

# Alexa and elections – how voice interactive devices and assistants alter the provision of political information

*Ben Murphy - January 21, 2019*

The modern political environment has been rapidly and repeatedly reshaped by developments in technology. Traditional media empires have been disrupted by the internet, information provision reimaged as a result of the rise of social media and political operations redefined by the spread of smartphones. A new wave of technological development is now taking hold as voice interaction technology allows users to use a range of smart voice assistants and smart devices without the need for a traditional interface.

This paper considers how the development of voice interaction software and voice interactive devices will impact democratic and political systems. Part 1 provides an overview of voice interaction software and its capabilities. Part 2 considers how the use of voice interaction software may have both positive and negative impacts on democratic political systems and part 3 canvases potential policy and regulatory responses.

In the coming years, it is likely that voice interactive devices will continue to proliferate, bringing both benefits and risks to the political system. Whether these benefits or risks are realized will ultimately turn on the behavior and policies of the large technology companies that control the underlying voice interaction software. For this reason, this paper recommends that these companies take proactive steps to consider and address the political impact of voice interactive devices, before voice interaction software has a material effect on the political system.

## 1. Background

### 1.A. Voice assistant devices

The notion of voice-based human-computer interaction has been the object of fantasy and fascination for a substantial period of time.<sup>1</sup> Having moved from punch-cards, through the keyboard and mouse and more recently the touchscreen, voice control represents the next evolution in human computer interaction.<sup>2</sup> Modern voice interaction software can be distinguished from other interfaces by the capability to:

- take in and comprehend voice instructions and queries expressed in natural language;
- perform tasks that are not limited to a set series of phrases or capabilities; and
- interact with users in a natural and flexible manner.<sup>3</sup>

Devices powered by voice interaction software can do away with traditional user interfaces of textboxes, icons, buttons and keys, allowing for flexible user input that adapts to the user's needs and for users to receive information without requiring a screen or indeed a fixed computing resource.<sup>4</sup> In short, voice interaction software has the potential to drastically reshape how humans interact with computers and digital information.<sup>5</sup>

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<sup>1</sup> Brian Merchant, *The One Device: The Secret History Of The iPhone*, 233 (2018).

<sup>2</sup> Nicholas Bayerque *A Short History of Chatbots and Artificial Intelligence* in *Artificial Intelligence* 37 (Michael Issitt eds, 2018)

<sup>3</sup> Page Laubheimer and Raluca Budiu *Intelligent Assistants: Creepy, Childish, or a Tool? Users' Attitudes Toward Alexa, Google Assistant, and Siri* NNG Research ( 8/5/2018) last accessed 1/20/2019, available at <https://www.nngroup.com/articles/voice-assistant-attitudes/>

<sup>4</sup> Bayerque supra n 2.

<sup>5</sup> The Economist *How Voice Technology is transforming computing* The Economist 1/7/2017, last accessed 1/19/2019, available at <https://www.economist.com/leaders/2017/01/07/how-voice-technology-is-transforming-computing>

## 1.B. Hardware uses

The hardware use cases for voice interaction are seemingly limitless. Voice interaction software has already been integrated into microwaves, fridges, and scales.<sup>6</sup> Core smart speakers, such as Amazon's Echo range, Google's Home and Apple's HomePod are putting voice interaction software at the center of the modern 'smart' home while applications and software updates are making voice interactive assistants an increasingly important aspect of the smartphone experience.<sup>7</sup>

For the most part the hardware form of voice interaction technology is less important than the underlying software such as Amazon's Alexa, Google's Assistant, Apple's Siri or Microsoft's Cortana.<sup>8</sup> Indeed, the ubiquitous smart-speakers are not particularly intelligent devices,<sup>9</sup> merely providing a conduit to the cloud resources that support the underlying software.<sup>10</sup> It is this software determines what information is presented and how it is communicated, regardless of physical manifestation. For this reason, while there are a number of new hardware players entering the market, such as Facebook,<sup>11</sup> focus should be placed on the voice interaction software that enables the hardware use cases, particularly the market leading software products in Google's Assistant and Amazon's Alexa.

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<sup>6</sup> See, for example Amazon's list of Alexa built-in devices, last accessed 1/20/2019, available at <https://www.amazon.com/b?ie=UTF8&node=15443147011>

<sup>7</sup> Bret Kinsella and Ava Mutchter *Voice Assistant Consumer Adoption Report* November 2018, last accessed 1/20/2018, available at <https://voicebot.ai/wp-content/uploads/2018/11/voice-assistant-consumer-adoption-report-2018-voicebot.pdf>

<sup>8</sup> Matthew Hoy and Ariel Pomputius *Alexa, Siri, Cortana and More: An Introduction to Voice Assistants* 37(1) *Medical Reference Services Quarterly* 81, 83.

<sup>9</sup> Michael Miller, *The Internet of things how smart TVs, smart cars, smart homes, and smart cities are changing the world* 103 (2015).

<sup>10</sup> Marcia Ford & William Palmer, *Alexa, are you listening to me? An analysis of Alexa voice service network traffic*, *Personal and Ubiquitous Computing* (2018), last accessed 1/20/2019 available at <https://link.springer.com/article/10.1007/s00779-018-1174-x>

<sup>11</sup> Facebook portal relies on Alexa voice interaction. Edward Baig *Facebook unveils Portal video calling devices for the home with Alexa* USA Today (10/8/2018) last accessed 1/20/2019, available at <https://www.usatoday.com/story/tech/columnist/baig/2018/10/08/facebook-portal-devices-video-calls-amazon-alexa/1521113002/>

### 1.C. Growing importance in the market

Voice assistive devices are being adopted at a rapid pace. A 2018 Gallup poll found that 47% of Americans used a digital personal assistant on their smart phones, whereas 22% use intelligent home personal assistants or smart speakers such as Amazon Echo or Google Home.<sup>12</sup> Of those utilizing smartphone assistants, 24% use this software at least daily while for smart-speakers at least 43% use their devices on a daily basis.<sup>13</sup> The rate of adoption of voice interaction enabled devices has been incredibly high<sup>14</sup> – faster even than the adoption rate for smartphones at the same point in their life cycle – with forecasts estimating that by 2022 there will be 129 million smart speakers in American homes – compared to an estimated smartphone market of 351 million – with 1.6 billion smart assistant-compatible devices associated with the voice interaction software.<sup>15</sup>

### 1.D. Who controls the market

The market for voice assistant technology is currently dominated by Amazon, Google, Apple and to a lesser extent Microsoft. Amazon remains the preeminent player in the smart speaker category, while Apple has the strongest smartphone-based presence.<sup>16</sup> However, Google is making strong inroads in both categories<sup>17</sup> and Microsoft continues to push its

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<sup>12</sup> RJ Reinhart *Most Americans Already Using Artificial Intelligence Products* Gallup (3/6/2018) last accessed 1/20/2019, available at <https://news.gallup.com/poll/228497/americans-already-using-artificial-intelligence-products.aspx>

<sup>13</sup> Kinsella and Mutcher, *supra* n 9 at 25.

<sup>14</sup> See *Media Alert: Smart Speaker Installed base to hit 100 million by end of 2018* Canalys, (9/7/2018) last accessed 1/20/2019, available at [https://www.canalys.com/static/press\\_release/2018/090718%20Media%20alert%20Smart%20speaker%20installed%20base%20to%20hit%20100%20million%20by%20end%20of%202018.pdf](https://www.canalys.com/static/press_release/2018/090718%20Media%20alert%20Smart%20speaker%20installed%20base%20to%20hit%20100%20million%20by%20end%20of%202018.pdf).

<sup>15</sup> See *Rise of Alexa, Google Assistant and Siri to drive Us smart assistant-compatible device base to 1.6 billion in 2022* Canalys, (1/7/2019) last accessed 1/20/2019, available at <https://www.canalys.com/newsroom/rise-of-alexa-google-assistant-and-siri-to-drive-us-smart-assistant-compatible-device-base-to-16-billion-in-2022>

<sup>16</sup> Kinsella and Mutcher, *supra* n 9 at 8, 20.

<sup>17</sup> Lisa Marie Segarra, *Google Home Sales Outpace Amazon's Echo for the First time* Fortune (5/26/2018) last accessed 1/18/2019, available at <http://fortune.com/2018/05/26/google-home-sales-amazon-echo/>

Cortana software onto its dominant Windows operating system.<sup>18</sup> The market may also be disrupted in the near future with planned entries from Samsung<sup>19</sup> and from dominant Chinese players Alibaba and Xiaomei.<sup>20</sup>

However, beyond these major players, it is unlikely that the market for voice assistive devices will see substantial fragmentation in the short to medium term. The barriers for entry in this space are very high<sup>21</sup> due to the enormous computing power, linguistic data, advanced machine learning methods and social language experience required to make this software work.<sup>22</sup> As a result, the market for general voice interaction software is likely to be limited to and controlled by a small number of powerful companies.

