

INTRODUCTION TO INNOVATION MANAGEMENT

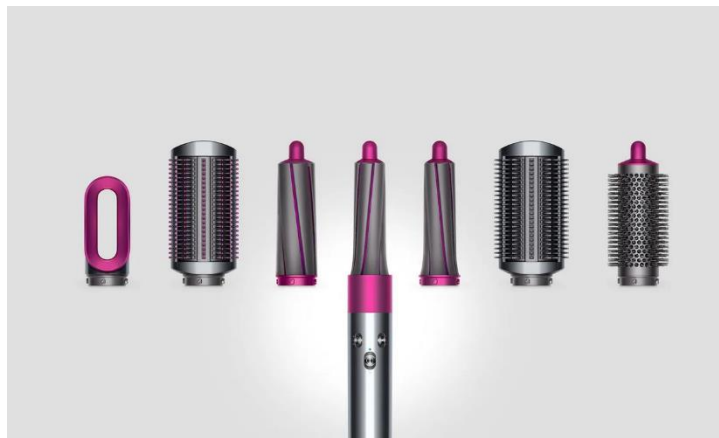
ASSESSMENT B

ACPA7005

A CRITICAL EVALUATION OF THE INNOVATION OF THE DYSON AIRWRAP

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A CRITICAL EVALUATION OF THE INNOVATION OF THE DYSON AIRWRAP

1 Introduction

- 1.1 This paper will critically evaluate the uncertainties and technical/business risks inherent within the innovation of the Dyson Airwrap Styler. It will synthesise a detailed view of how individual, team and corporate behaviour can both facilitate or stifle innovation, in relation to best practices.
- 1.2 Dyson is a brand that is famous for its bagless vacuum cleaners launched in 1993, designed to be more efficient and effective at cleaning than traditional models. Famously using the science of cyclone technology to separate the dust and debris from the air using centrifugal force.
- 1.3 Dyson has expanded its product line over the last thirty years to develop other household products including air purifiers, hand dryers, and lighting products. It has also expanded into new markets, such as personal care and beauty products, with the launch of its Supersonic hair dryer in 2016.
- 1.4 The Dyson Airwrap Styler was released in 2018 and like many (or all) of Dysons products, it takes a fairly standard, boring household product such as a vacuum cleaner, desk fan or in this case hair curling tongs, and re-imagines it with engineering, design and features to the point where many can not believe the price tag attached, but perhaps are even more surprised when people pay it.
- 1.5 The Airwrap is a hair care multi-tool. Think of a Swiss Army Knife for hair. The handle contains Dysons powerful digital motor technology and it comes with a series of head attachments designed to dry, straighten, smooth and curl your hair. The scientific 'gimmick' in this case is the Coanda effect that directs the hair around the tools, drying and styling the hair with the use of extreme heat and therefore less damage to the hair.
- 1.6 The tool sold out almost immediately and within a few weeks, had a waiting list of more than 130,000 people, all waiting to hand over £400 for the device.
- 1.7 Dyson consistently demonstrates the ability to invest in new innovations whilst remaining profitable as a business. This paper will evaluate the Airwrap innovation and present an evaluation of its success.

2 The principal drivers for the innovation

- 2.1 The innovation of the Dyson Airwrap was part of a strategic product portfolio expansion into the world of hair care.
- 2.1 Dysons core expertise revolves around the use of motors and air filtration, cooling and heating, and whilst surprising to many, the transition into personal care and beauty tools is not a far reach from its core expertise. It is merely an alternative use of technology, transforming and adapting its core expertise into another field of use, ultimately providing a product of value to its customers by addressing the problems inherent with existing solutions.

