



JUAN ALCACER  
RAFFAELLA SADUN  
OLIVIA HULL  
KERRY HERMAN

## Alphabet Eyes New Frontiers

*We'd like to have a bigger impact on the world by doing more things.*

— Larry Page, *Cofounder and CEO of Alphabet*<sup>1</sup>

In June 2016, Tony Fadell announced that he was “leaving the nest” after six years at the helm of Nest Labs, an Alphabet subsidiary that made smart household appliances. “I’m a guy who’s at the beginning of things,” he told the *New York Times*. “I don’t like to do maintenance mode. It’s not what gets me out of bed.”<sup>2</sup> The news followed press reports that revealed turmoil at Nest and raised questions about Google’s recent decision to restructure into Alphabet, a holding company.

When the reorganization had first been announced in August 2015, experts said Nest would be among the main beneficiaries. “Nest and the rest gain more freedom to spend money, acquire other companies, etc. without having to try to explain how such costs are benefiting the core ad business when they clearly were not,” one analyst noted.<sup>3</sup> “[Alphabet’s] new stand-alone companies will have more freedom to take risks,” another observer commented.<sup>4</sup> But when internal problems at Nest and other subsidiaries surfaced in the press, observers began to fault the reorganization. “Google co-founders, now Alphabet honchos, really want to replicate their search engine’s success across a range of industries with operations run like startups,” one observer wrote. “To do that, though, they have to face a dilemma inherent in their structure. That is, they must find execs willing to work within Alphabet’s corporate umbrella, and teams willing to work with their chosen execs.”<sup>5</sup>

The makeup and management of Alphabet’s diverse collection of subsidiaries had been in flux since the restructuring announcement. In August 2015, a day after Google announced that it would reorganize, gaming subsidiary Niantic, an early “autonomous business unit” under Google,<sup>6</sup> said it would become an independent company.<sup>7</sup> In December 2015, life sciences subsidiary Verily announced the creation of a new surgical solutions venture that would also spin off.<sup>8</sup> Also that month, *Bloomberg* reported that Alphabet would soon create a separate subsidiary to house the company’s self-driving car project, which had been the founding project of Google’s X lab.<sup>9</sup> News outlets reported on a growing culture of fiscal discipline at Alphabet, where subsidiaries were now being asked to pay the parent company for shared services.<sup>10</sup> And in March 2016, Alphabet’s robotics subsidiary, Boston Dynamics, was reportedly put up for sale.<sup>11</sup>

---

Professors Juan Alcacer and Raffaella Sadun and Associate Case Researchers Olivia Hull and Associate Director Kerry Herman (Case Research & Writing Group) prepared this case. This case was developed from published sources. Funding for the development of this case was provided by Harvard Business School and not by the company. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

Copyright © 2016, 2017, 2018 President and Fellows of Harvard College. To order copies or request permission to reproduce materials, call 1-800-545-7685, write Harvard Business School Publishing, Boston, MA 02163, or go to [www.hbsp.harvard.edu](http://www.hbsp.harvard.edu). This publication may not be digitized, photocopied, or otherwise reproduced, posted, or transmitted, without the permission of Harvard Business School.

Against this backdrop of change, long-time Google observers wondered, were Nest's problems evidence that the new corporate form was incompatible with the ambitious innovation agenda set out by Google's founders, or would it in fact make it easier to deliver breakthrough innovations to market? And did it make sense to host such a large and diverse set of "moonshots" under a single corporate owner?

## Google's Rise

Founders Larry Page and Sergey Brin met at Stanford University in 1995. At first, they called their search engine "BackRub," but in 1997, they registered the domain Google.com. The name referred to the number googol, which is equivalent to  $1 \times 10^{100}$ . In 1998, Google, Inc. filed for incorporation in California, with headquarters based in a garage in Menlo Park, California. By 2000, Google had become the largest search engine in the world, with an index of 1 billion pages,<sup>12</sup> and in 2006, "google" became a verb in the Oxford English Dictionary.<sup>13</sup> In 2015, Google had 64% of the U.S. market share of search; no other competitor had even 20%.<sup>14</sup> That year, revenues came in just under \$75 billion, with total assets of \$147 billion by December 2015.<sup>15</sup> (**Exhibits 1a** and **1b** provide information on Alphabet's financials.)

Eric Schmidt came to Google as chairman in March 2001 and became CEO a few months later. He shared management responsibilities with the two founders. Schmidt had risen to prominence during his successful tenure at Sun Microsystems and had been running Novell since 1997. Brin and Page were impressed by Schmidt and felt he would be the right fit to round out the professionalism and management expertise of their youthful leadership team. Schmidt oversaw the company's IPO in 2004 and, in his first few years at the company, saw Google through its expansion into several new products and services, including Google News, Blogger, Google Books, Gmail, Google Earth, Google Maps, and the acquisitions of YouTube and DoubleClick.

## Investor Relations

In August 2004, Google became a publicly traded company in a controversial initial public offering (IPO) that lagged many investors' expectations.<sup>16</sup> Both the initial share price of \$85 and demand for the stock were lower than Google expected.<sup>17</sup> The IPO was unusual for two reasons. First, the founders opted to run the IPO in a rare auction format, which precluded the underwriters from setting an opening price, marketing the IPO on behalf of Google, and earning high fees on the transaction.<sup>18</sup> In marketing its own IPO, Google faced criticism for failing to answer investors' questions, such as how the company planned to spend the money it raised.<sup>19</sup> Some felt that Google had alienated investors and investment banks by eschewing the standard Wall Street IPO process.<sup>20</sup> "Their mantra was 'Trust us,'" said one hedge fund manager. "That doesn't work for a company with a high price if you have no idea what the future will bring."<sup>21</sup> Also unconventional was Google's election of a dual stock structure, in which Class A shares carried one vote each while Class B shares, reserved for Google insiders, carried 10 votes.<sup>22</sup>

In a letter to prospective investors, Page and Brin explained that choice:

[The] standard structure of public ownership may jeopardize the independence and focused objectivity that have been most important in Google's past success and that we consider most fundamental for its future. Therefore, we have implemented a corporate structure that is designed to protect Google's ability to innovate and retain its most

distinctive characteristics. We are confident that, in the long run, this will benefit Google and its shareholders, old and new.<sup>23</sup>

On the first day of trading following the auction, Google stock climbed above \$100 per share.<sup>24</sup> The stock jumped 1,294% over the next 10 years, outperforming all but 10 other stocks during the same period.<sup>25</sup> (See **Exhibit 2** for Alphabet share pricing since the IPO.)

By many accounts, Google's relationship with investors had two sore spots: its approach to corporate governance and its large, opaque research budget. Shortly after Google's IPO, the Institutional Shareholder Services, which advised institutional investors, gave the company a lower corporate governance rating than all the Fortune 500 firms.<sup>26</sup> Corporate governance experts said the dual class structure was "problematic" and amounted to "benevolent despotism."<sup>27</sup> In the 2004 prospectus, Google itself admitted that the structure "will make it harder for outside parties to take over or influence Google."<sup>28</sup> The structure made it difficult if not impossible for activist investors to gain traction.<sup>29</sup> "The attitude Google has toward outside investors is worth watching," one analyst said. "But in the end, you are basically buying management. You either think they are capable or you don't. If Sergey and Page don't make it here, there won't be anything left."<sup>30</sup>

In early 2011, Schmidt brought Page back as CEO of Google after a 10-year hiatus, announcing via Twitter, "Day-to-day adult supervision no longer needed!"<sup>31</sup> Schmidt became executive chairman, announcing he would focus "externally on deals, partnerships, customers and broader business relationships."<sup>32</sup> That April, Page moved to increase capital expenditures and significantly expand Google's workforce.<sup>33</sup> Some predicted that these investments would make shareholders impatient. "Having a Google that's a little more willing to invest in what they have, in order to build out beyond search, will ultimately create shareholder value,"<sup>34</sup> one analyst commented. "But that's not going to make the next few quarters look how they'd like."<sup>35</sup>

In March 2014, Google introduced a new share class, Class C, which carried no voting power.<sup>36</sup> Shareholders tried to prevent the change with a resolution that would have ensured equal voting rights, but a resolution introduced by Brin and Page defeated it.<sup>37</sup> Some thought the shift would create future problems for shareholders. "What comes out of Google ten years from now is probably dysfunctional," one technology investor said.<sup>38</sup>

Unlike other technology companies, Google did not pay dividends to shareholders.<sup>39</sup>

## Innovation at Google

Google embraced unconventional human resources practices in the interest of fueling innovation. One of its most famous employee perks was known as "20% time." In their 2004 letter, the founders explained, "We encourage our employees, in addition to their regular projects, to spend 20% of their time working on what they think will most benefit Google."<sup>40</sup> Several successful Google products had been invented during 20% time, including Google's autocomplete system, AdSense,<sup>41</sup> the advertising technology behind Gmail (Ad Sense); Google News; Gmail; and even the buses that transported Googlers to work.<sup>42</sup> Ad Sense alone brought in about one-fourth of Google's annual revenues.<sup>43</sup>

There was no shortage of ideas at Google; projects born during 20% time numbered in the thousands.<sup>44</sup> In 2011, Page began an annual campaign to offload the projects that had failed to catch on or had been made redundant by other products on the market.<sup>45</sup> "There were so many interesting projects going on that almost nothing had enough investment to be truly great," said CEO of People Operations Laszlo Bock.<sup>46</sup>

In addition to 20% time, Googlers were offered five-month maternity leave, on-site laundry, free meals, and even death benefits.<sup>47</sup> “At times Google’s largesse can sound excessive – noble but wasteful from a bottom-line perspective,” an observer noted.<sup>48</sup>

Work spaces at the “Googleplex” in Mountain View were designed to promote what Bock termed “casual collisions” between coworkers.<sup>49</sup> The inspiration for this choice came from Bell Labs, the historic research arm of AT&T. Bock explained:

When they built the buildings that Bell Labs were in, they set up the buildings where there’s a long corridor down this long building, and all the offices were off to the sides. And the thesis was people would kind of stumble out of their offices and bump into each other and have interesting conversations. There’s a direct line from that to the way, for example, at Google we run our cafes, where we have these round tables and long tables where you end up sitting next to strangers and bumping into them. And we try to manufacture these moments of serendipity in much the way Bell Labs did.<sup>50</sup>

To encourage risk-taking, Google leadership embraced failure. One of the company’s public failures was Google Wave, a live messaging platform that allowed users to collaborate on documents in real time. Less than six months after introducing the service in March 2010, Google pulled the project due to low user adoption.<sup>51</sup> Bock explained, “The team . . . took a massive, calculated risk. And failed. So we rewarded them,” with bonuses.<sup>52</sup> He added, “The biggest lesson was that rewarding smart failure was vital to support a culture of risk-taking.”<sup>53</sup>

Page gave one project manager some advice when he was hired: “It’s O.K. if you fail, I just want you to fail quickly.”<sup>54</sup> In March 2015, the *Wall Street Journal* reported that Google was investing more resources in Advanced Technology and Projects (ATAP), the research lab that limited projects to two years, while scaling back support for other innovative projects.<sup>55</sup> “One week of their time is one percent of their entire duration in ATAP,” said ATAP’s founder. “That makes them impatient with bureaucracy and process. And with a small enough group, you can start to strip away those things and go really fast.”<sup>56</sup> Investors were pleased. “If Google can make research projects shorter and with less investment, that’s positive,” one analyst said. “It’s going to be less worrying if projects fail.”<sup>57</sup>

**Loving the Googleplex** Each year more than 2 million people applied to work for Google.<sup>58</sup> A 2015 survey found that Google was the preferred employer of both engineering students and business students.<sup>59</sup> “Millennials want to truly understand a company’s purpose, align with it, and work with others to propel the organization’s performance,” the study’s authors commented. “Millennials are highly attracted to entrepreneurial energy in the workplace.”<sup>60</sup> About 89% of Googlers gave their employer a high satisfaction rating in 2015, according to PayScale.<sup>61</sup> “Google works from the bottom up,” explained one Google engineer. “If you have a great technical idea, you don’t have your V.P. send out a memo telling everybody to use it. Instead, you take it to your fellow engineers and convince them that it’s good.”<sup>62</sup> Google leadership sought to establish a culture where employees felt comfortable speaking up.<sup>63</sup> “People with vision were given the opportunity to create their own Google,” Bock wrote in his 2015 book, *Work Rules!*<sup>64</sup>

**Leaving the Googleplex** Despite an effort to create what one spokesman called “the happiest, most productive workplace in the world,”<sup>65</sup> large numbers of Googlers left after short tenures. Between July 2012 and July 2013, Google was ranked fourth in a list of Fortune 500 firms with highest employee turnover.<sup>66</sup> Though employees enjoyed a median pay of \$107,000, they only stuck around for a median of 1.1 years.<sup>67</sup> Part of this, experts explained, was a function of Google’s exponential growth; between 2007 and 2013, Google added 19,000 employees.<sup>68</sup>

One engineer who left the company in 2012 said the former “innovation factory” had become preoccupied with beating rival Facebook in advertising.<sup>69</sup> “The Google I was passionate about was a technology company that empowered its employees to innovate,” he wrote. “The Google I left was an advertising company with a single, corporate-mandated focus.”<sup>70</sup> Another cited “creeping bureaucracy” as the reason she left Google.<sup>71</sup> A third said she wanted to run her own show: “Google is a great training ground for how to build an amazing culture and an amazing product. But Google is not that good at teaching you how to build a business.”<sup>72</sup> An eight-year Google veteran felt too sheltered from failure at Google: “Google teaches you so much, but it also buffers and protects you.”<sup>73</sup>

Some executives left to start their own firms, many of which Google funded through its venture capital department, Google Ventures (GV).<sup>74</sup> One ex-Google who went on to start a company commented, “Google has always wanted to have a major impact on the world. Having us go to other companies is an extension of that.”<sup>75</sup>

## Investing Outside the Core

From the beginning, Google’s founders vowed to take the long-term view. “Despite the quickly changing business and technology landscape, we try to look at three to five year scenarios in order to decide what to do now,” the founders wrote in 2004.<sup>76</sup> They warned investors that the company would “place major bets on promising new opportunities,” incurring substantial risk.<sup>77</sup> “We will not shy away from high-risk, high-reward projects because of short term earnings pressure,” they wrote.<sup>78</sup>

And, although online advertising accounted for the vast majority of Google’s total revenues (95% in 2012), the company also showed a strong interest for the pursuit of new opportunities beyond search. Page appeared to believe that Google had a significant margin for expansion. “You know, we always have these debates: We have all this money, we have all these people, why aren’t we doing more stuff?” he said in 2013.<sup>79</sup> “You may say that Apple only does a very, very small number of things, and that’s working pretty well for them. But I find that unsatisfying. I feel like there are all these opportunities in the world to use technology to make people’s lives better.”<sup>80</sup> He pointed to a tension between investors and taking risks: “Investors always worry, ‘Oh, you guys are going to spend too much money on these crazy things.’ But those are now the things they are most excited about . . .”<sup>81</sup>

Some argued that Google had no choice but to diversify to ensure future growth. “If you think historically, go back 30 or 35 years, the organizations with big R&D [Research and Development] divisions were AT&T, IBM, and Xerox,” said one academic.<sup>82</sup> “Notice that each of those companies had a de facto monopoly.”<sup>83</sup> But others noted that these very companies had poured large sums of money into R&D, but often failed to profit directly from new discoveries.<sup>84</sup> (**Exhibits 3a** and **3b** show innovations at Bell Labs and PARC.)