#### 1.E. What are devices used for

Not only are voice interactive devices being adopted by consumers at a fast rate, they are also being used to obtain information relevant to the political process. This use can be broken down into three categories: news content, informational query responses and specific political information.

While news content is not necessarily a highly valued feature amongst prospective voice assistive device purchasers,<sup>23</sup> 70% of smart speaker users report listening to general news

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<sup>18</sup> Segarra, above n 18.

<sup>19</sup> Kevin Tofel *Hey Google, ask Alexa, Siri and Cortana what's up with Bixby in the smart home* Staceyoniot (1/2/2019) last accessed 1/20/2019, available at <https://staceyoniot.com/google-assistant-vs-bixby-alex-cortana-siri/>

<sup>20</sup> Kia Kokalitcheva *The big picture: China wants its smart speakers in every home* Axios 7/14/2018, last accessed 1/18/2019, available at <https://www.axios.com/china-smart-speakers-home-xiaomi-alibaba-db37ead1-e031-498c-9f7f-608f483b4a65.html>.

<sup>21</sup> George Anders *Alexa, Understand Me* MIT Technology Review (8/9/2017) last accessed 1/18/2019, available at <https://www.technologyreview.com/s/608571/alex-understand-me/>

<sup>22</sup> Julia Hirschber and Christopher Manning *Advances in natural language processing* 349(6245) Science 261, 261-262 (2015).

<sup>23</sup> Maddie Iribarren, *Google News AI Brought to Google Assistant* voiceBot.AI (12/11/2018) last accessed 1/20/2019, available at <https://voicebot.ai/2018/12/11/google-news-ai-brought-to-google-assistant/>

content on their devices while 37% listen to at least 2 hours of news each week.<sup>24</sup> General news is supplemented by informational queries, which are amongst most common uses of smart speakers,<sup>25</sup> although the political content of these queries is unclear. Finally, voice interaction software is developing the ability to recognize and respond to specific political queries. For example, ahead of the 2017 UK general elections<sup>26</sup> and the 2018 mid-term elections in the United States,<sup>27</sup> Amazon released specific election packages to allow Alexa to provide up to date election information. In each case, these election packages added a series of prompts that users could use to access relevant election logistics (when are polls open, who is running ), substantive measures (what does it mean to vote [yes] on a ballot measure) and results (who is winning in state x).

While these use cases are clear, there is, however, a dearth of direct empirical research as to the impact of the use of voice enabled devices on political views and voting decisions. Such studies are undoubtedly complex and come with ethical challenges but will be necessary to fully understand the impact of these devices.<sup>28</sup>

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<sup>24</sup> NPR and Edison Research *The Smart Audio Report* Edison Research (Spring 2018) last accessed 1/20/2019, available at <https://www.nationalpublicmedia.com/wp-content/uploads/2018/07/Smart-Audio-Report-from-NPR-and-Edison-Research-Spring-2018-Downloadable-PDF.pdf>

<sup>25</sup> Bret Kinsella and Ava Mutchler *Smart Speaker Consumer Adoption Report* March 2018, last accessed 1/20/2018, available at <https://voicebot.ai/wp-content/uploads/2018/10/voicebot-smart-speaker-consumer-adoption-report.pdf> , 16.

<sup>26</sup> Aatif Sulleyman *Election 2017: Amazon sets Alexa up as Voice-Controlled Source of Latest Political News* the Independent (6/2/2017) last accessed 1/20/2019, available at <https://www.independent.co.uk/life-style/gadgets-and-tech/news/election-2017-amazon-alexa-latest-news-politics-labour-tories-jeremy-corbyn-theresa-may-a7769961.html>

<sup>27</sup> Bill Barton, *Alexa, what's my election update?* Amazon Blog post (10/31/2018) last accessed 1/20/2019, available at <https://blog.aboutamazon.com/innovation/alexa-whats-my-election-update>

<sup>28</sup> See, for example, the ethical concerns raised in relation to manipulating search engine results, discussed in Robert Epstein & Ronald E. Robertson, *The search engine manipulation effect (SEME) and its possible impact on the outcomes of elections*, E4512, E4516, Proceedings of the National Academy of Sciences (2015).

## 1.F. How is information surfaced

Voice interaction software sources and surfaces news content, informational query responses and specific political information in a variety of ways. While the creators of this software have control over the device responses to a degree, they are not necessarily responsible for all the content generated.

In respect of news content, both Amazon and Google offer their own curated news updates, where they control and determine the content that is distributed.<sup>29</sup> Amazon has also sought to develop technology to mimic the tone and style of a professional newscaster for these updates.<sup>30</sup> However, substantial content is also delivered and controlled by third parties using voice interaction software as a platform.<sup>31</sup> There are currently over 50,000 third party ‘skills’ (additional capabilities and applications) available through the Alexa platform and able to be added to users profiles,<sup>32</sup>. All major American news outlets and a range of government bodies have developed their own ‘skills’ which deliver information to users voices interactive devices when prompted.<sup>33</sup> News organizations particularly are devoting substantial resources to developing content targeted at users of voice interactive devices<sup>34</sup> Importantly, once installed by the user, third party skills may be triggered without directly calling on the name of the provider. For example, once the Fox News skill is installed on Alexa, asking for a news update

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<sup>29</sup> Iribarren, supra n 23

<sup>30</sup> Amazon blog post *Alexa, what's the latest* Amazon (1/16/2019) last accessed 1/17/2019, available at <https://blog.aboutamazon.com/devices/alexa-whats-the-latest>

<sup>31</sup> Hoy, supra n 8 at 83.

<sup>32</sup> Ted Karczewski *IFA 2018: Alexa Devices Continue Expansion Into New Categories and Use Cases* Amazon (9/1/2018) last accessed 1/19/2019, available at <https://developer.amazon.com/blogs/alexa/post/85354e2f-2007-41c6-b946-5a73784bc5f3/ifa-2018-alexa-devices-continue-expansion-into-new-categories-and-use-cases>

<sup>33</sup> Khari Johnson *Alexa talks politics, but avoids Republicans, Democrats and Trump* VentureBeat (11/6/2018) last accessed 1/21/2019, available at <https://venturebeat.com/2018/11/06/alexa-talks-politics-but-avoids-republicans-democrats-and-trump/>

<sup>34</sup> Lucia Moses *For news publishers, smart speakers are the hot new platform* Digiday (7/23/2018) last accessed 1/20/2019, available at <https://digiday.com/media/news-publishers-smart-speakers-hot-new-platform/>

will trigger content produced by Fox News. In each case, while the third party controls the content, skills are able to adopt the native Alexa or Google voice and tone.<sup>35</sup>

In respect of informational queries, answers provided by voice interaction software are often automatically generated from Wikipedia or other open access websites, without vetting from the software controller.<sup>36</sup> As a result, the quality of answers is dependent on the source being up to date and accurate.<sup>37</sup> This may create issues in the future, as voice assistant devices have the potential to undermine Wikipedia's ability to maintain volunteer editors and funding, which may in turn compromise the accuracy of answers.<sup>38</sup>

Finally, in respect of direct political information, Amazon has partnered with an external provider Ballotpedia,<sup>39</sup> while Google has sought to connect to government or NGO websites to respond to political questions.<sup>40</sup> These partner organizations provide content to software creators which is then pushed onto the devices. When asked about the consequences of voting yes or no on a ballot, voice interaction software platforms will generally respond with answers based on material provided and edited by these nominally independent organizations, giving them a substantial degree of influence over voters using the platform. When these partner organizations have not provided an answer, the software will resort to its standard web search approach, which may return an answer from an organization with no affiliation with the platform.

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<sup>35</sup> This provides skills with a degree of trust and legitimacy. See, Luke Munn *Alexa and the Intersectional Interface* French Perspectives on the Anglophone World, originally published in Digital Subjectivities (6/5/2018) available at <http://angles.saesfrance.org/index.php?id=1492>

<sup>36</sup> Brittany Shoot, *Amazon has donated \$1 million to Wikimedia Foundation. Here's why.* Fortune (9/25/2018) last accessed 1/20/2019, available at <http://fortune.com/2018/09/25/amazon-alexa-wikipedia-million-donation/>

<sup>37</sup> See, for example, the ability of Burger King to manipulate a Wikipedia article for a viral advertising campaign, discussed in Hyunji Chung, Michaela Iorga, Jeffrey Voas and Sangjin Lee *Alexa, Can I Trust You?* 50(9) Computer 100, 100-101.

