Antifragile Organizations: Embracing Uncertainty to Gain in the Face of Crisis

Albert Munoz[1*], Mary Papakosmas[2], Mathew Todres[3] and Laura Rook[4]

Abstract

Crises pose significant challenges to industries and organizational operations. The global crisis presented by the COVID-19 pandemic destabilized business environments and led many organizations towards failure. However, some organizations displayed considerable gains, achieving enhanced performance in response to the elevated uncertainty. These organizations have the potential to inform future organizations facing similar periods of elevated uncertainty. This study employs the use of case study design underpinned by thematic identification and analysis to explore how antifragility was evidenced in three organizations (The Walt Disney Company, The Tractor Supply Company, and Zoom). Our exploratory analysis reveals two antecedents to antifragility namely 'embracing uncertainty' (informed by flexibility and exploration) and 'resource reconfiguration' (underpinned by key decisions and actions). These antecedents constitute a potential for antifragility to organizations aiming to gain through increased outputs and performance. Our findings contribute to the emerging body of literature on leveraging gains from uncertainty, providing insights for organizations to consider when faced with future crises.

Keywords: Antifragility; Crisis; COVID-19 Pandemic; Uncertainty; Organizational Gain

---

[1*] School of Business, Faculty of Business and Law, University of Wollongong, NSW, 2522, Australia, amunoz@uow.edu.au, ORCID ID: https://orcid.org/0000-0002-8298-3498
[2] Faculty of Business and Law, University of Wollongong, NSW2522, Australia, maryp@uow.edu.au, ORCID ID: https://orcid.org/0000-0002-0052-220X
[3] School of Business, Faculty of Business and Law, University of Wollongong, NSW2522, Australia, mtodres@uow.edu.au; ORCID ID: https://orcid.org/0000-0001-6496-7809
[4] School of Business, Faculty of Business and Law, University of Wollongong, NSW2522, Australia, lrook@uow.edu.au; ORCID ID: https://orcid.org/0000-0002-4945-9993

1. INTRODUCTION

Economic downturns, military conflicts, and pandemics are examples of crises that significantly impact industries and organizational operations. A crisis can be defined as "a sequence of events that can have substantial negative consequences if not managed appropriately" (Pederson et al., 2020, p 315). The uncertainty and disruption caused by crisis alters the operational environment for organizations, compelling them to explore alternative working methods.

While the notions of disruption and crisis are not new, the dimensions of the crisis triggered by the COVID-19 pandemic propelled organizations into extreme levels of uncertainty. Within these unprecedented environmental conditions, governments closed borders, enforced social distancing, and banned social gatherings to slow the spread of the disease. In many business settings, these responses heightened environmental uncertainty, risking organizational failure as pre-pandemic structures became ineffective (Ritter and Pedersen, 2020). Consequently organizations, confronted by the mismatch between their pre-pandemic business models and the subsequent crisis conditions, quickly adapted their structures, strategies, and business models, resulting in performance outcomes that ranged from business failure to net gains (Wenzel et al., 2020). This setting offers a valuable context in which to examine organizational performance and the emergence of antifragility during such challenging times.

This paper focuses on organizations that, rather than failing or merely surviving, have achieved increased performance outcomes triggered by the pandemic. Taleb (2012) refers to this increase in performance as 'antifragility'. However, more than a decade after its original publication, management practitioners and theorists still lack sufficient knowledge about antifragility to guide organizational designs and actions in times of elevated uncertainty (Munoz and Zhou, 2023; Größler, 2020). While previous research has highlighted the impact of the COVID-19 pandemic on organizational performance, and called for further investigation, there remains a limited understanding of how evolving business models, values, and practices in response to increased uncertainty have resulted in antifragile outcomes (Amankwah-Amoah et al., 2021; Anker, 2021). We recognize that distinct performance outcomes exist, for example robustness refers to an insensitivity to uncertainty (Mackay et al., 2019), resilience refers to a recovery after experiencing performance degradation (Williams et al., 2017), and antifragility refers to an upside gain (Munoz et al., 2022). The time during and after the pandemic has seen some examples of performance gains because of businesses being exposed to elevated uncertainty throughout the pandemic. These businesses offer great potential to business research and motivate our approach to explore antifragility in organizations facing crises. Specifically, our study utilises a case study design and thematic analysis to examine how three organizations responded to the pandemic resulting in performance gains. Further, we identify key antecedents to antifragility generated by a strategic embracing of uncertainty.