### *Early Investments*

In a 2005 discrete transaction, Google acquired Android, a small software company, at an estimated price of up to \$50 million.<sup>85</sup> “The bet that Larry, Sergey, and Eric made at the time was that smartphones are going to be a thing, there’s going to be Internet on it, so let’s make sure there’s a great smartphone platform out there that people can use to, among other things, access Google services,” said Hiroshi Lockheimer, Google’s Vice President for Engineering at Android.<sup>86</sup> By 2015, Android had become the most popular mobile operating system in the world.<sup>87</sup> Increasingly, however, cell phone makers were altering the operating system to disengage Google’s apps. “About 30 percent of Android smartphones shipped in the last quarter of 2014 were actually modified, or forked, versions of the OS that may not

be very hospitable to Google's services, according to the firm ABI Research," the *New York Times* reported.<sup>88</sup>

In October 2006, Google agreed to buy the popular online video site YouTube for \$1.65 billion in stock. (Eric) Schmidt called it "the beginning of an Internet video revolution."<sup>89</sup> At the time, there was significant doubt as to whether user-generated content sites would attract top advertisers. YouTube was considered an unproven entity, and many were perplexed by the high price Google paid for a company with a string of losses and no clear path to profitability.<sup>90</sup> In 2016, this acquisition was generally viewed as successful, with YouTube's annual ad revenues estimated at several times the 2006 purchase price and growing. However, the unit's overall contribution to Alphabet remained unclear.

Less than a year later, in April 2007, Google announced that it would acquire the online advertising company DoubleClick for \$3.1 billion in cash. This purchase price, over 20 times revenue, was even more perplexing.<sup>91</sup> Wall Street analysts viewed it as a sign that Google was willing to spend anything to keep Microsoft off its online advertising turf.<sup>92</sup> Schmidt said the purchase would improve the end-user experience, but the press and shareholders felt his explanation was light and his rationale was vague.

### *Moonshots*

In 2010, Google X became the home of Google's riskiest projects, called "moonshots."<sup>93</sup> The secretive lab pursued futuristic ideas like driverless cars, Wi-Fi balloons, and smart eyeglasses.<sup>94</sup> Google X projects were chosen if they had potential to affect millions of lives and employed existing technologies.<sup>95</sup> Research activities at Google X were closed off from the rest of Google; other Google employees were denied entry to the building.<sup>96</sup> The "X" was originally just a stand-in for a better name,<sup>97</sup> but some Googlers said it indicated that X was willing to invest in projects that were 10 years away from large-scale implementation.<sup>98</sup>

Within Google X, projects could fail as long as the group was commercially viable.<sup>99</sup> "The portfolio has to make money," said Obi Felten, whose title at Google was "Head of Getting Moonshots Ready for Contact with the Real World." She added, "Some of these will be better businesses than others, if you want to measure in terms of dollars. Others might make a huge impact on the world, but it's not a massive market."<sup>100</sup> In February 2016, Astro Teller, the head of X, gave a speech titled "The Unexpected Benefit of Celebrating Failure," in which he described several X projects that had been discontinued in recent years, including a project to automate vertical farming that failed to grow staple crops and a lightweight cargo ship that would have cost \$200 million to prototype.<sup>101</sup> "We work hard at X to make it safe to fail," Teller said. "Teams kill their ideas as soon as the evidence is on the table because they're rewarded for it. They get applause from their peers. Hugs and high fives from their manager, me in particular. They get promoted for it. We have bonused every single person on teams that ended their projects, from teams as small as two to teams of more than 30."<sup>102</sup>

Also in 2010, Page began secretly funding a startup based near Google's Mountain View, California, campus that was working to invent the flying car.<sup>103</sup> "Page is using his personal fortune to build the future of his childhood dreams," *Bloomberg* reported.<sup>104</sup>

Some said Google's ambitious research activities made it easy to recruit talent. "These fantastical ideas create a growing halo around the company, fostering the perception that Alphabet [Google] is a place where magic happens, where the most innovative minds from iPod creator Tony Fadell to life sciences' chief Andy Conrad, come to tinker," a *Fast Company* contributor wrote.<sup>105</sup> For every 100 ideas that fail at Google's X division, "an army of new fans gets minted."<sup>106</sup>

But investors continued to voice concerns about the reporting of internal investments.<sup>107</sup> “There are some investors who have been looking at Google and saying, ‘They spend like crazy and I have zero recourse to change the direction, so I don’t want to be involved with them,’” said one analyst.<sup>108</sup>

In September 2013, Page introduced Calico, a lab probing human longevity. He assured investors that the project was in line with the company’s mission, stating:

You’re probably thinking wow! That’s a lot different from what Google does today. And you’re right. But as we explained in our first letter to shareholders, there’s tremendous potential for technology more generally to improve people’s lives. So don’t be surprised if we invest in projects that seem strange or speculative compared with our existing Internet businesses. And please remember that new investments like this are very small by comparison to our core business.<sup>109</sup>

In June 2014, analysts called for greater transparency in Google’s expense line, noting that while revenues went up 22-fold between 2004 and 2014, expenses increased 23-fold.<sup>110</sup> Pointing to a decline in capital expenditure efficiency, the analysts contrasted investments like Android, DoubleClick (the advertising subsidiary), and YouTube with the company’s new investments like the self-driving car and the smart home, projects with less “transparent monetization potential.”<sup>111</sup>

Google’s then-CFO emphasized a conservative approach to research spending. “I just want to kind of reaffirm to you that we do it in a smart way and a disciplined manner,” he said in a call with investors. “We’re driving forward to make sure we don’t waste our shareholders’ money.”<sup>112</sup> The then-head of Google X defended his division. He compared expectations for X to those of a venture capitalist who invests in a young company. “Because risk abounds, we owe a very strong return,” he said.<sup>113</sup>

In 2014, Google spent 12% of its revenues on research and development, the highest percentage since the company’s 2004 IPO.<sup>114</sup> In all, the company spent \$9.8 billion on R&D, up 38% from 2013.<sup>115</sup> Meanwhile, online advertising continued to dominate, generating nearly 90% of total revenues in 2015.<sup>116</sup> Some of those profits had been funding the company’s moonshots, but consolidated reporting made it difficult for investors to evaluate the performance of these riskier endeavors.

### *Other Moonshot Factories*

Though perhaps less extravagant than Google’s big bets, other technology companies had their own moonshot factories. In addition to its core business, an online retail store, Amazon contained several other ventures, including drone, data storage, video streaming, publishing, and tablet units under its umbrella.<sup>117</sup> “Most large organizations embrace the idea of invention, but are not willing to suffer the string of failed experiments necessary to get there,” noted CEO Jeff Bezos.<sup>118</sup>

Similarly, Facebook operated WhatsApp, virtual reality company Oculus Rift, Instagram, drone company Ascenta, and an artificial intelligence initiative, in addition to its core social media platform and ad tech businesses, all of which furthered Facebook’s business goals.<sup>119</sup> “We like problems that have very low business risk and very high technical risk,” said CTO Mike Schroepfer. “Meaning, we know what we will use this for, but we have no idea whether you can actually get it done.”<sup>120</sup>

Apple, the largest public corporation in the world by market value, spent less on R&D than other top technology firms as a portion of revenue. In fiscal year 2015, Apple spent only 3.5% of its revenue on R&D, compared with Facebook’s 21% and Alphabet’s 15%.<sup>121</sup> In 1998, Apple founder Steve Jobs said, “Innovation has nothing to do with how many R&D dollars you have.”<sup>122</sup> Still, Apple was reportedly pursuing some ambitious projects, including a self-driving car and a pay TV project.<sup>123</sup>

## *Trends in Technology*

In 2015, McKinsey consultants counted 146 private tech companies worth \$1 billion or more (known as “unicorns”), 14 of which were valued above \$10 billion.<sup>124</sup> (See **Exhibit 8a** for a graph showing U.S.-listed tech IPOs, 1995–2015, and **Exhibit 8b** for all U.S. IPOs since 1980.) Meanwhile, an estimated 40% of such firms saw their valuations drop between 2011 and 2015.<sup>125</sup> “There is demand, too—just not at the valuations VCs have given the startups,” said one analyst.<sup>126</sup> Said another, “Many of the jazzier companies found they could raise virtually infinite amounts of money while staying private. Had Google and Facebook had the option, they probably would have stayed private longer.”<sup>127</sup>

## **Ruth Porat**

In March 2015, Google hired Wall Street banker Ruth Porat to serve as CFO. “We’re tremendously fortunate to have found such a creative, experienced and operationally strong executive,” Page said. “I look forward to learning from Ruth as we continue to innovate in our core from search and ads, to Android, Chrome and YouTube as well as invest in a thoughtful, disciplined way in our next generation of big bets.”<sup>128</sup> Porat came to Google from financial-services firm Morgan Stanley, where she was CFO and had advised technology clients like Amazon and eBay.<sup>129</sup> Analysts interpreted the hire as a shift in priorities toward expense reduction. “The perception has long been that they throw money at things,” one analyst said. “That’s not going to change because of one earnings report, but with her there and showing a serious commitment to some discipline, it becomes part of a story line. People are saying there’s probably a lot more that could be cut. If so, Google could be a very strong-performing stock.”<sup>130</sup> On her first call with investors as Google CFO, she presented the second-quarter earnings report, indicating she would in fact move to keep expenses in check. “A key focus is on the levers within our control to manage the pace of expenses while still ensuring and supporting our growth,” Porat said.<sup>131</sup> Investors responded enthusiastically to the earnings report, which exceeded their expectations,<sup>132</sup> and Porat’s commitment to fiscal discipline; the next day Google stock climbed 16.3%, boosting the company’s market value by nearly \$65 billion.<sup>133</sup> “She gave a lot more qualitative and directional information than her predecessors and she seems to be more in-tune with the investor community,” one analyst noted.<sup>134</sup>

## **Google Announces Restructuring**

On August 10, 2015, Google announced that it would restructure and create a new holding company named Alphabet. Page, the CEO of Google since 2011, announced that he would become the CEO of Alphabet,<sup>135</sup> and would promote Sundar Pichai, former Senior Vice President of Google-branded products,<sup>136</sup> to CEO of Google.<sup>137</sup> Page and Brin would run Alphabet, along with Porat. Schmidt would remain executive chairman. The Google subsidiary included its Internet-related businesses, such as search, advertising, maps, YouTube, and Android phones. The non-Google subsidiaries included DeepMind, an artificial intelligence company;<sup>138</sup> Nest, a smart home thermostat system; Fiber, an Internet service; Calico, a longevity research lab; X, the moonshot incubator; Sidewalk, an urban technology project; and two investment arms, GV and Google Capital.<sup>139</sup> (**Exhibits 5** and **6** provide a selection of Google and non-Google subsidiaries, with brief descriptions of each.)