<sup>38</sup> Katherine Maher (executive director, Wikimedia Foundation) *Facebook and Google must do more to support Wikipedia* Wired (6/15/2018) last accessed 1/20/2018, available at <https://www.wired.co.uk/article/wikipedia-google-youtube-facebook-support>.

<sup>39</sup> Barton, supra n 27.

<sup>40</sup> See for example, the responses to political queries set out in annexure 1A.

Software creators have also sought to keep their software generally apolitical and, as a result, it does not appear that any of the major software providers are vetting answers provided by third party political organizations. Further, the major software creators have programmed their software not to answer questions such as ‘who should I vote for’<sup>41</sup> and to generally avoid even using the names of political parties or political figures.<sup>42</sup> However, in some cases software has been imbued with ostensibly political opinions<sup>43</sup> and where questions are not pre-empted, it is possible for the one-sided political views of an organization to be surfaced in response to a query.<sup>44</sup>

Generally, the creators of voice assistive software have a greater degree of control over the content their software surfaces than social media or traditional web platforms. While third parties can deliver content via these devices, doing so requires investing in building a skill or action, which is subject not only to the terms and conditions imposed by the voice interaction software creator, but also to pre-release review and certification before the service is made available.<sup>45</sup> Once created the user must currently select the skill before it is loaded to their device. While the barriers to skill creation may fade over time,<sup>46</sup> voice interaction software creators will likely retain a greater degree of control over the content and users of their platforms relative to other platforms.<sup>47</sup>

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<sup>41</sup> See for example, the responses to direct queries as to voting in annexure 1B.

<sup>42</sup> Johnson, supra n **Error! Bookmark not defined.**

<sup>43</sup> Phillip Tracy *Alexa is a Black Lives Matter-supporting feminist* The Daily Dot – Technology (12/8/2017) last accessed 1/20/2019 available at <https://www.dailydot.com/debug/amazon-alexa-black-lives-matter/>

<sup>44</sup> See, for example, the response to a proposition query in annexure 1C.

<sup>45</sup> *Certification Requirements* Amazon, last accessed 1/21/2019, available at

<https://developer.amazon.com/docs/custom-skills/certification-requirements-for-custom-skills.html>

*Publish your Actions* Google last accessed 1/21/2019, available at

<https://developers.google.com/actions/console/publishing>

<sup>46</sup> Madhur Bhargava *Alexa Skills Projects* (2018) available online at

<https://proquest.safaribooksonline.com/book/programming/9781788997256>

<sup>47</sup> In essence, the control over skills is analogous to Apple’s control over content distributed through its smartphone Appstore, see, Brian X Chen *Always On: how the iPhone unlocked the anything-anytime-anywhere future and locked us in* 95 (2011).

## 1.G. How do these devices provide information?

Voice interaction software and voice assistant devices provide information in a manner and form that differs from traditional technology interfaces in a number of ways. First, rather than delivering a range of options from various sources as a search engine would, voice activated devices tend to take the role of an action engine, delivering only the single answer that the software considers most appropriate.<sup>48</sup> Second, the information provided in response to voice queries is necessarily less detailed and complex than information provided by a graphical user interface. Answers provided to most queries are less than a few sentences, and limited to 90 seconds (approximately 150 words) without any capacity for visual assistance. Essentially, the answer to a voice assistive question is limited to the length of a single Google search snippet or preview.<sup>49</sup> Third, the format of information provided by voice interaction limits the options for users to seek further or cross-linked information. Unlike a Google snippet which immediately provides a user with the opportunity to seek further information, voice interaction software is currently limited in its ability to hold context so asking a follow-up question will often result in a null response.<sup>50</sup> Fourth, the source and quality of information provided by a smart device is often unclear.<sup>51</sup> While Google Assistant generally cites the source of its information, most commonly Wikipedia, Alexa does not. Beyond this general and, in contrast to the range of visual cues<sup>52</sup> available on websites, users of voice enabled devices must rely on the software

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<sup>48</sup> Judith Shulevitz *Alexa, Should we Trust You* The Atlantic (November 2018) available at <https://www.theatlantic.com/magazine/archive/2018/11/alexa-how-will-you-change-us/570844/>

<sup>49</sup> Winnie Wong, *Google's Title and Meta Descriptions Length*, SEOPresser, 16 March 2019, last accessed 2 May 2019 <https://seopressor.com/blog/google-title-meta-descriptions-length/>

<sup>50</sup> Caroline Richardson *The innovations that will take Voice User Interfaces to the next level* The Drum 10/02/2018, last accessed 1/20/2019, available at <https://www.thedrum.com/opinion/2018/10/02/the-innovations-will-take-voice-user-interfaces-the-next-level>

<sup>51</sup> Tracey, *supra* n 43

<sup>52</sup> Shira Dvir-Gvirsman *I like what I see: studying the influence of popularity cues on attention allocation and news selection*, 22(2) Information, Communication & Society, 286, 289-290 (2019).

filter alone. Finally, the provision of information through voice has the potential to change how information is received. Voice devices tend to adopt conversational tones adapted for the user. This leads to an observable increase in intimacy<sup>53</sup> and, particularly as these devices become part of daily life, an increase in trust placed in these devices<sup>54</sup> and the outputs they produce.<sup>55</sup> By its nature and ubiquity voice interaction software has the ability to become a source of truth for users seeking information, increasing the power of these devices to shape opinions.

### 1.H. Future developments

Voice interaction software is continually being improved<sup>56</sup> and is the focus of substantial research and investment.<sup>57</sup> By some estimates, Amazon and Google are spending approximately 10% of their annual research-and development budgets on voice technology<sup>58</sup> Amazon has dedicated a team of over 10,000 employees to developing and improving Alexa.<sup>59</sup> Some of these developments will alter the potential impact of these devices on the political system.

Of particular note, developers are seeking to provide voice activated software with further capacity to collect and recall contextual data on users.<sup>60</sup> This will allow software to better respond to user questions but may also allow the devices or third-party applications to tailor

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<sup>53</sup> Munn, supra n 35.

<sup>54</sup> Bayerque supra n 2 at 40; Shulevitz, supra n 48.

<sup>55</sup> The trust may reflect the trust that has been placed in google search results, see discussion in Michael P. Lynch, *The internet of us knowing more and understanding less in the age of big data* 25-27 (2017). See, also, Munn, Supra n 38.

<sup>56</sup> Richardson, supra n 50.

<sup>57</sup> Brian Dumaine *It might get loud: Inside Silicon Valley's Battle to Own Voice Tech* Fortune Long Form (10/24/2018) last accessed 1/20/2019, available at <http://fortune.com/longform/amazon-google-apple-voice-recognition/>

<sup>58</sup> Id.

<sup>59</sup> Douglas MacMillan *Amazon Says it has over 10,000 employees working on Alexa*, Echo Wall Street Journal (11/13/2018) last accessed 1/20/2019, available at <https://www.wsj.com/articles/amazon-says-it-has-over-10-000-employees-working-on-alexa-echo-1542138284>

<sup>60</sup> Robert Dole *The Return of the Chatbots* 22(5) Natural Language Engineering 811, 816 (2016).

responses<sup>61</sup> based on their understanding of user's political views. For example, a skill that recalls that a user has previously asked a question that it identifies as left or right leaning may alter a later response to match the user's political views. Patent filings also suggest that devices may in the future have the capability to detect further information regarding users, such as their emotional state,<sup>62</sup> which may impact on information responses. Software creators are also seeking to allow for a greater degree of personalization on these devices and Amazon has announced that it intends overtime to remove the requirement for users to select skills, with software learning what the user is likely to be asking for.<sup>63</sup> Another potential development is the opening of assistive software to advertising or the use of the devices to collect data for advertising.<sup>64</sup> Again, search voice related patents held by the major players suggests that advertising will eventually be integrated into these platforms<sup>65</sup> and which the advertising industry is rapidly preparing for.<sup>66</sup> These developments may increase the impact of these devices on the political environment.

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<sup>61</sup> Jeff Blankenburg *Announcing More Personalized Skill Responses When Alexa Recognizes a Customer's Voice (Developer Preview)* Alexa Developer Blog (11/30/2017) last accessed 1/21/2019, available at <https://developer.amazon.com/blogs/alexa/post/09acb84e-6d56-463b-959c-9e15c3ed3893/announcing-more-personalized-skill-responses-when-alexa-recognizes-a-customer-s-voice-developer-preview>

<sup>62</sup> For example, Amazon has filed a patent for a method detecting emotional states from a voice data US Patent No. 10,096,319 B1 (dated October 9, 2018).

