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Original Article

Exploration, exploitation, and mode of market entry: acquisition versus internal development by Amazon and Alphabet

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Abstract

Research on the tension between exploration and exploitation has made fundamental contributions to our understanding of firm growth via entry into new businesses. While there is consensus about the merits of balancing exploration and exploitation, there has been debate about the best means for achieving balance. In our prior analysis of firms' choices between acquisition and internal development as entry modes, we found that the role of acquisitions tends to differ inside versus outside a firm's primary business domain: firms use within-domain acquisitions largely for exploitation, while out-of-domain acquisitions support exploration. To examine these issues in greater depth, we focus here on the historical use of acquisition versus internal development by two major technology firms, Amazon and Alphabet. We show that the two firms have been remarkably different in their use of acquisitions versus internal development. Consistent with our prior analysis, Amazon has emphasized internal development but has used acquisitions to strengthen its existing businesses and to enter new products and services that were (initially) outside Amazon's primary business domain. In contrast, Alphabet has relied heavily on acquisitions to enter new businesses within its primary domain but has emphasized internal development of "moonshot" businesses outside this domain. These differences illuminate the use of acquisitions in market entry and make clear that there is no single right way to utilize acquisition versus internal development in the pursuit of balance between exploration and exploitation.

JEL Classification: L250, L860, O310, O320

1. Introduction

Research on the tension between exploration and exploitation (March, 1991) has made fundamental contributions to our understanding of firm growth via entry into new businesses. Exploration, by definition, involves efforts by an established organization to enter new businesses outside its existing business domain. Firms typically pursue exploitation by making incremental improvements to their existing businesses. However, they also pursue exploitation when they acquire businesses that fill gaps in their organizational capabilities or product lines. Most observers agree that maintaining balance between exploration and exploitation is critical to firm survival over the long run, particularly if the market environment is dynamic.

While there is consensus about the merits of balancing exploration and exploitation, prior research has pointed to a variety of approaches for achieving balance (e.g., Lavie *et al.*, 2010; Stettner and Lavie, 2014; O'Reilly III and Tushman, 2021). Most firms utilize some combination of internal development and business acquisition to achieve balance as they grow. In our prior

Table 1. Size comparison: Amazon versus Alphabet

	Amazon	Alphabet
Year founded	1994	1998
2022 financials ($billion)		
Revenue	514.0	282.8
Operating income	12.3	74.8
Total assets	462.7	365.3
Stock market capitalization ($billion) (as of February 10, 2023)	1007	1215
Number of employees (as of December 2022)	1 541 000	190 234

analysis of firms' choices between acquisition and internal development as entry modes (Lee and Lieberman, 2010), we found that the role of acquisitions tends to differ inside versus outside a firm's primary business domain; firms use within-domain acquisitions largely for exploitation, while out-of-domain acquisitions support exploration. To examine these issues in greater depth, we focus here on the historical use of acquisition versus internal development by two of the world's largest technology firms: Amazon and Alphabet.

Amazon and Alphabet (originally, Google) followed parallel yet distinct paths over the first two decades of the 21st century. The companies were founded just 4 years apart during the internet boom of the 1990s, initially with a narrow focus on, respectively, online bookselling and web search. By the early 2020s, both companies had emerged as a new breed of technology conglomerate, ranking in the top tier of the world's most successful firms. Along the way, they eclipsed the industrial conglomerates of the 20th century, including General Electric, which was in the throes of dismemberment by 2023.

The two companies are roughly comparable in size, with Amazon leading in revenue and employment, and Alphabet leading in market capitalization (see Table 1). Both have expanded into a vast array of businesses beyond their narrow origins, and they now overlap in an increasing range of markets, such as web services and consumer home devices. To accommodate its burgeoning diversification, Google was reorganized in 2015 as the largest component within a new holding company, Alphabet.[1]

The growth paths of Amazon and Alphabet were sustained through a combination of exploration and exploitation, as the companies entered new businesses and improved their existing operations. Despite their comparable size and growth, the companies have differed markedly in their emphasis on, and use of, acquisitions versus internal development. Alphabet has been far more reliant on acquisitions, which have served almost exclusively as Alphabet's method for establishing new businesses within Google's primary domain and for gradually extending that domain. Amazon, meanwhile, has been far more reliant on internal business development. One distinctive feature of Amazon has been its success in creating major new businesses (such as Amazon Web Services [AWS]) in which Amazon "rents" to outside parties key organizational capabilities that Amazon developed initially to improve its own operations.

Figure 1 shows that Alphabet has acquired companies at nearly three times the rate of Amazon. We argue that Alphabet has been extraordinary, and perhaps unique, in the way it uses acquisitions to expand into new businesses, extending the company's primary domain. In fact, Alphabet has often made *multiple* acquisitions in quick succession, integrating the acquired companies with each other and with Alphabet's preexisting internal efforts. The vast majority of Alphabet's acquisitions have been small- and medium-size companies; conversely, although Amazon has made fewer acquisitions overall, it has utilized *large* acquisitions to enter businesses that stretch the company beyond its existing primary domain.[2]

1 Alphabet continues to use the name Google for its core set of businesses. We refer to the company as Alphabet, except when discussing its actions prior to 2015.

2 By way of comparison, Apple, another tech giant that has emphasized internal development, maintained a rate of business acquisition almost identical to Amazon's. From 2002 to 2022, Apple made 108 acquisitions, compared to 113 for Amazon and 253 for Alphabet.

