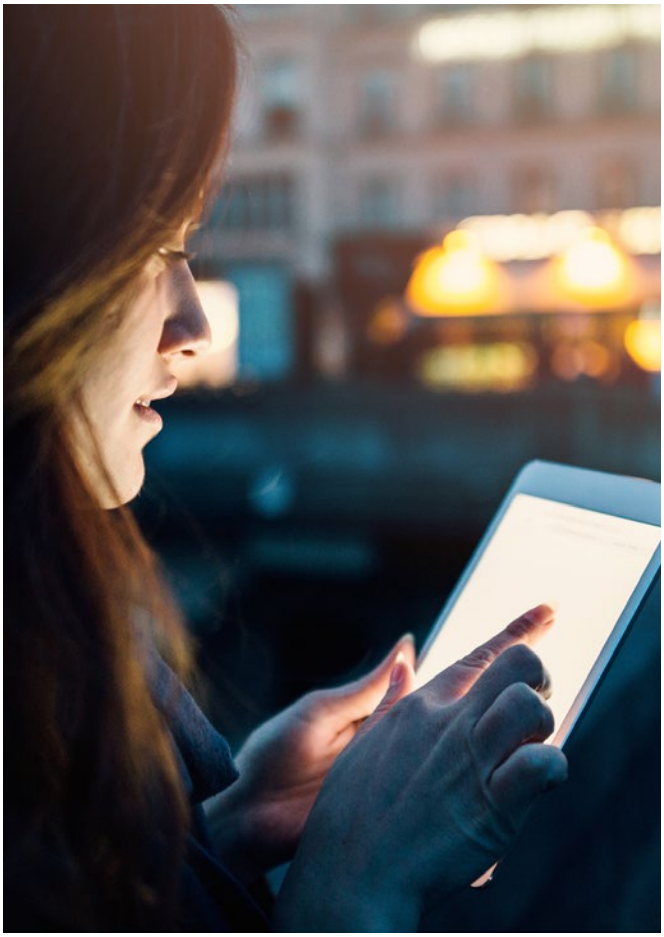
1. Spending heavily to capture people at transition moments – "Superbowl" spending will be on an individual level, occurring when someone is unsatisfied with their current brand or newly exploring a product category.

2. Buy their interest with samples and loss leading deals that will rise to the top when assistants are evaluating purchases.

3. One traditional approach that may see a temporary renewed investment in, is media targeted at people who are about to age into a product line. For example, prospective parents can expect to be bombarded by whatever ad supported media they consume as the day approaches.

4. Invest in becoming the generic option – many people won't ask for "brand X." They'll simply ask for paper towels and the service providing them will make the choice for them based on price and any other variables they've set out (organic, Made in America, etc.). This new version of prime shelf space will be highly effective, highly predictable and highly expensive.

5. Exploit how machines buy from machines – as discussed elsewhere, our assistants will do some of our shopping for us, using search algorithms and basing their decisions on structured and unstructured data. This new kind of SEO will be a survival tactic.



5.4. AGENTS AS BRAND AMBASSADORS

In the digital ecosystem we predict agents will be developed by businesses, as commonly as websites and mobile apps are today. Already there's an upward curve in the growth of "skills" being built for the search assistants and smart speakers on the market, but it is the earliest of days.

Agents will serve multiple purposes within three broad categories;

- Customer-facing agents that bring a specific, branded capability to a larger platform. These will probably be the domain of larger brands as they pay to access the coveted shelf space of 2020. Chatbots, such as Expedia's travel-bot for Skype and Cortana, allow consumers to accomplish a widening array of tasks within a walled environment.