<sup>63</sup> Interview with Rohit Prasad, Alexa Vice President – Monica Chin *Amazon is Killing the Skill (As We Know it)* Tom's guide (11/13/2018) last accessed 1/21/2019, available at <https://www.tomsguide.com/us/amazon-alexa-kills-skills,news-28072.html>

<sup>64</sup> Dumaine, supra n 57. See also, Ben Rubin *Ads for voice assistants are hear and they are already terrible* Cnet (4/21/2017) last accessed 1/20/2019, available at <https://www.cnet.com/news/ads-voice-assistants-amazon-alexa-google-home-burger-king/>

<sup>65</sup> See, for example Amazon's patent for Key Word determinations from voice data for purposes such as targeted advertising, US Patent No. 14,828,220, publication number US2017/0323645 A1 (published 11/9/2017).

<sup>66</sup> See, for example Ann-Marie Alcantara *Why Brands should be Ready for Alexa Ads, despite what Amazon says* (1/4/2018) last accessed 1/21/2018, available at <https://www.adweek.com/digital/why-brands-should-be-ready-for-alexa-ads-despite-what-amazon-says/>

## 2. Impact of smart-devices on elections and voters

The growing prevalence of voice interaction software will have substantial effects on the political system and how political information is distributed.

### 2.A. Centralized power

The potential to control a single answer to a question will likely give enormous power to the creators of voice interaction software. Where users seek political information through these devices, they will not be provided with any alternative information or countervailing position.<sup>67</sup> Research has shown that when search engine results are presented in this way, with all or substantially all information modified to benefit one candidate, there can be a significant impact on voting intentions.<sup>68</sup> Given that single answers are the natural way for information to be presented by voice bots and in light of the trust that it appears voice devices engender,<sup>69</sup> it is likely that voice-controlled answers favoring a particular position would have similar impacts.

Beyond direct answers, assistive software creators have substantial power over which third-parties are able to access their platforms. The requirement for pre-screening and the complexity of building third party integration means that these entities have a greater degree of control as to the content that is distributed on these devices.<sup>70</sup>

Further, voice interaction software and particularly ‘always on’ smart-speakers collect enormous amounts of data and have been regularly criticized for a perceived lack of privacy protection and for inappropriate data collection.<sup>71</sup> However, it does not appear that this has

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<sup>67</sup> See examples in Annexure 1.

<sup>68</sup> Epstein and Robertson, *supra* n 28.

<sup>69</sup> Munn, *supra* n 35 and see discussion in 1.G above.

<sup>70</sup> Chen, *supra* n 47.

<sup>71</sup> Jay Stanley *The Privacy Threat from Always-on Microphones like the Amazon Echo* in *Internet Abuses and Privacy Rights 77-80.* (Betsy Maury eds 2017).

affected take-up of devices or usage.<sup>72</sup> Indeed, evidence from early providers of voice interactive devices suggests that users of these technologies are more likely to provide detailed or intimate information to voice interaction software,<sup>73</sup> which software controllers are collecting.<sup>74</sup> This data can be used by the controllers of voice interaction software in a myriad of ways.

As a result of these factors, the political power of organizations that control voice interaction software will continue to grow as use of these devices increases. As these technology companies already hold substantial power in the electoral system,<sup>75</sup> consideration will need to be given to the broad control that this power gives these technology companies over the political system.<sup>76</sup>

## 2.B. Data and manipulation

The power held by the controllers of voice assistive devices is likely to be sufficient that they could manipulate voting patterns, political decisions and outcomes.<sup>77</sup> Each of the major voice interaction software producer's states in their privacy policy that they record information provided by users and continue to store that information indefinitely.<sup>78</sup> This information can be used by providers in connection with their services and may also be passed on to third parties.

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<sup>72</sup> Kinsella and Mutchler, supra n 25 at 26.

<sup>73</sup> Shulevitz, supra n 48.

<sup>74</sup> Stanley, supra n 71.

<sup>75</sup> See, for example, Daniel Tambini *Social Media Power and Election Legitimacy* in Digital dominance: the power of Google, Amazon, Facebook and Apple 265-266 (Moore and Tambini eds, 2018).

<sup>76</sup> Samantha Shorey and Philip Howard *Automation, Big Data and Politics: A Research Review* 10 International Journal of communication 5032, 5037 (2016).

<sup>77</sup> Liesl Yearsley *We Need to Talk about the Power of AI to Manipulate Humans* MIT Technology review 6/5/2017 last accessed 1/20/2019 available at <https://www.technologyreview.com/s/608036/we-need-to-talk-about-the-power-of-ai-to-manipulate-humans/>

<sup>78</sup> Amazon privacy policy available at <https://www.amazon.com/gp/help/customer/display.html/?nodeId=GVP69FUJ48X9DK8V> . Google policy available at <https://support.google.com/googlehome/answer/7072285?hl=en>

Just as existing players have sought to utilize search and social media data in the political process, so too may data collected from smart speakers be valuable to political campaigns.<sup>79</sup>

As the capability of these devices increases, and users continue to share their feelings with and place trust in voice interactive devices,<sup>80</sup> the potential for this information to be abused increases. For example, if a smart speaker device determines that a user is in a ‘positive’ or ‘angry’ mode, it could then trigger advertising to that user (through the device or otherwise) that accounts for that mood, allowing for substantial manipulation. This will be further exacerbated if these devices are, as forecast, opened to political advertising. By utilizing the information collected by smart speakers, advertising could be further targeted to alter individual voting decisions by voice interaction software controllers and those that they allow onto the platform. Particularly, voice assistive devices are likely to be particularly sensitive to issue or platform advocacy as they have the potential push an issue through the voice interface into homes.<sup>81</sup>

More directly, one of the key use cases for assistive devices is the provision of directions and logistical information.<sup>82</sup> This extends to the political context and both Alexa and Google Assistant sought to push information through their devices as to how and where users could vote during the 2018 election.<sup>83</sup> This exposes another potential for abuse if software providers seek to manipulate voter turn-out by pushing information only to certain voters.<sup>84</sup> As a result of the above factors, the power held by the controllers of these devices may be so great as to justify a regulatory response.

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<sup>79</sup> Daniel White *What Google and Twitter can Tell Us about 2016* in Campaign Trends and Election Law 169-171 (Betsy Maury eds, 2016).

<sup>80</sup> Shulevitz, *supra* n 48.

<sup>81</sup> Abbey Stemler, *Platform Advocacy and the Threat to Deliberative Democracy* 78 Maryland Law review 107.

<sup>82</sup> Kinsella and Mutcher, *supra* n 25 at 16.

<sup>83</sup> Scott Brown *Google Assistant will tell you exactly when and where to vote, so you can go vote* Android Authority (11/6/2018) last accessed 1/21/2019, available at <https://www.androidauthority.com/google-assistant-vote-2018-922278/>

<sup>84</sup> Jonathan Zittrain *Engineering an election* 123 Harvard Law Review Forum 335, 335-336 (2014).

## 2.C. Security

The power held by the controllers of voice interaction software could also be misappropriated if the devices are able to be attacked. The nature of voice interactive devices, constantly listening for activation and operating through small decentralized hardware, makes them particularly vulnerable to attack and these vulnerabilities may be difficult to address. Initial studies have identified a number of security issues that arise specifically from the use of voice interaction software<sup>85</sup> and as a result of lax security hardware and software connecting to the core voice interaction software.<sup>86</sup> These vulnerabilities could be exploited to collect data from unsuspecting individuals and manipulate the information they receive through the voice interaction software. In essence, vulnerabilities in voice interaction software would allow malicious actors to exercise many of the powers held by the software creators and set out above.

## 2.D. Disinformation, polarization and bias

### *2.D.1. Potential reduction of disinformation within closed elements of voice software*

As a result of the greater editorial control held by software creators, the closed nature of voice interaction software platforms and the limited number of software creators, the use of voice assistive devices has the potential to reduce the spread of disinformation and increase the quality of information provision, at least in respect of the closed elements of the software such as informational queries.

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<sup>85</sup> Xinyu Lei, Guan-Hua Tu, Alex X. Liu, Chi-Yu Li and Tian Xie *The Insecurity of Home Digital Voice Assistants - Amazon Alexa as a Case Study* arXiv paper available at <https://arxiv.org/abs/1712.03327> (2017).