Under the restructuring, existing shares of Google would convert to Alphabet shares and trade under the same stock tickers as before, GOOG and GOOGL.<sup>140</sup> The change had implications for the way Google reported earnings to investors; Google planned to introduce segment reporting so that



Google earnings could be viewed separately from the other business segments at Alphabet.<sup>141</sup> In August 2015, Page and Brin held more than 50% of the voting stock in the company.<sup>142</sup>

### *Larry “Warren Buffett” Page?*

“In general, our model is to have a strong CEO who runs each business, with Sergey and me in service to them as needed,” Page wrote in a public post on the Alphabet website (abc.xyz).<sup>143</sup> Reorganization would allow the company more management scale, Page wrote, adding, “We can run things independently that aren’t very related.”<sup>144</sup>

Google’s founders had long drawn inspiration from businessman Warren Buffett, the CEO of Nebraska-based holding company Berkshire Hathaway Inc. Page and Brin cited Buffett’s writing as a major influence for their Google’s 2004 Founders’ IPO Letter,<sup>145</sup> and often praised him publicly.<sup>146</sup> In creating Alphabet, Page said Google leadership borrowed “aspects”<sup>147</sup> of the Berkshire Hathaway model. “I think there’s things that they do really well,” he said.<sup>148</sup> In 2015, Berkshire Hathaway was the 14<sup>th</sup>-largest company in the world by revenue.<sup>149</sup> Since Buffett bought failing textile company Berkshire Hathaway in 1965, the stock price had increased 1,826,163%, growing 21.6% on average each year.<sup>150</sup>

Google’s move to restructure inspired further comparison between the two companies. Like Alphabet, Berkshire Hathaway had a diverse array of subsidiaries, including Geico insurance, See’s Candies, Helzberg Diamonds, and Heinz Ketchup, which were all run independently.<sup>151</sup> “Google’s Alphabet sounds like a 21st century Berkshire Hathaway,” LinkedIn CEO Jeff Weiner wrote on Twitter when Google’s plans to restructure were announced.<sup>152</sup> Though Buffett controlled a large portion of Berkshire Hathaway shares, his companies operated more or less independently.<sup>153</sup> “We will continue to operate with extreme – indeed, almost unheard of – decentralization at Berkshire,” Buffett wrote in his 2016 letter to shareholders.<sup>154</sup> Like Alphabet, Buffett’s holding company had a dual share class structure, with B shares trading at lower prices.<sup>155</sup> In 2014, when Buffett held a 20% stake in his company, shareholders rejected a dividend proposal.<sup>156</sup> “Now, you may think that I stuffed the ballot box,” Buffett said at the time. “I did.”<sup>157</sup>

Porat said the Google founders shared Buffett’s commitment to “long-term value creation”<sup>158</sup> and “backing great leaders.”<sup>159</sup> Some observers were less convinced. They pointed out that unlike Alphabet’s founders, Buffett had not historically invested in technology.<sup>160</sup> In addition, Berkshire Hathaway’s subsidiaries were generally added to the portfolio via acquisition, while Alphabet’s ventures were commonly developed internally.<sup>161</sup>

### *Investors Relations*

Investors cheered the new structure. When the news broke on August 10, Google’s shares – which lagged during the first two quarters of 2015 – climbed 6.2% in late trading.<sup>162</sup> Analysts viewed the new corporate structure as evidence that Google’s attitude toward investors had improved. “We continue to think an era of more disclosure and cost consciousness . . . is positive for Google,” said one analyst.<sup>163</sup> Another analyst called it a “positive surprise”<sup>164</sup> from Porat, a “Wall Street veteran known for complex financial engineering.”<sup>165</sup> On October 2, 2015, Alphabet, Inc. became officially incorporated in the state of Delaware.<sup>166</sup> That day, Alphabet shares surged 2.3% to \$657 apiece.<sup>167</sup> (**Exhibit 4** shows the Google (Alphabet) stock price between August 2015 and June 2016.)

During the fourth quarter of 2015, Alphabet had a higher percentage of institutional fund ownership (31%) than any other stock.<sup>168</sup> “Alphabet has a best-possible 99 IBD Composite Rating, meaning it’s

outperformed 99% of all stocks on key metrics such as sales and profit growth in recent quarters," one observer commented.<sup>169</sup>

In October 2015, Porat announced Alphabet's first-ever share buyback (a \$5.1 billion purchase).<sup>170</sup>

By February 2016, Alphabet stock was nearly 50% above share prices in summer of 2015.<sup>171</sup> (See **Exhibit 7** for a chart showing the major institutional investors in March 2016.)

### *Innovation*

Following the restructuring announcement, Alphabet leadership also reiterated a commitment to nurturing long-term projects. In November 2015, Page indicated that the incubation period for a moonshot was generally longer than a venture capitalist's investment. "I think a lot of the things we are doing we have a lot of conviction about them working over time, but I think a lot of them have the characteristic of taking longer than an average venture capital bet," Page said.<sup>172</sup> In October 2015, Porat described Alphabet's approach of monitoring spending while optimizing value: "[The restructuring] wasn't about cost cutting our way to greatness, it was about ensuring that we have the same very detailed, disciplined approach to looking at the growth and expenses, making choices in order to optimize while still supporting revenue growth."<sup>173</sup>

Porat went on to outline Alphabet's "70:20:10 system" in which 70% of the company's resources were spent on the core, 20% on adjacent projects, and 10% on research.<sup>174</sup> For some, the creation of Alphabet marked a cultural shift. "It is such a large company now and with all large companies, politics and bureaucracy gets [*sic*] in the way of moving fast, from being able to launch an idea and set up a TV campaign it became layers and layers of management," said one ex-Googler.<sup>175</sup> Others noted that the "bet" companies<sup>a</sup> now controlled more of their own business, adopting hiring and marketing functions. "It gets a little faster, more efficient and a little more independent," said Andy Conrad, CEO of Verily (formerly Google Life Sciences). "I act as a CEO of an independent company instead of a senior executive within a large company."<sup>176</sup> He added, "Sundar [Pichai] will act in the best interests of Google Inc. I will act in the best interests of Google Life Sciences."<sup>177</sup>

In support of this view, Porat said the new structure would enable the company to be "an accelerant" for entrepreneurship.<sup>178</sup> She added:

A lot of that is about giving them the autonomy to operate within this larger family of Alphabet. So what's been very valuable is creating a structure that allows us on the one hand to have maniacal focuses within businesses and at the same time, to continue to plant the seeds and really nurture in a smart way those next engines of growth so that we're not dealing with this question of incrementalism leading to irrelevance.<sup>179</sup>

Google insiders commented that the creation of separate bet companies would reduce competition for talent and funds between units.<sup>180</sup> In November 2015, the *Wall Street Journal* reported that Alphabet would charge Other Bets subsidiaries for corporation-wide services such as computing, recruiting, and marketing. "The people familiar with the matter said executives hope to make the bet companies more accountable for their costs, which may lead to more caution on spending," the newspaper reported.<sup>181</sup> *The Economist* offered a summary: "Alphabet is grappling with a problem that has already troubled many other big tech firms: how much freedom, money and time to give internal startups."<sup>182</sup>

---

<sup>a</sup> "Bet" companies, also called Other Bets, were subsidiaries of Alphabet.

## Alphabet Spells a New Google

### *Q4 Earnings Released*

Alphabet's 2015 fourth-quarter earnings were strong. Total revenue was \$21.3 billion, an increase of 18% over the previous year and 14% above the previous quarter (refer to **Exhibit 1a**).<sup>183</sup> Porat credited mobile search, YouTube, and programmatic advertising for revenue gains. "The primary driver was the increased use of Mobile Search by consumers, benefiting from our ongoing efforts to enhance the efficiency of Mobile Search, as well as from the holiday season," she said.<sup>184</sup> Alphabet was now reporting along two segments: Google and Other Bets, which included "an aggregation of businesses, many of which operate in distinct sectors with different business models," Porat said. Due to certain "idiosyncrasies with respect to the timing of revenue, expenses and CapEx resulting from milestones, partnerships, and other factors," Porat said it would likely be more instructive to evaluate the performance of the Other Bets segment on a 12-month basis.<sup>185</sup> In the Google segment, revenues were \$21.2 billion, up 18% over 2014.<sup>186</sup> Other Bets, which were grouped together, reported revenues of \$448 million, 37% higher than in 2014.<sup>187</sup> Porat noted that Nest, Fiber, and Verily generated the majority of Other Bets revenues, adding, "The majority of efforts within Other Bets are pre-revenue."<sup>188</sup>

As a whole, Other Bets revenues, sourced from Nest hardware sales, Internet and TV services, and revenues from licensing and R&D services, made up 0.6% of Alphabet's consolidated revenues.<sup>189</sup>

Alphabet reported an operating loss of \$3.6 billion in the Other Bets segment for 2015, excluding stock-based compensation, which, Porat said, reflected "the impact of project milestones established several years ago."<sup>190</sup> Looking ahead, she expected Alphabet to continue to pursue "longer-term opportunities both within Google and Other Bets, consistent with our emphasis on pushing the frontier to adjacent areas and moonshots."<sup>191</sup>

### *Nest*

Nest Labs made Internet-connected thermostats and smoke alarms for what Fadell called "the conscious home."<sup>192</sup> Founded in 2010 by Fadell, a former Apple executive who helped design the iPod, and Matt Rogers, another Apple engineer, Nest released its first smart thermostat in October 2011.<sup>193</sup> The device was an "innovative reimagining of a product category," the *New York Times* quipped, "a stylish piece of hardware, a circle of brushed stainless steel, reflective polymer and a crystal-sharp color display."<sup>194</sup> In late 2013, Fadell said the thermostat hung in "almost 1% of U.S. homes."<sup>195</sup>

In January 2014, Google acquired Nest for \$3.2 billion in the second-largest purchase in the company's history.<sup>196</sup> Fadell said Google would provide Nest financial, legal, and administrative resources that would help them grow.<sup>197</sup> "I was spending so much time in my days just worrying about infrastructure and not worrying about product," Fadell said when the deal was announced.<sup>198</sup> "This allows us to concentrate on the stuff that differentiates us."<sup>199</sup> Roughly six months later, Nest bought Dropcam, a security-camera startup, for \$555 million.<sup>200</sup> Between 2011 and 2015, annual revenue growth at Nest surpassed 50%.<sup>201</sup>

When Alphabet announced plans to restructure, Nest was seen as a beneficiary. As a subsidiary separate from Google, observers said the business would enjoy independence and financial support.<sup>202</sup> During 2015, Nest's revenues totaled \$340 million, lagging expectations, according to reports from *Recode*.<sup>203</sup> By 2016, Nest had 1,100 employees and offered a smart thermostat, a smoke detector, and a security camera.<sup>204</sup>

But in March 2016, Fadell told tech news outlet The Information that Alphabet was pressuring non-core divisions to tighten their belts.<sup>205</sup> In his words, Alphabet leadership told its Other Bets subsidiaries, “Show us your business plan for the year. We’re going to hold you to those numbers.”<sup>206</sup>

The Information also reported that 70 employees had left Nest between spring and fall of 2015.<sup>207</sup> Current and former employees complained about Fadell’s strict management style and blamed him for product delays.<sup>208</sup> Later that month, Dropcam founder Greg Duffy, who left the company in 2015, expressed his frustration in a public blog post, declaring that it was a “mistake to sell” his startup, which was in the “middle of a record year of sales” when Google acquired it.<sup>209</sup> He faulted Nest for moving slowly. “All of us have worked at big companies before, where it is harder to move fast. But this is something different, as evidenced by the continued lack of output from the currently 1,200-person team and its virtually unlimited budget,” Duffy wrote.<sup>210</sup>

In April, news outlets reported that Nest would be closing Revolv, a company it acquired in 2014.<sup>211</sup> Revolv made devices that could control several smart appliances.<sup>212</sup> “Unfortunately, that means we can’t allocate resources to Revolv anymore and we have to shut down the service,” Revolv’s founders wrote in a blog post. “As of May 15, 2016, your Revolv hub and app will no longer work.”<sup>213</sup> Nest said it bought Revolv for the talent, not the products. “We are not fans of yet another hub that people should have to worry about,” Rogers said.<sup>214</sup>

On June 3, 2016, Alphabet said Fadell would leave Nest and move into an advisory role at Google.<sup>215</sup> Observers speculated that Fadell was being let go in light of the complaints lodged against him, but he said the departure had been planned since late 2015.<sup>216</sup> “I don’t know of any regrets that I have,” he said. “To do what we do at the level we do it, no one’s done it before. So you’re bound to make mistakes.”<sup>217</sup> One observer said a cultural mismatch had ended Fadell’s reign. “Nest, with its Apple DNA, was very much a top-down company, where only one person was in charge – Fadell,” he wrote. “Google, on the other hand, has an engineer-driven, bottom-up culture.”<sup>218</sup>

Alphabet chose Marwan Fawaz to replace Fadell. A former Motorola executive, Fawaz was known for his people skills and team-oriented approach. Page said Fawaz would “deepen Nest’s partnerships, expand within enterprise channels, and bring Nest products to even more homes.”<sup>219</sup>

### *Other Moonshots*

The creation of Alphabet preceded widespread change also among other divisions formerly operated by Google, including Nest.

