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**The evolution of the concept of *sustainable*
competitive advantage:
A literature review**

Luca Bovolenta
Student N°: 3821

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Professor Afonso Almeida Costa

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Luca Bovolenta
Via Carlo Alberto dalla Chiesa 59, 40024, Castel San Pietro Terme, Italy
+39 3381569593
luca.bovolenta@novasbe.pt

ABSTRACT

The present paper is conceived to assess whether or not the sustainable competitive advantage is still achievable and how the concept changed. The literature review of RBV, dynamic capabilities approach and exploration vs exploitation tradeoff underlines the evolution of the concept over time. All the frameworks analyzed stress the importance of the concept although indicating different causes. In addition, the exploitation vs exploration idea may provide a way to reconcile the other theories. The literature review suggests that the sustainability of competitive advantage is a valid concept even when the firms face environmental changes.

Keywords: *Sustainable Competitive Advantage, Resource-based View, Dynamic Capabilities, Ambidexterity*

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1. Introduction

Dramatic changes in business have caused a discussion within strategy since many companies are using frameworks designed decades ago for a different business era. Since the onset of strategy as a discipline, the goal of researchers and practitioners alike has been the understanding of the sources of sustainable competitive advantage. However, in a volatile and uncertain world, many scholars think that executives need to stop basing strategy on it. The starting force of this work project is the book “The end of competitive advantage” by Rita Gunther McGrath and the literature review and discussion presented here is aimed to analyze how this fundamental concept has changed over time questioning if it is still valuable to talk about sustainable competitive advantage. McGrath points out in her empirical research that executives have realized the need for new approaches in strategy. She realized also an increasing distance between theory and practice because managers need to learn more frequently how to exploit short-lived opportunities instead of relying on the sustainability of the advantage.

The literature review will be helpful to understand the different explanations that various theories give about sustainable competitive advantage. The underlying question is whether the *sustainable* competitive advantage is still achievable by firms today and, consequently its notion is still useful for strategic management. I start by presenting the definition of sustainable competitive advantage. Then, I analyze the resource-based view’s (RBV) concept of sustainable competitive advantage and how it was understood by scholars. Subsequently, I point out how the concept has been applied and changed through the creation of the dynamic capabilities framework. Beyond the dynamic capabilities perspective, I describe how the notion of sustainable competitive advantage relates to the broad exploration vs. exploitation trade-off. For illustrative purposes, every presented theory is exemplified with a player in the information technology space. Finally, the concluding section tries to draw a general picture of the role of

sustainability in competitive advantage in light of the different reviewed theories and recent real-world developments, while discussing potential future research directions in this domain.

1.1 Research Method

The analytical approach used in this research has started from the analysis of the book from professor Rita Gunther McGrath “The end of competitive advantage”. The findings have been calling into question the RBV framework. Analyzing empirically American companies, she realizes that in many economic sectors a firm cannot optimize its systems and processes around a set of long-term sources of advantages but to rather more profitably focus on temporary sources of advantage.

The method I use is a literature review, tracing the concept of sustainable competitive advantage and its evolution over time and mapping the most relevant literature streams. Therefore, I analyze the relevant and most recent literature including the state of art articles for RBV theory, dynamic capabilities approach and exploration vs exploitation framework. Regarding the examples provided at the end of each chapter, I considered company annual reports and specialized websites.

1.1 Defining sustainable competitive advantage

In the discipline of management strategy, competitive advantage is delivering a superior value creation for a given target customer segment relative to competitors. The value creation is given by the difference between benefits and costs. It is sustainable when neither current nor potential competitors would be able to replicate a firm’s value creation for some customers and if it still exists after attempts to duplicate or imitate that advantage have ended (Barney, 1991). The competitive advantage is the aim of a firms’ strategy because the result is having above-average returns (Porter, 1985). RBV theorists assume that the firms’ desired outcome is that the competitive advantage is also sustainable when reached (Peteraf 1993). They sustain that if the foundations under a competitive advantage could be easily eroded, so that advantage would not

be a true advantage, but it would have a time limitation (Slater, 1996). Hence, if firms want to have strong performance over time, the competitive advantage need to be sustainable (Barney 1991). However, even if firms' resources are not imitable, it does not imply that the competitive advantage will last forever (Barney, 1991). For instance, variations in the target market can make the firm's bundle of resources no longer valuable.

The following second, third and fourth chapters will focus on how the notion of sustainability of competitive advantage has been addressed by different theories over time, and whether the achievement of sustainable competitive advantages is still possible and opportune for firms.

2. Resource-based view

Before the emergence of the resource-based view or RBV, Penrose (1959) noticed the importance of resources to firms' performance. She argued that a firm comprises a long list of resources and capabilities and its performance depends on the way how those resources are used. The resource-based view or RBV emerged between the 1980s and the 1990s and it is a management theory that explicitly connects resources to superior value creation. RBV considers the firm essentially a bundle of resources and capabilities. According to Dierickx and Cool (1989), resources have the biggest responsibility in helping firms to achieve higher financial performance. Depending on those resources and in the way they are coupled, companies have the opportunity to differentiate themselves from others and in that way gain a sustainable competitive advantage (Mahoney and Pandian, 1992).

2.1 Identifying the sources: the VRIO framework

As the name shows, RBV underlines the importance of resources exploitation to create a sustainable competitive advantage. According to RBV scholars resources are all assets, capabilities, information, knowledge and firm's attributes (Dierickx e Cool 1989). They can be divided into three major categories. The first is tangible resources such as financial resources, technological resources and physical resources. The second is intangible resources, which

include the human resource, the innovation and reputation. The third category is organizational capital resources that involve the capacity of combining the intangible and tangible resources (See also Appendix 1).

However, not every resource has the potential to create a sustainable competitive advantage. To have this potential, a resource must have four characteristics that are summarized in the VRIO framework (Appendix 2). According to Barney (1991), if a resource is valuable, rare, imperfectly imitable and organized then it holds the potential to build a sustainable advantage. A resource is considered valuable when it enables a firm to create and implement strategies that improves its efficiency and effectiveness, in other words it enables value creation. The question of the value of a resource is explained in two ways (Peteraf, 1993). First, a resource is valuable if it allows the firm to reduce costs due to the fact that value is given by subtracting costs to benefits. Second, when a resource can improve the revenue it means that it provides advantage over competition because of ability to provide greater customer surplus and/or increase industry profits.

By definition, valuable resources held by numerous companies are not a source of competitive advantage because the value creation must be unique compared to other players. The underline assumption is that resources and capabilities are heterogeneous (Barney, 1991). If organizations would have the same bundles of resources, it would be a priori difficult for them to attain differential value creation through their strategies. The actions of one company could simply be followed by others and therefore no form of competitive advantage would be achieved. However, in the real world, companies that compete in the same market can implement different strategies and beat the competition (Barney, 1991).