<sup>86</sup> Nan Zhang, Xianghang Mi, Xuan Feng, XiaoFeng Wang, Yuan Tian, and Feng Qian *Understanding and Mitigating the Security Risks of Voice-Controlled Third-Party Skills on Amazon Alexa and Google Home* arXiv paper available at <https://arxiv.org/pdf/1805.01525.pdf> (2018).

Whereas it is difficult for entities to remove fake news from web searches,<sup>87</sup> voice interaction software creators have a greater ability to redirect particular queries.<sup>88</sup> Moreover, rather than providing a personalized filter through which aggregable content can be found and crosscutting content avoided,<sup>89</sup> provided that voice interaction software creators remain politically neutral<sup>90</sup> the single answer provided by a voice interaction software can directly refute incorrect statements. Further, voice interaction software providers will not, at least in the short term, be faced with the risk that acting to combat disinformation will result in groups seeking out an alternative service that they find aggregable. For the reasons set out above, high barriers to entry will prevent alternative services springing up<sup>91</sup> while personal switching costs faced by individual consumers, including replacement of hardware mean that they will not readily change between voice interaction ecosystems.<sup>92</sup> As a result voice interaction software providers will, at least in the short term, face fewer hurdles to combating misinformation.

For similar reasons, it is also unlikely that there will be overt stratification in the provision of voice interaction software services in the manner seen in traditional media outlets.<sup>93</sup> As a result, at least in respect of the closed elements of the voice interaction software (informational

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<sup>87</sup> Danah Boyd *Google and Facebook can't just make fake news disappear* Wired (3/27/2017) last accessed 12/15/2018, available at <https://www.wired.com/2017/03/google-and-facebook-cant-just-make-fake-news-disappear/>

<sup>88</sup> See, for example, appendix 1.

<sup>89</sup> Jeremy Frimera Linda J. Skitkab and Matt Motyl *Liberals and conservatives are similarly motivated to avoid exposure to one another's opinions* 72 *Journal of Experimental Social Psychology* 1 (2017). <https://www.sciencedirect.com/science/article/pii/S0022103116304024?via%3Dihub>

<sup>90</sup> Providers will face a similar debate as google faces in respect of its search algorithm. See, for example Jeff Hancock, Danaë Metaxa-Kakavouli and Joon Park *Are Google search results politically biased?* The Guardian (11/6/2018) last accessed 1/20/2019, available at <https://www.theguardian.com/commentisfree/2018/sep/06/google-search-results-rigged-news-donald-trump>

<sup>91</sup> Anders, supra n **Error! Bookmark not defined.** Hischber and Manning, supra n 22.

<sup>92</sup> A recent survey found that only 11% of smart speaker users would consider purchasing a competing product Voicelabs.co *The 2017 Voice Report Executive Summary* 2017, last accessed 1/20/2019, available at [https://s3-us-west-1.amazonaws.com/voicelabs/report/vl-voice-report-exec-summary\\_final.pdf](https://s3-us-west-1.amazonaws.com/voicelabs/report/vl-voice-report-exec-summary_final.pdf) ,

<sup>93</sup> See, for example, Yochai Benkler et al *Partisanship, Propaganda, and Disinformation: Online Media and the 2016 U.S. Presidential Election* Berkman Klein Research Publication (August 2017) available at <https://cyber.harvard.edu/publications/2017/08/mediacloud>

queries and curated news) there is unlikely to be substantial polarization of view-points provided through voice interaction software.

#### *2.D.II. Limitation on the ability to counteract disinformation*

It must be recognized, however, that to reduce disinformation, software providers to determine a clear ‘answer’ to queries that can be delivered in an appropriate manner for the medium. This can be difficult to achieve and often results in the software surfacing a neutral answer to complex questions. For example, when Alexa or Google Assistant are asked about ‘Pizzagate’ both state directly that it is a ‘*debunked conspiracy theory*’. If users trust these devices, this is a positive development.<sup>94</sup> However, when asked about “death panels,” both major software platforms simply state that it is a political term coined by Sarah Palin, without passing any comment.<sup>95</sup> While it is arguable that this response is better than conducting a Google search, which returns within the first 7 responses an article that implies that death panels exist,<sup>96</sup> it is likely that it will not be possible for voice interaction software to address misinformation in complex or politically charged topics.

#### *2.D.III. Benefits undermined by personalization and third-party access*

While voice interaction software creators may be able to control and direct content delivered natively through their devices in closed queries, they do not have such a degree of control over third party applications. Users can select particular service providers and curate

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<sup>94</sup> See annexure 1.D – searches and screen captures created by author.

<sup>95</sup> See annexure 1.E – searches and screen captures created by author.

<sup>96</sup> Notwithstanding the fact that these claims have been repeatedly discredited. See, Adam Berinsky *Rumors and Health Care Reform: Experiments in Political Misinformation* British Journal of Political Science 1 (November 2015).

the content that they receive, allowing them to continue to seek out aggregable content and replicating the echo chamber and polarization effects seen on other information platforms.<sup>97</sup>

These effects are likely to be exacerbated as voice interaction software becomes more personalized and gains the ability to retain contextual user information. If this contextual information is used to determine the response to a query or the skill that should be used to address the request (for example, directing a user who is identified as being ‘left wing’ to a left wing skill or application) the use of this software could actually increase polarization, as the single answer impacted by the contextual information would be presented as authoritative,<sup>98</sup> without any signals as to how the response was generated and with limited options for correction.

## 2.E. Accessibility and engagement

Separately to the quality of information provided, the growth in voice interaction software and devices has the ability to increase the ability of certain marginalized groups to engage in the political process. Individuals who lack literacy skills or who are physically unable to use traditional computer interfaces may become isolated from political information and participation.<sup>99</sup> Voice assistive devices may provide these groups with greater access to political information and allow them to participate further in the political process.<sup>100</sup> In addition to the disabled or elderly, providing information through voice interaction platforms may allow for broader English language or translated information<sup>101</sup> to be provided to voters with lower

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<sup>97</sup> Id. Frimera et al, supra n 89.

<sup>98</sup> Munn, supra n 35.

<sup>99</sup> Janet Lord *Accessible ICTs and the opening of Political Space for Persons with Disabilities* Human Rights and Information Technology 27 (Jonathan Lazar eds, 2017)

<sup>100</sup> Robin Christopherson *How do Alexa and Amazon Echo help disabled people* Ability Net (12/5/2016) last accessed 1/21/2019, available at <https://www.abilitynet.org.uk/news-blogs/how-do-alexa-and-amazon-echo-help-disabled-people>

<sup>101</sup> Hoy, supra n 31.

English literacy levels.<sup>102</sup> As a result, the proliferation of voice interaction software enabled devices has a real potential to increase participation in the political process.

### 3. Managing the impact of smart-devices

Given the issues identified above and the likely growth of voice interaction technology in coming years, it is worthwhile considering what steps could be taken to maximize the benefits that voice technology may have and reduce any negative outcomes.

#### 3.A. Direct regulation of voice assistive devices

##### 3.A.1. *Bespoke regulation unlikely*

The software that governs voice interaction software and voice assistive devices is unlikely to be subject to direct, bespoke regulation. The large technology companies that control voice interaction software are incredibly powerful and have a history of avoiding regulation.<sup>103</sup> Further, the voice interaction software is already in wide use and the AI systems that sit behind these tools are incredibly complex<sup>104</sup> and difficult to understand for regulators. As a result, and given the small number of participants, the voice interaction software market appears likely to be governed by platform self-regulation, with creators adjusting their behavior to adapt to community expectations.<sup>105</sup> Given the small number of participants, there may also be co-ordination between voice interaction software providers as to the political issues they may face, although this may require adjustments to anti-trust restrictions.<sup>106</sup> Ultimately,

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<sup>102</sup> For example, research has found that videos are more effective in causing Hispanic voters to register, and similar patterns may be found in voice systems. Philip Rosenstein *Digital Video Plays critical role in 2016 election* in *The Reference Shelf: Campaign Trends and Election Law* 168 (Betsy Mauray eds. 2016).

<sup>103</sup> Jonathan T. Taplin, *Move fast and break things: how Facebook, Google, and Amazon cornered culture and undermined democracy* 125 – 132 (2017)

<sup>104</sup> For an alternative example, see Kate Crawford and Vladan Joler, *Anatomy of an AI System* (2018) last accessed 1/20/2019, available at <https://anatomyof.ai/>

<sup>105</sup> Rolf Weber and Romana Weber *Internet of Things Legal Perspectives* 125-126 (2009).

<sup>106</sup> Cass Sunstein *#Republic* 223-224 (2017).

however, it will likely fall on the creators of voice interaction software creators to manage their impact for the short to medium term.