The paper begins with a review of literature on the concept of antifragility in organizations, and the contrasting approaches that are averse to uncertainty with those approaches that embrace uncertainty. The antecedents of antifragility currently found in the literature are identified, followed by a description of the methodology for data collection and analysis. The paper concludes with reflections and suggestions for future research.

2. LITERATURE REVIEW

2.1 Antifragility and the Antifragile Organization

Antifragility has been defined by Taleb (2012) as a property that enables systems to benefit from exposure to uncertainty. This deliberate exposure is a fundamental precursor to gaining advantage from uncertain conditions (Markey-Towler, 2018). Taleb (2012) further characterizes antifragility as the antithesis of fragility, wherein a system not only survives but thrives when confronted with uncertainty, disruption, or crisis. A systematic literature review by Ramezani and Camarinha-Matos (2020) reveals that antifragility has been explored across various disciplines, including biology, organizational studies, supply chain management and disaster management. Although different authors describe the concept of antifragility in various ways, common themes can be identified across the literature. These include the system's capacity to not only withstand shocks but also leverage them to become stronger, as well as an ability to adapt to changes and learn from experiences, mistakes, and incidents.

Research has found several factors can contribute to antifragility. These include social capital (Warren and Grigaliūnaitė, 2023), digital technologies (Corvello et al., 2023), intangible resources, tangible surplus resources, (Corvello et al., 2024), plasticity (Nikookar et al., 2024), organizational slack (Giordino et al., 2024), and the learning opportunities and resource sharing provided by collaborative networks (Sagala and Őri, 2024). Antifragility can also be achieved by investing in (or eliciting) existing adaptive capacity, strategic adaptive capabilities, or possessing an availability of mechanisms by which organizations can reconfigure themselves before, or after, a disruption. A literature review by Ramezani and Camarinha-Matos (2020) identified capabilities that can be activated to create antifragility in response to disruptions or crisis. Their extensive list included capabilities such as adaptability, cohesiveness, cognitive ability, creativity, diversity, flexibility, fault tolerance, redundancy, and transformability. The authors also noted these capabilities are often scattered in the literature, reflecting partial views and inconsistent terminology (Ramezani and Camarinha-Matos, 2020). Therefore, further research to develop an understanding of antecedent organizational characteristics is crucial for understanding what creates the conditions for organizational gains. Such understanding would help construct better organizational designs with greater potential to gain while navigating crises like the pandemic in the future.

The potential for antifragility becomes evident during times of crisis when the resources and capabilities that contribute to antifragility gain value in new, changed contexts. This aligns with arguments of latent functionality (Merton and Merton, 1968), a term which refers to the hidden strengths that are only revealed under stress, and which bring significant positive returns in these circumstances. Similar notions of latent functionality are also present in an organization's ability to reconfigure and change during times of crisis (Worley and Lawler III, 2006). For example, during the pandemic, breweries, distilleries and perfume manufacturers made hand sanitiser in response to shortages, and teams of engineers redesigned assembly operations to produce ventilators (Jones, 2020). This type of change supports the idea that an organization's adaptive abilities may only become apparent when specific opportunities arise. Sudden, unexpected increases in uncertainty, such as the pandemic, can reveal these latent adaptive abilities.

2.2 Organizational Responses to Crisis

Periods of elevated uncertainty often compel organizations to modify their business models (Ahokangas and Myllykoski, 2014; Saebi et al., 2017). In such environments, factors beyond managerial control can significantly influence, or even dominate, performance outcomes. The pervasive impact of global megatrends may lead managers to perceive uncertainty as a threat, prompting defensive strategies such as cost-cutting and downsizing (Deng et al., 2021; Griffin and Grote, 2020). However, these actions typically deplete the organizational reserves that are crucial for navigating periods of high uncertainty (Gittell et al., 2006). A more effective approach involves embracing uncertainty and implementing proactive change initiatives (Munoz et al., 2021). This strategy seeks to create synergies between existing capabilities and emerging opportunities (Cavanagh, 2017) potentially positioning the organization to achieve performance gains amidst uncertainty, as opposed to merely surviving such a period (Corvello et al., 2022). By adopting this perspective, organizations can turn uncertainty from a threat into an opportunity, focusing on adaptation and exploiting new opportunities (Miles et al., 1978). This increases the potential for adopting new or hybrid strategies during uncertain times (Forte et al., 2000).