The advantage created with valuable and rare resources is sustainable when other firms are not able to imitate or replicate them. Scholars found three main reasons of imperfect imitability, which are unique historical conditions, causal ambiguity and social complexity (Dierickx &

Cool, 1989). First, the RBV approach asserts that firms' ability to acquire and use resources depend upon their place and time. Companies cannot obtain those time- and space-dependent resources when a particular moment has passed (David, 1985). For example, if an oil company discovers a vast oilfield at a given time and establishes its facilities to deploy the natural resource, the competitors cannot obtain it anymore. The second reason is causal ambiguity that shows when the it is not clearly understood the connection link resources and competitive advantage (Rumelt, 1984). Then, it is difficult for imitators to understand which resources they should replicate and the same applies for the company who owns the resources (Lippman and Rumelt, 1982). When every competitor and the firm itself have an imperfect comprehension of the link between resources and competitive advantage or causal ambiguity cannot verify. The third reason is social complexity, which is the presence of complex social phenomena that cannot be altered by companies. The firm's culture and its reputation are representatives because they can be linked to competitive advantage and the replication of them could be beyond the capabilities of competitors (Barney, 1986). Salesforce is a CRM cloud-based software house established in 1999. Its dynamic and customer-centric culture facilitates development of services and increases the ability to respond to changes. Such a culture it is difficult to imitate because it requires the involvement of all the employees (social complexity). Which feature was the main cause of its success did not become clearly understood by anyone (causal ambiguity).

The common assumption across causal ambiguity, unique historical conditions and social complexity is that resources are immobile or imperfectly mobile, hence they cannot be taken away from competitors, at least in the short-run (Collis and Montgomery, 2008). Resources are perfectly immobile when they cannot be traded (Dierickx and Cool, 1989). Resources are imperfectly mobile when are tradable but more valuable within the company that owns them than they would be in others (Peteraf, 1993). Resources become rare because they are either

non-tradeable or they are less valuable to competitors (Peteraf,1993). For example, usually intangible resources like company reputation, human resources and brand are usually immobile in the short term.

The resources that are valuable, rare and not imitable confer none advantage if the firm is not organized to get any value from them. There are many components to the question of organization, the most important are the complementary capabilities, in particular the co-specialized resources. Co-specialized resources are complementary resources and their full economic value can be reached only when they are used together with other particular resources (Teece, 1986). For example, a case of resource co-specialization is the economies of scope. In this case co-specialized resources have limited economic value in separate use, and they create sustainable competitive advantages only when used together (Teece, 2007). Concluding, an enterprise needs to organize its structure, processes and in general every resource it has to fully exploit the potential of them.

2.2 Implications

Answering the research question—that is, if sustainable competitive advantages are still achievable by firms or not—, the RBV states, not only that competitive advantages can be sustainable but also makes the notion of sustainability central within its theory. RBV argues resources analysis is essential to understand if companies' resources have competitive potential and Barney (1991) developed the VRIO framework to assess practical applications. Thus, the VRIO skeleton might help managers to choose the most suitable strategy to gain sustained advantage. Thereby, VRIO provides a direction in choosing appropriate information processing system, strategic planning and alliances. Common resources among firms does not bring a sustained advantage. Hence, a resource could be a source of sustainable competitive advantage if it is either immobile or imperfectly mobile. To be imperfectly mobile, a resource is either not

free to move between firms, or a firm without a resource faces high costs in elaborating, gaining, or using it. In contrast, if a resource is not rare then the competitive advantage is not sustainable. More importantly, resources with VRIO characteristics are both necessary and sufficient to reach the sustainable competitive advantage. There is a sufficiency relationship because VRIO resources lead to sustainable competitive advantage. At the same time, if a firm have a sustainable competitive advantage it is because it owns VRIO resources, therefore there is a necessary relationship too.

2.3 The Apple example

Using the VRIO framework, I analyze Apple's resources to discover if the full framework applies in this case. The examined resources are the ability to integrate hardware and software, the base of developers, the product design and engineering and the brand equity. Even though the tech industry is a relatively turbulent industry, those resources has proven to be sources of stable sustainable competitive advantage.

Starting with the question of value, Apple's resources allow the firm to boost the revenue, profit margin and overall enable value creation even if it occurs fluctuations in the industry. The brand is one of the most recognized and valuable in the world, the integration between hardware and software makes the device easy to use creating a unique user experience. For example, in 2001 Apple's Steve Jobs, launched the iPod that thanks to the integration between design, hardware and software was much more valuable than its competitors. The click wheel and the gestures used to command iPod illustrate how to create value through an innovative combination of design, engineering and UX interface. Ever since, for any new product line they added the features of existing devices into new ones. It is the case of the browser Safari adapted for iPhone and iPad or the fingerprint sensor introduced with iPhone and implemented in the computers too.

Second, the aforementioned resources are rare. Apple launched products like iMac, iPod and iPhone that enjoyed first-mover advantages while there is now a plethora of followers. Even so, the quality of its product design is difficult to match, and it remains rare. The proprietary software and the hardware innovations are all protected by patents which are rigorously defended in court. In addition, it is difficult for competitors to create such a critical mass of external developers that enrich the platform with new applications and network externalities.

Following, Apple's resources are expensive to imitate. Few competitors have imitated devices like iPhone and have gained larger market, however, they have not fully surpassed Apple. A reason is that Apple has developed a comprehensive ecosystem that include all the previously mentioned resources creating a mix that competitors cannot match, at least for Apple's core customers (Appendix 3). Apple's resources are not unique if taken separately. The uniqueness steams from the way they are mixed to create how a product is conceived, designed, built, marketed, opened, and used. This extreme integration is hard to replicate by competitors. Even taken separately it is hard to copy the resources. For instance, building a brand as strong as the Apple's one required a long time, effort and sizable financial resources.

Last, Apple's organization enables the full exploitation of its resources. They leadership team is stable, manage co-specialized resources and has cross-product functions. The executive team does not include a senior vice president for phones who works together with a senior vice president for tablets (Appendix 4). That is because Apple has a functional structure that allows for collaboration. Apple can create features like Continuity across different products or use a chip designed for the Apple Watch to power the new Touch Bar in part because its top executives manage departments like hardware engineering and worldwide marketing rather than for specific products. Through functional experts collaborating with each other, Apple's management facilitates to cope with variations and fluctuations in the industry and helps in establishing coherence throughout the entire organization.

In conclusion, it is possible to apply the RBV and its notion of sustainable competitive advantage (VRIO) to a case of a company in the turbulent IT space.