- 2.2 Dyson's transition into hair products is the result of years of work and sizable investment. Dyson have been researching hair for more than a decade and have invested over £100 million into laboratories around the world. In the hair care product area Dyson continue to research and develop tools to meet their mission: products for every hair type, every style, with less damage and today, there are over 6,000 engineers, scientists, and stylists working within Dyson globally to help drive this mission forward.^[1]

3 The barriers and risks faced by the company in developing this innovation

- 3.1 The innovation of the Dyson Airwrap was inherently risky. There was uncertainty over whether the technology would actually work and whether the market would embrace the change. There was also the risk that competitors would move in a different and more successful direction.
- 3.2 There would have been many technical challenges in getting the Airwrap to work. One of the technical challenges was fitting all the technology into a small and lightweight envelope, as this becomes the handle of the device that the user is holding aloft throughout its use. Another challenge was accuracy. It was of utmost importance to get the right width and the right air pressure for the Coanda effect to take place. Getting that accuracy right on all the attachments was a big challenge.^[2]
- 3.3 From a competitive perspective Dyson protects their new ideas through secrecy within the business. Dyson operates a need to know policy and famously develops all new products within its access controlled D9 research lab where engineers and scientists experiment and innovate.
- 3.4 Dyson also protects new ideas through patents. At one point Dyson filed for more intellectual property patents than any other company in the UK. Since 1979, Dyson has received over 2,300 patents worldwide from over 4,000 patent applications and over 1,200 registered designs worldwide from over 1,300 registered design applications.^[3]
- 3.5 Dyson employees could have focused on failures of the past such as their failed foray into electric vehicles, but James Dyson's mantra is repeated in some form or other all over their branding and is found to be repeated in quotes by employees:
- "Successes teach you nothing. Failures teach you everything.
Making mistakes is the most important thing you can do."* — James Dyson
- 3.1 The culture at Dyson is therefore encouraged to push boundaries, make mistakes and try again.
- 3.2 Not only does Dyson have the habit of entering new markets, but it also has a track record of doing it while completely blowing mainstream price points out the window, and establishing higher and more controlled pricing than any of its competition.^[4]

- 3.3 One of the consistent themes of Dysons technology is the concept of perfection. Perfection comes at a price and perhaps one of the greatest challenges in innovation for Dyson is the cost of development.
- 3.4 Dyson researchers and designers worked on the Airwrap for six years with 642 prototypes made and \$31.4 million spent on its overall research and development.^[2] With these long timelines and costly prototyping, it is no doubt that development costs would need to be amortised in product sales and that may partly explain the expensive price tag. This was probably the biggest risk for the Airwrap innovation.
- 3.5 Dyson mitigates the risk of the market embracing the technological change that their products represent by clever marketing and branding.
- 3.6 In Dysons advertising the product is the focus combining the glossy state of the art product with the strategic innovation behind the design. It glamourises the technology but keeps the complex science simple by creating illustrations and animations that are easy to follow and buy in to.
- 3.7 Luckily (or by design) Dyson's attention to detail and over-engineering for every day products at an inflated price point have created almost a status symbol or fashion that people want to be part of.

4 The key determinants in the process of committing to develop the innovation

- 4.1 Dyson are consistent with their marketing style promoting the science behind the innovation to explain why this new product is far superior than all others in its class.
- 4.2 In the case of the Airwrap, the science behind the 'reinvention' is known as the 'Coanda Effect'. In fluid mechanics this is where a fast moving jet of air traveling over a surface will attach to that surface and even if the surface is curving away the jet of air will attach to that surface and follow it. The Dyson Airwrap uses this phenomenon by creating a spinning vortex of air around the cylindrical shaped barrels of the tool picking up the hair and encouraging it to wrap itself around the barrel and curling it through the use of the air vortex. The result creates a natural hair style look without the extreme heat damage caused by conventional stylers.
- 4.3 The science philosophy is one of the key determinants of the innovation, but without Dysons digital motor technology the product would not exist. Dyson has specialised in digital motors and these feature in all of Dysons products, from the vacuum cleaner to the hair drier.
- 4.4 Another key determinant in the Airwrap innovation is its multitool attachment heads. Part of the lure of the Airwrap is the concept that the product is versatile and suitable for every hair type, and every style. This ensures the widest demographic and marketing opportunities. It also conveys a value for money if the tool does more than one thing.
- 4.5 Perhaps the most important key determinant for the Airwrap innovation however, is the use of social media in its marketing campaign. The Airwrap is a viral super-product and status symbol, ensuring a market willing to pay its inflated price.