The COVID-19 pandemic created significant uncertainty, prompting organizations to use managerial actions to achieve desired performance outcomes (Altig et al., 2020). However, the pandemic-induced uncertainty often made it difficult for managers to predict *how* their actions would affect organizational outcomes. Early studies on organizational responses to the pandemic suggest that thriving post-crisis often requires some form of processual transformation (Ritter and Pedersen, 2020; Wenzel et al., 2020). Such transformations can help organizations endure and potentially thrive by creating and capitalizing on new opportunities (Alvarez and Barney, 2020; Alvarez et al., 2018; Duchek, 2020; Hillmann and Guenther, 2020). This adaptive approach underscores the potential for organizations to emerge stronger from crises by embracing change and innovation, an observation that provided valuable insights for managers navigating future periods of elevated uncertainty. Later works empirically examined organizational responses to the pandemic. For instance, the work of Silva et al., (2023) concluded that some businesses responded by innovating, rethinking business processes, and embracing digitalisation.

Another empirical study claimed organizational responses to the pandemic varied in scope and approaches, while some aimed to mitigate risk, others sought to leverage potential gains (Klöckner et al., 2023).

So far, the notion of antifragility as an outcome to be sought has had some limited applications, primarily in areas of supply chain (e.g., Nikookar et al., 2024), social systems (e.g., Derbyshire and Wright, 2014), inventory management (e.g., Munoz and Zhou, 2023), sociotechnical settings (e.g., Abbas and Munoz, 2021), and dynamic systems more generally (e.g., Größler, 2020). The work of Taleb (2012) is mostly derived from financial markets and investments and is largely descriptive, relying on repeated empirical observations of performance outcomes as a phenomenon. According to Größler (2020) antifragility is limited to an abstract concept, leaving many interested management practitioners to interpret how to drive antifragility as an outcome in their organizations. This operationalization is crucial because the assumption that antifragile systems thrive under uncertainty can guide managerial decisions to achieve performance gains, whereas fragile systems may incur losses. Applying such concepts to academic endeavours is also difficult, as the concept is not a theory per se, but rather a property of a system (Nikookar et al., 2021). It is also important to acknowledge that uncertainty itself is a departure from determinism (Walker et al., 2003) and any assertion of antecedents to gains need to be carefully qualified as gains cannot be determinable during periods of elevated uncertainty. To address these gaps in understanding, our paper addresses the following research question:

RQ1: How have organizations transformed to achieve antifragile outcomes in response to crisis?

3. METHODOLOGY

3.1 Research Design: Case Study

This study employs a case study design (Yin, 2018), selected because such a design enables the exploration of a case or series of cases in a real-world setting. The case study design focuses on specific cases in their contextual settings, involving data collected from multiple data sources, and offers the flexibility needed for comprehensive data collection and analysis to shed light in new and emerging research areas (Robson, 2024). In addition to theory development, the case study design also allows for the development of practical insights. This study aims to explore how organizations have adapted to achieve antifragile performance outcomes during the COVID-19 pandemic, and in doing so attempts to offer theoretical and practical insights in times of crisis. The case study approach is well suited to developing understanding of how organizations have made sense of and responded to the COVID-19 pandemic.

3.2 Case selection

Three organisational cases were selected using a purposive sampling technique, a variant of nonprobability sampling (Marshall, 1996). With other literature focussing on SMEs during the pandemic (Corvello et al., 2024) we aim to add to this understanding by exploring the antecedents of antifragility in different organisational contexts. We therefore selected large, global organizations for this study. The criteria for case selection were for-profit entities that faced significant threats due to the COVID-19 pandemic; organizations that implemented major changes (e.g., business model, operations); and those organizations that initially experienced a significant decline in operational and/or financial performance, but ultimately thrived financially and benefited from the uncertainty generated by the pandemic. We decided to identify for-profit entities, based on the reasoning that quarterly revenues and operating costs for example, would serve as useful financial markers for performance prior to, during, and after the height of the pandemic. The pandemic caused a rise in financially distressed organizations (Amankwah Amoah et al., 2021; Singh and Rastogi, 2022), many of which failed. This prompted us moreover, to select organizations with strong financial performance. The organizations were identified through an initial analysis of media news sources.