2.4 RBV criticisms

RBV has same theoretical and practical challenges even if is popular. One of the principal weak point of this theory is its static nature (Priem and Butler, 2001). In particular, the RBV fails to explain how firms can still sustain their advantages when the environmental conditions change (Eisenhardt and Martin 2000). Most of the companies are forced to be quick when respond to changes, need to be innovative and need to be ready to change their internal structure (Teece et al. 1997). Priem and Butler (2001) note that while having VRIO resources is important, it might be not important anymore if the context changes. That is because resources are context-dependent, their value is subject to the characteristics of the context. Because environment is more prone to change than the resources, the adaptation of a firm is slower compared to the changes in the industry (Teece et al. 1997). So, in fast changing industries, a great focus on core resources might create core rigidities. Core rigidities are the contrary of core competencies and appears when a firm relies on an advantage for too long.

Another problem derived by its static nature is that RBV does not deal with the threat of substitution. It means that new innovations or environmental turbulence that displace existing sources of competitive advantage are less considered since RBV mainly focuses on defenses against imitation.

From a practical perspective, Priem and Butler (2001) argue that the RBV does not meet the operational validity criteria. In fact, the value of a resource might differ across industries, and it is challenging for researchers to measure value of the resources especially the intangible ones. So, resources are particularly complex, unobservable and difficult to measure (Priem and Butler, 2001). In addition, according to RBV, VRIO resources are both sufficient and necessary for superior performance. Priem and Butler (2001) believe it is a tautology since it is a situation

in which it is impossible to say which of the two (VRIO resources or sustainable competitive advantage) cause the other one.

To sum up, the RBV has been criticized as not include the business dynamism and with limited indications on how to observe and measure resources used to gain competitive advantage.

3. Dynamic capabilities

The dynamic capabilities framework has attracted great attention from management researchers and practitioners since the foundational article written by Teece, Pisano and Shuen in 1997. The dynamic capabilities approach deals with understanding the sources of superior firm performance over time and changing environmental circumstances, and thus it is directly related to our research question on the relevance of the notion of sustainability in competitive advantage. Dynamic capabilities are high-level ('meta') capabilities above more regular resources and capabilities. Sustainable competitive advantage can be reached through dynamic capabilities, which integrate, build, and reconfigure internal and external resources to address fast changing environments (Teece, Pisano and Shuen, 1997). So, this framework proposes that resources are necessary but not sufficient for sustained superior results in dynamic industries (Helfat, 2007).

There are many views on how dynamic capabilities are connected to sustained competitive advantage and I will discuss them later in the controversy section. Here I will discuss the dominant one developed by Teece. He argues that sensing and seizing lead to better firm performance. Sensing is a dynamic capabilities of opportunity searching, seizing refers to investing in opportunities. In addition, dynamic capabilities for reconfiguration reshuffle the resources and capabilities base further. Even if a firm owns VRIO resources but does not use the dynamic capabilities, the superior financial results might be short-term if and when the industry reshapes (Wu, 2010). So, companies to maintain competitive advantage have to exploit

dynamic capabilities advantage by adapting, recombining and reshuffling their resources base. In this way they avoid core rigidities that hold back innovation (Ambrosini and Bowman, 2009). The dynamic capabilities framework assumes a greater relevancy nowadays because globalization is changing landscapes of almost every industry. In this world, paths to sustainable competitive advantage are shifting rapidly and successful companies can take advantage of opportunities. Organizations in such a complex environment must have flexible infrastructures, punctual strategies and the ability to use resources and capabilities in innovative ways. In a sense, dynamic capabilities can be thought as superimposing capabilities, a sort of meta-capabilities, for resources recombination. RBV theory does not explain how and why firms enjoy a sustainable competitive advantage in situations of rapid change. Eisenhardt and Martin (2000) point out that rudimentary efforts were made by Penrose (1959), Nelson and Winter (1982) and Teece (1986) to determine how the companies' capabilities can be sources of sustainable advantage.

3.1 Defining dynamic capabilities

Dynamic capabilities were sometimes depicted as 'routines to learn routines', but this definition has been disapproved as being tautological, vague and nonoperational (Priem and Butler, 2000). However, Eisenhardt and Martin (2000) describes dynamic capabilities like precise and identifiable routines that are the subject of many empirical researches (Hansen, 1999; Fredrickson, 1984; Hargadon and Sutton, 1997). For instance, dynamic capabilities that recombine resources are product development routines by which an employee can realize new product lines and extensions. Another example are strategic decision routines by which executives shape the main strategic decisions of the organization (Eisenhardt and Martin, 2000). Other dynamic capabilities emphasize the reconfiguration of resources. An example is the routines used for replication that are utile to recombine resources and processes (Hansen, 1999). Also, resource allocation routines reconfigure the resources allocating limited resources such

as raw materials and capital. For instance, coevolving is a dynamic capability that involves routines to create shifting synergies among businesses (Eisenhardt and Martin, 2000). In sum, dynamic capabilities are specific processes that have a direct link with resources recombination and their value is positively connected to the performance (Eisenhardt and Martin, 2000).

Dynamic capabilities might have common features that are associated with routines. It is possible to identify many suitable ways of dealing with a challenge and executing a dynamic capability (Winter, 2003). In other words, it is possible, having different routines, to arrive at similar results; hence equifinality may happen with dynamic capabilities. In addition, there may be common features among dynamic capabilities across companies, but this does not mean that every dynamic capability is exactly alike across companies (Eisenhardt and Martin, 2000). In contrast, RBV requires resources to be unique to obtain a sustainable competitive advantage. Potential equifinality and commonality among dynamic capabilities have two consequences. First, they are equifinal so there are multiple paths to the sustainable competitive advantage since companies have different dynamic capabilities which leads to similar results. Second, commonality implies that routines are somewhat substitutable but not fully-substitutable across different context and somewhat fungible but not fully-fungible across different industries.

3.2 Differences to the RBV

The RBV and dynamic capabilities perspectives study different units of analysis but they both remark that competitive advantage is coming from the inside of the firm and also interacting with the environment (Appendix 5; Teece, Pisano and Shuen, 1997). Even so, there are three main differences between these two perspectives.

First, in the dynamic capabilities approach, resources are only necessary but not sufficient to reach sustainable competitive advantage. They need to be combined with dynamic capabilities and through the constant recombination of the resources base the competitive advantage can be sustained. Interestingly even the dynamic capabilities alone, without a base of proper resources,

cannot sustain any advantage. To sum up, resources and dynamic capabilities, each on its own, are only necessary but not sufficient to sustain the advantage. Instead resources and dynamic capabilities together are necessary and sufficient to gain the sustainable competitive advantage. Second, high-velocity markets are a restriction for RBV. This happens because in such markets the companies must cope both with external competition and internal challenges because dynamic capabilities are themselves unstable processes (Eisenhardt, 2000). In addition, RBV does not consider the length of current advantage and does not help to predict the sources of possible future opportunities (Teece, Pisano and Shuen, 1997).

