Colvin Consulting Group

Insight

Why Market Leading Companies Are Also the Leading Innovators

Introduction

This paper explores critical factors that drive innovation and how market leaders distinguish themselves as top innovators. This high level of quality innovation is underpinned by research and development (R&D) spending that is two to three times more than their peers. The paper also shows that the most innovative companies are some of the most profitable.

Innovation drives profit. What drives innovation?

The next page highlights the fact that market leaders capture 80 per cent of positive economic profit produced in a sample of 5,750 companies in 2016[2]. Innovation drives profit by fostering dynamic workplaces, creating differentiated products, and increasing market capture. But what drives innovation?

In a March 2019 survey, Boston Consulting Group (BCG) listed as their top, most consistent innovators some of the most globally known multinational corporations today: Microsoft, Samsung, Amazon, Toyota, IBM, Apple and Google/Alphabet.[1]

Here, we will explore the critical factors that differentiate these companies from their competition, allowing them to maintain their positions as global innovators while consistently earning above-market profits.

Critical factors – Overview:

Firms like BCG and McKinsey have identified six key factors that drive innovation:

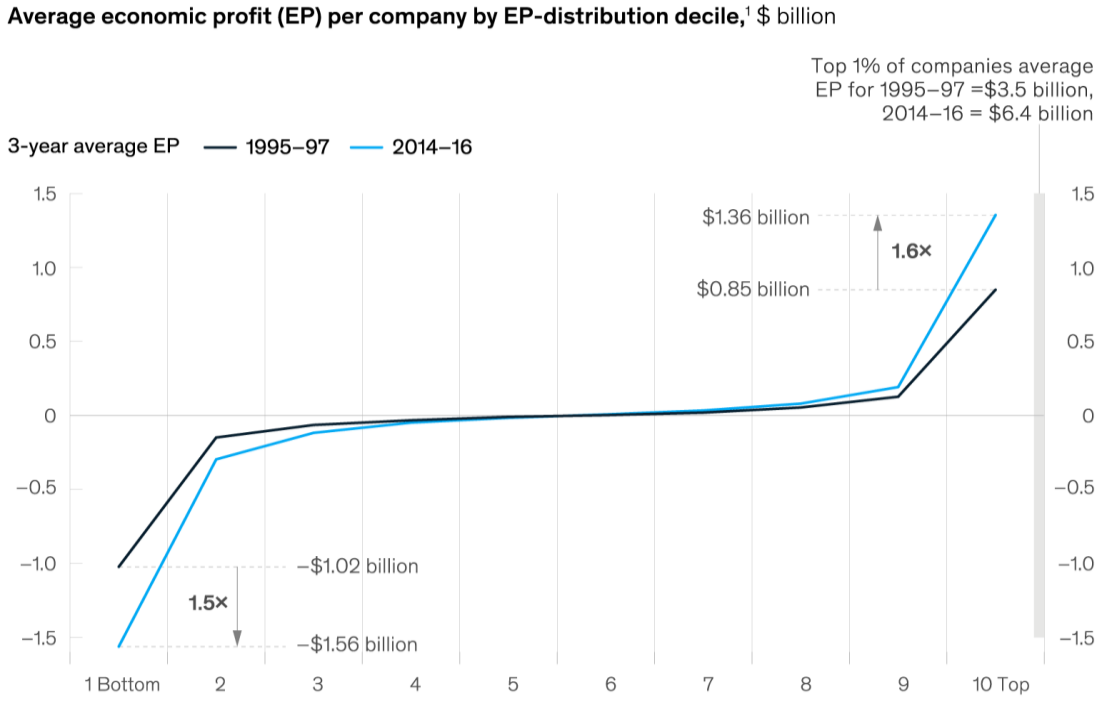
- Heavy investment in research and development (R&D)
- Key metrics used to determine R&D effectiveness
- Diversifying to stay ahead of the competition
- A company culture that fosters innovation
- A drive to use technology for competitive advantage
- A sustained focus from upper management.