3.3 Thematic Data Collection and Analysis

We opted to gather and analyse secondary data available in the public domain, focusing particularly on media reports and articles that addressed the impact of disruption and organizational responses to the pandemic. Secondary data collection was chosen over primary data collection due to its cost-effectiveness and time efficiency, characteristics that were useful particularly during the rapidly unfolding events of the pandemic (Creswell and Poth, 2018) and the restrictions that affected all aspects of business and society. Thematic analysis involving the identification, analysis and interpretation of meaning (Braun and Clarke, 2008) from secondary data available in the public domain, was used to identify how our selected cases—Walt Disney Company, Tractor Supply Company, and Zoom—responded to, and gained from, the uncertain operating conditions. Our analysis employed explanation building (constructing a narrative), cross-case synthesis (i.e., identifying common elements), and comparative analysis (noting any differences and/or similarities) between cases (Yin, 2018). Following an inductive approach allowed patterns to emerge organically from the case study data (Kyngas, 2020) to uncover three emergent themes across the three cases, namely 'embracing uncertainty', resource reconfiguration' and 'exhibiting antifragility', which when the preceding two themes are combined, form antecedents to antifragility. Prior to the identification and discussion of these themes, we first describe the selected cases and their actions taken during the height of the pandemic.

4. RESULTS

In this section, we address each case study as a unique example of antifragility in response to a crisis. Our discussion begins with a broad organizational overview before then exploring how the cases navigated the challenges of the pandemic. This enables us to uncover the key elements that foster antifragility—those factors that not only allowed these companies to survive, but to gain as a result. This analysis aligns with the core aim of the paper, shedding light on the underlying principles that contribute to organizations being able to increase their performance outcomes in times of crisis.

4.1 Walt Disney Company

General Description of the Organization: Originally founded in the 1920s, as the 'Disney Brothers Cartoon Studio', the Walt Disney Company produced cartoons and iconic characters including Pluto and Mickey and Minnie Mouse, with content distributed by other companies (Wasco, 2016). The company opened its first 'Disneyland' theme park in 1955, later followed by the foundation of the Disney Channel in 1995 and Disney Online in 1996. After adopting several name changes, the organization became known as Walt Disney company in 1986.

Antifragility antecedents: By the start of the COVID pandemic, Disney was a long-established mass media and entertainment conglomerate, covering theme parks (Hong Kong, Shanghai, Tokyo, Paris), Cruises

(Disney Cruise Lines), Cinema and Television, and Stage productions. The pandemic led to the delayed production of 18 films and television series and the postponed release of another three major films (BBC, 2020). Government mandates preventing large scale public gatherings led to the company closing Hong Kong Disneyland, Shanghai Disneyland and Tokyo Disneyland Resort in 2020 (CNBC 2020a, 2020b). Moreover, the company announced it was laying off 28,000 employees across its parks, resorts, cruise lines and retail store businesses (Barnes, 2020). While the theme parks re-opened on a staged basis by 2021, the closures resulted in a $3.5B loss in operating revenues and an associated 37% drop in operating income by the third quarter of 2020 (Whitten, 2020).

The global pandemic, while potentially viewed as a crisis for the company's traditional brick and mortar locations, also marked an opportunity for the pivot to digital streaming. Disney had already started to move toward streaming in 2016 with its $3.8B majority share acquisition of video streaming firm BAMTech (Reuters, 2022). Prior to this, Disney had diversified through high profile acquisitions such as Pixar Animation studios for $7.4 B in 2006, Marvel Entertainment for $4B in 2009, and Lucasfilm for $4.1B in 2012 (Tracxn, 2024). These acquisitions helped set the stage for the launch of Disney+ in November 2019 – only months before the World Health Organization (WHO) declared COVID-19 a worldwide pandemic in March 2020 (World Health Organization, 2020). Disney+ subsequently increased content offerings from its acquired Marvel Universe and Star Wars franchises, amassing 164.2 million subscribers globally by the fourth quarter of 2022 (Stoll, 2024).

Disney+ was well positioned to benefit from timely investment by its parent company at a time when overall Subscription Video on Demand (SVOD) rates accelerated during the pandemic (ABI Research, 2020). However, several challenges persisted post-COVID, namely the high cost of funding new original content and need for adherence to policy on family and child-friendly content. Disney+ invested $33B in new content creation in 2022, partially accounting for operating losses of $420M in 2023 (Stoll, 2022), and decided not to provide R-rated content, which remains offered by the platform's competitors – Netflix and Amazon Prime (He, 2024). Nevertheless, aggressive acquisitions and new content creation pre-pandemic have accounted for the explosion in Disney+ subscription rates (Das, 2024). Disney+ had a 68% subscription retention rate beyond six months, occupying an 11% share of the highly competitive SVOD market 2024 (Gaines, 2024). Its revenue grew from 7.4B in 2022 to 23.91B in the first quarter of 2024 (Johnson, 2024).