Third, RBV emphasizes long-term competitive advantage based on a stable bundle of resources and capabilities (Eisenhardt and Martin, 2000). In high-speed markets those resources are often reconfigured, dropped and added so the notion of a stable bundle is problematic. It is so because in those environments the value of a given resource can always change. In these cases, growth, not profit, may be the most important performance metric in the short-term (Mauboussin 2012). Ultimately, understanding the rhythm of when and how to change is more important than having a stable bundle of resources in fast-changing industry.

3.3 The temporary competitive advantage

RBV poses its foundation upon the logic of resource leverage. According to dynamic capabilities framework sometimes resources configuration brings to a sustainable competitive advantage; however competitive advantage is often a short-term advantage. Then, companies must have an opportunistic reasoning because it is useful for them to create a series of short temporary advantages that are gained by taking advantages of occasions. Managers should then employ dynamic capabilities to create different resource bases and progress into new positions using the logic of opportunity and change. While RBV put emphasis in leveraging VRIO resources to get a sustainable competitive advantage, the dynamic capabilities focus is creating a series of temporary competitive advantages through timing and changing. So, the sustainable

competitive advantage achieved through dynamic capabilities is instantiated by a series of temporary advantages to continuously changing, recombining, reconfiguring and redeploying the firm's resources base (Teece, 2007).

In sum, according to the dynamic capabilities framework, superior resources and capabilities lead to a competitive advantage that it is not sustainable. What is required to have a sustainable competitive advantage is permanently shifting. Thus, to establish a sustainable competitive advantage a company must not only have superior resources and capabilities but also dynamic capabilities.

This finding is valuable for the research question. The concept of sustainable competitive advantage is still relevant considering the dynamic capabilities approach but has been reinterpreted. It is considered as a sequence of temporary advantages over time and managers need to continuously re-shuffle the resources base through dynamic capabilities. Therefore, sustainable competitive advantage is achievable by firms.

3.4 The Samsung example

Samsung Group is a highly diversified conglomerate and its offering includes services, apparel, chemicals and consumer electronics. I provide an example of dynamic capabilities developed by Samsung Group for their consumer electronic products, in particular regarding the evolution of smartphones. The smartphone industry is ever changing and the bases for competitive advantage are permanently shifting, thus it is important to sense the environment and to seize opportunities reconfiguring resources and capabilities to successive changes. After the launch of the iPhone, Samsung understood the changing trend of the phone industry and developed its own touchscreen technology while partnering with Google to offer a distinctive gestures experience. Later, a decade ago, Samsung saw customers need for bigger phones, and the need to type messages using one hand in Asia where it is convenient to write symbols by one hand. Therefore, they consequently launched phones with bigger screens in the market. Following,

the market direction changed again, and they extended the offering launching a new concept of phone that was positioned in the middle between tablets and smartphones, the phablet. The Galaxy Note phablet introduced along its evolution different value innovations (Appendix 6). It created a new product category differentiating itself through a bigger but portable screen that improve web browsing, multimedia and gaming experience while at the same time introduced innovation like the stylus. The South Korean conglomerate can transform itself, hence it reconfigures its resources and capabilities to address new opportunities. The firm has done it successfully many times. For example, the stylus, introduced with the Note series, reduces the need for carrying a notebook or papers while using the bigger screen that the phablet offers. At the same time the company discovered the need for both incorporating artificial intelligence in portable devices and simplifying the interface. This led to the development of Bixby, an AI assistant specifically designed to avoid the complexity of increasingly fully features phones. The last change in the environment that was quickly assimilated is the need of foldable device that Samsung revealed in November 2018 before any competitor (Appendix 7). In addition, they can bring solutions in the smartphone industry leveraging their resources and capabilities deployed in other industries. This corresponds to the corporate dynamic capability in allocating resources and capabilities across different markets or industries. For example, the adopted top-quality cameras in phones recombining resources used before only in the camera division. The same happened with OLED screen on the other way around. They were introduced first with smartphones and then integrated and adapted, as the environment was demanding, on TV screens and smart watches.

In sum, across time, Samsung can gain a sustainable competitive advantage through a constant and iterative redeployment of its resources and capabilities. They sense when the market is likely to change and decide the technological trends in the phone industry that make sense to embrace. Meanwhile, Samsung has the ability to seize existing businesses finding the way to

satisfy customers. To do so the firm recombines, integrates, builds both resources of a specific division and corporate resources.

3.5 Current debates in dynamic capabilities approach

The aim of the dynamic capabilities framework is arduous: understanding how organizations could create a sustained competitive advantage by reacting to changes in the industry (Eisenhardt and Martin, 2000). Considering the great numbers of scholars' studies unavoidably different points of view appeared along with its sped-up development. I highlight three ways suggested by scholars regarding the relationship between dynamic capabilities and performance. The first way is the predominant one, and it has been described in the previous sections. It asserts a direct link between dynamic capabilities coupled with the resources base and the reaching of sustainable competitive advantage (Teece et al., 1997).

The second way states that dynamic capabilities do not necessarily bring a sustained competitive advantage (Eisenhardt and Martin, 2000) and that performance might depend on how the new resources configuration fits with the firm or on how executives use dynamic capabilities to reshuffle resources. For example, if they use them more astutely and quicker.

The third way claims an indirect connection between dynamic capabilities and performance is what matters the most (Zott 2003) (Wang e Li 2008). They agree that dynamic capabilities lead to sustained performance, but key is how the capabilities are created. The development of the capabilities can be seen looking at the same capabilities over time. Thus, the value of dynamic capabilities is defined by the resulting resources, as well as the quickness of building the required firm capabilities. In conclusion, the connection between dynamic capabilities and sustainable competitive advantage is still questioned by scholars. However, sustained competitive advantage does not arise from an immobile resources base as the RBV states.

4. Exploration vs Exploitation

The environment is considered stable in the RBV and unstable in the dynamic capabilities framework. However, an environment may be both at different points in time. While considering this, the exploration vs exploitation tradeoff directly connects to the idea of both exploring and exploiting (Appendix 8). Exploring pertains the exploration of new possibilities, trying to achieve breakthrough innovation. Exploiting refers to the exploitation of current capabilities, making steadily improvements to an existing business. When competing in mature businesses where hierarchy, unit efficiency and steady progression are rewarded and simultaneously competing in new businesses where adaptability, autonomy and experimentation are requested. But, how important is it to exploit the existing resources and capabilities? And how important is it to explore new opportunities? Further, is it possible to do both at the same time? So far, it seems that RBV underlines more the importance of exploit existing resources and capabilities. On the other hand, dynamic capabilities framework stresses the on-going resources recombination to explore new opportunities. In both frameworks the sustainable competitive advantage appears as central and valid, albeit with a different interpretation. In this section I try to achieve some synthesis between the notions of sustainability of the RBV and dynamic capabilities approach. Therefore, I analyze the exploration vs exploitation trade-off assessing whether the sustainable competitive advantage is achievable facing this approach.