On August 12, 2015, Google startup Niantic Labs, a game company, announced its independence from Google: “We’ll be taking our unique blend of exploration and fun to even bigger audiences with some amazing new partners joining Google as collaborators and backers.”<sup>220</sup> In October, Niantic, best known for video game Ingress, announced that it had raised \$20 million in backing from Pokémon, Nintendo, and Google. “That’s kind of a theme at Google, to take businesses that are not search and give them more independence,” said Niantic’s founder. “We’re kind of at the vanguard of that.”<sup>221</sup>

In December 2015, *Bloomberg* reported on Alphabet’s plans to turn its self-driving cars unit, which had been contained in X, into a standalone business.<sup>222</sup>

In the same month, Verily announced it would create a new company, Verb Surgical Inc., reportedly backed by Johnson & Johnson and Ethicon, to pursue advances in surgical technology.<sup>223</sup> STAT reported that a dozen senior staff members had left Verily since 2014 amid complaints about the CEO, Andy Conrad. “They said he exaggerates what Verily can deliver, launches big projects on a whim,

and rashly diverts resources from prior commitments to the next hot idea that might bring in revenue,” STAT reported. “This has led to what they describe as difficult meetings with business partners, and resignations by demoralized engineers and scientists in the face of seemingly impossible demands.”<sup>224</sup> Technology analyst Rob Enderle said the premature timing of the employees’ departures suggested staffers “are losing confidence in the leadership.”<sup>225</sup>

In March 2016, Google put robotics firm Boston Dynamics, a 2013 acquisition, up for sale.<sup>226</sup> News reports, citing project insiders, said Google had decided the robots were not close enough to generating revenue.<sup>227</sup> Insiders also cited growing friction between engineers at Boston Dynamics and their Tokyo- and California-based counterparts.<sup>228</sup> According to internal memos, Google executives had become impatient with the slow pace of Boston Dynamics’ projects.<sup>229</sup> “We as a startup of our size cannot spend 30-plus percent of our resources on things that take ten years,” said one executive during a November 2015 meeting. “There’s some time frame that we need to be generating an amount of revenue that covers expenses and [that] needs to be a few years.”<sup>230</sup> News outlets also reported that robotics group Replicant was no longer a standalone unit; its employees had been folded into X.<sup>231</sup> The moonshot group said it was “defining some specific real world problems in which robotics could help.”<sup>232</sup>

## Looking Ahead

As June 2016 came to a close, the future of Nest and other Alphabet moonshots remained uncertain. And despite a concerted effort to diversify, the search engine and its advertising service remained the firm’s biggest revenue driver, accounting for nearly 90% of revenues. “In six months, you can say whether the structure has made things better—it has either made them worse or hasn’t change [*sic*] things at all,” one analyst concluded.<sup>233</sup> “Being liberated from Google, the moonshots were supposed to thrive under the Alphabet umbrella. Have they? The early results are not good,” *The Guardian* wrote in early June 2016.<sup>234</sup>

Others read the departure differently. One observer said leadership change at Nest meant the Alphabet structure was in fact succeeding. She predicted that Nest and Google Home, a Google subsidiary developing a virtual assistant for the home, would succeed:

Google’s whole motivation for creating the Alphabet holding structure in the first place was to force more financial discipline at its various “moonshots” and other businesses, like Nest, that didn’t fit neatly into Google’s core focus. It’s likely that Alphabet’s chief enforcer, CFO Ruth Porat, had a say in deciding that such an important product for the company [home automation] should be fledged elsewhere [within Google Home, a Google subsidiary]—so that it could earn its wings free of the division’s drama, financial or otherwise.<sup>235</sup>

As the campaign to expand Alphabet’s product line continued, Page and Brin had some critical decisions to make about the non-Google subsidiaries. Was it important to give the companies independence or would that strategy empower divisive leadership? How long should Other Bets be allowed to experiment before producing a viable, profitable product? Was Alphabet providing the resources startup ventures desperately needed to succeed, or would the conglomerate structure stifle innovation?

**Exhibit 1a** Alphabet Selected Income Data, Q3 & Q4 2015 (in millions US\$)

|   | Q3 2015 | Q4 2015 |
|---|---------|---------|
| Revenues  | 18,675  | 21,329  |
| Costs and expenses                                    |         |         |
| Cost of revenues                                      | 7,037   | 8,188   |
| Research and development                              | 3,230   | 3,510   |
| Sales and marketing                                   | 2,223   | 2,679   |
| General and administrative                            | 1,477   | 1,572   |
| Total costs and expenses                              | 13,967  | 15,949  |
| Income from operations                                | 4,708   | 5,380   |
| Other Income (expense), net                           | 183     | (180)   |
| Income from continuing operations before income taxes | 4,891   | 5,200   |
| Provision for income taxes                            | 912     | 277     |
| Net income  | 3,979   | 4,923   |

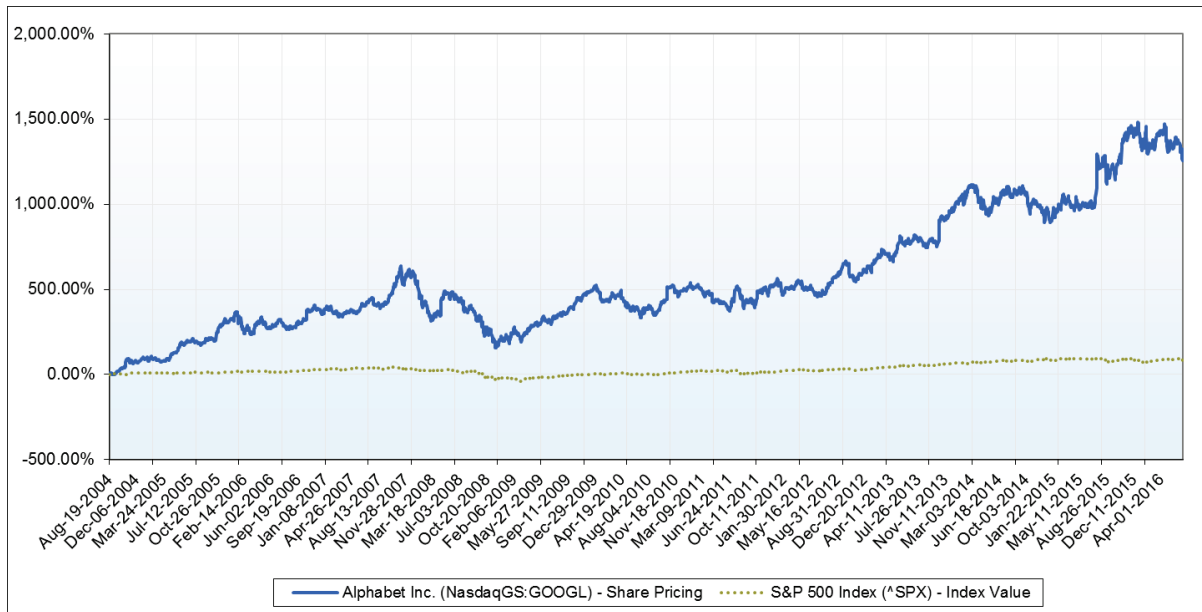
Source: Alphabet, Inc., 2015 Annual Report, [https://abc.xyz/investor/pdf/20151231\\_alphabet\\_10K.pdf](https://abc.xyz/investor/pdf/20151231_alphabet_10K.pdf), accessed February 2015.

**Exhibit 1b** Alphabet Selected Segment Information, 2013–2015

|  | 2013          | 2014          | 2015          |
|--|---------------|---------------|---------------|
| Revenues   |               |               |               |
| Google   | 55,507        | 65,674        | 74,541        |
| Other Bets   | 12            | 327           | 448           |
| <b>Total revenues</b>                              | <b>55,519</b> | <b>66,001</b> | <b>74,989</b> |
| Segment operating income (loss)                    |               |               |               |
| Google   | 16,260        | 19,011        | 23,425        |
| Other Bets   | (527)         | (1,942)       | (3,567)       |
| Administrative costs and other miscellaneous items | (330)         | (573)         | (498)         |
| <b>Total income from operations</b>                | <b>15,403</b> | <b>16,496</b> | <b>19,360</b> |
| Capital expenditures                               |               |               |               |
| Google   | 7,006         | 11,173        | 8,849         |
| Other Bets   | 187           | 501           | 869           |
| Reconciling Items                                  | 165           | (715)         | 197           |
| <b>Total capital expenditures</b>                  | <b>7,358</b>  | <b>10,959</b> | <b>9,915</b>  |

Source: Alphabet, Inc., 2015 Annual Report, [https://abc.xyz/investor/pdf/20151231\\_alphabet\\_10K.pdf](https://abc.xyz/investor/pdf/20151231_alphabet_10K.pdf), accessed February 2015.

**Exhibit 2** Alphabet, Inc. Share Pricing, Relative to the S&P 500 Index, August 2004 to June 2016



Source: Alphabet Share Pricing, August 2004 to June 2016, Capital IQ, Inc., a division of Standard & Poor’s.

**Exhibit 3a** A Selection of Top Innovations at Bell Labs

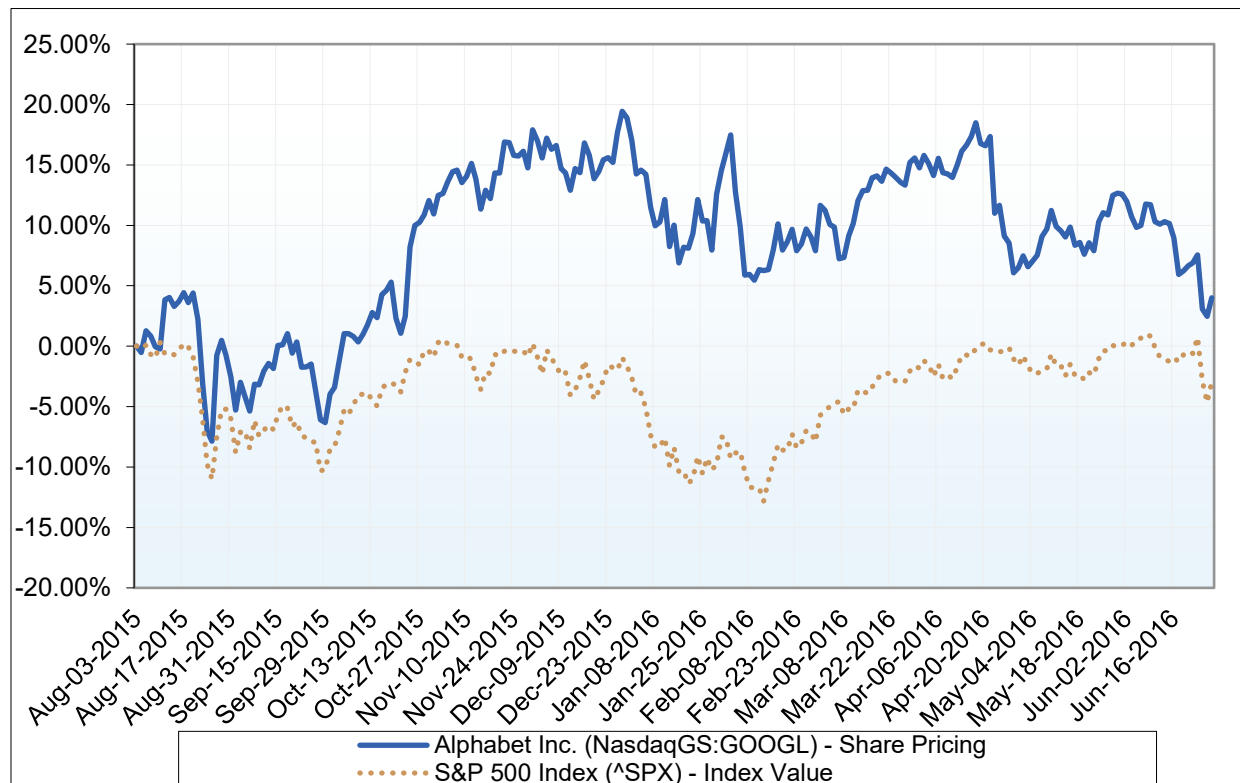
| Innovation  | Applications                                     |
|---|--|
| Data networking, late 1940s                         | Digital Subscriber Line (DSL)                    |
| Transistor, 1947                                    | Computers, radios, stereos                       |
| Cellular network, suggested in 1947, installed 1980 | Mobile phones                                    |
| Silicon solar cells, 1954                           | Solar power                                      |
| First patented laser, 1958                          | Medicine, electronics, communications            |
| Communications satellites, 1962                     | Long distance phone calls, television, and radio |
| Touch tone dialing, 1963                            | Replaced rotary dialing on telephones            |
| Unix C, C++, 1969-1972                              | The Internet, computer programming               |

Source: Alcatel-Lucent, “Bell Labs Top 10 Innovations,” from the University of Texas website, <http://www.cs.utexas.edu/~cannata/networking/Class%20Notes/02%20Bell%20Labs%20Top%2010%20Innovations.pdf>, accessed June 2016.

**Exhibit 3b** A Selection of Top Innovations at Xerox PARC

| Innovation                          | Applications   |
|-------------------------------------|--|
| Laser printing, 1972                | Photocopiers   |
| Xerox Alto personal computer, 1973  | Apple's Macintosh Computer   |
| Ethernet networking, 1973           | Local Area Network (LAN)   |
| Cut-and-paste and text editor, 1974 | Microsoft Word   |
| Graphical User Interface, 1975      | Computer user interfaces, popularized by Apple                     |
| Multi-beam lasers, 1986             | Advanced printers  |
| 16-bit coding system, 1989          | Unicode standard, allows computers to communicate across languages |