4.2 *Zoom*

General Description of the Organization: Web-conferencing platform Zoom, was established in 2011 (Bloomberg, 2020) followed by the launch of conferencing applications in 2014. In 2019 the company completed an Initial Public Offering (IPO) to trade publicly and by the start of the pandemic, Zoom was the leading global web conferencing platform leading to a 418% growth in adoption rate in the first two months of the year (Tonneson, 2020).

Antifragility Antecedents: The pandemic-driven 'work from home' business model precipitated widespread customer adoption of Zoom software while also uncovering issues with software scalability (Morris, 2020). By early April 2020, privacy and security concerns had developed along with reported issues around system flaws which allowed the hijacking of accounts (Warren, 2020; CyberAware, 2020). The company acknowledged that these threats required solutions (Brandom, 2020; Hamilton, 2020) leading to the appointment of experienced security researchers (Turk, 2020).

Between May and July 2020, Zoom released a series of service iterations which focused on providing end to end encryption (E2EE) (Statt, 2020; Paul, 2020). To address the issues of scalability, Zoom procured additional infrastructure and staff that enabled an increase in capacity (Morris, 2020). Once these security issues were largely resolved, and additional capacity was brought online to address scalability issues, uptake of the software rose with wider use in workplaces and educational settings.

From January 2023 to May 2024, Zoom experienced both significant successes and notable challenges. Financially, Zoom saw a steady increase in revenue, with FY 2024 revenue reaching $4.52 billion, a 3% rise from the previous year; this was followed by a 3.2% increase in the first quarter of FY 2025 (Rodriguez and Eveslage, 2024). Product-wise, Zoom introduced several new features, including Zoom One, Zoom Contact Center, and Zoom Workplace to enhance its service offerings. Challenges included a 15% staff reduction in February 2023 and legal issues stemming from changes to its terms of service, which raised privacy concerns and led to a class action lawsuit settlement for $86 million (Peters, 2023; Murphy Battista, 2024). Additionally, regulatory compliance, especially with the introduction of the European Union's General Data Protection Regulation (GDPR), posed some ongoing hurdles (Lomas, 2023).

4.3 Tractor Supply Company

General Description of the Organization: Tractor Supply Company (TSC) began with one store in 1938 in North Dakota. As of March 2024, the rural lifestyle retailer sells products for farming, ranching, and outdoor pursuits through 2,234 stores in 49 states throughout the USA, alongside its online distribution networks (Tractor Supply Company, 2024a).

Antifragility Antecedents: During the pandemic, TSC was classed as an essential business, allowing continuity of operations and sales (Lynch, 2020) and the organization adapted to reconfigured to meet these demands. The contagious nature of COVID-19 meant that most of TSC's traditional face-to-face transactions could no longer safely occur, and workplace health restrictions prohibited many of the day-to-day operations. Given the threat of lost revenue, management focused on the new business and sales mechanisms which included the rise in cashless payments and curbside pickup (Withers, 2020).

The work from home trend caused by the pandemic, as well as the population shift to rural areas, created a new TSC customer base, circumstances which the company met by further reconfiguring operations. A revamped website and smart app updates to support the re-launched customer loyalty program became part of TSC's e-commerce innovation (Whaba, 2021). Further, increased visibility necessitated that TSC engage in greater transparency and disclosure on its environmental operations and corporate social responsibility initiatives, which resulted in an increase in revenue and public profile (Pilkington, 2021).

From January 2023 to May 2024, Tractor Supply Company (TSC) made significant progress in expanding its operations and enhancing its market presence. The company has continued to grow its store footprint, aiming to open 80 new stores in 2024 and planning to increase annual new store openings to 90, from 2025 (Howland, 2023). TSC has also focused on improving customer engagement and satisfaction through technology enhancements and store transformations (Tractor Supply Company, 2023). Since 2020, TSC has been adding garden centres to new and existing stores, aiming to open another 100 by the end of 2024, in response to a pandemic-driven spike in gardening.

Financial results for TSC in the second quarter of 2024, saw a net sale increase of 1.5% to $4.25 Billion (Tractor Supply Company, 2024b), however, TSC has faced challenges during this period. In the fourth quarter of 2023, net sales declined by 8.6% and comparable store sales dropped 4.2% (Tractor Supply Company, 2023), attributed to a shorter quarter and lower demand in some product categories. This challenging economic landscape has impacted consumer spending, leading to a conservative financial outlook for 2024 (GuruFocus Research, 2024). Despite these challenges, TSC is dedicated to its 'Life Out Here' strategy, launched in 2020, investing nearly $2.5 billion in new and remodelled stores, distribution centres, upgraded technology, and other initiatives to enhance its market position (Tractor Supply Company, 2023). Table 1 summarizes the key points emerging from the data which show the business state of each case organisation pre-crisis through to post-crisis.