A Heavy Investment in Research and Development

Striving for growth requires a heavy investment in research and development. McKinsey Global Institute's (MGI) April 2019 study on *Superstar Companies* shows a strong relationship between R&D investment and competitiveness. As seen by the variation between the 2014-16 curve in Figure 1:

- The top ten per cent of current market competitors analysed capture 80 per cent of positive economic profit[2]
- Market leaders are spending two to three times more on R&D than their peers; accounting for 70 per cent of total spending on R&D[2]
- Companies in the top one per cent by positive economic profit are investing almost three times more in R&D than median companies and nearly ten times more than market laggards.[2]

Figure 1: The distribution of economic profit and loss over the past 20 years:[2]



[1]In 2016 dollars. Considers corporations with average sales of ≥$1 billion (adjusted for inflation) to calculate economic profit in each time period. Sample sizes are 2,450 companies in 1995–97 and 5,750 companies in 2014–16.
Source: Chris Bradley, Martin Hirt, and Sven Smit, *Strategy Beyond the Hockey Stick: People, Probabilities, and Big Moves to Beat the Odds*, John Wiley & Sons, 2018; *'Superstars': The dynamics of firms, sectors, and cities leading the global economy*, McKinsey Global Institute, October 2018, McKinsey.com; Corporate Performance Analytics by McKinsey; McKinsey analysis

McKinsey & Company

Figure 2: R&D Intensity of leading technology companies

	Amazon	Microsoft	Google/Alphabet
2018	12.4%	13.3%	15.7%
2017	12.7%	13.5%	15.0%
2016	11.8%	13.2%	15.5%
2015	11.7%	12.9%	16.4%

**R&D intensity is calculated by dividing R&D expenditure by a company's total revenue*

As shown in Figure 2, Amazon, Microsoft, and Alphabet stay well above the five per cent average R&D intensity across all industries, with Alphabet three times that average.[3] Arguably, a consistent focus on research and development can maintain stability in volatile market conditions, whereas companies who become 'comfortable' with their existing suite of products risk falling behind the curve, unable to keep up with everchanging consumer demand.

Echoing some of these points in his Quantitative Economics study *Research and Development, Profits and Firm Value (2015)*, economist Missaka Warusawitharana shows that firms can expect about a 20 per cent jump in profitability with high investment in innovation.[4]

Whilst scrutinised, the R&D cultures of market leaders are also defined by strong in-house and 'closed (secret) innovation' practices.[5] By doing so, companies are able to release their products and secure the relevant intellectual property rights before any of their competitors, maintaining their competitive advantage.[5] These conditions can be seen with products such as:

- Google's search algorithm
- Microsoft's software packages
- Google's data evaluation and advertising systems
- Apple and Microsoft's operating systems
- Apple and Amazon's device families
- Apple, Amazon and Google's cloud services
- Amazon's ordering and logistic systems.[5]

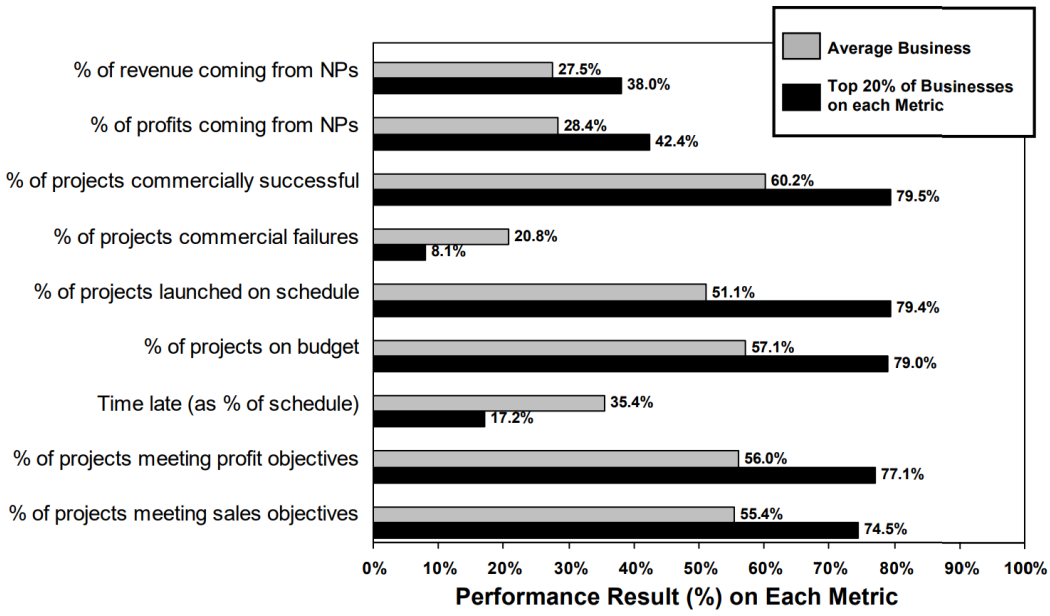
The company's collaborative and productive workplaces combined with strict non-disclosure rules allow them to continually have first-mover advantages in their respective industries. Strong, secretive investment in R&D allows market leaders to continuously release innovations before their competitors.