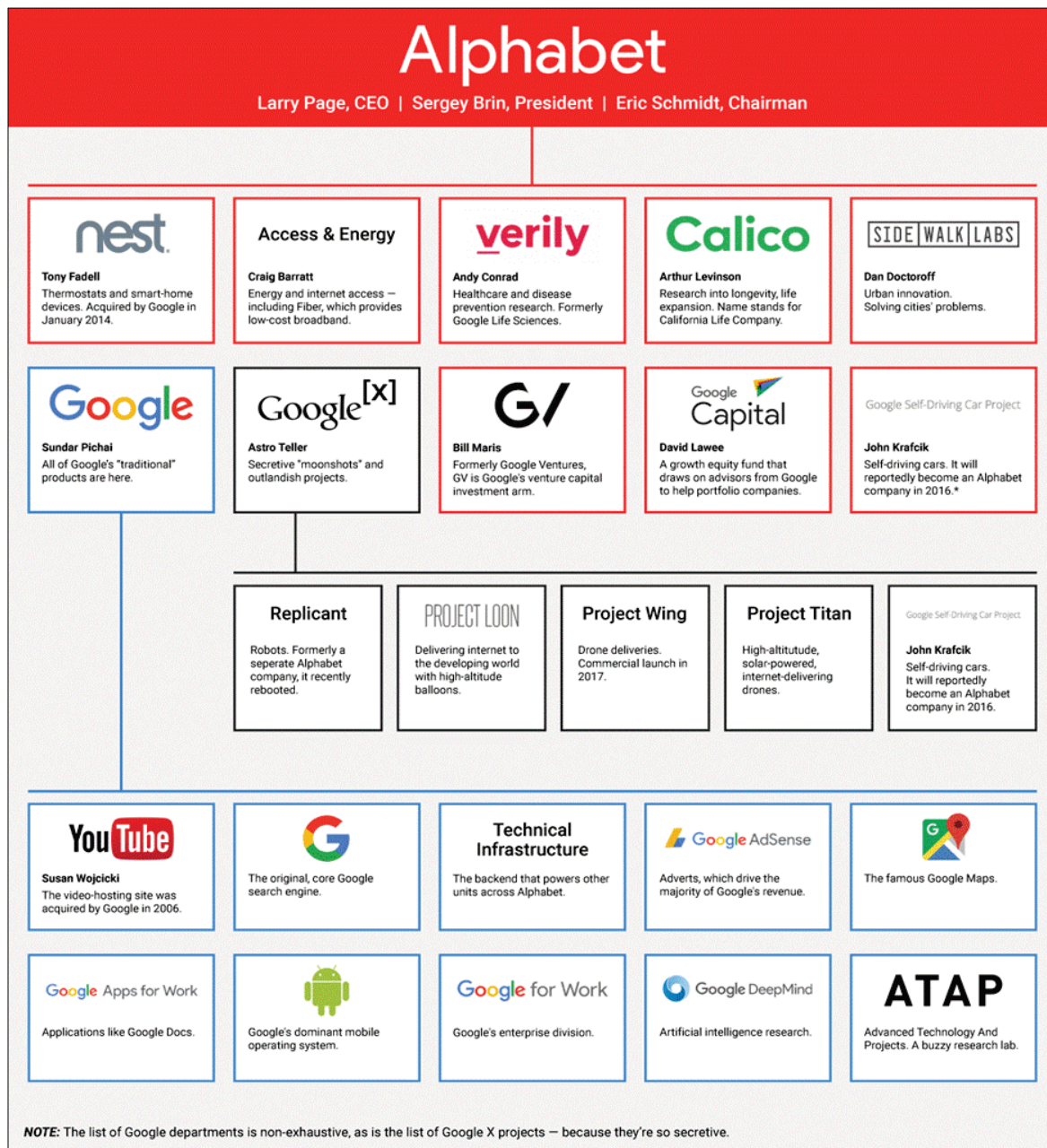
Source: Todd R. Weiss, "Timeline: PARC Milestones," *Computerworld*, September 20, 2010, <http://www.computerworld.com/article/2515874/computer-hardware/timeline--parc-milestones.html>, accessed June 2016; and Dan Farber, "Tracing the Origins of the Macintosh," *CNet*, January 21, 2014, <http://www.cnet.com/news/tracing-the-origins-of-the-macintosh/>, accessed June 2016.

**Exhibit 4** Alphabet Inc. Share Pricing, Relative to the S&P 500 Index, August 2015 to June 2016

Source: Alphabet Share Pricing, August 2015 to June 2016, Capital IQ, Inc., a division of Standard & Poor's.



Exhibit 5 Alphabet’s New Corporate Structure, 2016



Source: Rob Price and Mike Nudelman, "Google's Parent Company Explained in One Chart," Business Insider, January 12, 2016, <http://www.businessinsider.com/chart-of-alphabet-google-parent-company-infographic-x-gv-2016-1>, accessed February 2016.

**Exhibit 6** Alphabet's "Other Bets" Companies, 2016

| <b>Company</b>                | <b>Function</b>  | <b>Location</b>   |
|-------------------------------|--|-------------------|
| Access/Google Fiber           | Provides TV and Internet service in 9 U.S. cities through fiber-optic networks   | Various           |
| Calico                        | Conducts research into human longevity with the goal of increasing the human lifespan  | San Francisco, CA |
| Nest                          | Makes smart thermostats and other remote-monitoring devices for residential use, founded in 2010 and acquired by Google in 2014                | Palo Alto, CA     |
| Verily                        | Conducts life science research mission: "To bring together technology and life sciences to uncover new truths about health and disease"        | Mountain View, CA |
| GV (formerly Google Ventures) | Venture capital firm investing in life science, healthcare, artificial intelligence, robotics, transportation, cyber security, and agriculture | Mountain View, CA |
| Google Capital                | Growth equity fund investing in tech entrepreneurs, founded in 2013  | San Francisco, CA |
| X (formerly Google X)         | Conducts research on moonshots like robots, self-driving cars, and drones, pursuing breakthrough technologies                                  | Mountain View, CA |
| Sidewalk Labs                 | Consults with cities on innovation and problem-solving.  | New York, NY      |
| Deep Mind                     | Conducts research into artificial intelligence, founded in 2010 and acquired by Google in 2014   | London, England   |

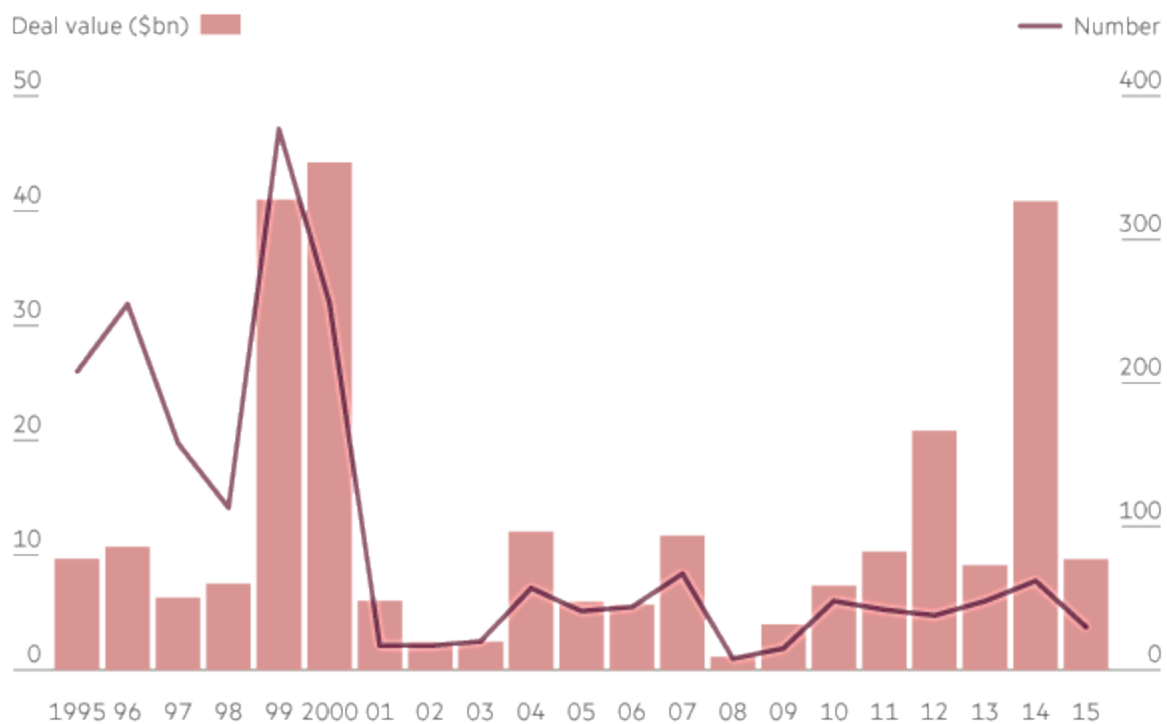
Source: Compiled by casewriter from the company websites: calicolabs.com, solveforx.com, nest.com, gv.com, googlecapital.com, verily.com, sidewalklabs.com, fiber.google.com, and deepmind.com, all accessed February 2016.

Note: This is not an exhaustive list of Other Bets ventures.

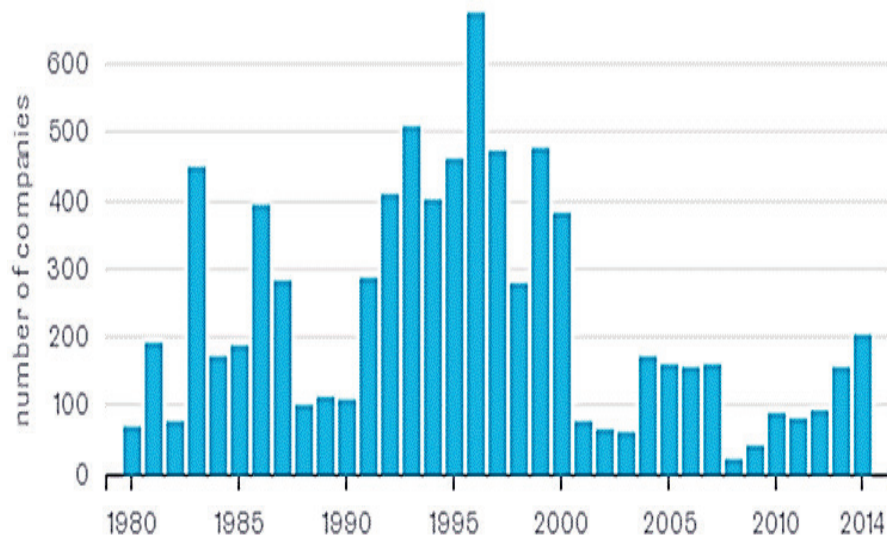
**Exhibit 7** Top Five Institutional Shareholders (GOOGL), March 2016

| Owner Name                            | Shares Held | Value (in \$1,000s) |
|---------------------------------------|-------------|---------------------|
| FMR LLC (Fidelity)                    | 18,588,835  | \$12,661,599        |
| Vanguard Group, Inc.                  | 17,822,708  | \$12,139,759        |
| State Street Corp.                    | 11,181,006  | \$7,615,830         |
| T. Rowe Price Associates, Inc.        | 8,076,641   | \$5,501,323         |
| Blackrock Institutional Trust Company | 7,618,239   | \$5,189,087         |

Source: Adapted by casewriter from "Alphabet Inc. Institutional Ownership," from the Nasdaq, Inc. website, <http://www.nasdaq.com/symbol/google/institutional-holdings>, accessed June 2016.

**Exhibit 8a** U.S.-listed Technology IPOs, 1995–2015

Source: Dealogic data via Nicole Bullock, "Technology Unicorns Stay Shy of IPOs," *Financial Times*, February 9, 2016, <http://www.ft.com/intl/cms/s/0/85bd0034-cb2b-11e5-a8ef-ea66e967dd44.html#axzz4BrLFhyjY>, accessed June 2016.

**Exhibit 8b** U.S.-listed IPOs since 1980

Source: Jay Ritter, University of Florida.

## Endnotes

- <sup>1</sup> Miguel Heft, "Google's Larry Page: The Most Ambitious CEO in the Universe," *Fortune*, November 13, 2014, <http://fortune.com/2014/11/13/googles-larry-page-the-most-ambitious-ceo-in-the-universe/>, accessed June 2016.
- <sup>2</sup> Steve Lohr, "Tony Fadell Steps Down Amid Tumult at Nest, a Google Acquisition," *The New York Times*, June 3, 2016, [http://www.nytimes.com/2016/06/04/technology/tony-fadell-nest-google-alphabet.html?\\_r=0](http://www.nytimes.com/2016/06/04/technology/tony-fadell-nest-google-alphabet.html?_r=0), accessed June 2016.
- <sup>3</sup> Mark Sullivan, "Nest May Benefit More from Alphabet than any Other Company in the Group, Save Google," *VentureBeat*, August 11, 2015, <http://venturebeat.com/2015/08/11/nest-may-benefit-more-from-alphabet-than-any-other-company-in-the-group-save-google/>, accessed June 2016.
- <sup>4</sup> Heather Kelly, "Meet Google Alphabet—Google's New Parent Company," *CNN Money*, August 11, 2015, <http://money.cnn.com/2015/08/10/technology/alphabet-google/>, accessed July 2016.
- <sup>5</sup> Mark Bergen, "Google's Alphabet Has a CEO Problem," *Recode*, March 29, 2016, <http://www.recode.net/2016/3/29/11587320/googles-alphabet-nest-verity-ceo-problem>, accessed July 2016.
- <sup>6</sup> Mark Bergen, "Why Did Google Get Rid Of The Company Behind Pokémon Go?" *Recode*, July 12, 2016, <http://www.recode.net/2016/7/12/12153722/google-niantic-pokemon-go-spin-out>, accessed July 2016.
- <sup>7</sup> Nick Wingfield, "Game Maker Niantic Adds Nintendo, Pokémon as Investors After Google Spinout," *Bits* (blog), *The New York Times*, October 15, 2015, [http://bits.blogs.nytimes.com/2015/10/15/game-maker-niantic-adds-nintendo-pokemon-as-investors-after-google-spinout/?\\_r=1](http://bits.blogs.nytimes.com/2015/10/15/game-maker-niantic-adds-nintendo-pokemon-as-investors-after-google-spinout/?_r=1), accessed February 2016.
- <sup>8</sup> "Johnson & Johnson Announces Formation of Verb Surgical Inc., In Collaboration with Verily," *PR Newswire*, December 10, 2015, <http://www.prnewswire.com/news-releases/johnson-johnson-announces-formation-of-verb-surgical-inc-in-collaboration-with-verity-300191210.html>, accessed February 2016.
- <sup>9</sup> John Lippert and Jack Clark, "Google to Make Driverless Cars an Alphabet Company," *Bloomberg*, December 16, 2015, <http://www.bloomberg.com/news/articles/2015-12-16/google-said-to-make-driverless-cars-an-alphabet-company-in-2016>, accessed April 2016.
- <sup>10</sup> Alistair Barr, "Google Parent to Ask Subsidiaries to Pay for Corporate Services," *The Wall Street Journal*, November 23, 2015, <http://www.wsj.com/articles/google-parent-to-ask-subsidiaries-to-pay-for-corporate-services-1448325619>, accessed February 2016.
- <sup>11</sup> Will Knight, "Why Google is Selling Off Some of the Coolest Robots Ever Built," *MIT Technology Review*, March 17, 2016, <https://www.technologyreview.com/s/601068/why-google-is-selling-off-some-of-the-coolest-robots-ever-built/>, accessed March 2016.
- <sup>12</sup> James Titcomb, "Google and Alphabet: What Does This All Mean?" *The Telegraph*, August 12, 2015, via Factiva, accessed February 2016.
- <sup>13</sup> Dominic Rushe and Sam Thielman, "Inside Alphabet: Why Google Rebranded Itself and What Happens Next," *The Guardian*, August 18, 2015, via Factiva, accessed February 2016.
- <sup>14</sup> comScore, "comScore Releases March 2015 U.S. Desktop Search Engine Rankings," April 15, 2015, <http://www.comscore.com/esl/Insights/Market-Rankings/comScore-Releases-March-2015-US-Desktop-Search-Engine-Rankings>, accessed July 2016.
- <sup>15</sup> Alphabet, Inc., Form 10-K, pp. 21-22, <https://www.sec.gov/Archives/edgar/data/1288776/000165204416000012/goog10-k2015.htm>, accessed February 2016.
- <sup>16</sup> Kevin J. Delaney and Robin Sidel, "How Miscalculations and Hubris Hobbled Celebrated Google IPO," *The Wall Street Journal*, August 19, 2004, <http://www.wsj.com/articles/SB109281895373094578>, accessed March 2016.
- <sup>17</sup> Delaney and Sidel, "How Miscalculations and Hubris Hobbled Celebrated Google IPO."
- <sup>18</sup> Andrew Ross Sorkin and Landon Thomas, Jr., "The Google IPO, Wall Street; an Egalitarian Auction? Bankers Are Not Amused," *The New York Times*, April 30, 2004, [http://www.nytimes.com/2004/04/30/business/the-google-ipo-wall-street-an-egalitarian-auction-bankers-are-not-amused.html?\\_r=0](http://www.nytimes.com/2004/04/30/business/the-google-ipo-wall-street-an-egalitarian-auction-bankers-are-not-amused.html?_r=0), accessed March 2016.
- <sup>19</sup> Delaney and Sidel, "How Miscalculations and Hubris Hobbled Celebrated Google IPO."