Actions	**Walt Disney Co.**	**Zoom**	**Tractor Supply Co.**
Business pre-pandemic	Cartoons, theme parks and Disney channel	Web conferencing platform	Farming rural lifestyle retailer
Obstacles to operations arise.	Theme parks closed Movie filming paused	Software scalability Security concerns	Retail closure, End of face-to-face sales
Opportunity	Digital online streaming	Software security and functionality improved	Classification as an essential business Cashless pickup Online sales options New customer base
Response	Disney + established New content acquired	Acquired security expertise and storage capability	Online sales platform established Curb-side pickup option launched New product sectors launched (garden centers)
Result	Revenue 7.4 billion in 2022	FY 2024 revenue reached $4.52 billion,	Net Sales increased 1.5% to $4.25 Billion in June 2024

	FY 2024 Q1 revenue 23.91 billion - a 223% rise	a 3% rise from the previous year	

Table 1: Summary of individual case results

4.4 Cross-case analysis

Our thematic analysis reveals several antecedents of antifragility, which may possibly be leveraged in the future to produce gains. We do not claim that such antecedents guarantee gains in future periods of elevated uncertainty, with such reasoning based on our acknowledgement of Walker et al., (2003) who assert that uncertainty is nondeterministic by nature. Thus, antecedents that emerge from a retrospective analysis of organizational responses to the pandemic are accurately labelled as antecedents to antifragility in the sense that we can assert these organizational characteristics resulted in gains. Furthermore, these common elements were consistently identifiable across the three cases. For instance, the organizations examined, all displayed a willingness to adapt to the challenges presented by the pandemic. This notion of 'embracing uncertainty' is evident when an organisation is faced with crisis and shifts their perception from viewing circumstances as a threat to seeking and exploiting emergent opportunities. The second common element was 'resource reconfiguration', is described as organizational adaptation or procurement of resources or expertise to maximise gain potential while facing elevated uncertainty. We classify these two notions as organizational antecedents that lead to gains from the period of elevated uncertainty marked by the COVID-19 pandemic.

4.4.1 Antecedent 1: Embracing uncertainty

Prior to the pandemic, all three organizations were operating successfully, relying on traditionally applied business models. Faced with uncertainty as a threat, each experienced the risk of business failure without undertaking transformation. These perceptions of uncertainty represented different challenges to each business. For the Disney Company, the closure of its theme parks, brick and mortar stores and cruise line activities threatened its operations, as these traditional business models quickly became unsustainable. Such threats to certainty led to the accelerated pivot to, and investment in, streaming content. Just as Disney faced challenges with the closure of its public entertainment venues, TSC encountered similar operational threats due to restrictions on face-to-face sales. Demand for products then surged as the company was classed as an essential service, however this business opportunity was accompanied by an operational challenge in terms of dealing with the escalating number of transactions. The organization responded by changing how products were sold, moving to cashless pickup and revamping their online presence to facilitate the expanded customer demand. As a result of the pandemic, Zoom was also presented with business opportunities to capitalize on unprecedented demand, but this opportunity was accompanied by the discovery of security vulnerabilities. Zoom had to address the challenge of addressing security issues while simultaneously leveraging capabilities and resources to gain from the crisis environment. Each of the three case organizations embraced uncertainty and appreciated the need to adapt to a highly uncertain environment.

Leadership teams in the three cases confronted the uncertainty generated by the pandemic and devised plans to adapt and leverage new opportunities. In essence this embodies much of the behaviors explained by Miles et al., (1978) as akin to prospector and analyzer organizations which emphasize adaptation and the exploitation of new opportunities. In contrast, an uncertainty adverse reaction may have resulted in these organizations reducing their workforce, ceasing operations, or exiting a market (Deng et al., 2021; Griffin and Grote, 2020). In all three cases, the organizations adapted their business models to address heightened uncertainty, modifying or abandoning pre-pandemic models, and pursuing new opportunities for improved performance.