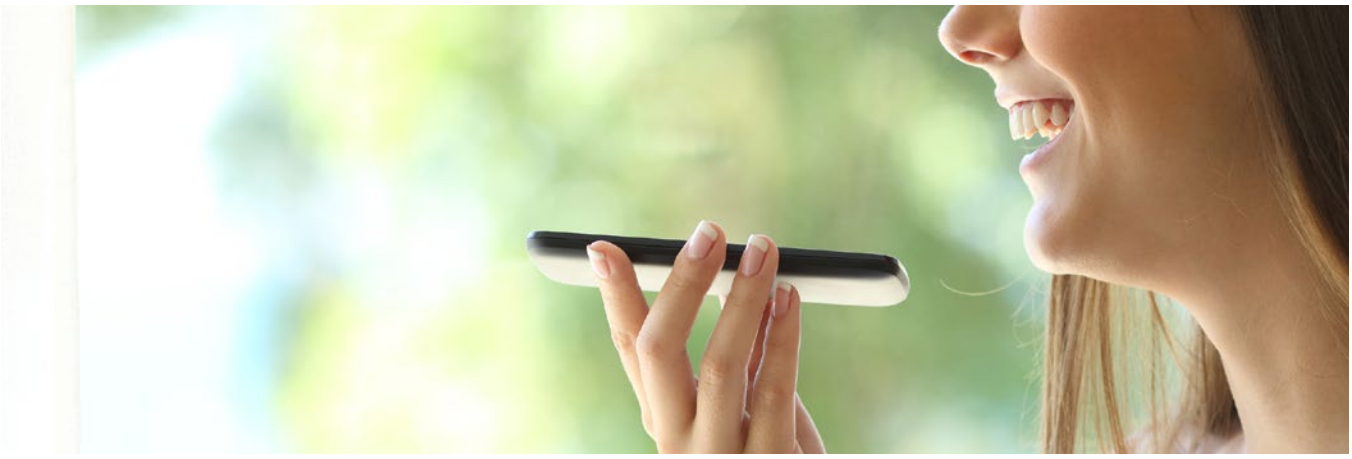
  Brand agents will extend into various areas of marketing and loyalty. For example, a credit card company might build on a white labeled version of a search assistant itself, offering customized service, style and capabilities.

  It's simply too early to tell how consumers and their devices will work with brand agents as the system evolves, but the time to experiment is arriving.

> "Curation depends on trusted sources, and brands can be those sources. Say we are RedBull drinkers. Maybe we're open to events, products and services that are suggested by RedBull as part of a consistent lifestyle. We only have so much energy for decision making, so help in finding a limited consideration set will be increasingly valuable."
>
> ***Brad Berens, Chief Strategy Officer at the Center for the Digital Future at USC Annenberg***

- Behind the scenes agents, that work with search assistants to accomplish a task, may also become commonplace. For example, an aggregator of auto information might offer an agent, that provides white labeled responses to search assistants, answers to specific questions. The agent then becomes the conduit to a deeper related search.

- The most specific type will be agents that work in tandem with products and services, communicating with the larger network to answer questions posed through the assistant, replenish supplies, address problems or enable customizations.



Regardless of goal, the key to success in today's agents is specificity and strategy. The first agents date back to the late 1980s. Even though the computing power was minimal, a good strategy and rules system allowed an agent to win the game Diplomacy without being identified as a machine.

"Negotiation is the key skill for an agent. Whether it's playing a game or helping someone navigate the climate control in a car, it needs to predict outcomes and provide advice based on what it believes they will expect and accept."

Dr. Judith Donath, Faculty Fellow at Harvard University's Berkman Center for Internet and Society

When brands consider their strategy for venturing into this new world, they may want to avoid falling into the trap that Hollywood has laid for us. Thanks to Hal, Jarvis, Samantha and dozens of other fictional AI, our collective imagination has us expecting to laugh and cry with our digital assistants.[xviii] The reality is likely to be more prosaic and useful.

"People are not machines and machines are not people… no successful technology has mimicked humans."

Dr. Ben Schneiderman

The purpose of agents, and the digital assistants they'll report to, is to accomplish a task. In the vast majority of cases, a good customer experience will be as fast as possible, ideally occurring invisibly. Of course, brand agents will want to be seen and heard, but if they intrude they run the risk of instant obsolescence.