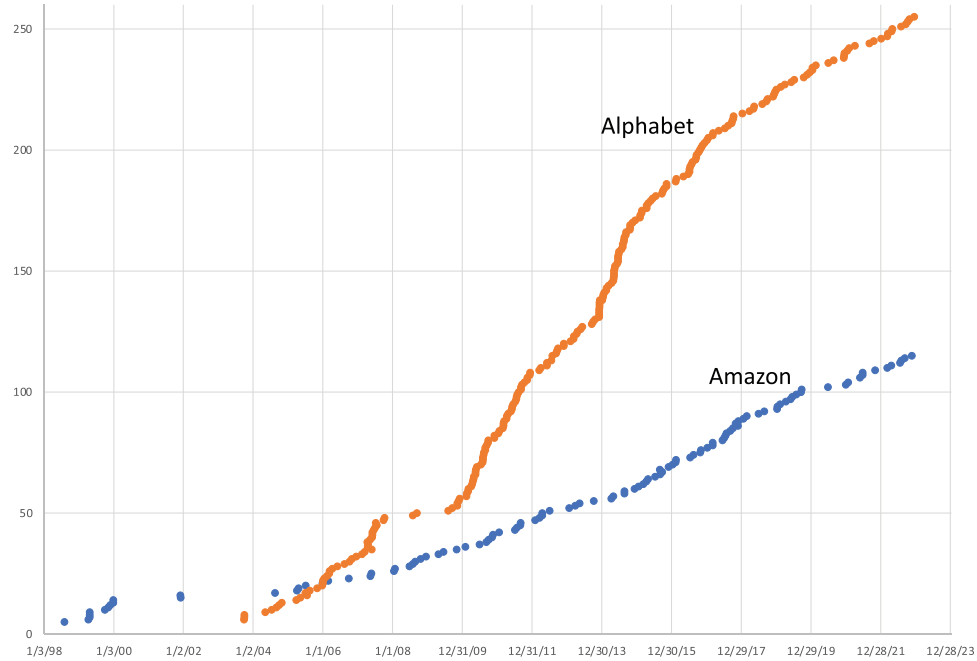

Figure 1. Cumulative count of acquisitions made by Amazon and Alphabet

These contrasts between Amazon and Alphabet help illuminate and extend our earlier work (Lee and Lieberman, 2010) on the dynamics of firms' expansion and their choice between acquisition and internal development as entry modes. It is well known that these two entry modes have advantages and disadvantages. Acquisitions typically enable the firm to enter a new domain faster and with less business risk, given that the acquired firm is an established entity. On the other hand, acquisitions incur integration risk, and they may be more costly than internal development because an acquisition premium is normally paid (Puranam and Vanneste, 2016, Chapter 6). Our prior study goes beyond such generic factors by making a conceptual and empirical distinction between entries inside versus outside a firm's primary business domain. We argue that inside the primary business domain, the firm is likely to track potential acquisition opportunities and may act opportunistically when a candidate becomes available to widen the firm's product line or fill resource gaps. Outside this domain, the firm may expand along a path that stretches the corporate enterprise in new directions, and acquisitions can be used to extend this path.

Thus, according to Lee and Lieberman (2010), we argued that the choice between acquisition and internal development is likely to follow a different logic inside versus outside the firm's primary business domain. Inside a firm's primary business domain, acquisitions are used to fill persistent gaps near the firm's existing products, whereas outside that domain, acquisitions are used to extend the corporate enterprise. Using a fine-grained dataset on 1719 entry events by 163 public companies over 15 years in the telecommunications sector, our empirical findings provide support for these propositions. One interpretation of our prior findings is that "within the primary business domain acquisitions are used largely for exploitation, whereas outside this domain they support exploration by the firm" (Lee and Lieberman, 2010: 156).

We demonstrate that Amazon's acquisition behavior has been mostly consistent with our prior findings. Amazon has used acquisitions in two main ways: (i) to strengthen businesses once they had been established by Amazon through internal development and (ii) to enter new businesses that were located (at least initially) outside Amazon's primary domain. By comparison, Alphabet's choices between acquisition and internal development have been more idiosyncratic. Alphabet has emphasized entry via acquisition (often combining multiple acquisitions) within and proximate to its primary domain. Remarkably, Alphabet has used internal development to

establish a constellation of radically innovative and risky ventures ("moonshots") outside its primary domain. Alphabet's distribution of acquisition versus internal development is in many ways opposite of the general pattern we found in our prior study.

Such contrasts between Amazon and Alphabet make clear that there is no single right way to utilize acquisition versus internal development in the pursuit of balance between exploration and exploitation. Both companies have succeeded despite having fueled their diversification and growth in very different ways. We cannot predict the future, but corporate behavior tends to be persistent, and it seems likely that each firm will continue to use acquisition and internal development in a manner resembling its past behavior.

Obviously, a study comprising two extraordinary companies cannot be viewed as representative. Even so, the pattern demonstrated by Amazon serves to extend our 2010 study by providing detail on how the processes we identified using a statistical sample play out in a specific case. Alphabet is the more unusual case and perhaps unique as a counterexample. Taken together, our comparison of the two companies provides an "existence proof" that different modes of entry can lead to similar levels of corporate growth.

In the next section, we briefly review the literature on exploration versus exploitation as it relates to market entry. Then, starting with Amazon, we describe the evolution of the two companies and their reliance on internal development versus acquisition. We conclude by drawing further comparisons between Amazon and Alphabet in the context of the literature on exploration and exploitation.

2. Internal development and acquisition as modes for balancing exploration and exploitation

The tension between exploration and exploitation poses a fundamental problem for firm growth. For a firm to grow and survive over the long run, it needs to engage in both processes, yet the two have conflicting demands. The conflict is rooted in the difference in their pay-offs, the timing in generating returns, and the sources of productivity. Compared to pay-offs from exploration, pay-offs from exploitation are more certain, reaped sooner, and easier to achieve. In addition, exploiting what is known generates immediate returns; exploring what is unknown increases the odds of generating future returns. Moreover, their sources of productivity are characteristically different. Whereas stability is what drives the productivity from exploitation, flexibility is what drives the productivity from exploration. As such, balancing exploration and exploitation is not trivial. It is akin to balancing the conflicting demands for long-term adaptability and short-term efficiency (Tushman and O'Reilly III, 1996; Rivkin and Siggelkow, 2003; Smith and Tushman, 2005). It is also akin to balancing the possibility of superior alternatives with the wisdom of current practices (Levinthal, 2021).

Prior research has pointed to a variety of organizational approaches for achieving balance (e.g., Lavie *et al.*, 2010; Stettner and Lavie, 2014; O'Reilly III and Tushman, 2021). These approaches can be classified according to four mechanisms for coping with the conflicting demands of exploration and exploitation: (i) organizational separation (creating highly differentiated units where each unit exhibits internal consistency in tasks, culture, and organizational arrangements, but across units, tasks and cultures are inconsistent and loosely coupled); (ii) temporal separation (transiting sequentially between exploration and exploitation); (iii) domain separation (specializing in either exploration or exploitation within a given domain); and (iv) no separation (nurturing a supportive context for ambidexterity: an approach for simultaneously exploring and exploiting).