### 3.A.II. *Free speech and the first amendment*

Any restriction on the use of or output of voice interaction software could arguably constitute an undue imposition on the freedom of speech of the creators of voice interaction software. Despite ongoing debate,<sup>107</sup> it appears likely that the First Amendment rights of search engine operators preclude direct regulation of the content of search engine outputs.<sup>108</sup> Similar arguments could be applied apply with respect of the outputs of voice interaction software controlled by voice interaction software creators such as Amazon and Google or by third party content creators. That is, any restriction on the response made by voice interaction software could be argued to be a restriction on the free speech rights of the controller of that software. Additionally, restrictions on the use of voice interaction software or devices could also constitute a restriction on rights of users of these devices to ‘receive’ information.<sup>109</sup> These arguments are, however, far from clear and it may be that the current generation of voice interaction software remains too primitive to justify First Amendment Protection.<sup>110</sup> This question has yet to be directly addressed by the Courts – Amazon did seek to raise first amendment arguments in resisting a search warrant in a matter that was ultimately resolved by the parties without a

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<sup>107</sup> Eugne Volokh & Donald Falk *Google First Amendment Protection for Search Engine Search Results* 8(4) *Journal of Law, Economics and Policy* 883, 886. Heather Whitney *Search Engines, Social Media and the Editorial Analogy* Knight First Amendment Institute paper (2/26/2018), last accessed 1/20/2019, available at <https://ssrn.com/abstract=3130724>

<sup>108</sup> *Langdon v. Google, Inc.*, 474 F. Supp. 2d 622, 630.

<sup>109</sup> *Griswold v Connecticut* 381 US 479,482.

<sup>110</sup> Toni Massaro and Helen Norton *Siri-ously? Free Speech Rights and Artificial Intelligence* 110 *Northwestern University Law Review* 1169, 1193 (2016).

ruling<sup>111</sup> – and it can be anticipated that any substantive regulation of voice interaction software will likely lead to a First Amendment challenge.

### *3.A.III. Political advertising*

To the extent that political advertising or communications find their way into voice interaction software, consideration will also need to be given to the application of political advertising regulations.<sup>112</sup> Communications through voice interactive devices currently fall into a gap in the regulations as ads placed on voice interaction services do not utilize broadcast or satellite communication and fall within the exception for communications over the internet other than communications placed on a web site.<sup>113</sup> As a result, while advertisements over voice interaction software are analogous to radio ads, they are not currently regulated as Public Communications by the Federal Election Commission (**FEC**).

This gap is, however, likely to be closed by forthcoming changes proposed by the FEC, which extend the definition of Public Communication to encompass ads placed on an “internet-enabled device or application.”<sup>114</sup> As voice interactive devices rely on cloud connections for content, they would fall within this definition and, if it is adopted, become subject to regulation. The extent of any regulation will depend on which of two proposed approaches the FEC takes in framing disclaimer requirements. The first proposal would likely result in such ads being treated as analogous to radio advertisements, requiring a statement spoken by the candidate, while the second would allow for flexibility depending on the amount of time the advertisement

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<sup>111</sup> Memorandum of Law in Support of Amazon’s Motion to Quash Search Warrant, *State of Arkansas vs James Bates*, no CR-2016-370-2, 10-12 (Circuit Court of Benton County Arkansas, 2/17/2017)

<sup>112</sup> 11 CFR 110.11 - Communications; advertising; disclaimers (52 U.S.C. 30120).

<sup>113</sup> 11 CFR 100.26 - Public communication (52 U.S.C. 30101(22)).

<sup>114</sup> Federal Election Commission, *Proposed Rules – Internet Communication Disclaimers and Definition of “Public Communication”* 83(58 Federal Register 3/26/2018, available at <https://www.govinfo.gov/content/pkg/FR-2018-03-26/pdf/2018-06010.pdf>

would take.<sup>115</sup> Given the limited length of interactions with most voice interactive devices, the second proposal is likely to be more appropriate, however, it is unlikely that there will be any clarity as to the proposal pursue in the short to medium term<sup>116</sup> and, in the interim, political advertising on voice interaction software and devices will remain unregulated.

### 3.A.IV. *Privacy regulation*

While there has been much discussion of the privacy implications of voice interactive devices,<sup>117</sup> it is unlikely that existing privacy regulation will greatly impact on the conduct of voice interaction software creators in their day to day operations. While the private home has often been given special significance in privacy related laws,<sup>118</sup> this does not override the informed consent of users that is provided when they accept relevant privacy policies for voice assistive devices. Each of the major voice interaction software creator's privacy policies clearly specify that voice interaction software can be used to collect all manner of data and that data shared.<sup>119</sup> As a result of these broad consents, there is unlikely to be any substantial restriction on the operations of voice interaction software controllers arising out of privacy laws, provided that compliance with these policies is maintained.

Compliance with privacy policies cannot of course be guaranteed and there have been public reports of voice interactive devices recording and sharing information in the absence of commands.<sup>120</sup> These events are likely, however, to remain outliers,<sup>121</sup> albeit outliers that keep

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<sup>115</sup> *Id.*

<sup>116</sup> Erika Franklin Fowler, Michael Franz and Travis Ridout *Online Political Advertising in the United States* Draft on file, 14.

<sup>117</sup> Ford and Palmer, *supra* n 10 at 2.

<sup>118</sup> Stanley, *supra* n 71 at 79.

<sup>119</sup> See policies, *supra* n 78

<sup>120</sup> Sam Wolfson *Amazon's Alexa recorded private conversation and sent it to a random contact* the Guardian, 5/24/2018, <https://www.theguardian.com/technology/2018/may/24/amazon-alexa-recorded-conversation>

<sup>121</sup> Given the enormous number of interactions users have with voice interactive devices every day, it is somewhat surprising that these issues have not manifested more regularly.

privacy issues in the public eye. Public attention is also likely to continue to be focused on the privacy implications of voice interactive device recordings being used as evidence in criminal proceedings.<sup>122</sup> While requests for voice interaction software creators to provide data to law enforcement have captured public attention, the tendency of courts to grant such requests (over the software creator's objections)<sup>123</sup> is hardly surprising when it is considered that the users of these devices have already consented to their recordings being collected and shared beyond their home. Privacy issues may also arise through the use of third-party skills and applications, who may wish to push beyond the scope of the voice interaction software provider's core privacy policy.<sup>124</sup> However, voice interaction software will likely be better protected from such actors and from incidents such as the Facebook Cambridge Analytica breach, due to fact that third party applications require review required before they are activated onto the core voice interaction software platform.<sup>125</sup> Ongoing monitoring of the actions of third parties will be required to ensure that this type of conduct does not occur on voice interaction software devices. Ultimately, voice interaction software and voice interactive devices will likely continue to be subject to substantial scrutiny from privacy organizations and any policy breach will likely lead to action, however, in the short-term privacy concerns are unlikely to restrict the broad operation of this software.<sup>126</sup>

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<sup>122</sup> Andrew Guthrie Ferguson *Alexa, What is Probable Cause?* Slate 11/20/2018

<https://slate.com/technology/2018/11/amazon-echo-alexa-murder-case-new-hampshire-warrant.html>

<sup>123</sup> *Id.*

<sup>124</sup> Zhang et al, *supra* n 86.

<sup>125</sup> See discussion in 1.G above.

<sup>126</sup> Broader issues such as law-enforcement access may also be litigated in coming years, but this falls outside the scope of this paper. See discussion in Stanley, *supra* n 71.

### 3.B. Steps to be taken by providers

As a result of the limited scope of regulation of voice interaction software, it is likely that it will fall to the voice interaction software providers to manage the impacts of their software and devices on the political process. In doing so, there a number of particular steps that could be taken as these providers develop their software.

#### 3.B.I. *Limiting political personalization*

Voice interaction software providers have repeatedly stated an ambition for their software to be more personalized, to account for the particular background and interests of their users.<sup>127</sup> Care should be taken to ensure that this personalization does not extend to political personalization that would result in a user receiving one-sided political information without being aware that responses are being personalized. Without appropriate safeguards, users of different political persuasions could receive different answers to the same from their voice interactive device, which would almost certainly increase previously observed echo chamber effects and lead to increased political polarization.<sup>128</sup>

#### 3.B.II. *Known unknowns*

Regardless of any benevolent, apolitical intent, it is unlikely that voice interaction software creators will be able to completely separate their institutional and political values from the programming of their software.<sup>129</sup> As a result, there are some questions of political opinion that should not be answered by voice interaction software, particularly given the limitations on the length and complexity of content delivered by these devices. In responding to questions

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<sup>127</sup> See discussion in 1.H supra.