Brands designing agents and experiences to compliment the smart device environment should remember what their customers care about – their travel plans or grocery bills or media choices. Anything that gets in the way, however clever or cute, may not serve the best interests of the customer and therefore the brand.

"My family named the car years ago. It's Sally. We're fond of her after all the miles we've spent together. That doesn't mean I need her to have a personality. If she talked it would be to tell me that she needs fuel or that a part is out of order. We can imbue her with all the humanity a car should have, which is none really."

Lynette Saunders, senior analyst, Econsultancy

Even when people think about the interactions they expect from some future version of their search assistant, the highest form of that interaction is silence; that "The search assistant will have a good idea when I want, so I'll tell it what to do and it will figure out what the optimal solution is, without much interaction." **See Section 4.0**

5.5. NEW WAYS OF LOOKING AT AUDIENCES

The value of demographics as a diagnostic or predictive tool has eroded with the explosion of media and choices. When there weren't many options, variables like age, gender and ZIP were much more helpful than they are today. Our ability to determine individual characteristics has laid bare how these "norms" are the vaguest of indicators, and of diminishing use in making decisions about targeted media and messaging or a personalized customer experience.

For example, we tend to assign meaning to generational cohorts whether it's there or not. More specifically, those named generational segments (from the Greatest Generation to Generation Z) rarely define their members any more exactly or usefully than their age range already did.[xix]

Still, age is an important factor in how someone sees the evolution of technology and culture; when it comes to change we find age to be the most meaningful demographic variable, including gender, employment status, HH income, urban/rural and education.

Digital has made it possible to see the individuals that make up audiences, and to back out meaningful variables from their behavior. As our access expands with more and different inputs, the importance of behavioral and attitudinal segments will increase.

The ways in which people choose to interact with their search assistants, and therefore brands, will differ just as significantly. Marketers thinking about the customer experience need to consider the varied paths these groups take to the same destination and signposts they'll need. The way they 'feel' about emerging technologies will affect the way they behave and interact with them.

> "My husband and I have worked hard to stop thanking Alexa. My children don't say 'thank you'."
>
> ***Dr. Alexandra Samuel, author focusing on how technology affects business and social interaction***

Our feelings about technology can be ambiguous. Three in four consumers agreed with the statement that "I see the benefits of modern conveniences like smartphones, but feel they take something away from life." Of those nearly 2,000 respondents, many are young, highly educated, urban dwellers who otherwise seem to embrace change, innovation and technology.

At the same time, 76% of the sample also agrees that "Generally speaking, technology solves more problems than it creates." These views can happily coexist, but under the surface, there are subsets of the audience that are more specific in their views, and more valuable to identify.

But you can't see everyone accurately through the lens of age. As the chart below suggests, personality and attitudes are equally, if not more, important.

Does someone buy American when they can? Do they prefer stores they can walk to from their apartment, regardless of price or selection? In twelve winters and all those sweaters, have they ever bought a crew neck? Do they say no to drone delivery and the mobile app?

It's simply too complex to ask, answer and act on every potentially useful variation of the questions above. The marketing discipline has scrambled to assemble the technology and expertise to personalize and target at scale, but much of that opportunity is left on the table.