Internal development and acquisition can be combined in many ways to achieve balance. Firms typically engage in both but emphasize one mode more than the other. Depending on context, internal development can promote exploration or exploitation—and the same is true for acquisition. Internal efforts to refine products or services, fill product-line gaps, or improve operational capabilities are, essentially, exploitation, whereas the internal development of fundamentally new businesses is exploration. Similarly, firms make acquisitions to fill gaps or to improve capabilities (exploitation), and firms acquire businesses that operate in markets far from their current

core (exploration). There is no unique mapping that connects acquisition and internal development with exploration on the one hand versus exploitation on the other hand. The modes can be variably combined to create a broad palette for corporate growth.

In this vein, O'Reilly III and Tushman (2021) declare that there is no single right answer for scaling a new venture. All modes—acquisition, internal development, and alliances—can be used to meet the needs of the new venture. Quite opposite from Stettner and Lavie (2014), O'Reilly III and Tushman (2021) do not specify what level of balance between exploration and exploitation would be appropriate or should be achieved by balancing across distinct modes. Rather, they emphasize the balance in doing what is needed to achieve revenue growth without excessive costs. They assert that the firms that are best at scaling use all options to meet the needs of the new venture in adding capital, customers, capacity, and capability fast enough to maximize the market opportunity.

3. Amazon

Amazon was founded in 1994 as an online bookseller. Since then, it has evolved into one of the most diversified consumer-oriented companies on Earth. Amazon has been remarkable in the speed and extent of its diversification, as well as the degree to which its new business entries have been made via internal development (O'Reilly III and Tushman, 2021). Even so, during its history, Amazon has also made numerous acquisitions. Its acquisition behavior fits a pattern consistent with our 2010 study, with acquisitions being "used to fill persistent gaps near the firm's existing products," as well as "used to extend the enterprise in new directions" outside the company's current primary business domain.

Table 2 shows the major businesses that Amazon entered from 1994 to 2022. Following its early days as an online bookseller, Amazon's business domain evolved rapidly, and its boundary continues to expand. Given Amazon's steady growth, there is some ambiguity about what might be considered inside versus outside the company's primary business domain. Indeed, it would be hard to characterize Amazon today as a company with just a single core business. According to Amazon's 2022 annual report, the company's operations are organized into three segments: North America, International, and AWS. (The company avoids providing a more detailed breakdown of its numerous businesses.) We suggest that Amazon can be viewed as a firm with three major business domains in 2023—Amazon Marketplace (the historical core), Amazon Prime Membership (including an extensive range of consumer services beyond Amazon Marketplace), and AWS, which serves commercial customers. In 2023, the Amazon Marketplace and AWS domains are reasonably distinct and well defined. (Notably, AWS originated as an internal operation serving Amazon Marketplace). The domain defined by Amazon Prime gives a more holistic perspective on the company, given that a wide range of businesses fit under the Prime umbrella. These perspectives suggest that rather than formally defining the core versus periphery of Amazon, it may be instructive to simply distinguish the set of established businesses within the company. By this definition, entries outside the company's primary domain would be businesses that were, at least initially, less related to Amazon's established operations. (Amazon's entries into brick-and-mortar grocery retailing and primary health care are two such examples.)

Many projects at Amazon began as incremental improvements to existing businesses that morphed into new businesses in cloud services, third-party fulfillment, logistics, retail sales, and consumer technology. Table 2 shows that Amazon entered most of its businesses via internal development rather than via acquisition. From Amazon Marketplace, warehousing and distribution logistics developed further into Amazon's online platform and Amazon Prime Membership. AWS, which originated from internet storage serving Amazon, provides information technology (IT) infrastructure services to businesses and for developers to access cloud computing. AWS offers machine-learning services and supports cloud infrastructure, putting machine-learning algorithms in the hands of every developer, data scientist, and expert practitioner. While most companies endeavor to keep their organizational and technological capabilities proprietary, Amazon has profited by developing new businesses that enable the company to rent its capabilities to outside parties, with AWS, Amazon Marketplace, and Fulfillment by Amazon serving as the most prominent examples.

Table 2. Major businesses entered by Amazon (by year and mode of entry), 1994–2022

Entry year	Business description (name)	Internal development	Acquisition
Online retail			
1994	Books	X	
1998	Music and video	X	
1999	Auctions[a]	X	
2000	Third-party sellers (Amazon Marketplace)	X	
2007	Grocery delivery (Amazon Fresh)	X	
2018	Pharmacy (PillPack)		X
Online retail—Non-US geographic markets			
Various	Europe	X	
2004	China		X
2013	India	X	
2017	Middle East (Souq)		X
Physical retail stores			
2015	Books	X	
2018	Checkout-free shopping (Go)	X	
2017	Groceries (Whole Foods)		X
2020	Checkout-free grocery store (Fresh)	X	
Consumer electronics			
2007	e-Reader (Kindle)	X	
2011	Tablet computer (Kindle Fire)[a]	X	
2014	TV set-top box (Fire TV)	X	
2014	Smartphone (Fire Phone)[a]	X	
2014	Smart speaker (Echo)	X	
2018	Home security (Ring)		X
2022	Home robotics (iRobot)		X
Digital content			
2006	Video	X	
2007	Music	X	
2007	e-Books (Kindle Store)	X	
2009	Publishing	X	
2010	Movie production (Amazon Studios)	X	
Digital services			
2002	AWS	X	
2005	Membership Bundle (Amazon Prime)	X	
Games			
2012	Video games (Amazon Game Studios)	X	
2020	Cloud-gaming service (Luna)	X	
Health care			
2019	Employee health care (Amazon Care)	X	
2022	Concierge primary care (One Medical)		X

[a]Business was subsequently exited by Amazon.
https://en.wikipedia.org/wiki/Amazon_(company).
https://en.wikipedia.org/wiki/List_of_Amazon_products_and_services.
AWS, Amazon Web Services.