However, there are some 'controlled openings'.[5] Defined by Dahlander and Gann as 'inbound innovation sourcing',[5] companies that communicate with open source communities are exposed to a wide range of external ideas and knowledge that comparatively ask for very little in return.[5] These relationships have aided in the development of the operating systems, devices and infrastructure applications of many of BCG's top innovators, including Apple, Google, Amazon and IBM.

Key Metrics Used to Determine R&D Effectiveness

Companies that invest in R&D without periodically gauging their effectiveness risk losing capital to unproductive projects. As evidenced by Figure 3, developing a range of products that are, by all metrics, successful is no easy task. Drs. Cooper, Edgett and Kleinschmidt in their report *Best Practices in Product Innovation: What Distinguishes Top Performers* outline that new products fail at an alarming rate, though companies in the top 20 per cent experience an almost 20 per cent higher success rate with less than half the failure rate of an average business.[29] The report also documented the top 20 per cent of firms as having around 38 per cent of sales and 42.4 per cent of profits coming from new products and outlined these statistics as clear indicators of success.

Figure 3: New Product Development Performance results: The Top 20% vs. the Average Business [29]



Thus, understanding how new products are contributing to sales is key. The success of a firm's R&D contribution can be easily measured through tangible metrics such as its impact on new products. McKinsey cites two simple metrics that determine the effectiveness of R&D spending:

- R&D-to-product (RDP) conversion

  (Calculated by taking the ratio of R&D spending as a percentage of sales to sales from new products)[6]

- New-products-to-margin (NPM) conversion

  (Calculated by taking a ratio of gross margin percentage to sales from new products).[6]

RDP allow organisations to visualise how R&D translates into new-product sales and NPM the contribution of new-product sales to margin uplift.[6]

Evidently, 3M's New Product Vitality Index (NPVI) demonstrates how innovation can be measured within a company. Closely monitoring the performance of their sales from new product development, their NPVI quantifies the percentage of company sales from products introduced in the past five years.[7] More specifically, 3M are able to gauge that roughly 30 per cent of total sales in any year comes from new products that are less than five years old,[30] a statistic close to the range that the report indicated as a sign of successful R&D activity.

Ultimately, one cannot guarantee that an investment in research and development will produce the expected level of discovery as there are extraneous market factors to guarantee success. Even more concerning, any fruitful investment in research and development is not certain. However, monitoring how R&D translates to firm profits does assist a company in considering their handling of current and future projects.

Diversifying to Stay Ahead of The Curve

Intense innovation dynamics have led to high market volatility; half of the top market competitors lose their status in every business cycle.[2] To defy market forces, the most innovative companies expand outwards to new industries, increasing the chances of profitability by acquiring new technologies and capabilities.[5] Innovation leaders Amazon, Alphabet, and Apple adopt this strategy, persistently challenging the conventions of existing industries.

- Amazon's purchase of online pharmacy PillPack in June 2018 for $753 million initiated their encroachment on the prescription drug market[8]