- <sup>20</sup> Jay Ritter, "Google's IPO: 10 Years Later," *Forbes*, August 7, 2014, <http://www.forbes.com/sites/jayritter/2014/08/07/googles-ipo-10-years-later/#5f0606ab70f9>, accessed March 2016.
- <sup>21</sup> Delaney and Sidel, "How Miscalculations and Hubris Hobbled Celebrated Google IPO."
- <sup>22</sup> Rolfe Winkler, "That 'Class C' Google Stock Split Is Finally Happening. Here's What It Means," *The Wall Street Journal*, March 27, 2014, <http://blogs.wsj.com/digits/2014/03/27/that-class-c-google-stock-split-is-finally-happening-heres-what-it-means/>, accessed March 2016.
- <sup>23</sup> Larry Page and Sergey Brin, "2004 Founders' IPO Letter," Alphabet, Inc., <https://abc.xyz/investor/founders-letters/2004/ipo-letter.html>, accessed March 2016.
- <sup>24</sup> David A. Vise, "Investors Greet Google with \$27 Billion Smile," *Washington Post*, August 20, 2004, <http://www.washingtonpost.com/wp-dyn/articles/A15325-2004Aug19.html>, accessed March 2016.
- <sup>25</sup> Steven Russolillo, "Google's IPO, 10 Years Later: Just 10 Stocks Beat It," *The Wall Street Journal*, August 19, 2014, <http://blogs.wsj.com/moneybeat/2014/08/19/googles-ipo-10-years-later-just-10-stocks-beat-it/>, accessed March 2016.
- <sup>26</sup> Kathleen Pender, "Google's Weak Governance Rating," *San Francisco Chronicle*, August 24, 2004, <http://www.sfgate.com/business/networth/article/Google-s-weak-governance-rating-2731010.php>, accessed March 2016.
- <sup>27</sup> Pender, "Google's Weak Governance Rating."
- <sup>28</sup> Google, Inc., "Prospectus," August 18, 2004, <https://www.sec.gov/Archives/edgar/data/1288776/000119312504143377/d424b4.htm>, accessed March 2016.
- <sup>29</sup> Erin Griffith, "Why Activist Investors are Targeting the Tech Industry," *Fortune*, July 1, 2015, <http://fortune.com/2015/07/21/activist-investors-tech-companies/>, accessed March 2016.
- <sup>30</sup> Pender, "Google's Weak Governance Rating."
- <sup>31</sup> "Google names co-founder Larry Page as new CEO," *The Guardian*, January 20, 2011, <http://www.theguardian.com/technology/2011/jan/20/larry-page-google-eric-schmidt>, accessed March 2016.
- <sup>32</sup> "Google names co-founder Larry Page as new CEO," *The Guardian*.
- <sup>33</sup> "Investors are falling out of love with Google," CNN Money, April 14, 2011, [http://money.cnn.com/2011/04/14/technology/google\\_stock/](http://money.cnn.com/2011/04/14/technology/google_stock/), accessed March 2016.
- <sup>34</sup> "Investors are falling out of love with Google," CNN Money.
- <sup>35</sup> "Investors are falling out of love with Google," CNN Money.
- <sup>36</sup> Stephen Foley, "Activist Investor Jeff Ubben Urges 'Fix' for Silicon Valley," *Financial Times*, April 23, 2014, <http://www.ft.com/cms/s/0/d4dd7dcc-ca67-11e3-bb92-00144feabdc0.html#axzz44DChVquR>, accessed March 2016.
- <sup>37</sup> Nick Summers, "Why Google is Issuing a New Kind of Toothless Stock," *Bloomberg*, April 3, 2014, <http://www.bloomberg.com/news/articles/2014-04-03/why-google-is-issuing-c-shares-a-new-kind-of-powerless-stock>, accessed March 2016.
- <sup>38</sup> Foley, "Activist Investor Jeff Ubben Urges 'Fix' for Silicon Valley."
- <sup>39</sup> Adam Satariano and Shin Pei, "Apple to Cisco Lead Record Dividends as Google Holds Out," *Bloomberg*, July 11, 2013, <http://www.bloomberg.com/news/articles/2013-07-11/apple-to-cisco-lead-record-dividends-as-google-holds-out>, accessed July 2016.
- <sup>40</sup> Page and Brin, "2004 Founders' IPO Letter."
- <sup>41</sup> Ryan Tate, "Google Couldn't Kill Its 20% Time If It Wanted To," *Wired*, August 21, 2013, <http://www.wired.com/2013/08/20-percent-time-will-never-die/>, accessed June 2016.
- <sup>42</sup> Bharat Mediratta and Julie Bick, "The Google Way: Give Engineers Room," *The New York Times*, October 21, 2007, [http://www.nytimes.com/2007/10/21/jobs/21pre.html?\\_r=0](http://www.nytimes.com/2007/10/21/jobs/21pre.html?_r=0), accessed June 2016.
- <sup>43</sup> Tate, "Google Couldn't Kill Its 20% Time If It Wanted To."
- <sup>44</sup> Laszlo Bock, *Work Rules!* (New York, NY: Hachette Book Group, 2015), p. 329.

<sup>45</sup> Bock, *Work Rules!* p. 329.

<sup>46</sup> Bock, *Work Rules!* p. 329.

<sup>47</sup> Farhad Manjoo, "How Google Became Such a Great Place to Work," *Slate*, January 21, 2013, [http://www.slate.com/articles/technology/technology/2013/01/google\\_people\\_operations\\_the\\_secrets\\_of\\_the\\_world\\_s\\_most\\_scientific\\_human.html](http://www.slate.com/articles/technology/technology/2013/01/google_people_operations_the_secrets_of_the_world_s_most_scientific_human.html), accessed June 2016.

<sup>48</sup> Manjoo, "How Google Became Such a Great Place to Work."

<sup>49</sup> Bock, *Work Rules!* p. 271.

<sup>50</sup> "How Google's Laszlo Bock Is Making Work Better," *Hidden Brain*, National Public Radio, June 7, 2016, <http://www.npr.org/templates/transcript/transcript.php?storyId=480976042>, accessed June 2016.

<sup>51</sup> Ina Fried, "Google Pulls Plug on Wave Project," *CNet*, August 4, 2010, <http://www.cnet.com/news/google-pulls-plug-on-google-wave/>, accessed June 2016.

<sup>52</sup> Bock, *Work Rules!* p. 255.

<sup>53</sup> Bock, *Work Rules!* p. 255.

<sup>54</sup> Dan Fost, "Keeping it All in the Google Family," *The New York Times*, November 12, 2008, <http://www.nytimes.com/2008/11/13/business/smallbusiness/13tree.html>, accessed June 2016.

<sup>55</sup> Alistair Barr, "Google Lab Puts a Time Limit on Innovations," *The Wall Street Journal*, March 31, 2015, <http://www.wsj.com/articles/google-lab-puts-a-time-limit-on-innovations-1427844751>, accessed June 2016.

<sup>56</sup> Robert McMillan, "Meet the Woman Launching Google's Fastest Moonshots," *Wired*, April 21, 2015, <http://www.wired.com/2015/04/regina-dugan/>, accessed June 2016.

<sup>57</sup> Barr, "Google Lab Puts a Time Limit on Innovations."

<sup>58</sup> Stan Phelps, "Cracking into Google: 15 Reasons Why More Than 2 Million People Apply Each Year," *Forbes*, August 5, 2014, <http://www.forbes.com/sites/stanphelps/2014/08/05/cracking-into-google-the-15-reasons-why-over-2-million-people-apply-each-year/2/#5a3761b3d5e6>, accessed June 2016.

<sup>59</sup> Julie Verhage, "The Companies Where Millennials Want to Work the Most," *Bloomberg*, June 24, 2015, <http://www.bloomberg.com/news/articles/2015-06-24/the-companies-where-millennials-want-to-work-the-most>, accessed June 2016.

<sup>60</sup> Verhage, "The Companies Where Millennials Want to Work the Most."

<sup>61</sup> Kristen Felicetti, "These Companies Have the Highest Starting Salaries in Tech," *Monster.com*, March 7, 2016, <http://www.monster.com/technology/a/tech-companies-salaries-compared>, accessed June 2016.

<sup>62</sup> Mediratta and Bick, "The Google Way: Give Engineers Room."

<sup>63</sup> "Our Culture," Google website, <https://www.google.com/about/company/facts/culture/>, accessed June 2016.

<sup>64</sup> Bock, *Work Rules!* p. 26.

<sup>65</sup> James B. Stewart, "Looking for a Lesson in Google's Perks," *The New York Times*, March 15, 2013, <http://www.nytimes.com/2013/03/16/business/at-google-a-place-to-work-and-play.html>, accessed June 2016.

<sup>66</sup> Vivian Giang, "Ranking America's Biggest Companies by Turnover Rate," *Slate*, July 28, 2013, [http://www.slate.com/blogs/business\\_insider/2013/07/28/turnover\\_rates\\_by\\_company\\_how\\_amazon\\_google\\_and\\_others\\_stack\\_up.html](http://www.slate.com/blogs/business_insider/2013/07/28/turnover_rates_by_company_how_amazon_google_and_others_stack_up.html), accessed June 2016.

<sup>67</sup> Giang, "Ranking America's Biggest Companies by Turnover Rate."

<sup>68</sup> Barbara Hernandez, "Despite Employee Perks, Google Has High Turnover," *NBC*, July 29, 2013, <http://tinyurl.com/gtuhpr3>, accessed July 2016.

<sup>69</sup> James Whittaker, "Why I Left Google," *Microsoft Developer Network*, March 13, 2012, [https://blogs.msdn.microsoft.com/jw\\_on\\_tech/2012/03/13/why-i-left-google/](https://blogs.msdn.microsoft.com/jw_on_tech/2012/03/13/why-i-left-google/), accessed June 2016.

<sup>70</sup> Whittaker, "Why I Left Google."