Amazon's branching evolved over three phases. Phase 1 was Amazon's expansion from a bookstore to an online superstore between 1994 and 2000. Phase 2 was Amazon's expansion in becoming an online platform between 2000 and 2005, offering goods from third-party sellers as well as from its own holdings. Phase 3 was Amazon's expansion in becoming a cloud computing company, in parallel with Amazon's entry into a broad range of new services and products under the umbrella of Amazon Prime, a subscription bundle offered to consumers.

From its roots as an online bookstore, Amazon became an "everything store" (Stone, 2013). Although most of Amazon's growth across retail product categories was achieved through internal development and partnerships with outside retailers selling on the Amazon Marketplace platform, Amazon increasingly resorted to acquisitions to fill persistent product and capability gaps or to take advantage of unique expansion opportunities, as shown in Table 3. Table 3 lists

Table 3. Major acquisitions by Amazon[a]

Company name	Business description	Gap-filling?	Domain extending?	Purchase price ($million)	Acquisition date
Zappos	Shoes	x		1200	November 2, 2009
Quidsi	Diapers	x		545	November 8, 2010
Kiva Systems	Factory robotics	x		775	March 19, 2012
Twitch Interactive	Video game streaming		x	970	August 25, 2014
Whole Foods Market	Groceries		x	13 700	June 16, 2017
Souq.com	Regional online retail		x	580	July 3, 2017
Ring	Home security		x	839	February 27, 2018
PillPack	Pharmacy		x	753	June 28, 2018
Zoox	Autonomous vehicles	x	x	1200	June 26, 2020
MGM Studios	Movie library	x		8450	May 26, 2021
One Medical	Health care		x	3900	July 21, 2022
iRobot	Consumer robots		x	1700	August 5, 2022

[a]Acquisitions with a purchase price exceeding $500 million, prior to March 2023.
https://en.wikipedia.org/wiki/List_of_mergers_and_acquisitions_by_Amazon. Accessed February 10, 2023.

Amazon's largest acquisitions, those with a purchase price exceeding $500 million. These acquisitions, which began about 15 years after Amazon's founding, were focused initially on gap-filling but soon shifted toward domain extending.

Most of Amazon's initial major acquisitions were intended to fill gaps in Amazon's line of retail products, its operational capabilities, or its geographic reach. These acquisitions included Zappos (2009) and Quidsi (2010), both online retailers specializing in key product categories (shoes and diapers, respectively) that had proven challenging for Amazon. In 2012, Amazon acquired Kiva Systems to provide much-needed robotics and inventory management technology that Amazon had struggled to develop internally. While Amazon was successful in applying its own internal efforts to develop a footprint in online retail spanning much of the world, it resorted to acquisitions in China (acquiring Joyo.com in 2004) and the Middle East (acquiring Souq.com in 2017).

Other large acquisitions were designed to stretch the company beyond conventional e-commerce. The acquisition of Twitch Interactive in 2014 brought Amazon into the domain of video game livestreaming (and into competition with Google's YouTube and online gaming companies). Amazon's 2017 acquisition of Whole Foods—at a purchase price of $13.7 billion, Amazon's largest acquisition ever—put the company into brick-and-mortar retailing of groceries, extending Amazon's domain beyond its Amazon Fresh grocery delivery service, which the company developed internally. (By 2022, Amazon had started to link Whole Foods with the automated checkout technology of its Amazon Go stores to transform Amazon Fresh into a high-tech entrant in the brick-and-mortar grocery space.) With the acquisition of Ring in 2018, Amazon entered the home security market, and the acquisition of iRobot in 2022 gave Amazon an instant presence in the home robotics market. In health care, the acquisition of PillPack in 2018 made Amazon a significant player in the pharmacy prescription market; 4 years later, Amazon entered primary care with its acquisition of One Medical, which replaced a fledgling internal development effort. These acquisitions of established industry players gave Amazon an instant presence in a wide range of new product and service categories.

Some of Amazon's more recent acquisitions can be classified as gap-filling. MGM Studios augments Amazon Studios with a major historical film library, enabling Amazon Video to compete more effectively in video streaming. Zoox, acquired in 2020, put Amazon on the map in the

emerging autonomous vehicle industry, positioning the company to incorporate Zoox's technology into its own delivery vehicles, as well as creating a direct pathway for Amazon to enter the autonomous vehicle market as a service provider.

Much of Amazon's recent growth has involved incorporating artificial intelligence (AI). Here, Amazon has closely integrated acquisitions with its own internal development efforts. From AWS, Intelligent Assistant created a branch of new businesses. Amazon Lab126 started to work on speech analysis in the early 2011. This is the same lab that created Kindle, Fire Phone, and other devices. Intelligent assistant Alexa, a voice interface powered by cloud computing, is an application of AI to natural language processing. Alexa's "voice skills" enable end users to use speech to shop (e.g., on Amazon Marketplace) and to interact with many applications developed by third parties for its many devices. Alexa's voice skills also provide software as a service that can interface with many devices, from car dashboards to consumer wearables. For example, Amazon Lex, the natural language processing inside Alexa, is an AWS service used for creating conversational interfaces for applications (conversational AI for chatbots).[3] Third-party developers pay Amazon for accessing the voice skills that are a part of Alexa Voice Services (AVS), thus fortifying Amazon's AWS business ecosystem.

In using acquisitions to amplify the exploitation of AVS, Amazon acquired AI that had been developed by Yap, Evi, and Graphiq as well as text-to-speech software developed by Ivona Software to improve Amazon Echo's voice response more quickly. Amazon also acquired AI developed by Orbeus and harvest.ai to amplify the exploitation of AWS. In addition to its AI-related acquisitions, Amazon acquired 16 companies to integrate with AWS.[4] Thus, in recent years, Amazon has relied heavily on acquisitions to bulk up its AI capabilities and augment AWS. The company's recent pursuit of multiple, smaller acquisitions—integrating them with Amazon's internal operations—shows resemblance to Alphabet's playbook.