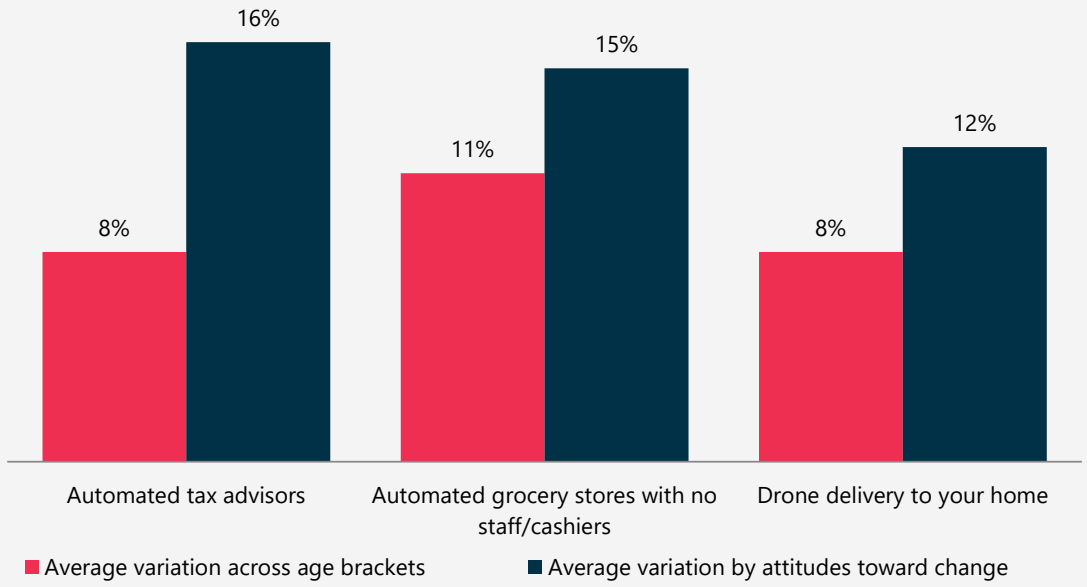
It's entirely possible that the most important shift coming from technology may be that we can let go of the reins. Marketers will have access to more varied and deeper data about their prospects and customers with each passing year and that curve will only get steeper with our adoption of search assistants. To take advantage of these smart technologies, we will have to rely on smart technologies that, like the best game playing systems, eliminate the 99.9% of variables that don't matter in a situation in favor of the one that does.

In the not-so-distant future, our digital assistants may personalize, not just to the individual and their external context, but to their internal state of mind.

Today, real time sentiment analysis is rudimentary. But it's not too early to consider state of mind as an essential element of the customer experience, and a variable in search. Thinking about audiences in terms of personality, behavior and technological affinity may be more useful than trying to paint them into demographic corners.

> "As users become more accustomed to communicating with computers in a more human-like fashion, it's possible to develop even closer connections. If you add in advances in machine learning, such as sentiment analysis, applications can fine-tune themselves to a user's emotional state. People will be spending more time interacting with computers. It seems to be a natural transition to have computers recognize a user's individual needs, which could very well, vary from one day to the next."
>
> ***Korey Becker, AI expert, software developer and author***

Figure 10: Thinking ahead to the future, how comfortable would you feel about these possible uses for automation?



Respondents: 1,903

6. CONCLUSION: PLANNING FOR 2018, 2020 AND BEYOND

It's impossible to predict what business will look like in 2027, except that customers aren't going to want less convenience, irrelevant information or slower responses. In a system that's going to be increasingly driven by product specifications and personal necessities instead of media, the solution at the intersection of easy, effective and affordable always wins.

We buy emotionally, but robots don't. When personal transactions become programmatic, the lubrication of brand and positioning disappear. Every type of company will have to plan for the future of search or be caught responding to it.

We don't care about most of the choices we have to make, and will outsource them. In business, we use the word *commodity* but a better word for the future might be *utility*, because it captures the idea that consumers want a goal accomplished with a minimum of fuss. Like utilities, we'll only notice and care when they fail.

This is why our personal digital assistants will play an important role in our lives years before they are making decisions about where we're going on vacation.

Search will be at the heart of this relationship, and our definition of it will expand and evolve. We already see a movement in search to offer a single answer based on context, and that trend will continue.[xx] Focused queries will yield focused results, presenting the one "right" answer, eventually connecting us to the right action and ultimately acting independently.