5 The processes and technologies which the company used to carry this development forward

- 5.1 In 2012 Dyson founded a new state-of-the-art manufacturing facility in Singapore's tech hub, West Park. Here, high-precision robots assemble around 15 million Dyson digital motors a year. These motors sit at the heart of nearly all of Dyson's products.
- 5.2 Over 400 machines are fully automated and can make one motor every two seconds. It is a huge feat of production engineering with state of the art robotics and manufacturing processes. The production lines are organised into a spiral pattern calculated to minimise the distance components have to travel between each station.
- 5.3 All 36 work stations are monitored by the 'Control Tower', a complex Manufacturing Enterprise System (MES), which replaces the factory foreman of old and can slow down or speed up individual parts of the line in real-time to prevent build ups or bottlenecks.
- 5.4 While Dyson does not disclose exactly how much it costs to make each motor that comes off this line, simply by looking at the hundreds of millions of pounds of investment it has spent on the advanced robotic manufacturing line that makes them, it is clear that this is one of the most important technologies they have ever designed.^[5]
- 5.5 Whilst the media and advertising focus on the product, and the Coanda effect technological gimmick, the key to the Airwrap lies with the digital motor.

6 The extent to which the development relied on resources external to the company and the ways in which the deployment of these resources was managed

- 6.1 One of the keys to the Dyson Airwrap innovation success is its use of social media in its marketing strategy. The timing of the products release was around the same time as the popular influencing app TikTok and then in 2020, a convenient twist ensured plenty of people were at home in lockdown amidst the Covid-19 pandemic, with plenty of time on their hands to create videos and scroll social media platforms. Dyson made use of this marketing opportunity encouraging the Airwrap into a viral sensation and super product.
- 6.2 If you search #dysonairwrap on TikTok, you will be met with an endless amount of content relating to its praise. While a few of the content videos featuring the Dyson Airwrap are posted by sponsored creators, the vast majority are just people who love their Dyson Airwrap and want to show it off.
- 6.3 In 2022 a Dyson employee responded to this plethora of tutorials given by inexperienced individuals in a sassy TikTok tutorial which gained over 8 million views, 1 million likes, and ten thousand comments in under a week.^[6] This level of interaction on a product featured content is a dream come true for companies.

- 6.4 The Dyson Airwrap is incredibly aesthetic and fast and the combination of features paved the way for a multitude of creators on TikTok to showcase its capabilities and produce over 1.1 billion views of content with #dysonairwrap.

7 How management overview of the development was maintained

- 7.1 Sir James Dyson is an inventor, entrepreneur and philanthropist who has devoted his life to solving problems and developing products through the application of new technologies. He is very much the heart and soul of the company.
- 7.2 Dysons culture is centred around innovation and problem-solving. According to James Dyson, Dyson's culture is based on “solving the problems that others have ignored, and solving them first using our technology and ingenuity”, and this has been reflected in the company's approach to product development and its willingness to take risks and try new things.
- 7.3 In Dysons D9 research building, engineers and scientists experiment and innovate, and come up with pitches to present to the founder himself in the neighbouring building. Whilst passionate and hands-on this illustrates very much a Power Culture led organisation.
- 7.4 James Dysons strategy and mantra are well published and even used in their marketing strategy.
- 7.5 “You can't make progress unless you experiment. And if you experiment and do something different or something new, you are almost bound to fail multiple times before you make a success of it. So, we just have to get used to the fact that our whole day is going to be full of experiments and failure.” ^[7]
- 7.6 Dyson researchers and designers worked on the Airwrap for six years with 642 prototypes made and \$31.4 million spent on its overall research and development. The support of the business to sustain such lengthy time lines and costly experimentation, is testament to James Dysons commitment to technological innovation.
- 7.7 Dysons philosophy remains the same as it was almost 30 years ago when James Dyson invented the first cyclonic vacuum cleaner. Dyson remains family-owned. They don't bow to outside shareholders or report to the stock exchange. Instead they plot their own path, unshackled from conventional thinking.^[8]