In his shareholder letter recapping 2016, Bezos explained Amazon's AI strategy: "At Amazon, we've been engaged in the practical application of machine learning for many years now. Some of this work is highly visible: our autonomous Prime Air delivery drones; the Amazon Go convenience store that uses machine vision to eliminate checkout lines; and Alexa our cloud-based AI assistant….But much of what we do with machine learning happens beneath the surface. Machine learning drives our algorithms for demand forecasting, product search ranking, product and deals recommendations, merchandising placements, fraud detection, translations, and much more. Though less visible, much of the impact of machine learning will be of this type – quietly but meaningfully improving core operations. Inside AWS, we're excited to lower the costs and barriers to machine learning and AI so organizations of all sizes can take advantage of these advanced techniques."

4. Alphabet

Launched in 1998 as an internet search engine, Google expanded into a range of web-based businesses that are mostly monetized through advertising. Compared with Amazon, Google has relied more heavily on acquisitions. To better manage the growing complexity of its businesses, Google was reorganized in 2015 as the main element within a larger holding company, Alphabet.

Table 4 shows Alphabet's business holdings as of late 2022. Other than Google (which is by far the largest subsidiary of Alphabet), the 2022 subsidiaries include X Development (formerly GoogleX, an incubator for moonshot technologies) and CapitalG, a venture capital fund. Other Alphabet subsidiaries include Google Fiber (providing internet access via optical fiber), DeepMind (Alphabet's critical acquisition in the field of AI), and a large set of moonshot businesses. The latter include Waymo (autonomous driving), Wing (drone-based freight delivery), and Calico (anti-aging), as well as more recent businesses spun out from X Development, such as Verily (human health), Intrinsic (robotics software), and Mineral (sustainable agriculture).

3 https://aws.amazon.com/lex/?p=ft&c=ml&z=3.

4 These acquisitions include Amiato in 2014; 2lemetry, ClusterK, AppThwack, Safaba Translation Systems, and Orbeus in 2015; NICE, Emvantage Payments and Cloud9 in 2016; harvest.ai, IDE, Thinkbox Software, and Do.com in 2017; Sqrrl in 2018; CloudEndure and E8 Storage in 2019; and Wickr in 2021.

Table 4. Main Alphabet business holdings in 2022

Subsidiary	Business description	Start date	Acquisition?
Google	Internet services	1998	
GV	Venture capital for technology companies	2009	No
Waymo	Autonomous driving	2009	No
X Development	Incubator for "moonshot" technologies	2010	No
Google Fiber	Internet access via optical fiber	2012	No
Wing	Drone-based delivery of freight	2012	No
Calico	Human health (by overcoming aging)	2013	No
CapitalG	Private equity for growth-stage technology companies	2013	No
DeepMind	AI	2014	Yes
Verily	Human health	2015	No
Intrinsic	Robotics software	2021	No
Isomorphic Labs	Drug discovery	2021	No
Mineral	Sustainable agriculture	2023	No

Source: https://en.wikipedia.org/wiki/Alphabet_Inc.
AI, Artificial intelligence.

Except for DeepMind, these businesses were all internally developed within Google/Alphabet. As the term *moonshot* implies, they are high-risk ventures with enormous potential; as of this writing, none had yet proven commercially successful. According to Alphabet's 2015 Form 10-K (item 1), these businesses "generally are pretty far afield of our main Internet products.… our goal is for them to become thriving, successful businesses in the long term."

Since its founding, Google has expanded to offer a vast array of internet-related products and services. Table 5 shows the main Google businesses as of late 2022. For reporting purposes, Google (as a subsidiary within Alphabet) is organized into two segments: Google Services and Google Cloud. Google Services' products and platforms include ads, Android, Chrome, hardware, Gmail, Google Drive, Google Maps, Google Photos, Google Play, Search, and YouTube. Google Cloud consists of Google Cloud Platform (a competitor to Amazon's AWS) and Google Workspace, a set of collaboration tools.

As a subsidiary of Alphabet, Google serves as Alphabet's core collection of businesses for organizing information and providing universal access to information. Google originated with internet search in 1998, adding advertising 2 years later, followed in the mid-2000s by Gmail, Social Networking (Google released a series of products, including Orkut, Google Friend Connect, Google Buzz, and Google+, all of which it abandoned), Maps, Android, and YouTube. The Google Services segment generates revenue by showing ads alongside relevant search results on Google.com and other products, including Maps, YouTube, and Android. Additional revenue comes from apps and in-app purchases, digital content products, hardware, and fees received for subscription-based products such as YouTube Premium and YouTube TV. The Google Cloud segment generates revenue from Google's infrastructure and platform services, while Google Workspace offers collaboration tools and other services for enterprise customers.

Google serves as the profitable core that supports the constellation of diverse and risky technology-based startups at the periphery of the Alphabet umbrella. Alphabet's profitability is driven by a subset of businesses within Google—principally, the Android app store, as well as Internet search and YouTube, both of which are monetized by advertising (Dotan, 2022). Remarkably, the company has chosen internal development as the mode to establish its substantial set of disparate moonshot businesses. This choice and the holding company organizational structure supporting it are highly unusual, even within the tech sector. Moreover, the technological distance between Google's core and many of Alphabet's business holdings (e.g., Waymo, Calico, and Wing) is far greater than anything seen at Amazon. Alphabet's strategy has been to focus on exploitation within its highly profitable core businesses in order to fund: (i) expansions of the core, mostly by incorporating acquisitions within Google, and (ii) the constellation of internally developed moonshot ventures.

Within its primary domain, Google is distinctive not only for relying heavily on acquisitions to enter new business areas but also for the way it integrates these entry acquisitions with internal

Table 5. Main Google businesses in 2022[a]

	Year introduced	Notes
Google Services		
Search	1998	
Advertising	2000	
Gmail	2004	
Social networking	2004	[b]See below
Google Maps	2004	Acquisition (Where 2 Technologies)
Android	2005	Acquisition (Android)
YouTube	2006	Acquisition (YouTube)
Google Play	2008	Originally Android Market
Chrome	2010	
Google Drive	2012	
Google Photos	2015	Spun off from Google+ in 2015
Hardware	Various	Mostly acquisitions
Google Cloud		
Google Workspace	2006	
Google Cloud Platform	2008	