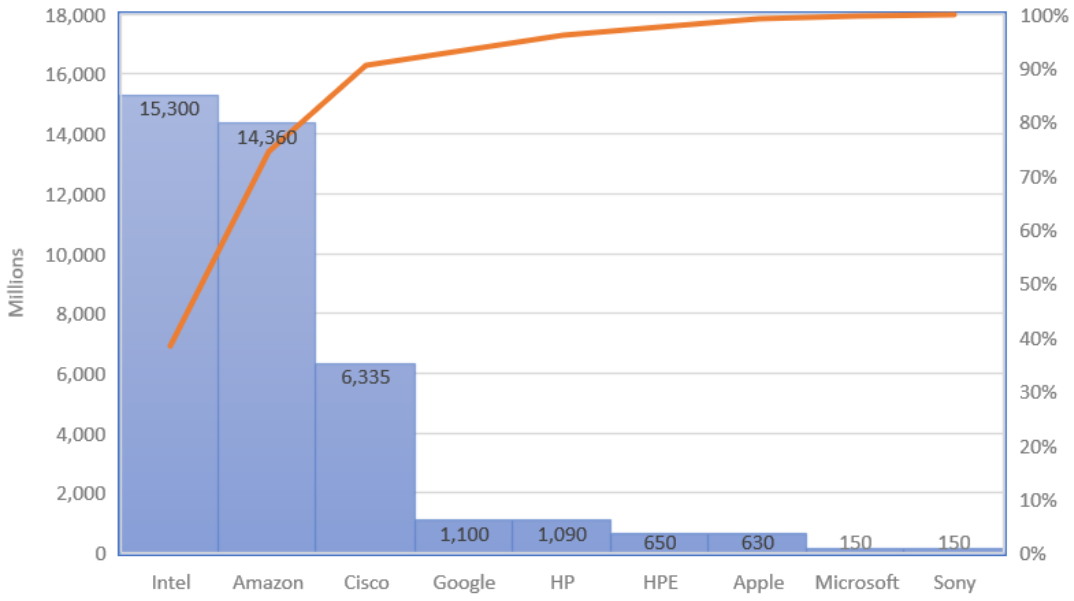
- Amazon's presence in the whole foods market was established through their acquisition of Whole Foods in June 2017 for $13.7 billion[9]

- Alphabet's acquisition of start-up Senosis Health in September 2018, an app that uses a smartphone's camera to measure haemoglobin to detect health conditions, increased their presence in the health sector[10]

- Apple's December 2018 acquisition of Platoon, an artist development platform, shows their persistent effort to establish themselves in the music industry[11]

- Google and Amazon are each venturing into the automobile industries, competing in the connected car sector.[12]

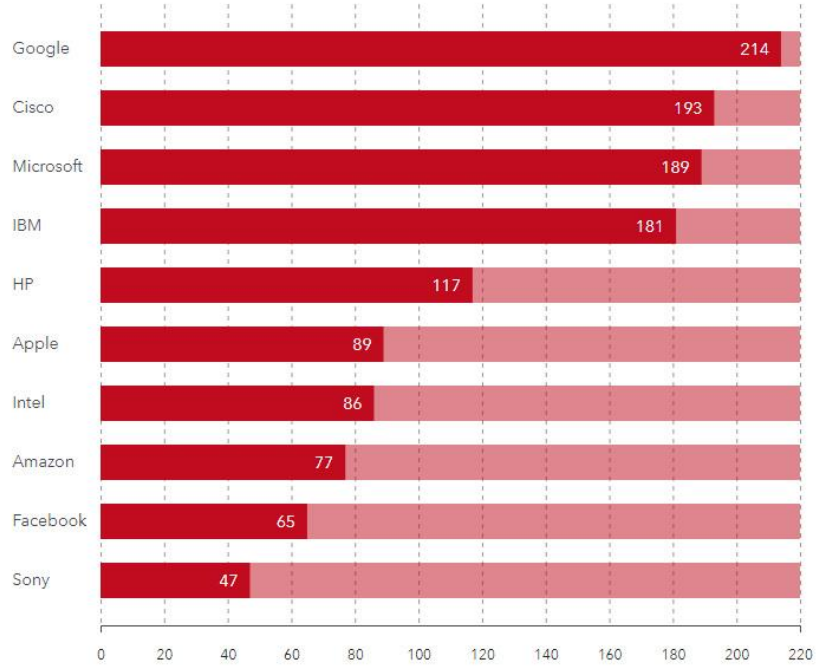
Figure 4: Top 19 Tech Acquisitions 2017[31]



Business Insiders' top 19 most significant tech acquisitions of 2017 (as seen in Figure 4) lists tech-giants Amazon, Google, HP, Apple, Intel and Microsoft amongst its' ranks, implying a correlation between a heavy acquisition strategy and a company's competitive positioning.[31]

The logic behind a strong acquisition strategy is straightforward. Diversifying through smaller companies temporarily fends off competition and allows the opportunity to utilise the unique capabilities of the acquired company to venture into new fields.[5] Clearly this logic has not evaded many of the tech market-leaders, with Figure 5 showing the aggressive M&A strategies of tech-giants since 1991. As illustrated, many innovation leaders of today are also those with the strongest, most aggressive acquisition strategies.