4.1 Introducing the framework

James March (1991) notes that firms need to adapt to their environments and while doing this most critical challenge is the need to both exploit existing businesses and to have sufficient resources for exploration to avoid existing businesses to decrease their profitability by changes in markets and technologies innovations. He believes that exploitation is about efficiency, exploitation and strict control, while exploration is about innovation, discovery and business development. Usually firms reserve more time to exploitation than exploration because of its

greater certainty of short-term results. Exploration is less efficient, and it is associated with failures because of its nature. On the other hand, with no effort toward exploration, companies, when the environment changes, are likely to fail.

When analyzing organizations Lawrence & Lorsch (1967) discovered that the firm structure is similar if the firm face the same environmental conditions and have similar strategies. For instance, firms operating in stable industries develop well-defined systems, standard processes and high-level of hierarchy. In contrast, companies operating in more changing industries develop open systems, non-specialized units and have less focus on efficiency.

Because different firms' organization are needed to exploit and explore, Tushman and O'Reilly (1996) suggest firms needs to pursue both to achieve the sustainable competitive advantage. The term "ambidextrous" was used firstly by Robert Duncan (1976) when he argues that firms need to change structures to start and execute innovation. Tushman and O'Reilly (1996) propose that companies have to do both at the same time to be ambidextrous. Nowadays, the term is directly connected to doing both in a balanced way.

The original theory proposes that ambidexterity is positively associated with the performance of companies, but this over time has been questioned by empirical tests. Most evidences show that ambidexterity is positively correlated with sales growth (Yang & Demirkan, 2007), innovation (McGrath, 2001), performance (O'Reilly & Bidwell, 2012) and firm survival (Hensmans & Johnson, 2007). Despite using different techniques, in-depth case studies and data, the results linking positively ambidexterity to firms' performance are strong.

The empirical studies imply three main outcomes. First, ambidexterity and firm performance can be positively associated. Second, the firms' environment has effects on ambidexterity outcomes. For instance, with greater degree of uncertainty ambidexterity has more effects on performance (O'Reilly and Tushman, 2013). Third, as March (1991) suggests, the over-use of exploitation is costly for firms. Uotila (2008) estimates that more than 80 percent of the firms

analyzed in his sample over-used exploitation and missed new business opportunities (Uotila et al., 2008).

Although some scholars report no effects for ambidexterity on performance (Ebben & Johnson, 2005), the final conclusion seems clear. The ambidexterity, especially in changing industries, is positively correlated with continuous innovation, better financial performance, and higher chance of survival (O'Reilly and Tushman, 2013).

4.2 The paths to achieve ambidexterity

Over time scholars theorized three ways to achieve ambidexterity: sequential, simultaneous and contextual.

Duncan (1976) suggests that to solve the frictions given by pursuing efficiency and innovation companies need to change their organizational structure when the strategy of the firm changes. In his view, organizations achieve ambidexterity by changing sequentially the firm every time it is necessary. However, how to achieve successfully and smoothly the transition is missing (Tushman and O'Reilly, 2013). It is defensible that companies may shift structures when managers change the strategy. But major structural transitions can be highly disruptive and companies most of the times do not have the capabilities to sustain such a dramatic change. Moreover, ambidexterity is about balancing exploration and exploitation while this model suggests that firms oscillate time to time between moments of exploitation and exploration.

The second path proposed to balance the trade-off between the exploration option and exploitation one is to use separate sub-units. Tushman and O'Reilly (1996) argue that considering rapid change, sequential ambidexterity might be too slow, and firms need to explore and exploit in a hasty manner. To fully exploit separate sub-units, firms need to create autonomous explore and exploit separated sub-units but with a certain amount of integration to ensure the use of shared capabilities (Tushman and O'Reilly, 1996). In this perspective, the essential while reaching ambidexterity is the leadership that need to have the ability to sense

occasions and seize existing businesses. So, the problem is managerial more than an organizational one. Leaders need to be able of managing tensions associated with multiple organizational objectives and stakeholders.

Third, Gibson and Birkinshaw (2004) sustain that firms can be ambidextrous by giving to employees the power to decide how and when to do exploration and exploitation, here the ambidexterity is called contextual. In this approach, ambidexterity is achieved when individuals are able to make their own decision about the exploitation and exploration tradeoff, and firms create the conditions to do so. The contextual ambidexterity slightly differs from the first two aforementioned types. First, the emphasis is on individuals and ambidexterity is achieved when employees agree to work on the same objectives. Second, it is not specified what how a firm can successfully adapt this kind of ambidexterity at every level of the organization (O'Reilly and Tushman, 2013). Contextual ambidexterity might work within a stable unit, but it is rare to see a firm using it to contrast a disruptive change in the industry (O'Reilly and Tushman, 2013). Nevertheless, even if researchers do not agree in how ambidexterity can be reached, they agree on the positively correlation between ambidexterity and sustained performance.

4.3 The link to sustainable competitive advantage

The three paths to pursue ambidexterity might be valuable depending on the type of business and industry. On one hand, a simultaneous approach may be more suitable in dynamic industries where environment is ever changing. On the other hand, a sequential approach is more valuable in stable industries where the conditions vary rarely (Benner & Tushman, 2003). Different approaches may have different performance consequences depending on the environmental conditions faced, but how do these approaches connect to the notion of sustainability of competitive advantage?

The notion of sustainable competitive advantage does not show up evidently in the literature which it is more focused on the long-term firm survival. The ambidexterity adds more

organizational and management process element, focusing more on corporate long-term survival and less about value creation in markets per se. Only in few articles ambidexterity is viewed critical to get a sustained advantage (O'Reilly & Tushman, 2008). Even so, the firms' ability to pursue both exploitative and exploratory actions simultaneously bring to firms the sustainable competitive advantage (O'Reilly & Tushman, 2013). The reason is that the sustainable competitive advantage may be implicit when the scholars describe how to gain a long-term firm survival. Indeed, in strategic management the notion of competitive advantage is considered as the mediator through which a long-term superior firm performance in a specific market is achieved.

In sum, the sustainable competitive advantage is still a valid concept, but it is achievable by firms in a different way. Sustainable competitive advantage, considering the ambidexterity perspective, steams from the capacity to solve the exploration vs. exploitation tradeoff, and to pursue both. In other words, to strike a balance between those two apparently paradoxical actions.

4.4 An application of ambidexterity: the Google example

I provide an explanation of the knowledge processes within Google illustrating how the company pursue exploration and exploitation concurrently. The first success of Google was the algorithmic web search. This service allowed Google to build a competitive advantage and ensure to the firm a stable revenue flow through advertising. Because the search algorithm sometimes did not deliver relevant results, Google's engineers constantly strived to refine the search algorithms (Appendix 9). Moreover, the advertising services were enhanced with efforts in order to have more clients by providing them track tools to get more campaign insights. An example is the cost-per-click based approach. Thus, the company proved to always further trying to exploit its existing sources of competitive advantage by refining its resources.