[a]Alphabet's 2021 10-K Report states that:
For reporting purposes, Google comprises two segments: Google Services and Google Cloud.
Google Services' core products and platforms include ads, Android, Chrome, hardware, Gmail, Google Drive, Google Maps, Google Photos, Google Play, Search, and YouTube.
Google Cloud Platform enables developers to build, test, and deploy applications on its highly scalable […] infrastructure.
Google Workspace collaboration tools—(part of Google Cloud) which include apps like Gmail, Docs, Drive, Calendar, Meet, and more—are designed with real-time collaboration and machine intelligence to help people work smarter.
[b]Social networking businesses were discontinued in 2019. Google+ (introduced in 2011) was the company's fourth entry into social networking. Previous entries included Google Buzz (introduced 2010, retired in 2011), Google Friend Connect (introduced 2008, retired by March 2012), and Orkut (introduced in 2004).
Sources:
Alphabet Inc. Form 10 K 2021.
https://en.wikipedia.org/wiki/Alphabet_Inc.
https://en.wikipedia.org/wiki/List_of_Google_products.
https://en.wikipedia.org/wiki/Google%2B.
https://en.wikipedia.org/wiki/Google_Photos.
https://en.wikipedia.org/wiki/Google_Drive.
https://en.wikipedia.org/wiki/Google_Workspace.

elements of the company. Table 5 shows that Google's entries into Maps, Android, and YouTube were made via acquisitions. As mentioned before, Google has gone beyond simple acquisition to develop its own distinctive mode of entry, which connects the companies it acquires with Google's own internal resources. Often, it acquires a series of related companies to integrate in quick succession.

Google Maps, a web-based mapping platform and consumer application, is a good example. Google Maps began as a C++ desktop program developed by Lars and Jens Rasmussen, Noel Gordon, and Stephen Ma at Where 2 Technologies, which Google acquired in October 2004. That same month, Google acquired the geospatial data visualization company Keyhole (whose main product became Google Earth), having also acquired a company with a real-time traffic analysis program, ZipDash, in September 2004. To create Google Maps, which was launched in February 2005, Google converted Where 2 Technologies' desktop program into a web platform and then integrated it with technology from Keyhole and ZipDash.

According to Geis (2015: ix), in sharp contrast to its rivals, Google engaged in "an unprecedented level and type of M&A activity. [… E]arly in the company's existence, a playbook for M&A activity was established, and this pattern became a core element of Google's success." Compared with most companies, Google has been remarkably successful with its acquisitions, which Geis (p. 12) attributes to Google's "organizational learning relating to how to create revenue synergy that blends existing with newly acquired resources." Geis dubbed this distinctive style of acquisition integration by the term, "semi-organic growth."

Google hit upon this process early in its history. While it made a few early acquisitions in social networking and search, the company's first critical acquisition was Applied Semantics in 2003,

which gave Google a powerful technology (AdSense) for placing advertising on its search engine. According to Geis (p. 20), "Google amalgamated ASI's people, technology and other assets with its own and achieved a massive revenue acceleration in context-based advertising." Google gained employees with experience in contextual advertising and an engineering team with its own unique ideas and methods of powering contextual ads, as well as a few existing partnerships.

This acquisition was Google's most important in its early years. As the company's co-founder, Sergey Brin, stated, "This acquisition will enable Google to create new technologies that make online advertising more useful to users, publishers, and advertisers alike" (Google, 2003). With The Applied Semantics acquisition, Google broke out of search and onto the wider Web with contextual targeting, developing the fundamental algorithm that automatically targets ads based on internet viewers and site content.

This highly successful acquisition established a pattern within Google of integrating acquisition targets with its own preexisting operations, combining human and technological resources to grow the company. Expansion in the advertising space followed. Google acquired banner-ad specialist DoubleClick in 2007 and, 2 years later, the mobile advertising platform AdMob, which supports Android, iOS, webOs, Windows Phone, and all standard mobile web browsers. A Google spokesperson noted that "Our acquisitions over the years have spurred investment, accelerated innovation and growth and benefited consumers. The vast majority of our acquisitions are smaller technology companies that we've invested in to help them grow faster, at lower cost" (Alcantara *et al.*, 2021).

Following these acquisitions, Google continued to bulk up in the advertising space (Geis, 2015: 68–70). In 2009, it acquired Teracent, a developer of data-driven advertising optimization technology. The following year, it acquired Invite Media, which had developed a demand-side platform to help ad buyers navigate high-volume display advertising exchanges. In 2011, it acquired Admeld, a provider of advertising network optimization technology. In 2014, Google acquired Spider.io, which had developed technology to identify and weed out fraudulent clicks on online ads, and mDialog, which had developed technology to manage and deliver video advertising across a range of products. All these acquisitions helped Google to better monetize its advertising across the company's growing set of properties in internet search, video, and other services. According to March's (1991) terminology, these acquisitions can be viewed as moves to better "exploit" its advertising franchise.

Other Google acquisitions expanded the domain of the company and, as such, are clearly classifiable as "exploration." Table 6 lists the Google/Alphabet acquisitions with a purchase price exceeding $500 million. Several of these acquisitions pushed the company into new domains, including YouTube (video sharing), Motorola Mobility (mobile devices), Nest Labs (home automation), DeepMind (AI), and Fitbit (wearables). Other large acquisitions might be judged as "exploitation" or gap-filling. Three (Apigee, Looker, and Mandiant) supported Google Cloud, one (Postini) supported Gmail, and the partial acquisition of HTC provided intellectual property to support Google's Pixel phones and other products.

Interestingly, for a company whose acquisition count is more than twice that of Amazon, Alphabet's list of acquisitions exceeding $500 million in Table 6 is only slightly longer (15 companies) than the comparable Amazon list (12 companies; see Table 3). Moreover, Alphabet spent $36.7 billion on these acquisitions, only slightly more than the $34.6 billion Amazon paid for its major acquisitions shown in Table 3. These numbers imply that the targets acquired by Google/Alphabet were disproportionately medium-size and small companies. Figure 2 illustrates the timing of Google's acquisitions across 10 major business areas. In a few cases (e.g., YouTube and Android), the company entered a new business area via a single acquisition. In other cases (e.g., Maps and Robotics), the company made a series of acquisitions in quick succession and then combined them to enter a new business area. In this way, the company used acquisition to explore new business areas. Even so, most of the acquisitions shown in Figure 2 served to augment existing operations, i.e., they helped to better "exploit" Google's established businesses.