But search will also provide variety when we need it. Many concepts, queries and experiences don't lend themselves to one answer – they benefit from variety. Here too, artificial intelligence will improve our ability to access information by doing a better job of curating massive datasets. Search will be there when we want to find new music or explore Tuscan rentals, and help us by refining the choices from overwhelming and disparate to manageable and relevant.

6.1. ADDITIONAL FINDINGS BY SECTOR AND COMPANY SIZE

By Sector

Automotive

The car buying process is inherently complex and from the marketers point of view is muddied by the search process. Shoppers take months to do their research and bounce between manufacturers' sites, industry media, review sites and individual dealers.

Search marketers are challenged to match traditional KPIs with the pace and variability of the process, especially because data sources can't be easily integrated.

As we increasingly take search with us through long-term projects, auto brands will have a much better idea of where we are in the process. This will allow much smarter investing.

B2B

The move to account-based marketing works well in tandem with the ability to target individuals, organizations and behaviors in the wider audience that fit the model. This capability will continue to improve as search assistants migrate from home into the office. Managing search budgets is already more efficient than in the past, and this will become more pronounced as the long sales cycles of B2B are better understood thanks to assistant-generated data.

In time there is a strong potential for automated negotiation, opening up wider networks of suppliers to an auction model brought that can apply to any transaction.

Consumer goods

"These advances radically benefit incumbents unless marketers find a way to promote discovery. It's going to be a nearly closed system but marketers will have to find a way to intrude without intruding…maybe the rise of sampling marketing. The good news is that we'll be able to target those samples in a far more efficient manner than when it was last popular. Private label goods will be the main threat to incumbents. When the consumer is just looking for a good solution the search/ecommerce provider can break the cycle."

Tom Cunniff

Financial services

FSI seems bound for disruption by AI. Outside of exotic products for high value customers, everything from tax advice to risk assessment to loan writing to retirement planning is highly susceptible to automation, which should commoditize many previously high margin areas of business. There will be a strong upside for incumbents as high levels of data sharing with search assistants and providers will encourage retention.

Media/publishing

Display advertising appears to have a narrowing future. For reasons explored throughout this report, access to media will be increasingly controlled by the individual and mediated by the intelligent assistant. What remains will continue to be dominated by the small group of publishers that "own" primary digital activities, including search, social and productivity.

The move toward contextual, first-party based advertising will continue, providing the highest value, but in necessarily smaller numbers than media plans of the past.

Subscription plans will benefit from more fluid payment mechanisms and impulse purchasing, but may need to open up more limited and one-off options to meet a search-driven audience.

Retail

Many of the trends discussed in this report – voice search driving impulse buying, automatic purchasing and the growing importance of digital assistants – suggest that the pressure on retail will only increase. As time passes, shopping as an activity unto itself will become more like a hobby or pastime than a necessity.

Brick and mortar stores won't disappear, but they will change, losing some of the square footage and geographic density of the current model. There are already experiments in shifting the function of physical locations from storing and selling directly toward fostering interactions and familiarity with products for later delivery.[xxi]

Parts of retail that have been protected by the sensory aspects of their products will be affected by new visual technologies. Large format screens, retinal displays and some variation on AR/VR will allow new types of purchases to go virtual.

Travel

"Weather is an emerging dimension that's going to dramatically change the travel sector. There's enormous impact on what to sell, when and to whom… but it's wildly underutilized."

Trevor Beddoe, Manager, eBay Enterprise

Using weather data has enormous potential, but manually adapting marketing or customer service to take advantage has been prohibitive. AI will be able to bring it into practical use, as a tool in performance marketing, a way of personalizing customer experience and as a key variable in anticipating the need for customer service.

Travel is better situated than many sectors to understand the implications of a model intermediated by technology as that has already occurred in a primitive form through travel aggregators.

Loyalty programs will increase in importance as the only meaningful differentiator for high value customers. For the providers, data from search assistants will make it easy to customize loyalty offers at an individual level to increase retention and support margins.