Figure 5: Comparison of the number of acquisitions made by tech-giants since 1991[13]



Furthermore, a 2012 McKinsey study on *M&A Value Creation* suggested that companies with a more programmatic pattern of M&A – defined as many small deals that represent 19 per cent or more of the acquirer's market capitalisation[14] – on average experience more profitability and productivity than their competitors who relied on organic growth. For example, IBM's acquisition of smaller software firms expedited their ability to access the global markets.

In the tech industry, companies with a more tactical approach to M&A – acquiring smaller companies that do not combine to make up a large portion of the acquirer's market capitalisation – were considered by McKinsey as significantly more successful than competitors that used other approaches relying on organic growth.[14] For example, Microsoft's history of utilising M&A to add features to its core products has been continually successful in compelling users to upgrade.[14]

Therefore, a company with an M&A strategy that complements their business objectives will foster innovative dynamics within their workforce. As existing employees are able to collaborate with new members with varied areas of expertise, companies are able to enrichen their R&D process to create innovative products. However, it is important to mention that this is only one strategy of diversification and should not be considered the be all and end all of pathways to an innovative workplace.

A Company Culture that Fosters Innovation

With workplace environment at the core of innovative discoveries, companies must cultivate a culture that encourages collaboration and creativity. Furthering this, nurturing a workplace accepting of different ideas and character types can elicit productive gains in innovative discoveries. Toyota and Amazon are a benchmark for this, emphasising the importance of:

- Not becoming complacent
    - Amazon's business model revolves around being constantly 'in day one', the innovation and growth stage of a business. Bezos considers "stagnation as a company's deathbed in today's fast-moving society"[15]
    - Embracing external trends. Amazon welcomes the digital disruption that characterises the upheaval of modern markets[15]
- Putting customer and societal needs at the forefront of company priorities
    - Bezos is focused on what the consumer wants before they know they want it, stating that "no customer ever asked Amazon to create Prime membership program, but it sure turns out they wanted it"[16]
    - Toyota prioritises consumer needs previously unaddressed by the automobile industry:[17]
        - Toyota's partnership with SoftBank in joint venture Monet Technologies Corp. will break into autonomous delivery services, allowing for portable medical treatment and on-demand vehicle and data assessment[18]
        - Toyota is test trailing the KINTO plan in Tokyo: a car subscription service that allows customers, for a flat monthly subscription rate, to utilise a variety of vehicles[19]
- Encouraging exploration
    - Amazon welcomes risky decision making: Bezos has stated that "most decisions should probably be made with somewhere around 70% of the information you wish you had. If you wait for 90%, in most cases, you're probably being slow… being wrong may be less costly than you think, whereas being slow is going to be expensive for sure"[16]

- Toyota's innovation fairs encourage employees to be constantly thinking and collaborating. Each year, 130+ ideas are submitted with the top 40 competing for awards and various funding schemes.[20]

In comparison, market laggards foster toxic workplaces that discourage creative thinking and reduce productivity. Such workplaces feature:[21]