Simultaneously, Google used its ambidextrous strategy to shape other successful businesses. For example, host video and books contents, email tool like Gmail, maps provider, cloud storage, security tools, communication system, operating system, desktop and mobile applications and hardware products. Most of this innovation like Maps, News, AdSense, Google Talk came along thanks to the 20 percent time rule created by the founders Larry Page and Sergey Brin in 2004. It gave to all the employees one full day per week, so 20 percent of their time, to work on a firm-related project of their own choosing or creation. In other words, exploration is embedded in the routines and the firm actively promote recombination that may lead to new businesses. Exploration is pursued at parent corporate level, too. Alphabet, the parent company of Google, has three venture capital firms (Appendix 10). From a strategic perspective, these start-up investments allow the firm to take early stakes in the most promising products or services built outside of the Google Plex. In synthesis, Google strategy has the primary aim to balance the exploitation actions with the exploration ones, and to pursue both at the same time.

5. Concluding remarks

I analyzed how the concept of sustainable competitive advantage has changed through time and has been re-elaborated and recast by different strategic management theories and perspectives. After decades of debate, the validity of sustainable competitive advantage as a strategic management concept and its connection to long-term superior firm performance is being put to a question by increasingly turbulent environments, new theories and empirical studies. This was the departure point of this work project and below there are the findings.

RBV, as one of the main strategic theory, assigns a great importance validity to the notion of sustainability of competitive advantage. Sustainability is obtained through resources which are both necessary and sufficient to create sustained advantage. However, they need to be valuable, rare, non-imitable and organized to have the potential to create sustained advantage.

The dynamic capabilities approach considers the sustainable competitive advantage achievable in a different way. It is established through a series of transitory advantages. The reason is that, considering the changes in the environment, firms need to constantly recombine the base of resources and capabilities using the dynamic capabilities. As a result, both resources and dynamic capabilities alone are necessary but not sufficient to sustain the advantage.

The exploration and exploitation tradeoff in my view may reconcile the tension between these different approaches while shedding light on the notion of sustainable competitive advantage. The tradeoff includes exploration which, referring to the exploration of new business in an ever-changing environment, is closer to the dynamic capabilities approach. At the same time, the framework includes exploitation which considers the use of existing resources in a stable environment and it is closer to RBV. In a way, exploration and exploitation ideas may provide a synthesis of RBV and dynamic capabilities views.

Both dynamic capabilities and RBV focus on achieving the sustainable competitive advantage while exploration and exploitation tradeoff focuses on the long-term firm survival. However, achieving the sustainable competitive advantage ensure the long-term firm survival. So, the sustainability of the advantage may be implicit in the ambidexterity tradeoff.

In conclusion, I agree with McGrath (2013) when she contends that in an increasingly volatile world it is important to exploring and exploiting short-lived opportunities. Contrasting with McGrath (2013), I believe sustainable competitive advantages are still achievable by firms, and that the concept of sustainability is still relevant even though it has been reinterpreted over time.

5.1 Limitations

Given the imposed constraints of this work, the assessed theories are only three and are chosen considering the close relationship with the research question. There is a vast array of literature about the sustainable competitive advantage in other theories that was not possible to examine. Nevertheless, I am confident that the methodology has provided sufficient insights into the

present state of the field. The mentioned examples have the mere purpose to deliver a practical application of the theories, and were chosen from the changing (and often) information technology space to put sustainability to a stricter test.

5.2 Directions for further studies

The proposed view of ambidexterity paradox highlights some interesting gaps in the field that may interest researchers. It seems important to establish more direct links between sustainable competitive advantage and ambidexterity. While those links are implicit would be useful to clarify them explicitly. Investigating the relationship between RBV and ambidexterity might enrich both frameworks. The same is valid for the relationship between dynamic capabilities and ambidexterity.

While I agree with McGrath (2013) on the fact that in ever-changing business environments it is impossible to sustain an advantage by only exploiting pre-existing and stable stocks of resources and capabilities; I believe it may be important to examine empirically how the sustainability of competitive advantage is achieved in those high-volatile businesses. In summary, even if in my view, the concept of sustainable competitive advantage is still useful and up-to-date, it may generate numerous opportunities for future research.

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Appendix

Appendix 1: The three types of resources

Tangible Resources	
Financial	<ul style="list-style-type: none"> Firm's cash and cash equivalents Firm's capacity to raise equity Firm's borrowing capacity
Physical	<ul style="list-style-type: none"> Modern plant and facilities Favorable manufacturing locations State-of-the-art machinery and equipment
Technological	<ul style="list-style-type: none"> Trade secrets Innovative production processes Patents, copyrights, trademarks
Organizational	<ul style="list-style-type: none"> Effective strategic planning process Excellent evaluation and control systems
Intangible Resources	
Human	<ul style="list-style-type: none"> Experience and capabilities of employees Trust Managerial skills Firm-specific practices and procedures
Innovation and Creativity	<ul style="list-style-type: none"> Technical and scientific skills Innovation capacities
Reputation	<ul style="list-style-type: none"> Brand name Reputation with customers for quality and reliability Reputation with suppliers for fairness, non-zero-sum relationships
Organizational Capabilities	
<ul style="list-style-type: none"> Firm competences or skills the firm employs to transfer inputs to outputs Capacity to combine tangible and intangible resources, using firm processes to attain desired end. <p>Examples</p> <ul style="list-style-type: none"> Outstanding customer service Excellent product development capabilities Innovativeness or products and services Ability to hire, motivate, and retain human capital 	