- <sup>71</sup> Patricia Sellers, "Why Powerful Women Love Google, and Why They Leave It," *Fortune*, September 10, 2015, <http://fortune.com/2015/09/10/women-of-google/>, accessed June 2016.
- <sup>72</sup> Sellers, "Why Powerful Women Love Google, and Why They Leave It."
- <sup>73</sup> Sellers, "Why Powerful Women Love Google, and Why They Leave It."
- <sup>74</sup> Miguel Heft, "Google CEO Sundar Pichai Confirms Area 120 Corporate Incubator," *Forbes*, May 19, 2016, <http://www.forbes.com/sites/miguelheft/2016/05/19/google-ceo-sundar-pichai-confirms-area-120-corporate-incubator/#786ae3d64f73>, accessed June 2016.
- <sup>75</sup> Sellers, "Why Powerful Women Love Google, and Why They Leave It."
- <sup>76</sup> Page and Brin, "2004 Founders' IPO Letter."
- <sup>77</sup> Page and Brin, "2004 Founders' IPO Letter."
- <sup>78</sup> Page and Brin, "2004 Founders' IPO Letter."
- <sup>79</sup> Steven Levy, "Google's Larry Page on Why Moonshots Matter," *Wired*, January 17, 2013, <http://www.wired.com/2013/01/ff-qa-larry-page/>, accessed February 2016.
- <sup>80</sup> Levy, "Google's Larry Page on Why Moonshots Matter."
- <sup>81</sup> Levy, "Google's Larry Page on Why Moonshots Matter."
- <sup>82</sup> University of Washington Computer Science Professor Ed Lazowska, cited in Conor Dougherty, "Hoping Google's Lab is a Rainmaker," *The New York Times*, February 16, 2015, [http://www.nytimes.com/2015/02/16/business/google-aims-for-sky-but-investors-start-to-clamor-for-profits.html?\\_r=0](http://www.nytimes.com/2015/02/16/business/google-aims-for-sky-but-investors-start-to-clamor-for-profits.html?_r=0), accessed March 2016.
- <sup>83</sup> Dougherty, "Hoping Google's Lab is a Rainmaker."
- <sup>84</sup> Jon Gertner, "What Will Alphabet Be When It Grows Up?" *MIT Technology Review*, October 2, 2015, <https://www.technologyreview.com/s/541806/what-will-alphabet-be-when-it-grows-up/>, accessed March 2016.
- <sup>85</sup> Daniel Roth, "Google's Open Source Android OS Will Free the Wireless Web," *Wired*, June 23, 2008, <http://www.wired.com/2008/06/ff-android/>, accessed June 2016.
- <sup>86</sup> Farhad Manjoo, "A Murky Road Ahead for Android, Despite Market Dominance," *The New York Times*, May 27, 2015, [http://www.nytimes.com/2015/05/28/technology/personaltech/a-murky-road-ahead-for-android-despite-market-dominance.html?\\_r=0](http://www.nytimes.com/2015/05/28/technology/personaltech/a-murky-road-ahead-for-android-despite-market-dominance.html?_r=0), accessed June 2016.
- <sup>87</sup> Manjoo, "A Murky Road Ahead for Android, Despite Market Dominance."
- <sup>88</sup> Manjoo, "A Murky Road Ahead for Android, Despite Market Dominance."
- <sup>89</sup> Paul R. La Monica, "Google to buy YouTube for \$1.65 billion," *CNNMoney.com*, October 9, 2006, [http://money.cnn.com/2006/10/09/technology/googleyoutube\\_deal](http://money.cnn.com/2006/10/09/technology/googleyoutube_deal), accessed June 2016.
- <sup>90</sup> Rolfe Winkler, "YouTube: 1 Million Viewers, No Profit," *The Wall Street Journal*, February 25, 2015, <https://www.wsj.com/articles/viewers-dont-add-up-to-profit-for-youtube-1424897967>, accessed July 2016.
- <sup>91</sup> Om Malik, "Why Google Bought Doubleclick," *Gigaom*, April 16, 2007, <https://gigaom.com/2007/04/16/why-google-bought-doubleclick>, accessed June 2016.
- <sup>92</sup> Donna Bogatim, "Google DoubleClick merger: Who wins, who loses," *ZDNet*, April 14, 2007, <http://www.zdnet.com/article/google-doubleclick-merger-who-wins-who-loses>, accessed June 2016.
- <sup>93</sup> Jon Gertner, "The Truth About Google X: An Exclusive Look Behind The Secretive Lab's Closed Doors," *Fast Company*, April 15, 2014, <http://www.fastcompany.com/3028156/united-states-of-innovation/the-google-x-factor>, accessed March 2016.
- <sup>94</sup> Brad Stone, "Inside Google's Secret Lab," *Bloomberg*, May 28, 2013, <http://www.bloomberg.com/news/articles/2013-05-22/inside-googles-secret-lab>, accessed March 2016.
- <sup>95</sup> Gertner, "The Truth About Google X: An Exclusive Look Behind The Secretive Lab's Closed Doors."
- <sup>96</sup> Gertner, "The Truth About Google X: An Exclusive Look Behind The Secretive Lab's Closed Doors."
- <sup>97</sup> Stone, "Inside Google's Secret Lab."



- <sup>98</sup> Gertner, "The Truth About Google X: An Exclusive Look Behind The Secretive Lab's Closed Doors."
- <sup>99</sup> Gertner, "The Truth About Google X: An Exclusive Look Behind The Secretive Lab's Closed Doors."
- <sup>100</sup> Gertner, "The Truth About Google X: An Exclusive Look Behind The Secretive Lab's Closed Doors."
- <sup>101</sup> TED, "The Unexpected Benefit of Celebrating Failure," YouTube, published on May 9, 2016, <https://www.youtube.com/watch?v=2t13Rq4oc7A>, accessed June 2016.
- <sup>102</sup> TED, "The Unexpected Benefit of Celebrating Failure."
- <sup>103</sup> Ashley Vance and Brad Stone, "Welcome to Larry Page's Secret Flying-Car Factories," *Bloomberg*, June 9, 2016, <http://www.bloomberg.com/news/articles/2016-06-09/welcome-to-larry-page-s-secret-flying-car-factories>, accessed June 2016.
- <sup>104</sup> Vance and Stone, "Welcome to Larry Page's Secret Flying-Car Factories."
- <sup>105</sup> "Learning Larry Page's Alphabet," *Fast Company*, March 22, 2016, <http://www.fastcompany.com/3057414/learning-larry-pages-alphabet-with-a-little-help-from-microsoft-nike-ge-facebook-and-google>, accessed March 2016.
- <sup>106</sup> "Learning Larry Page's Alphabet," *Fast Company*.
- <sup>107</sup> Rushe and Thielman, "Inside Alphabet: why Google rebranded itself and what happens next."
- <sup>108</sup> Liedtke, "Google's 2Q Signals New Era of Austerity with New CFO."
- <sup>109</sup> Robert Hof, "Why Investors Should Ignore Calico and Other Moonshots," *Forbes*, September 18, 2013, <http://www.forbes.com/sites/roberthof/2013/09/18/why-investors-should-ignore-calico-and-other-google-moonshots/#797d9d7a4814>, accessed March 2016.
- <sup>110</sup> Michelle Jones, "Google Inc. (GOOGL): Transparency Needed In CapEx," *Value Walk*, June 10, 2014, <http://www.valuewalk.com/2014/06/google-inc-googl-transparency-needed-in-capex/>, accessed March 2016.
- <sup>111</sup> Jones, "Google Inc. (GOOGL): Transparency Needed In CapEx."
- <sup>112</sup> Dougherty, "Hoping Google's Lab is a Rainmaker."
- <sup>113</sup> Conor Dougherty, "Wall Street Chafes as It Waits for Google's Projects to Pay Off," *Boston Globe*, February 16, 2015.
- <sup>114</sup> Dougherty, "Wall Street Chafes as It Waits for Google's Projects to Pay Off."
- <sup>115</sup> Barr, "Google Lab Puts a Time Limit on Innovations."
- <sup>116</sup> Alphabet, Inc., Form 10-K, p. 21, <https://www.sec.gov/Archives/edgar/data/1288776/000165204416000012/goog10-k2015.htm>, accessed February 2016.
- <sup>117</sup> Peter Nowak, "With Google Reorganizing As a Conglomerate, Amazon Should Too," *Canadian Business*, August 11, 2015, <http://www.canadianbusiness.com/blogs-and-comment/alphabet-google-amazon-conglomerate/>, accessed June 2016.
- <sup>118</sup> Farhad Manjoo, "Apple, Set to Move to Its Spaceship, Should Try More Moonshots," *The New York Times*, May 4, 2016, [http://www.nytimes.com/2016/05/05/technology/apple-set-to-move-to-its-spaceship-should-try-more-moonshots.html?\\_r=0](http://www.nytimes.com/2016/05/05/technology/apple-set-to-move-to-its-spaceship-should-try-more-moonshots.html?_r=0), accessed June 2016.
- <sup>119</sup> Julia Boorstin, "Facebook's Future: Drones, Artificial Intelligence, and Virtual Reality," *Media Money* (blog), CNBC, July 30, 2015, <http://www.cnbc.com/2015/07/30/facebooks-future-drones-artificial-intelligence-and-virtual-reality.html>, accessed June 2016.
- <sup>120</sup> Boorstin, "Facebook's Future: Drones, Artificial Intelligence, and Virtual Reality."
- <sup>121</sup> Adam Satariano, "Apple Is Getting More Bang for Its R&D Buck," *Bloomberg*, November 30, 2015, <http://www.bloomberg.com/news/articles/2015-11-30/apple-gets-more-bang-for-its-r-d-buck>, accessed June 2016.
- <sup>122</sup> Satariano, "Apple Is Getting More Bang for Its R&D Buck."
- <sup>123</sup> Manjoo, "Apple, Set to Move to Its Spaceship, Should Try More Moonshots."
- <sup>124</sup> McKinsey & Company, "Grow Fast Or Die Slow: Why Unicorns Are Staying Private," May 2016, <http://www.mckinsey.com/industries/high-tech/our-insights/grow-fast-or-die-slow-why-unicorns-are-staying-private>, accessed June 2016.

- 125 McKinsey & Company, "Grow Fast Or Die Slow: Why Unicorns Are Staying Private."
- 126 Nicole Bullock, "Technology unicorns stay shy of IPOs," *Financial Times*, February 9, 2016, <http://www.ft.com/intl/cms/s/0/85bd0034-cb2b-11e5-a8ef-ea66e967dd44.html#axzz4BrLFhyjY>, accessed June 2016.
- 127 Bullock, "Technology unicorns stay shy of IPOs."
- 128 "Ruth Porat to Join Google as Chief Financial Officer," Google press release, March 24, 2015, <http://googlepress.blogspot.com/2015/03/ruth-porat-to-join-google-as-chief.html>, accessed March 2016.
- 129 "Ruth Porat to Join Google as Chief Financial Officer," Google press release.
- 130 James B. Stewart, "Ruth Porat May Be Just What Investors Think Google Needs," *The New York Times*, July 23, 2015, <http://www.nytimes.com/2015/07/24/business/ruth-porat-may-be-just-what-investors-think-google-needs.html>, accessed June 2016.
- 131 Liedtke, "Google's 2Q Signals New Era of Austerity with New CFO."
- 132 Callie Bost, "Google Adds a Record \$60 Billion to Its Stock in One Day," *Bloomberg*, July 17, 2015, <http://www.bloomberg.com/news/articles/2015-07-17/google-appreciation-day-as-record-60-billion-is-added-to-stock>, accessed March 2016.
- 133 Alistair Barr, "Google's Share Price Hits All-Time High," *The Wall Street Journal*, July 17, 2015, <http://www.wsj.com/articles/googles-share-price-hits-all-time-high-1437141035>, accessed March 2016.
- 134 Alistair Barr, "On First Conference Call, Google's New CFO Is a Hit," *The Wall Street Journal*, July 17, 2015, <http://blogs.wsj.com/digits/2015/07/17/on-first-conference-call-googles-new-cfo-is-a-hit/>, accessed March 2016.
- 135 Titcomb, "Google and Alphabet: What does this all mean?"
- 136 Michael Dimler, "Google Teaches Investors (the) Alphabet," Morningstar Corporate Credit Research, p. 6, August 11, 2015, via Thompson Reuters, accessed February 2016.
- 137 Nic Fildes and James Dean, "Google Spells Out Future That's Easy As ABC," *The Times*, August 12, 2015, via Factiva, accessed February 2016.
- 138 "Learning Larry Page's Alphabet," *Fast Company*.
- 139 Alistair Barr and Rolfe Winkler, "Google Creates Parent Company Called Alphabet in Restructuring," *The Wall Street Journal*, August 10, 2015, <http://www.wsj.com/articles/google-creates-new-company-alphabet-1439240645>, accessed February 2016.
- 140 *G is for Google*, Alphabet website, <https://abc.xyz/>, accessed February 2016.
- 141 *G is for Google*, Alphabet website.
- 142 "What's Behind Google's Alphabet Restructuring?" Knowledge@Wharton, August 14, 2015, <http://knowledge.wharton.upenn.edu/article/googles-alphabet-reorg-can-the-whole-live-up-to-one-of-its-parts/>, accessed February 2016.
- 143 *G is for Google*, Alphabet website.
- 144 *G is for Google*, Alphabet website.
- 145 Page and Brin, "2004 Founders' IPO Letter."
- 146 Adam Satariano and Noah Buhayar, "'B Is for Buffett' in Page's Plan to Mold Google After Berkshire," *Bloomberg*, August 11, 2015, <http://www.bloomberg.com/news/articles/2015-08-11/-b-is-for-buffett-in-page-s-plan-to-mold-google-after-berkshire>, accessed March 2016.
- 147 *Fortune*, "Larry Page Talks Alphabet, Warren Buffett and Project Loon at Fortune Global Forum 2015," YouTube, published November 2, 2015, <https://www.youtube.com/watch?v=blAOPCNCszM>, accessed March 2016.
- 148 *Fortune*, "Larry Page Talks Alphabet, Warren Buffett and Project Loon at Fortune Global Forum 2015."
- 149 "Fortune Global 500: Berkshire Hathaway," *Fortune* website, <http://fortune.com/global500/berkshire-hathaway-14/>, accessed March 2016.