By organization size

SMB

The future of search may be beneficial for local businesses. While they may have less access to bespoke data tools, they enjoy an advantage in relevance that will count highly to intelligent assistants.

Tools will proliferate for small businesses to provide the necessary information to be known to automated systems.

Midmarket

Midmarket companies may be particularly challenged, caught between the relevance and sophistication. Small companies have the advantage of geographic relevance. Large companies have more data and technology.

The midmarket may have difficulty in maintaining the internal expertise and technology to compete with more sophisticated players. However, those that take advantage of their size instead of suffering from it may have an advantage – a midsized company with strong data standards and an aggressive, agile approach to their market may be able to innovate from inception to product/service more quickly than larger companies.

But this kind of aggressiveness can only be built on capabilities that require foresight, commitment and investment. An investment in data collection, classification and management today may well pay off in an advantage tomorrow.

Companies of any size that deeply understand their audiences will have the edge in a world intermediated by search agents constantly working to achieve maximum relevance.

Enterprise

The advantage and challenge to large organizations is scale. Large companies start a step ahead, having had business intelligence and data warehousing imperatives in place long before the midmarket began pursuing the marketing cloud.

But with every layer of bureaucracy, process and data comes inertia and intractability.

Large brands will find it particularly difficult to adapt to a post media world. The risk of private labels eating into market share rises when outcome is the only variable.

The opportunity for large organizations is to buy their way into the major search and ecommerce platforms, to become default brands and go-to suppliers of information.

> "Historically, the market was dominated by big companies that could overwhelm the market with ads or smaller, local businesses. In a digital market it goes to the most relevant."
>
> ***Shawn Mohammed***

7. APPENDIX: METHODOLOGY AND SOURCES

7.1. METHODOLOGY

This report is based on over twenty-five phone and in-person interviews, as well as primary and desk research.

Primary research consisted of an online survey of adults in North America in Q1 of 2017. Respondents were accessed via a third party, which offered an incentive to complete the survey, which closed with 2,652 qualified responses.

The sample is representative of North American consumers eighteen and older who own smartphones. This skew was intentional, because many survey questions explore related behaviors, such as usage of voice commands. Smartphone ownership is now over 77% in the U.S. and is surging among older and rural populations which have been lagging other populations. But, having a smartphone is not ubiquitous, especially in the case of Americans over 65, where it falls to 42%. This should be kept in mind when considering the general populace.[xxii]

7.2. CONTRIBUTORS

We would like to thank the scientists, marketers, futurists and search practitioners who offered their time and expertise to this paper.

Kory Becker is a software developer, entrepreneur, architect, hacker and author. She's an award winning technologist and has literally written the book on building voice enabled applications.

Trevor Beddoe is a search marketer and strategist who leads a paid search team at eBay. In former positions at Initiative, UM Worldwide and others, Trevor has managed search and go-to-market strategy for a range of S&P 500 companies.

Brad Berens is a futurist and historian. While working as a consultant, writer and public speaker focusing on media and technology, Brad is also a Senior Fellow at the USC Annenberg Center for the Digital Future.

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Tom Cunniff is a B2C and B2C marketing consultant and founder of Cunniff Consulting, a B2B brand marketing consultancy that focuses on technology.

Sean Donnelly is a senior analyst at Econsultancy.

Judith Donath is the author of *The Social Media Machine: Designs for Living Online*, along with numerous articles and essays on a wide range of subjects, including the neurology of lie detection and the growing role of online avatars in the personal life. She is a Faculty Fellow at Harvard University's Berkman Center for Internet and Society, and formerly the director of the MIT Media Lab's Social Media Group.

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Cindy Krum is the CEO of MobileMoxie, LLC. Cindy speaks on social network marketing, SEO and mobile web marketing at national and international trade events.

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Dr. Jason Mars is a professor of computer science at the University of Michigan. His research interests include cross-layer systems architectures and hardware/software co-design. Dr. Mars recently published an article in Wired magazine entitled *Voice Control Will Force Overhaul the Whole Internet*.