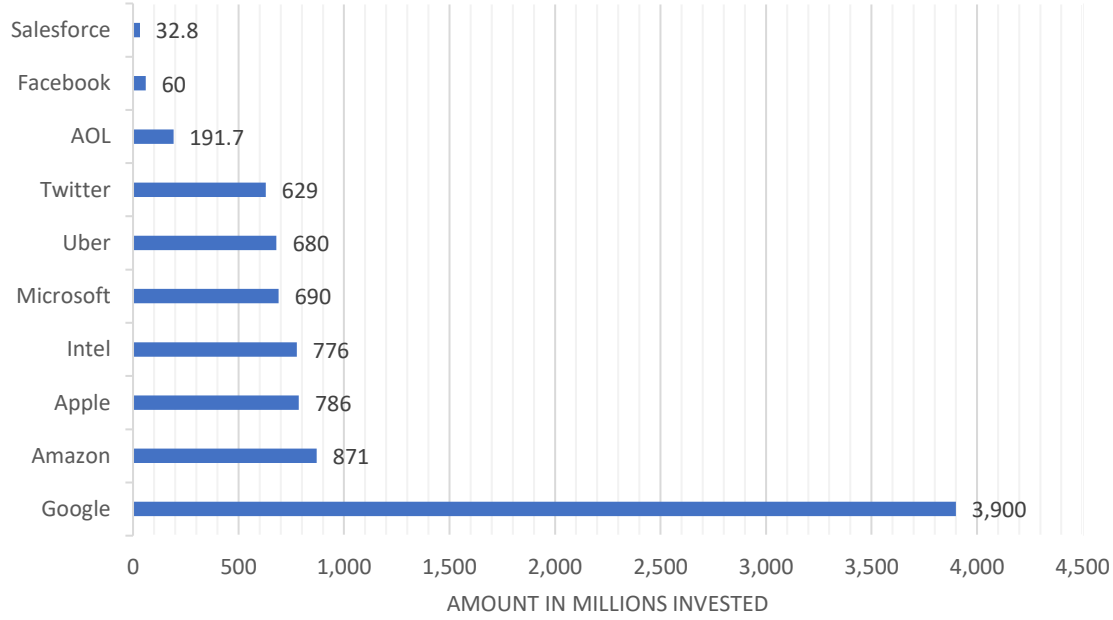
- Low levels of communication discussing innovation
- A fear of retaliation from employers
- Lack of cross-departmental collaborations
- Over-politeness
- High turnover
- Risk aversion
- Lack of core values.

The bedrock for innovation within a company, culture, is an undervalued asset to a business. Without a carefully cultivated company culture, a business cannot expect to have consistent innovative discoveries.

A Drive to Use Technology for Competitive Advantage

Technology is an increasingly useful tool to automate the value chain process and in product development. Innovative companies recognise this and look for ways to use technology to achieve advantage. For example, market leaders recognise the potential artificial intelligence adds to the value creation process of a business. As seen by Figure 6, the top companies investing in AI are also market leaders in their respective industries; with some also listed by BCG as the most consistent innovators.

Figure 6: The top 10 investors in Artificial Intelligence[27]*



**The top 10 tech companies based on how much they've spent acquiring AI start-ups where the price was disclosed since 1998.*

While machine learning (a branch of AI) remains a low hanging fruit for market players, AI leaders go further, recognising its potential in product development.[32] For example:

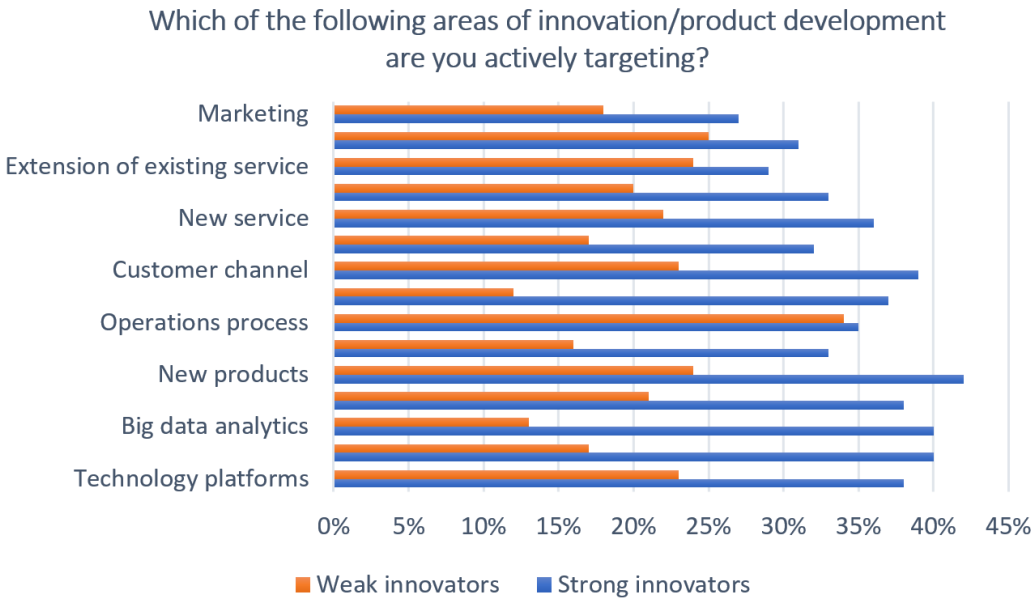
- Toyota concept-i vehicles will be able to 'learn' about its driver, listening to the user's conversations, facial expressions, driving habits and schedules to sense when a driver might be sleepy or distressed[22]
- Toyota's human support robot T-HR3 will be able to mirror a human user's movements and operate autonomously to support their users in various ways[23]
- Google is developing AI software that will aid in disease detection (e.g. Parkinson's Disease, diabetes and heart disease), healthcare data infrastructure and insurance[24]