- 150 Carol Loomis, "Grading Berkshire after 50 years under Buffett," *Fortune*, February 28, 2015, <http://fortune.com/2015/02/28/berkshire-after-50-years/>, accessed March 2016.
- 151 Satariano and Buhayar, "'B Is for Buffett' in Page's Plan to Mold Google After Berkshire."
- 152 Satariano and Buhayar, "'B Is for Buffett' in Page's Plan to Mold Google After Berkshire."
- 153 Satariano and Buhayar, "'B Is for Buffett' in Page's Plan to Mold Google After Berkshire."
- 154 Berkshire Hathaway Inc., "Berkshire Hathaway Inc.," <http://www.berkshirehathaway.com/letters/2015ltr.pdf>, accessed March 2016.
- 155 Richard Moroney, "Not All Shares Are Created Equal," *Forbes*, July 16, 2014, <http://www.forbes.com/sites/investor/2014/07/16/not-all-shares-are-created-equal-more-multiclass-stocks-to-join-google-in-the-sp-500/#4e87b566739e>, accessed March 2016.
- 156 Matt Phillips, "A brief history of Warren Buffett's Berkshire Hathaway, as told through its giant cash pile," *Quartz*, May 4, 2015, <http://qz.com/205972/warren-buffett-berkshire-hathaway-told-through-its-giant-cash-pile/>, accessed March 2016.
- 157 "Live Blog Berkshire Hathaway's Shareholder Meeting," *DealBook* (blog), *The New York Times*, May 3, 2014, [http://dealbook.nytimes.com/2014/05/03/live-blog-berkshire-hathaways-2014-shareholder-meeting/?\\_r=0](http://dealbook.nytimes.com/2014/05/03/live-blog-berkshire-hathaways-2014-shareholder-meeting/?_r=0), accessed March 2016.
- 158 *Vanity Fair* New Establishment Summit, "Ruth Porat Shares Her Vision," October 8, 2015, <https://www.youtube.com/watch?v=Qp37xhkb8n0>, accessed March 2016.
- 159 *Vanity Fair*, "Ruth Porat Shares Her Vision."
- 160 Satariano and Buhayar, "'B Is for Buffett' in Page's Plan to Mold Google After Berkshire."
- 161 Satariano and Buhayar, "'B Is for Buffett' in Page's Plan to Mold Google After Berkshire."
- 162 Barr and Winkler, "Google Creates Parent Company Called Alphabet in Restructuring."
- 163 James Titcomb, "Google Shares Leap as Investors Welcome New Era of Transparency," *The Telegraph*, <http://www.telegraph.co.uk/technology/google/11797346/Google-shares-leap-as-investors-welcome-new-era-of-transparency.html>, August 1, 2015.
- 164 MKM Partners LLC, "Under Alphabet, G is for Google: Reorg Will Provide Transparency and Likely Valuation Boost," August 11, 2015, via Thompson Reuters, accessed February 2016.
- 165 MKM Partners LLC, "Under Alphabet, G is for Google: Reorg Will Provide Transparency and Likely Valuation Boost."
- 166 "Certificate of Incorporation," from the Alphabet website, <https://abc.xyz/investor/other/certificate-of-incorporation.html>, accessed February 2016.
- 167 Alphabet, Inc. share pricing data, October 2015, Capital IQ, Inc., a division of Standard & Poor's.
- 168 Eric Chemi, "Facebook now among the top 20 most widely held stocks," *CNBC.com*, March 4, 2016, <http://www.cnbc.com/2016/03/04/facebook-now-among-the-top-20-most-widely-held-stocks.html>, accessed June 2016.
- 169 James Detar, "Institutional Investors Bulk Up On Alphabet, Apple, Microsoft Stock," *Investors.com*, March 4, 2016, <http://www.investors.com/news/facebook-joins-top-20-big-caps-being-acquired-by-institutions/>, accessed June 2016.
- 170 Conor Dougherty, "Google Announces Stock Buyback as Earnings Rise," *The New York Times*, October 22, 2015, <http://www.nytimes.com/2015/10/23/technology/google-q3-earnings-alphabet.html>, accessed March 2016.
- 171 Dan Gallagher, "What Google's Clearer View Shows; Alphabet's transparency shines better light on Google's core business," *The Wall Street Journal*, February 1, 2016, via ProQuest, accessed February 2016.
- 172 *Fortune*, "Larry Page Talks Alphabet, Warren Buffett and Project Loon at Fortune Global Forum 2015."
- 173 *Vanity Fair*, "Ruth Porat Shares Her Vision."
- 174 *Vanity Fair*, "Ruth Porat Shares Her Vision."

- <sup>175</sup> Sam Shead, "Entrepreneurial Googlers are quitting and launching their own companies out of Google's startup space," *Business Insider*, February 26, 2016, <http://www.businessinsider.com/ex-google-staff-in-london-are-launching-startups-out-of-campus-2016-2?r=UK&IR=T>, accessed June 2016.
- <sup>176</sup> Alistair Barr, "At Google, Breathing Room for New Ideas," *The Wall Street Journal*, October 1, 2015, <http://www.wsj.com/articles/at-google-breathing-room-for-new-ideas-1443729244>, accessed June 2016.
- <sup>177</sup> Barr, "At Google, Breathing Room for New Ideas."
- <sup>178</sup> *Vanity Fair*, "Ruth Porat Shares Her Vision."
- <sup>179</sup> *Vanity Fair*, "Ruth Porat Shares Her Vision."
- <sup>180</sup> Barr, "At Google, Breathing Room for New Ideas."
- <sup>181</sup> Barr, "Google Parent to Ask Subsidiaries to Pay for Corporate Services."
- <sup>182</sup> "Alpha Minus," *The Economist*, June 11, 2016, <http://www.economist.com/news/business/21700404-alphabet-still-working-out-how-treat-its-internal-startups-alpha-minus>, accessed June 2016.
- <sup>183</sup> HD Q4 2015 Alphabet Inc. Earnings Call, Fair Disclosure Wire, February 1, 2016, via Factiva, accessed February 2016.
- <sup>184</sup> HD Q4 2015 Alphabet Inc. Earnings Call, Fair Disclosure Wire, February 1, 2016.
- <sup>185</sup> HD Q4 2015 Alphabet Inc. Earnings Call, Fair Disclosure Wire, February 1, 2016.
- <sup>186</sup> HD Q4 2015 Alphabet Inc. Earnings Call, Fair Disclosure Wire, February 1, 2016.
- <sup>187</sup> HD Q4 2015 Alphabet Inc. Earnings Call, Fair Disclosure Wire, February 1, 2016.
- <sup>188</sup> HD Q4 2015 Alphabet Inc. Earnings Call, Fair Disclosure Wire, February 1, 2016.
- <sup>189</sup> Alphabet, Inc., 2015 Form 10-K, p. 32, <https://www.sec.gov/Archives/edgar/data/1288776/000165204416000012/goog10-k2015.htm>, accessed February 2016.
- <sup>190</sup> HD Q4 2015 Alphabet Inc. Earnings Call, Fair Disclosure Wire, February 1, 2016.
- <sup>191</sup> HD Q4 2015 Alphabet Inc. Earnings Call, Fair Disclosure Wire, February 1, 2016.
- <sup>192</sup> Marcus Wohlsen, "What Google Really Gets Out of Buying Nest for \$3.2 Billion," *Wired*, January 14, 2014, <http://www.wired.com/2014/01/googles-3-billion-nest-buy-finally-make-internet-things-real-us/>, accessed March 2016.
- <sup>193</sup> "Nest Labs Introduces World's First Learning Thermostat," company press release, October 25, 2011, <https://nest.com/press/nest-labs-introduces-worlds-first-learning-thermostat/>, accessed March 2016.
- <sup>194</sup> Lohr, "Tony Fadell Steps Down Amid Tumult at Nest, a Google Acquisition."
- <sup>195</sup> Rolfe Winkler and Daisuke Wakabayashi, "Google to Buy Nest Labs for \$3.2 Billion," *The Wall Street Journal*, January 13, 2014, <http://www.wsj.com/articles/SB10001424052702303595404579318952802236612>, accessed March 2016.
- <sup>196</sup> Winkler and Wakabayashi, "Google to Buy Nest Labs for \$3.2 Billion."
- <sup>197</sup> Winkler and Wakabayashi, "Google to Buy Nest Labs for \$3.2 Billion."
- <sup>198</sup> Wohlsen, "What Google Really Gets Out of Buying Nest for \$3.2 Billion."
- <sup>199</sup> Wohlsen, "What Google Really Gets Out of Buying Nest for \$3.2 Billion."
- <sup>200</sup> Lohr, "Tony Fadell Steps Down Amid Tumult at Nest, a Google Acquisition."
- <sup>201</sup> Lohr, "Tony Fadell Steps Down Amid Tumult at Nest, a Google Acquisition."
- <sup>202</sup> Alex Hern, "Why Google is restructuring, why the name Alphabet and how it affects you," *The Guardian*, August 11, 2015, <https://www.theguardian.com/technology/2015/aug/11/google-alphabet-why-change-restructuring-what-it-means>, accessed June 2016.
- <sup>203</sup> Mark Bergen, "With \$340 million in revenue, Nest is underperforming, and its future at Google is at risk," *Recode*, March 30, 2016, <http://www.recode.net/2016/3/30/11587388/nest-2015-sales-budget>, accessed June 2016.

- <sup>204</sup> Joshua Lindenstein, "Nest To Grow Boulder Presence Separate From New Google Campus," *BizWest*, March 11, 2016, <http://bizwest.com/nest-grow-boulder-presence-separate-new-google-campus/>, accessed June 2016.
- <sup>205</sup> Maya Kosoff, "Google's Parent Company Turns up the Heat on Its Moonshots: Make Money or Else," *Vanity Fair*, March 25, 2016, <http://www.vanityfair.com/news/2016/03/google-tells-moonshots-make-money-or-else>, accessed April 2016.
- <sup>206</sup> Kosoff, "Google's Parent Company Turns up the Heat on Its Moonshots: Make Money or Else."
- <sup>207</sup> Reed Albergotti, "Inside Tony Fadell's Struggle to Build Nest," *The Information*, March 24, 2016, <http://bizwest.com/nest-grow-boulder-presence-separate-new-google-campus/>, accessed June 2016.
- <sup>208</sup> Albergotti, "Inside Tony Fadell's Struggle to Build Nest."
- <sup>209</sup> Greg Duffy, "The Dropcam Team," *Medium*, March 29, 2016, <https://medium.com/@gduffy/the-dropcam-team-b9e81f44f259>, accessed February 2018.
- <sup>210</sup> Duffy, "The Dropcam Team."
- <sup>211</sup> Alex Hern, "Revolv devices bricked as Google's Nest shuts down smart home company," *The Guardian*, April 5, 2016, <https://www.theguardian.com/technology/2016/apr/05/revolv-devices-bricked-google-nest-smart-home>, accessed April 2016.
- <sup>212</sup> Klint Finley, "Nest's Hub Shutdown Proves You're Crazy to Buy Internet Things," *Wired*, April 5, 2016, <http://www.wired.com/2016/04/nests-hub-shutdown-proves-youre-crazy-buy-internet-things/>, accessed April 2016.
- <sup>213</sup> "A letter from Revolv's Founders," Company press release, <http://revolv.com/>, accessed April 2016.
- <sup>214</sup> Hern, "Revolv devices bricked as Google's Nest shuts down smart home company."
- <sup>215</sup> Ashlee Vance, "Tony Fadell Defends His Record and Methods," *Bloomberg*, June 3, 2016, <http://www.bloomberg.com/news/articles/2016-06-03/flying-google-s-nest-fadell-defends-his-record-and-methods>, accessed June 2016.
- <sup>216</sup> Vance, "Tony Fadell Defends His Record and Methods."
- <sup>217</sup> Jack Clark, "Nest Chief Fadell Out After Tumultuous Two Years at Google," *Bloomberg*, June 3, 2016, <http://www.bloomberg.com/news/articles/2016-06-03/nest-chief-fadell-leaves-after-tumultuous-two-years-at-google>, accessed June 2016.
- <sup>218</sup> Om Malik, "Tony Fadell, Nest, and the Failure of a Middle Ground," *The New Yorker*, June 10, 2016, <http://www.newyorker.com/business/currency/tony-fadell-nest-and-the-failure-of-a-middle-ground>, accessed June 2016.
- <sup>219</sup> Wendy Lee, "Nest's New CEO Has Selling Experience," *SFGate*, June 6, 2016, <http://www.sfgate.com/business/article/Nest-s-new-CEO-has-selling-experience-7966555.php>, accessed June 2016.
- <sup>220</sup> Ingress website, <https://plus.google.com/+Ingress/posts/GVvbYZzWyTT>, accessed February 2016.
- <sup>221</sup> Wingfield, "Game Maker Niantic Adds Nintendo, Pokémon as Investors After Google Spinout."
- <sup>222</sup> Lippert and Clark, "Google to Make Driverless Cars an Alphabet Company in 2016."
- <sup>223</sup> "Johnson & Johnson Announces Formation Of Verb Surgical Inc., In Collaboration with Verily," PR Newswire.
- <sup>224</sup> Charles Piller, "Google's Bold Bid to Transform Medicine Hits Turbulence," *STAT*, March 28, 2016, <https://www.statnews.com/2016/03/28/google-life-sciences-exodus/>, accessed June 2016.
- <sup>225</sup> Piller, "Google's Bold Bid to Transform Medicine Hits Turbulence."
- <sup>226</sup> Knight, "Why Google is Selling Off Some of the Coolest Robots Ever Built."
- <sup>227</sup> Brad Stone and Jack Clark, "Google Puts Boston Dynamics Up for Sale in Robotics Retreat," *Bloomberg News*, March 17, 2016, <http://www.bloomberg.com/news/articles/2016-03-17/google-is-said-to-put-boston-dynamics-robotics-unit-up-for-sale>, accessed March 2016.
- <sup>228</sup> Stone and Clark, "Google Puts Boston Dynamics Up for Sale in Robotics Retreat."
- <sup>229</sup> Stone and Clark, "Google Puts Boston Dynamics Up for Sale in Robotics Retreat."
- <sup>230</sup> Stone and Clark, "Google Puts Boston Dynamics Up for Sale in Robotics Retreat."

<sup>231</sup> Jack Nicas, "Alphabet Dismantling Robotics Effort; Seeks Buyer for Boston Dynamics," *The Wall Street Journal*, March 23, 2016, <http://www.wsj.com/articles/alphabet-dismantling-robotics-effort-seeks-buyer-for-boston-dynamics-1458755495>, accessed March 2016.

<sup>232</sup> Nicas, "Alphabet Dismantling Robotics Effort; Seeks Buyer for Boston Dynamics."

<sup>233</sup> Jessi Hempel, "Google's Alphabet Transition Has Been Tougher Than A-B-C," *Wired*, April 1, 2016, <http://www.wired.com/2016/04/googles-alphabet-transition-tougher-b-c/>, accessed June 2016.

<sup>234</sup> James Titcomb, "Alphabet's spin-offs are struggling to repeat the Google success story," *The Guardian*, June 12, 2016, <http://www.telegraph.co.uk/technology/2016/06/12/alphabets-spin-offs-are-struggling-to-repeat-the-google-success/>, accessed June 2016.

<sup>235</sup> Heather Clancy, "Fadell's Flight Is a Sign Alphabet's Structure Is Working," *Fortune*, June 6, 2016, <http://fortune.com/2016/06/06/nest-tony-fadell-alphabet-google/>, accessed June 2016.