<sup>128</sup> See discussion in 2.D.III supra.

<sup>129</sup> Munn, supra n 35.

such as “who should I vote for” or, more generally “is policy X good”, steps should be taken to over-ride the default voice interaction algorithm such that, rather than providing an opinion (however generated), the software provides a null response or directs the user to an alternative method of considering information.<sup>130</sup>

### *3.B.III. Source disclosure and advertising*

As voice interaction software continues to allow for greater interaction from third parties, increased personalization and potentially advertising, the lines between content generated by software creators and third parties will become increasingly blurred. In the absence of visual cues, it may not be immediately obvious to users whether they are listening to content that has been pushed to them by advertisers or third parties. The absence of this source information could be critical to user responses, as a user provided with information that is caveated by ‘according to Wikipedia’ is likely to treat that information differently than information that is caveated by ‘according to CNN / Fox News.’

For this reason, and given that users of voice interaction software have no other way to determine the source of information they are receiving, steps should be taken to ensure that, wherever possible, the source of political information provided by voice interaction software is disclosed to the user before information is provided. Similarly, in respect of political advertising and disclaimers, notwithstanding the lack of a current regulatory requirement, voice interaction software creators should require that any political advertising be covered with an appropriate disclaimer, in accordance with the FEC’s proposed rules and in anticipation of further regulation.<sup>131</sup>

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<sup>130</sup> This approach is generally taken now, see examples in Annexure 1. Care will need to be taken to ensure that personalization does not affect these null results.

<sup>131</sup> Franklin Fowler, *supra* n 116 at 118.

*3.B.IV. Security and monitoring*

Voice interaction software and voice interactive software could be used by malicious actors to affect the outcomes of elections in a number of ways. If devices are not secure, they could be used to record and release sensitive information. More directly, voice interaction software could be used to push misleading content through third party skills or to impede users' ability to vote by providing misleading logistical information.<sup>132</sup> Given these potential avenues for political manipulation and the anticipated proliferation of these devices, there is a real possibility that, by the time of the 2020 election, voice interaction software may be the target of malicious actors. For this reason, real-time monitoring and security efforts, akin to those undertaken by social media organizations, should be adopted by software controllers to ensure that voice interaction software isn't misused.<sup>133</sup> Such monitoring should also be put in place to ensure that, even absent malfeasance, these devices provide accurate information during time-sensitive electoral positions. For example, while software providers may pre-load devices with information as to when polling places close,<sup>134</sup> care will need to be taken to ensure that these services account for any last-minute changes, such as the extension of voting times, as out of date information could otherwise prevent voters from casting their ballot.<sup>135</sup> As users increasingly rely on voice interaction software as a source of political information, voice interaction software creators must take responsibility for the security of these devices and the

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<sup>132</sup> See discussion in 2.A and 2.C supra.

<sup>133</sup> See, Casey Newton *Inside Facebook's Election War Room* The Vert (10/18/2018) last accessed 1/20/2018, available at <https://www.theverge.com/2018/10/18/17991924/facebook-election-war-room-misinformation-fake-news-whatsapp>

<sup>134</sup> Brown, supra n 83.

<sup>135</sup> Grace Segers *Judges rule to keep some polling sites open late in Texas and Georgia* CBS News (11/6/2018) last accessed 1/20/2019, available at <https://www.cbsnews.com/news/judges-rule-to-keep-some-polling-sites-open-late/>

accuracy of information presented, to ensure that the use of these devices does not undermine the political system.

#### 4. Conclusion

It is clear that voice interaction software and voice interactive devices will have a growing presence in the American and global market in coming years and that the use of these devices will have an impact on the political process.<sup>136</sup> Ultimately, the burden of managing this impact will fall on the companies who pioneer and control voice interaction software. If these companies address the potential issues that voice interaction software and voice interactive devices may cause upfront and seek to leverage the benefits that they may bring, these devices could have a positive impact on political discourse. However, if unfettered personalization, data collection, and advertising is allowed, these devices could exacerbate many of the political challenges that have been brought about by existing internet and social media technology. The next few years and the next steps taken by voice interaction software creators will be crucial to resolving what impact this new technology will have on the political process.

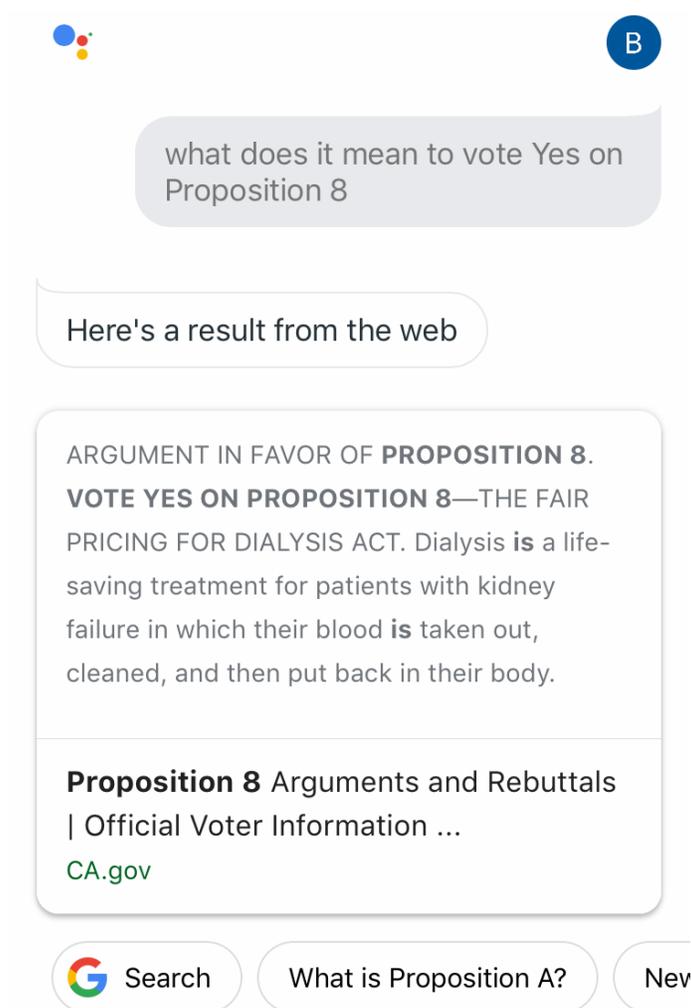
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<sup>136</sup> While further research will be required as to the precise impact, including scientific testing of the observations provided in Annexure 1, the pervasiveness of these devices suggests that there will be an impact.

## Annexure 1

Set out below are a number of examples of outputs from voice interaction software. In each case the output was delivered through the voice medium, but recorded in companion phone applications and captured by the author. Outputs are provided for example only.

### A. General responses to political queries.



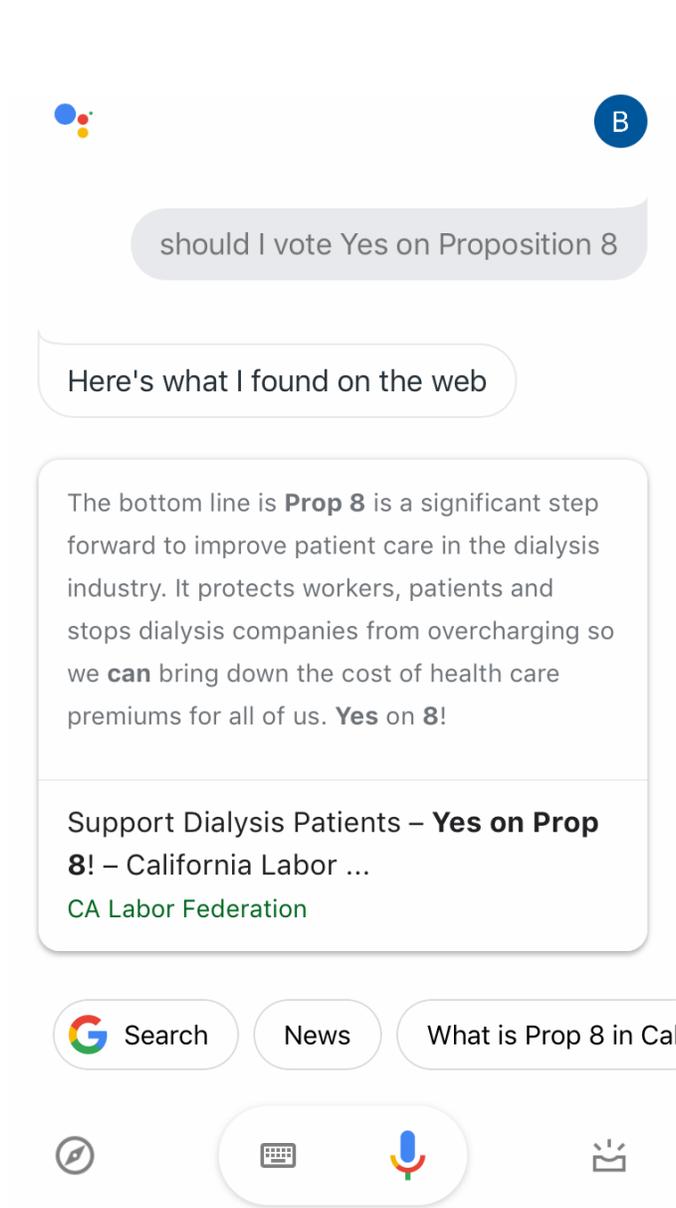
Google Assistant output -11/6/2018.