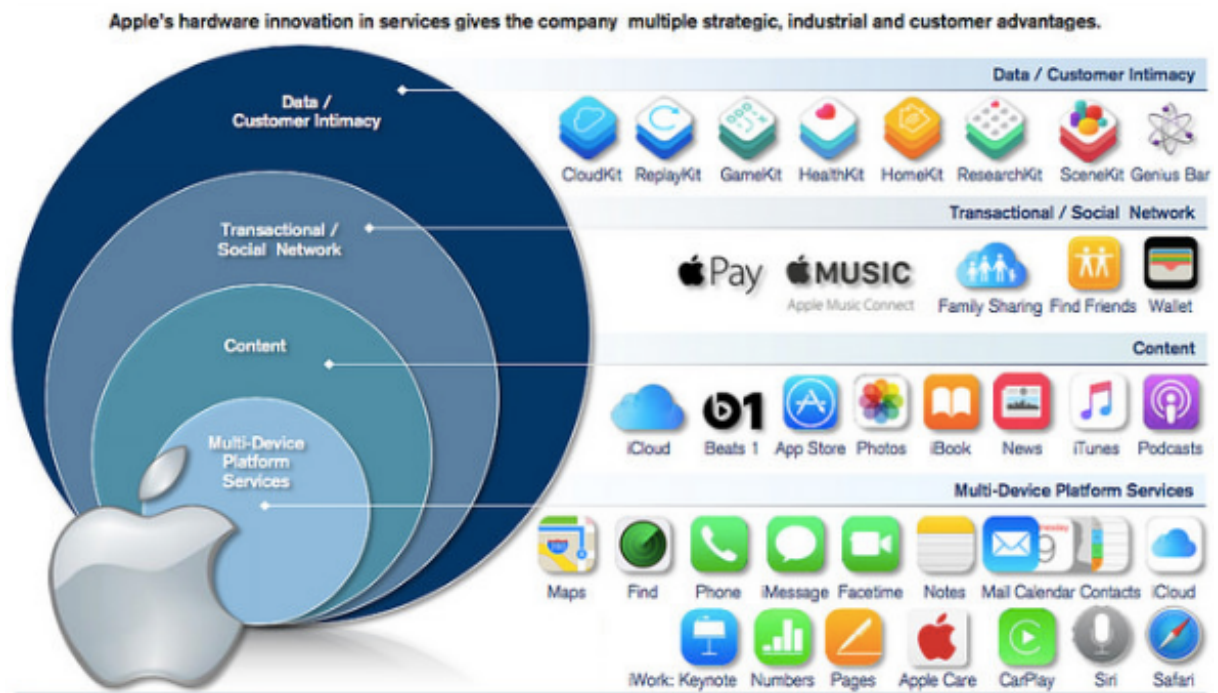
Adapted from G.G. Dess, G.T. Lumpkin, M.L. Taylor, A.A. Thompson, and A.J. Strickland III, *Strategic Management* (Boston, McGraw Hill, 2004) pp. 141-148.

Appendix 2: The VRIO framework

Summary of VRIO, Competitive Implications, and Economic Implications					
Valuable?	Rare?	Costly to Imitate?	Organized Properly?	Competitive Implications	Economic Implications
No			No	Disadvantage	Below Normal
Yes	No		↑ ↓	Parity	Normal
Yes	Yes	No		Temporary Advantage	Above Normal (at least for some amount of time)
Yes	Yes	Yes	Yes	Sustained Advantage	Above Normal

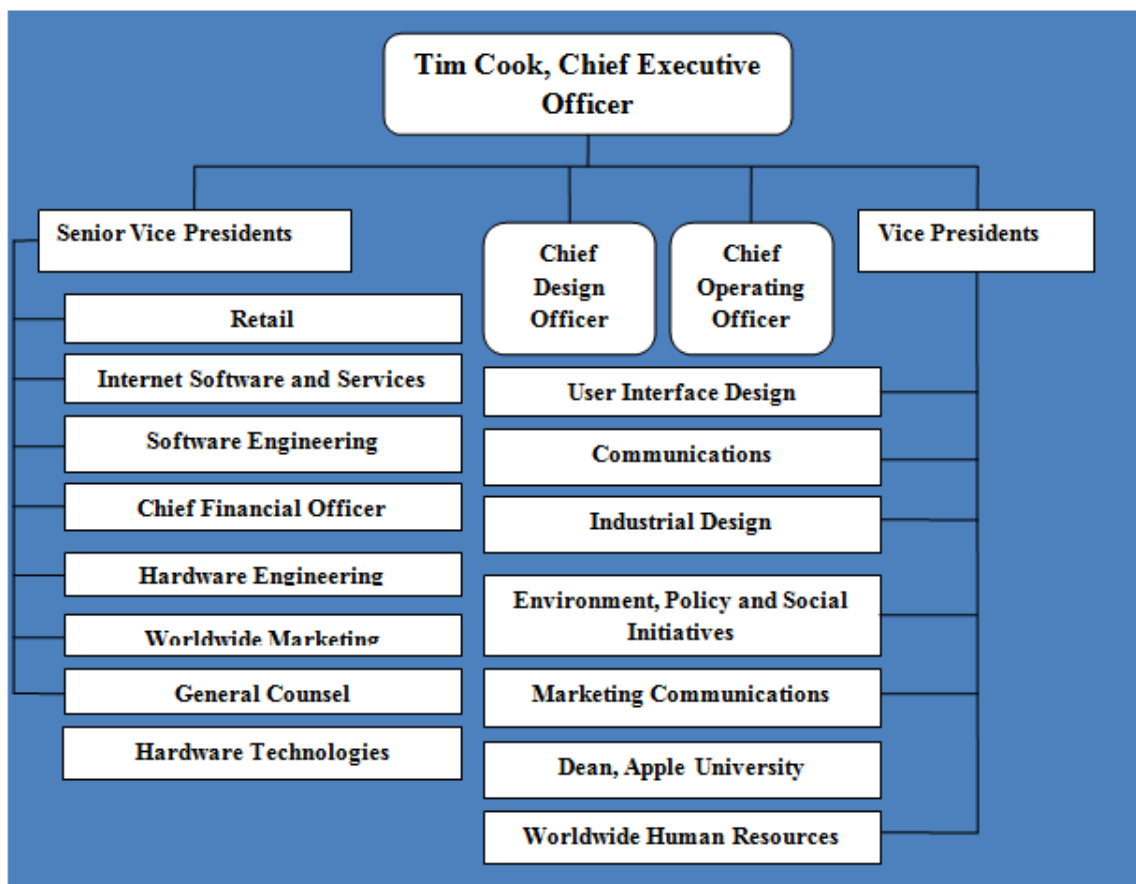
Adapted from G.G. Dess, G.T. Lumpkin, M.L. Taylor, A.A. Thompson, and A.J. Strickland III, *Strategic Management* (Boston, McGraw Hill, 2004) pp. 141-148.