In August 2005, for example, Google acquired Android, thereby obtaining a platform for entering the emerging smartphone industry. (Apple released the first iPhone in 2007.) Over the next decade, Google acquired more than 30 additional companies to reinforce its position with Android in what soon became an important market area. The YouTube acquisition in October

Table 6. Major acquisitions by Google/Alphabet[a]

Company name	Business description	Used with	Purchase price ($million)	Acquisition date
YouTube	Video sharing		1650	October 9, 2006
DoubleClick	Online advertising	AdSense	3100	April 13, 2007
Postini	Communications security	Gmail	625	July 9, 2007
ITA Software	Travel technology	Google Flights	676	April 12, 2011
Motorola Mobility	Mobile-device manufacturer	Android	12 500	August 15, 2011
Waze	GPS navigation software	Google Maps	966	June 11, 2013
Nest Labs	Home automation		3200	January 13, 2014
DeepMind	AI		625	January 26, 2014
Dropcam	Home monitoring	Nest Labs	555	June 20, 2014
Apigee	Application programming interface (API) management/analytics	Google Cloud	625	September 8, 2016
HTC (portions)	Intellectual property licenses	Google Pixel	1100	September 21, 2017
Looker	Big data, analytics	Google Cloud	2600	June 6, 2019
Fitbit	Wearables	Wear OS	2100	January 14, 2021
Mandiant	Cybersecurity	Google Cloud	5400	March 8, 2022
Raxium	AR hardware		1000	March 16, 2022

[a]Acquisitions with a purchase price exceeding $500 million, prior to March 2023.
Source:
https://en.wikipedia.org/wiki/List_of_mergers_and_acquisitions_by_Alphabet.
AI, Artificial intelligence.

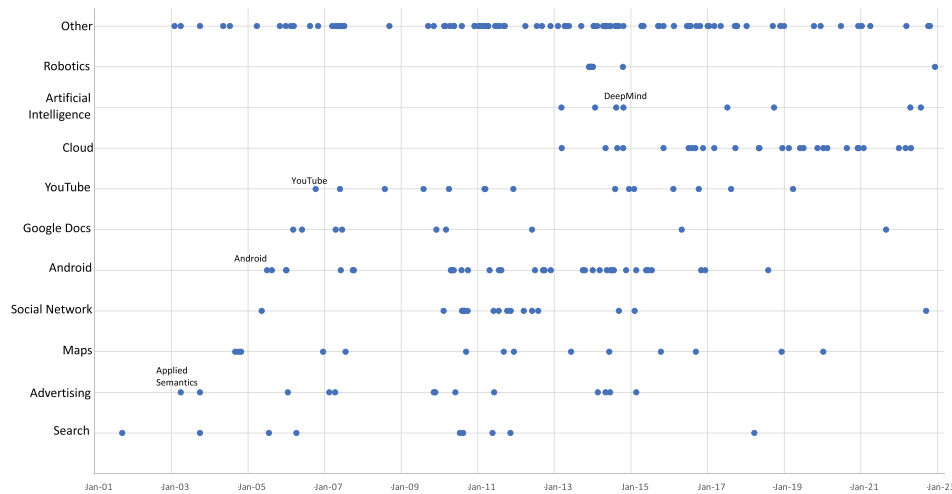

Figure 2. Alphabet acquisitions by business type and year

2006 enabled Google to enter the online video market. Google has since acquired more than a dozen additional companies to support its YouTube franchise.[5]

By successfully entering four key business areas—advertising, maps, phones, and video (of which three were entered via acquisition)—Google had, by 2006, assembled a powerful set of businesses to complement its original franchise in internet search. Google continued to grow these

5 These acquisitions included Omniso, a provider of online video services (2008); On2 Technologies, a provider of video compression/decompression software (2009); Episodic, whose platform helped publishers and marketers stream and analyze video content (2010); Green Parrot Pictures, a developer of video and image manipulation tools (2011); Next New Networks, a curator of online content for advertisers (2011); and Rights Flow, which tracked and processed royalty payments to music publishers and songwriters (2011) (Geis, 2015, pp. 66–68).

units through both acquisitions and internal development but did not enter another major new business area for almost 8 years (though it did try, unsuccessfully, to reboot its social networking business). Then, in quick succession, Google entered three new businesses—cloud computing, AI, and robotics—all via acquisition.

In cloud computing, Alphabet assembled more than 25 companies to create the Google Cloud Platform, building on an early app engine that the company developed internally in 2008. In AI, the company's critical acquisition was DeepMind, which became part of Google in January 2014 and subsequently was moved outside into Alphabet's holding company structure. The most dramatic example of Alphabet's acquisition "roll-up" strategy was its entry into robotics. Alphabet acquired eight robotics companies almost simultaneously in December 2013, combining them to create a robotics business area. It seems unlikely that Google could have entered cloud computing and robotics so quickly without using acquisitions. Even so, Alphabet's entry into robotics proved largely unsuccessful (Feiner, 2019).

Google has also used acquisitions to incorporate AI. For example, the Google Services segment used acquisitions to integrate AI developed by DNNresearch, Emu Messenger, Jetpac, Timeful, Moodstocks, Kifi, API.ai, and AIMatter. Using AI, new features across Search, Lens, AR, Maps, and Shopping make Google more helpful.[6] The Google Cloud segment used acquisition to integrate AI developed by Granata Decision Systems, which provides real-time optimization and scenario analysis capabilities for large-scale, data-driven marketing problems and group/organizational decision-making, as well as the technology by Onward, which builds tools for businesses looking to automate their customer service or sales workflows.

5. Discussion and conclusions

Amazon and Alphabet achieved extraordinary growth and success over the decades following their birth. By 2022, they had risen to near the top of the list of the world's most valuable companies. Yet, as we have described, they have made diametrically different choices regarding their use of acquisition versus internal development as their mode of entry into new business domains. Google has relied more heavily on acquisitions for new business entry and growth, making 2.6 times as many acquisitions per year as Amazon. In pursuing growth, the companies have followed distinctive paths to resolve the tension between exploration and exploitation.