- Samsung's AI voice assistant Bixby is set to be integrated into a diverse range of products, from TVs and kitchen appliances to washing machines. For example, Samsung's January 2019 announcement included the introduction of a new Bixby-enabled front-load washer, model WF6300R.[25]

BCG's 2018 Global Innovation Survey found that:[32]

- AI leaders apply big data and advanced analytics throughout the business process
- AI leaders use AI to create operational competitiveness
- Laggards tend to focus on buying generic AI products from weak providers
- Laggards tend to stray away to investing in AI beyond its automation capabilities.

Figure 7: 2018 BCG Global Innovation Survey on the areas of innovation/product development businesses are targeting[32]



The high cost of investment as well as the amount of data needed to develop AI products beyond what is already commonplace disincentivises laggards from pursuing this avenue for growth. However, as seen by Figure 7, those who are able to raise the capital to invest in AI products are able to leverage its unique capabilities for market dominance.

AI has value-adding qualities that can enrich products to the benefit of consumers, giving market players a competitive edge in their offerings. Their capabilities allow for more creative thinking regarding product development, leading to new innovative discoveries.

A Sustained Focus from Upper Management

Without sustained guidance from upper management, the workforce cannot be expected to 'steer' themselves toward innovative discoveries. Case in point, IBM was approaching collapse twenty years ago. Today, they are thriving. This shift can be attributed to the sustained focus by IBM C-Suite executives in R&D and their awareness of the disruption of the tech industry.[26]

Since 1992, IBM has had CEO's who have framed R&D at the forefront of their focus; Louis Gerstner Jr. (CEO from April 1993 – March 2002) set the path from mainframes to software and services, and Samuel Palmisano (CEO from March 2002 – October 2011) strengthened that transition through the acquisition of a range of software firms and selling the PC division in 2004 to Lenovo for $1.75 billion.[26] Since then, IBM has sustained a coherent and collegial board that has allowed for steady progress. Their sustained investments in R&D can be seen in a comparison between IBM and HP's R&D Intensity between 2013-17 (Figure 8).

Figure 8: HP and IBM 2013-2017 R&D and R&D intensity

R&D (in million USD)	HP	HP R&D Intensity	IBM	IBM R&D Intensity
2013	1,956	1.7%	5,743	5.8%
2014	2,197	3.9%	5,437	5.9%
2015	2,338	4.5%	5,247	6.4%
2016	1,714	3.6%	5,751	7.2%
2017	1,486	2.5%	5,781	7.3%

** From HP and IBM 2013-17 annual reports and other online resources.*

We can gather that:

- An innovative culture must begin at the top
- Upper management turmoil will be reflected in the company's output
- Companies must have a sustained level of focus and adaptability to remain ahead.

Conclusion

Undoubtedly, innovation drives a company's competitiveness and profitability. Though more publicly adopted by tech companies, any firm can embrace an innovation-first mindset. However, in doing so, boards must be wary of arbitrarily trying to foster innovation. Rather, they must consider:

- What can they do to create an environment that promotes and nurtures creativity?
- How will they structure their business to encourage the pursuance of new ventures?
- How can they finance creative ideas?

Finally, it is important to reiterate that boards cannot focus on only one of the above to be innovative. Rather, companies must adopt a mixture of these factors in order to foster a healthy company culture and productive workplace that inspires innovative behaviour.