Shawn Mohamed is the director of search advertising strategy, competitive intelligence, and marketing research at Microsoft. He has extensive experience in forecasting, strategy, and analytics.

Christi Olson is Head of Evangelism for Search at Microsoft and is on the SEMPO Board of Directors. She has lead digital marketing teams both in-house and at agencies, and was recognized as one of the top 25 experts in Paid Search in 2015, 2016 and 2017.

Andrew Ruegger is Senior Partner, Head of Data Science, at Catalyst, a digital marketing agency serving the Fortune 1000. Catalyst was named by Forrester Research as having the Top Core Offering in Forrester's 2016 Search Marketing Wave Report. Previously, as Catalyst's Group Director of Analytics & Innovation as well as a Catalyst Search Director, Ruegger managed $300MM+ in spend for some of the most recognizable brands in the world.

Alexandra Samuel is a consultant on technological and digital interaction matters, as well as a speaker on how technology affects business and social interaction. As a writer, Dr. Samuel has published her book *Work Smarter with Social Media: A Guide to Managing Evernote, Twitter, LinkedIn and Your Email* with the *Harvard Business Review Press*.

Lynette Saunders is a senior analyst at Econsultancy.

Dr. Ben Shneiderman is the Distinguished Professor of Computer Science at the University of Maryland. Dr Shneiderman's work involves Human-Computer interaction, UI design, and information visualization. A respected authority on computer interfacing, Dr. Shneiderman has recently published the sixth edition of *Designing the User Interface: Strategies for Effective Human-Computer Interaction* (Pearson, May 2016).

Dr. Joe Touch is a prolific researcher and publisher in the fields of computer science and computer engineering, and currently heads the University of Information Sciences Institute's (University of Southern California) Optical Turing Machine Project.

7.3. TIMELINE SOURCES

- Speech recognition
- Death of the check
- Voice search
- Natural language recognition – Dr. Jason Mars (Interview)
- Internet users hit 4 billion in 2020
- Contact lenses
- Deep learning AI designs deep learning AI
- Implanted wearables
- Battery development
- Illness prediction
- Simultaneous translation
- 50 billion connected things
- Data created every second
- Americans' view of 10 year future – Consumer survey
- AI humor
- Self-replicating, self evolving robot
- comScore suggests voice will be half of all searches by 2020
- Smartphone ownership
- DNA storage

7.4. ENDNOTES

i. Your smartphone is more powerful than Deep Blue was in 1997

ii. Billions of conversations taught assistants how to listen

iii. Speech recognition is on par with humans, and three times as fast as typing

iv. Artificial intelligence beats world's Go champion, and experts' predictions by 5 years

v. Centaurs – mix of machines and humans - can beat AI alone

vi. Connected devices are changing how children interact with their environments and their parents.

vii. Emotional bonds with mobile phones lead to anxiety if they're not close by

viii. Most household spending is already on repeat (we just haven't automated it yet)

ix. Two-thirds of online bankers use auto-payments

x. KCPB & Mary Meeker 2016 Internet Trends Report

xi. Speech recognition reaches parity with human transcriptionist

xii. Smart speakers and hubs are selling as fast as the original iPhone

xiii. Nearly one-third of searches be "screenless" by 2020

xiv. Chronic illnesses are fertile and important territory for the Internet of Things and progressive search

xv. Baby boomers give higher customer service ratings to human interactions than other cohorts

xvi. Tailored clothing at scale will be one of the customizations made feasible by artificial intelligence

xvii. Subscription services are surging and people are paying to stop seeing online ads

xviii. Hal, Jarvis and Samantha

xix. Generational labels are intuitive, thought provoking and meaningless

xx. The growth in voice queries and responses will drive more "answers," fewer SERPs

xxi. Brick and mortar experiment in displaying high consideration products for later delivery

xxii. Three in four Americans have a smartphone