4.4.2 Antecedent 2: Resource Reconfiguration

All three organizations willingly embraced uncertainty and transformed or adapted, as evidenced by the reconfiguration of their existing resources or acquisition of new resources including expertise. This flexibility enabled the organizations to engage in alternative business models. For example, Disney strengthened its commitment to developing its presence in the streaming entertainment industry; Zoom capitalized on the working from home and hybrid-working surge by increasing capacity and investing in security measures to counter emerging vulnerabilities; and TSC established an online sales platform to address capability issues presented by a surge in demand. Disney and TSC had both internal resources and abilities to hand, while Zoom acquired additional resources in terms of capacity and security features. When combined with the willingness to embrace the uncertainty created by the pandemic, each organization experienced performance gains.

An organization's response to reconfigure resources when confronted by crisis exemplifies latent value. The added flexibility afforded by these latent capabilities is often ignored by some organizations, as such investments can appear poor in times of low uncertainty. For example, the utility and necessity of restructuring or investing in TSC's web presence upgrade, or Zoom's procurement of additional security protection, may have been harder to justify, pre-pandemic. Similarly, a $33B investment in new content creation in 2022, may have been less justifiable to Disney Company executives and investors in pre-pandemic 2018 or 2019, particularly when this investment was nearly double to that of rival Netflix (Sukhanova, 2024). The three organizations refused to exit their respective industries and instead embraced uncertainty to adapt their business models.

4.4.3 Exhibiting Antifragility

Gains from the COVID-19 pandemic are apparent across all three organizations in this study. Walt Disney revenue increased 223% from 7.4 billion in 2022 to 23.91 billion in the first quarter of FY 2024; TSC's net sales increased relative to pre-pandemic levels (BusinessWire, 2020); and Zoom's revenue grew considerably with the FY 2024 revenue reaching $4.52 billion (Novet, 2020). Ultimately, a willingness to embrace uncertainty facilitated the adaptation of pre-pandemic business models, considering the changes brought forth by the COVID-19 pandemic.

Table 2 illustrates how the case organizations have demonstrated antifragility by transforming threats posed by the COVID-19 pandemic into opportunities for growth and innovation. Each one faced unique challenges but leveraged them to emerge stronger. These examples highlight the adaptive strategies employed by these organizations to thrive amidst uncertainty.

Organization	**Antecedent 1** ***Embracing uncertainty***	**Antecedent 2** ***Resource Reconfiguration***	***Exhibiting Antifragility***
The Walt Disney Company	*Threats:* closure of theme parks and pausing of film production and releases. *Opportunity:* digital online streaming.	Established Disney +, created and acquired new content.	Disney+ had rapidly grown its base from 26.5 million (in 2020) to 164.2 million subscribers (in 2022).

Zoom	*Threat:* software scalability *Opportunity:* improve software security and functionality.	Acquired security expertise and storage capability.	FY 2024 revenue reaching \$4.52 billion, a 3% rise from the previous year.
Tractor Supply Company	*Threats:* retail closure; the end of face-to-face sales *Opportunity:* classification as an essential business, cashless pickup, online sales options, and new customer base.	Established an online sales platform, a curb-side pickup option, opened new garden centers.	Net Sales Increase of 1.5% to \$4.25 Billion in June 2024.

Table 2: Summary of Antifragile Antecedents and Outcomes

5. DISCUSSION

The aim of this paper is to explore how organizations have adapted to achieve antifragile performance outcomes during the COVID-19 pandemic, offering theoretical and practical insights in times of crisis. As much of the existing literature focusses on SMEs during the pandemic (Corvello et al., 2022), we sought to add to this understanding by exploring the antecedents of antifragility in different organisational contexts.

Our analysis reveals a link between organizations' innovative actions and antifragility in times of increased uncertainty. These actions are manifested by procurement of resources, adapting existing business models, or engaging in alternatives. Our findings, in part, support Saebi et al., (2017) who found that organizations are more likely to adapt their business models in response to external threats than when they perceive opportunities. The resources and capabilities leveraged to achieve gains during the pandemic also possess characteristics of latent functionality arguments (Merton and Merton, 1968) or slack resources (Wenzel et al., 2020). This also supports our findings: all three cases possessed latent functionality that they took advantage of uncertainty through reconfiguring resources when faced with crisis. As such, we argue that our findings build on those of Corvello et al., (2024) who determined that intangible resources (intellectual and social capital) and tangible surplus resources (slack tangible and financial resources) contribute to antifragility. While we did not uncover evidence of intellectual or social capital, our findings could arguably align with the concept of ‘slack tangible resources’. In our cases this is an investment in enhancing web presence (TSC), procuring additional security (Zoom), and investing in content creation (Disney).