## B. Queries regarding who to vote for.

The image shows two screenshots of voice assistant interactions. On the left is an Alexa activity card titled 'ACTIVITY' with a hamburger menu icon. The card asks 'Who should I vote for?' and responds 'That's for you to decide.' Below this is a 'Voice feedback' section with a play button icon and the text 'Alexa heard: "who should i vote for"'. It then asks 'Did Alexa do what you wanted?' with 'Yes' and 'No' buttons. At the bottom of the card are 'Remove card' and 'Learn more' options, and a 'Less' button with an upward arrow. On the right is a Google Assistant chat interface. A user message asks 'should I vote for Gavin Newsom'. The assistant's response is 'I'll stay out of that, thanks. But I can find the latest political news, just ask'. At the bottom of the chat are icons for voice search, keyboard input, and a microphone icon.

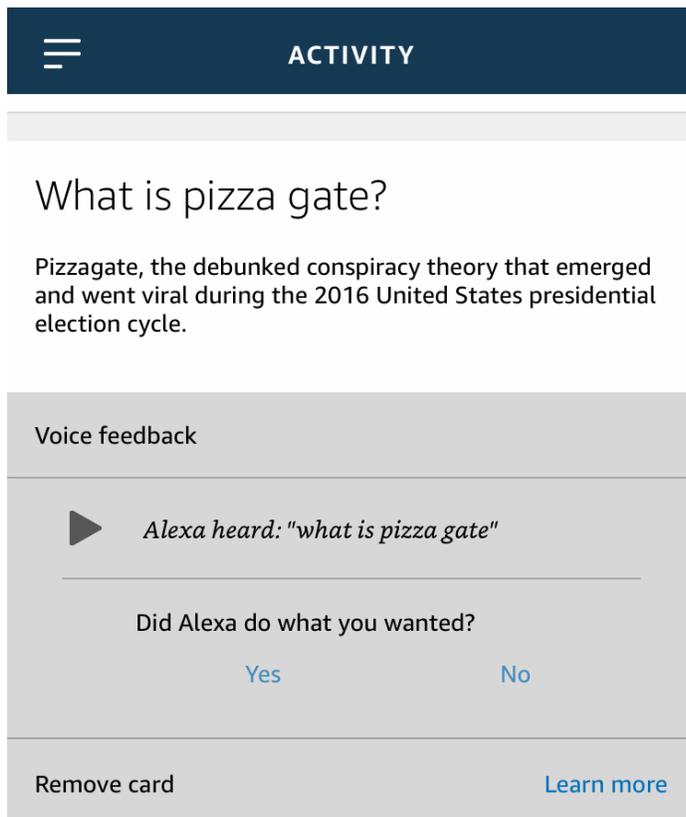
Alexa and Google Assistant output 11/6/2018

### C. Queries regarding propositions

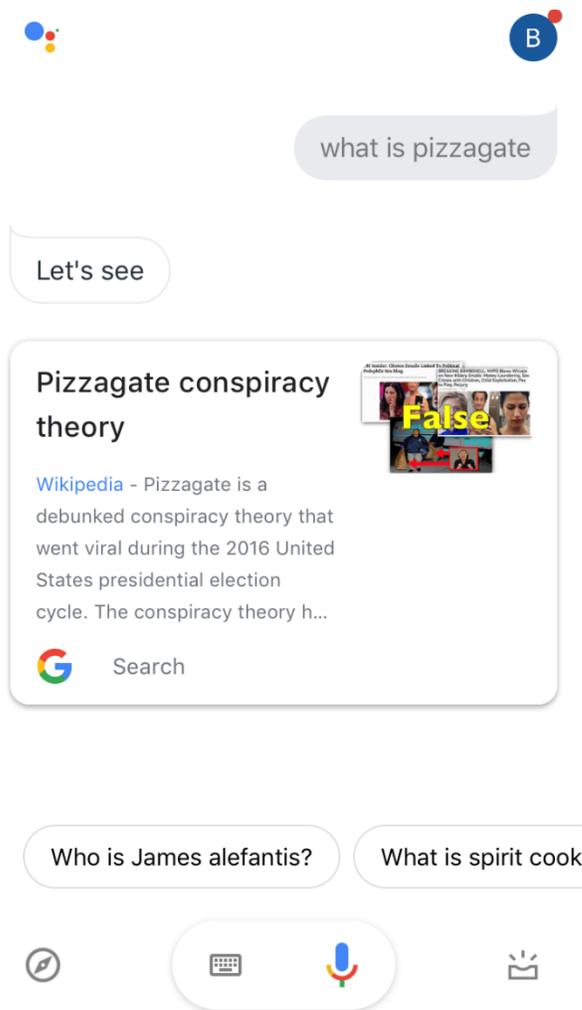


Google Assistant output -11/6/2018

### D. Queries regarding pizza gate



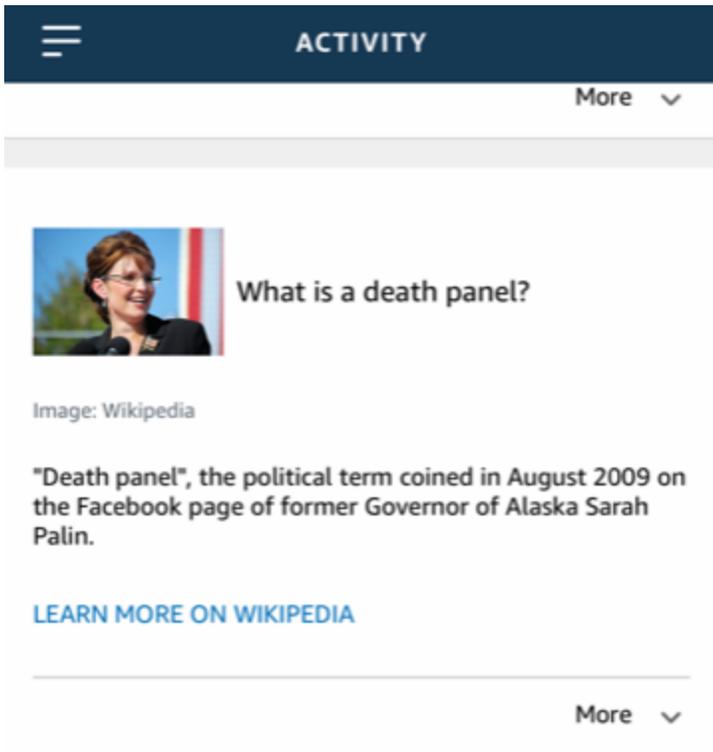
The screenshot shows an 'ACTIVITY' header with a menu icon. Below it, the query 'What is pizza gate?' is displayed. A text block explains that Pizzagate is a debunked conspiracy theory that went viral during the 2016 US presidential election. A 'Voice feedback' section contains a play button icon and the text 'Alexa heard: "what is pizza gate"'. Below this, it asks 'Did Alexa do what you wanted?' with 'Yes' and 'No' buttons. At the bottom, there are 'Remove card' and 'Learn more' options.



The screenshot shows the Google Assistant interface. A search bar contains the text 'what is pizzagate'. Below it, a 'Let's see' button is visible. A search result card for 'Pizzagate conspiracy theory' is shown, featuring a Wikipedia snippet and a thumbnail image with the word 'False' overlaid. Below the card are two suggested queries: 'Who is James alefantis?' and 'What is spirit cook'. At the bottom, there are icons for navigation, keyboard, voice search, and notifications.

Alexa and Google Assistant output  
11/6/2018

### E. Death Panel answers



Alexa and Google Assistant output 11/6/2018