Authors

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References:

1: https://www.bcg.com/en-au/publications/collections/most-innovative-companies-2019-artificial-intelligence-platforms-ecosystems.aspx

2: https://www.mckinsey.com/featured-insights/innovation-and-growth/what-every-ceo-needs-to-know-about-superstar-companies

3: https://www.oecd-ilibrary.org/docserver/sti_scoreboard-2017-21-en.pdf?expires=1563761783&id=id&accname=guest&checksum=5579FF51B0DE345432E2D85EEC06F3D3

4: https://doi.org/10.3982/QE282

5: Apple, *Amazon, Google, Facebook, Microsoft: Market concentration - competition - innovation strategies (Vol. 2017–01).* University of Stuttgart, Institute for Social Sciences, Department of Organizational Sociology and Innovation Studies.

6: https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/taking-the-measure-of-innovation?cid=other-eml-alt-mip-mck&hlkid=3387f68c9d304201ab3a38ddd211deb6&hctky=1365543&hdpid=aad9e095-a9d2-4f5c-aa1d-85704140ed31

7: https://www.forbes.com/sites/greatspeculations/2016/12/20/rd-one-of-the-driving-factors-behind-3ms-growth/#4f8d57716d6c

8: https://www.sec.gov/Archives/edgar/data/1018724/000101872419000004/amzn-20181231x10k.htm

9: https://theconversation.com/with-its-purchase-of-whole-foods-is-amazons-goal-to-revolutionise-food-distribution-93161

10: http://fortune.com/2017/08/14/google-health-diagnosis-senosis/

11: https://www.theverge.com/2018/12/7/18130936/apple-platoon-artist-development-startup-acquisition

12: https://www.the-ambient.com/features/best-smart-car-tech-ces-2019-1304

13: https://www.visualcapitalist.com/interactive-major-tech-acquisitions/

14: https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/taking-a-longer-term-look-at-m-and-a-value-creation

15: https://www.forbes.com/sites/quora/2017/04/21/what-is-jeff-bezos-day-1-philosophy/#67db5fe11052

16: https://ir.aboutamazon.com/static-files/e01cc6e7-73df-4860-bd3d-95d366f29e57

17: https://www.forbes.com/sites/simonmainwaring/2018/11/13/purpose-in-action-how-toyota-is-driving-growth-innovation-and-impact/#18341eac47fbs

18: https://www.cnbc.com/2018/10/04/softbank-and-toyota-announce-partnership.html

19: https://techcrunch.com/2019/02/04/toyotas-new-car-subscription-company-kinto-is-gamifying-driving-behavior/

20: https://www.cio.com/article/3030990/steal-this-idea-toyota-s-secret-to-innovation.html

21: https://www.inc.com/marcel-schwantes/5-signs-of-a-toxic-workplace-that-should-be-stopped-immediately.html

22: https://www.autoblog.com/2017/10/16/toyota-to-test-self-driving-talking-concept-i-car-by-about-2020/

23: https://spectrum.ieee.org/automaton/robotics/humanoids/toyota-gets-back-into-humanoid-robots-with-new-thr3

24: https://www.cbinsights.com/research/report/google-strategy-healthcare/

25: https://www.pocket-lint.com/phones/news/samsung/140128-what-is-bixby-samsungs-assistant-explained-and-how-to-use-it

26: https://channeldailynews.com/news/contrasts-in-it-innovation-ibm-vs-hp-since-1992/24003

27: https://www.techrepublic.com/article/the-10-tech-companies-that-have-invested-the-most-money-in-ai/

28: https://www.businessinsider.com/these-were-the-19-biggest-tech-acquisitions-of-2017-2018-6/?r=AU&IR=T

29: https://pdfs.semanticscholar.org/41f9/88ae80e62b8abade7001c4ad235bcedfb58c.pdf

30: http://multimedia.3m.com/mws/media/1216292O/full-goals-and-results-2016-sustainability-report.pdf

31: https://www.businessinsider.com/these-were-the-19-biggest-tech-acquisitions-of-2017-2018-6?r=AU&IR=T

32: https://www.bcg.com/en-au/publications/2019/most-innovative-companies-innovation.aspx

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