Consistent with the pattern we found in our 2010 study, Amazon has used acquisitions in two main ways: to strengthen its core businesses once they had been established and to enter new businesses situated (initially) outside Amazon's primary business domain. These outside business acquisitions stretched the company and established trajectories that Amazon used to expand. It is common for large companies to use acquisitions to enter and explore new domains, often becoming increasingly reliant on acquisitions to support growth. Amazon, however, as it approaches its fourth decade, continues to emphasize internal development.

By comparison, the historical patterns relating to Alphabet's mode of entry have been largely opposite of Amazon's. Within its primary business domain, Alphabet has entered new businesses almost exclusively via acquisition, often combining multiple companies with its own internal efforts to create the new entity. However, beyond its primary business domain, Alphabet has pursued internal development to enter numerous businesses. Alphabet's use of internal development to launch its series of moonshots is notable not only because it goes against the norm for large companies but also because it goes against Alphabet's strong reliance on acquisition within its primary business domain.

Amazon and Alphabet are similar in that, following entries to establish new business areas, both companies have made subsequent acquisitions to fill gaps and reinforce positions. Even so, Amazon typically has waited until these gaps became clear, whereas Alphabet has often been proactive in making acquisitions early.

These contrasts between Amazon and Alphabet demonstrate that, consistent with the arguments of O'Reilly III and Tushman (2021), there is no single right way to utilize acquisition versus internal development in the pursuit of balance between exploration and exploitation. Amazon

6 https://google-i-o-2021.prezly.com/innovating-on-our-core.

has followed a mixture of approaches but typically has emphasized internal development to pursue exploration and exploitation. By comparison, Alphabet has followed a more uniform and structured approach, particularly within its primary business domain. The way that Alphabet has combined acquisitions with internal development efforts for entry into new businesses is distinctive (Geis, 2015) and shows how firms can develop unique capabilities for acquisition. Alphabet's structured approach, with heavy reliance on acquisition, may be similar in some ways to that of Cisco, as discussed by Stettner and Lavie (2014). Thus, Amazon and Alphabet have found very different ways to achieve balance between exploration and exploitation.

As Lavie *et al.* (2010) point out, no guidelines have been established for classifying business activities as exploration versus exploitation; as a result, applied research studies have often been inconsistent in their analysis and conclusions. It can be hard to draw a sharp line between these two types of activities, which may be better viewed as extremes on a continuum. Moreover, the same corporate actions can sometimes be classified as both exploration and exploitation. Consider, for example, Amazon's establishment of AWS, which was designed to exploit technology that had been previously developed for internal use by the company. Yet, when AWS was initiated, there was major uncertainty about the extent to which outside parties would choose to purchase critical web services from an online retailer and potential competitor. Hence, Amazon's entry into AWS contained elements of both exploitation and exploration.

Similarly, precise delineation of a firm's core business, or its primary business domain, can be difficult, particularly in highly diversified conglomerate companies. In their early years, Amazon and Google were focused on a clear set of core businesses: internet retailing for Amazon; internet search (monetized by advertising) for Google. As they diversified, both companies added many additional businesses, some of which became key contributors to profitability. Many observers would come to view these businesses (e.g., AWS and YouTube) as positioned within each firm's primary business domain and arguably part of each firm's core. Eventually, it became difficult or impossible to delineate the firms' unique core business.

While such precise classifications may be fruitless, at a broader level, it is easy to see how the entry activities of both companies promoted exploration and exploitation. We have described the many new businesses entered by Amazon and Alphabet. At the same time, both companies have successfully developed, improved, and expanded their core. Moreover, Amazon and Alphabet chose fundamentally different mechanisms for coping with the conflicting demands of exploration and exploitation. Of the four coping mechanisms described in the literature, Alphabet has relied heavily on "organizational separation" and "domain separation," whereas Amazon, aiming to be as ambidextrous as possible, has mostly chosen "no separation."

Google pursued the transition to the Alphabet holding company structure to create more organizational separation and autonomy for the highly diverse set of exploratory ventures outside of its core. After its 2015 reorganization, the company chose to keep its primary businesses within a single unit—the Alphabet subsidiary called Google. This organization combined complementary elements of search, advertising, maps, YouTube video, Android phones, Gmail, and Google Docs to provide "domain separation" for the Google business core, where an overall emphasis on exploitation is increasingly required to promote high profitability. Early in its history, Google came to rely on a type of acquisition-based entry that had distinctive elements, whereby Google integrated (sometimes multiple, simultaneous) acquisitions with its own internal operations, in a manner that Geis (2015) calls "semi-organic growth." Thus, Google evolved a unique set of organizational structures and managerial routines that worked well for the company overall as a vehicle to balance exploration and exploitation.

Amazon, by contrast, has created an organization with relatively few major organizational divisions, other than the separation of AWS from the consumer-facing parts of the company. At a high level, the creation of Amazon Prime provided a broad instrument for connecting Amazon's multiplicity of consumer-oriented businesses, which are otherwise diverse. As a large and increasingly mature company, Amazon has been remarkable for the number of innovative products and services it has introduced, as well as for the sharing of essential elements (technology, customer data, and market information) to promote innovation in new business units. Whether this degree of organizational fluidity and innovation can persist as the company grows is an open question.

Even so, Amazon clearly stands out for its remarkable success in using internal development as the main driver for both exploration and exploitation.

To be sure, not all of Amazon's and Alphabet's entries have been successful. Through 2022, Amazon's net profit continued to be generated mostly by AWS, which supported a plethora of loss-making businesses on the retail side. A similar pattern was evident at Alphabet, where profit flowed mostly from search, YouTube, and other businesses that were able to draw heavily on the firm's capabilities in advertising. Alphabet's moonshot businesses have remained unprofitable, and its efforts to enter social networking and robotics have been failures.

As Alphabet and Amazon expanded, the two companies that originated from very different core businesses became direct rivals in e-commerce; in online advertising and networks that compete for advertising; in designing, manufacturing, and marketing consumer hardware products and digital assistants; and in enterprise cloud services, digital video services, digital content and application platforms, as well as proprietary platforms. Thus, Amazon and Alphabet emerged from distinct rootstocks but have grown to connect with intertwined branches. With the increasing importance of AI to both companies, it seems likely that we will continue to see more of these overlaps.

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