Appendix 3: Apple services ecosystem



Source: Credit Suisse report, April 2016

Appendix 4: Apple organizational structure in 2018



Source: John Dudovskij, posted on January 12th 2018 on researchmethology.net

Appendix 5: Main characteristics of RBV and dynamic capabilities

Paradigm	Intellectual roots	Representative authors addressing strategic management questions	Nature of rents	Rationality assumptions of managers	Fundamental units of analysis	Short-run capacity for strategic reorientation	Role of industrial structure	Focal concern
(3) Resource-based perspectives	Penrose, Selznick, Christensen, Andrews	Rumelt (1984) Chandler (1966) Wernerfelt (1984) Teece (1980, 1982)	Ricardian	Rational	Resources	Low	Endogenous	Asset fungibility
(4) Dynamic capabilities perspective	Schumpeter, Nelson, Winter, Teece	Dosi, Teece, and Winter (1989) Prahalad and Hamel (1990) Hayes and Wheelwright (1984) Dierickx and Cool (1989)	Schumpeterian	Rational	Processes, positions, paths	Low	Endogenous	Asset accumulation, replicability and inimitability

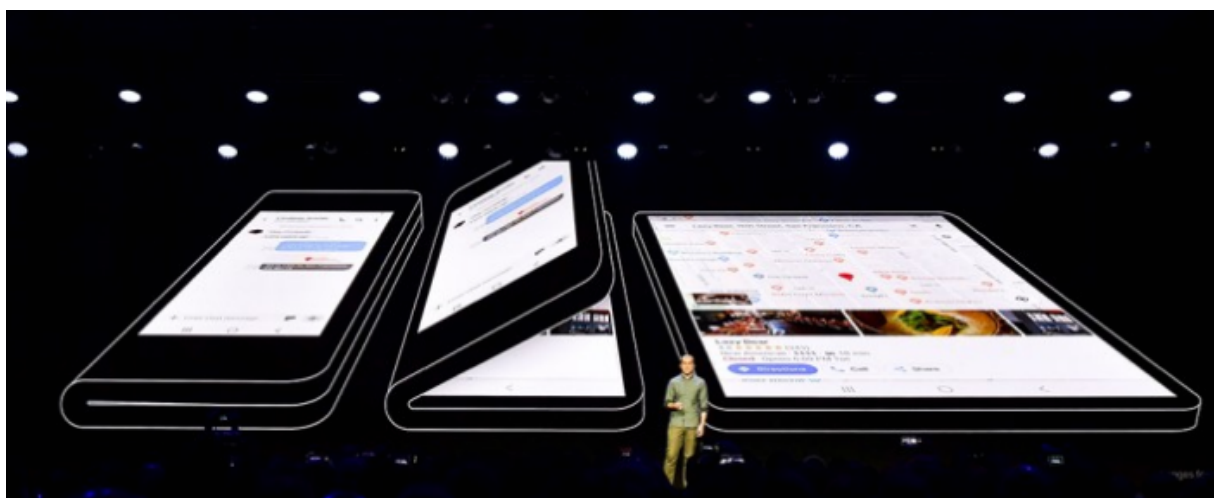
Adapted from Teece, D. J., Pisano, G., & Shuen, A. (1997). *Dynamic capabilities and strategic management*

Appendix 6: The evolution of Galaxy Note phablet



Source: <http://android-how.com/samsung-galaxy-note-evolution-of-the-s-pen/>

Appendix 7: The presentation keynote of the first Samsung foldable phone



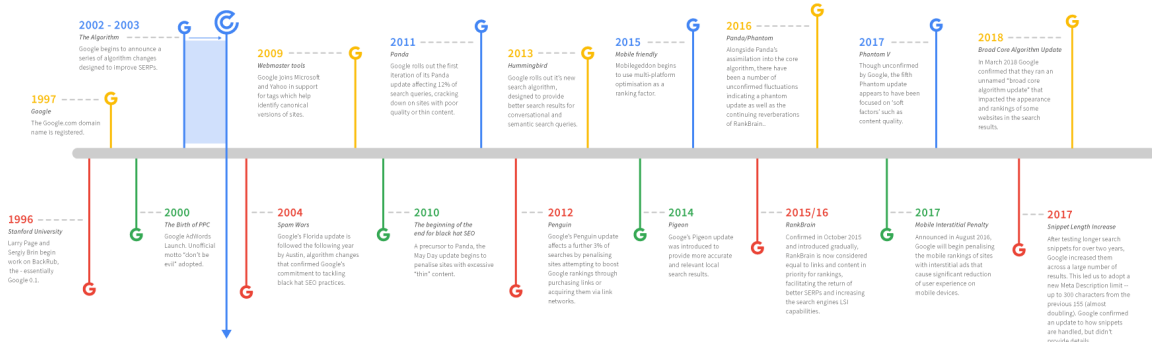
Source: <https://www.theweek.co.uk/smartphones/97659/samsung-unveils-world-s-first-folding-phone>

Appendix 8: The exploration vs exploitation tradeoff

High	Asymmetrical Ambidexterity -Exploration dominant	Symmetrical Ambidexterity -Parallel exploration- exploitation
Exploration	Not Ambidextrous	Asymmetrical Ambidexterity -Exploitation dominant
Low	Low	High

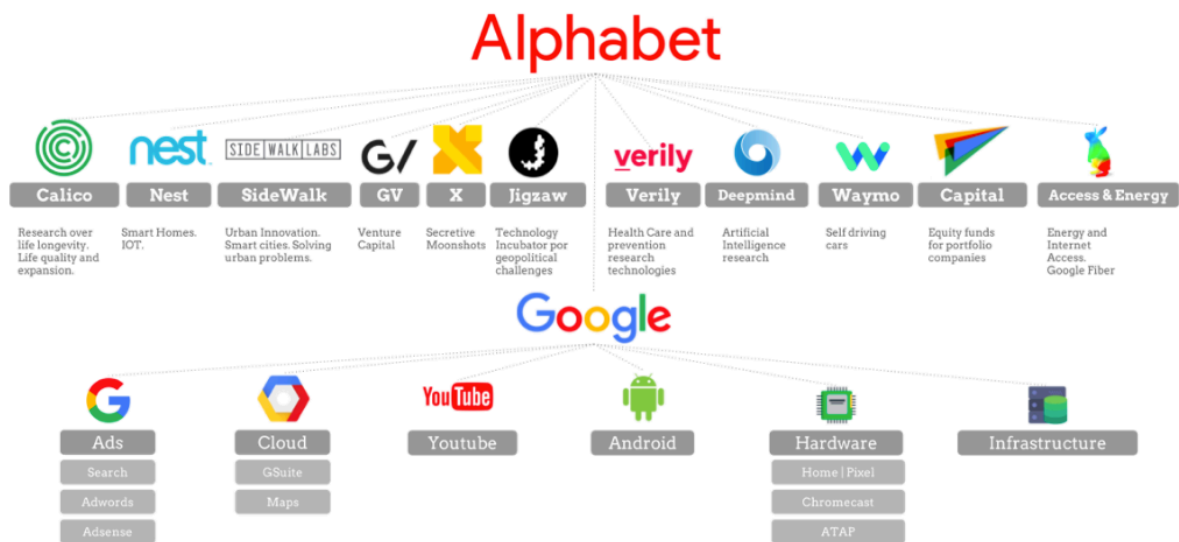
Source: Ramachandran, Indu R. (2012). *Toward A Dynamic View of Organizational Ambidexterity: Promoting a Sense of Balance and Contingency*

Appendix 9: Google algorithm timeline



Source: <https://www.click.co.uk/resource/google-timeline-infographic/>

Appendix 10: Alphabet and Google current structure



Source: <https://seekingalpha.com/article/4094329-alphabet-bets>