8 The extent to which you feel this innovation process represents best practice

- 8.1 According to Paul Trott ^[9], innovation is not a linear process where products are designed, handed over to production to make, and then handed over to marketing to sell, it relies on a cyclic innovation model where strategic innovation is engrained throughout the business all working together for a common goal. This is definitely true for Dyson. It is not just in the product design and engineering departments coming up with exciting new products.

8.2 According to Dysons website:

'Pioneering technology takes more than just inventive engineers. At Dyson, we take a problem-solving approach to everything we do. And across our support teams, we're proud to be different. And importantly, we support change to maintain our rapid growth. From our Finance and Security teams, through to Legal, Communications and our People function, we're focused on delivering an unsurpassed service across the entire business.'^[10]

8.3 Measured against Satell's Matrix^[11] the one of the key problems defined for the Dyson Airwrap team was to find an alternative technology to extreme heat for styling hair. This was certainly not a simple and defined step and required a completely alternative way of looking at the problem. This is what Dyson thrives on; looking for alternate ways to solve the problem, usually by taking scientific principles of airflow and implementing those principles into engineered products creating breakthrough innovation.

8.4 Considering the domain definition, for Dyson, hair care tools were a completely new area although the product range itself had a firm and existing foothold. An interesting article on the Dyson website^[12] talks of a lead Research Engineer becoming a 'hair expert' getting involved in user trials and understanding what hair means to people, gathering research from real people with emotional and cultural differences, people with different hair structure and ways of using products. Understanding that you can have too much power, creating an unpleasant hair drying experience, and that your hair can have a huge impact emotionally. All of this research will have been fed back to the design team to help steer the development and create requirements. Through this research it led to a product that made consumers think differently about the hair tools they were using. Now concerned with heat damaged hair, Dyson had created its niche to disruptive innovation.

8.5 It is also possible that the Airwrap was just another planned step in the product roadmap for Dysons digital motor technology and actually the creating different applications for the motor technology is part of sustaining that innovation.

9 Your report should also provide your own critique of the whole innovation process, and an evaluation of the success of your chosen innovation.

9.1 Whilst to many, the Dyson Airwrap is a glorified hair styler at an astronomical price, like it or not, the hype around the glamorous looking hair styler made so much profit in 2018, the year the Airwrap was launched, that the company's founder, James Dyson, became the richest man in Britain. His net worth surged by a whopping \$4 billion after his company reported a record £1.1 billion revenue for 2018, up 37 percent from the previous year.^[13]

9.2 In 2022 Dyson suffered a drop in profits despite record sales. Higher shipping and logistics costs hit profits, which fell to £1.3 billion from £1.5 billion, but sales remain high and hit £6.5 billion up from £6 billion a year earlier.

9.3 As an engineer I have always been inspired by James Dysons unwavering commitment to technology, thinking outside of the box and creating something special from the mundane.

- 9.4 The Airwrap has been a product on my wishlist since it was introduced. Intrigued and mesmerized by the spinning hair and the seemingly effortless curls it produces. However, it is still on my wishlist, waiting for the day that I have enough money to justify the spend.
- 9.5 In the past I have often thought of working at Dyson, with the promise of exciting new product development and creating products that defy the norm. However, what I have learnt in doing this research is the reality is probably more focused on attention to detail and prolonged iterative prototyping, and I can imagine this being quite a tough and demanding place to work 99% of the time.
- 9.6 Dyson is certainly not shy of investment in both time and money. This surely drives product price up, but through innovation management throughout the Dyson business and culture, this is saved by exceptional marketing strategy and branding.
- 9.7 Without the viral success of the Airwrap I don't think the innovation would have been quite so successful. However, fair play to James Dyson, for all of his failures, he hit the jackpot with this one!