This study builds on previous research which identifies antecedents to antifragility. Markey-Towler (2018) states that exposure to uncertainty is a precursor to gaining from uncertain conditions. Our findings align with this conclusion, with each of the case organizations gaining from the uncertain conditions they faced during the pandemic. We add to studies that explore antifragility in organizations by revealing two antecedents in response to the pandemic crisis – embracing uncertainty and resource reconfiguration. Furthermore, we add to the body of extant literature by supporting findings that adaptability, creativity and transformability are capabilities that organizations can activate to create antifragility in response to a disruptive organizational crisis (Ramezani and Camarinha-Matos, 2020). The adaptation and transformation of existing business models through exploration and exploitation of emerging business opportunities (Ahokangas and Myllykoski, 2014), potentially positions firms to better weather times of unanticipated increased uncertainty. This perspective extends beyond opportunity recognition to the creation of new opportunities at times when old certainties are irrelevant during extreme crisis.

Each of the organizations reconfigured and changed during the crisis, in line with findings by Worley and Lawler III, (2006) about the effects of crisis circumstance. Our research adds to the notion of antifragility as an outcome to be sought, building on previous somewhat limited findings in fields such as socio-technical areas (e.g., Abbas and Munoz, 2021), and adding relevant understanding from the discipline of organizational studies. The two antecedents we have identified, ‘embracing uncertainty’ and ‘resource reconfiguration’, build understanding of use to managers seeking to drive organizations towards antifragility. Our work contributes to recent empirical contributions highlighting how some businesses embraced the opportunity to change and thrive during the pandemic (Silva et al., 2023). Moreover, our cases and findings contribute to other recent empirical work highlighting organizations which opted to move beyond risk mitigation to leverage potential gains (Klöckner et al., 2023). As such, our work contributes to recent thinking distinguishing between robustness, resilience and antifragility (Munoz et al., 2022), where the antecedents identified above point to the upside gains achieved through emergent antifragility during crisis.

6. CONCLUSION AND LIMITATIONS

Exhibiting antifragility involves not just surviving disruptions but leveraging them to emerge even stronger from crisis. Organizations in this study viewed the COVID-19 pandemic as opportunities for growth and innovation. They adapted quickly, rethinking and transforming their business models to exploit new opportunities. This approach allowed them to outperform their pre-pandemic performance levels. By embracing change and uncertainty, these organizations developed strategies that both mitigated risks and capitalized on opportunities (Klöckner et al., 2023), turning potential setbacks into significant advantages. Antifragility fosters continuous improvement and long-term success, making it a powerful concept that supports thriving in an unpredictable world. The pandemic represented an event of significant increased uncertainty that enabled potential for organizational gain through change and adaptation. However, any efforts to attempt to generalize normative managerial guidance from this study should be carefully qualified as periods of elevated uncertainty may not repeat themselves in the same manner. This presents a limitation to our study.

Much of the work in the space of organizational antifragility makes modest contributions to the construction of normative managerial guidance. Of course, much of the work on organizational responses to uncertainty (e.g., Griffin and Grote, 2020) note that management in uncertain settings is difficult and lessons from the past may not have a positive payoff in the future. We acknowledge this fact and offer the antecedents identified in this study present future potential for antifragility rather than a recipe for determining gains during future crises. We do so to ensure our work is not misconstrued as lacking acknowledgement for the methodological shortcomings inherent in generalization of post-hoc observations. However, we assert that the value in our antecedents in future periods of elevated uncertainty remains. The potential benefits in embracing uncertainty and retaining the capability to reconfigure has broad scale applicability to exploiting emergent opportunities.

Our work has contributed to an emerging body of literature exploring and identifying antecedents contributing to organizational antifragility in terms of, for example, the leveraging of slack organizational resources, strategic agility, and engagement with collaborative networks (Corvello et al., 2022; Giordino et al., 2024). Future studies could further advance how antecedents to antifragility identified through post-hoc observation can be generalized to a broader range of possible periods of elevated uncertainty. In so doing, researchers would develop a fuller conceptualization of how antecedents are linked to organizational antifragility and develop subsequent insights for managers and organizations facing the next inevitable crisis. This research has some limitations. A larger sample of case organizations could achieve the generalizability of results. Additionally, it would have been beneficial to compare firms that had achieved antifragility with those that did not. There are also additional research opportunities for longitudinal studies to explore the long-term effects of crisis and antifragile outcomes. A further research opportunity exists in terms of varying the sample according to organization size. While this study developed understanding of the antecedents of antifragility as evidenced in large organizations there is potential for confirmatory studies in small to medium enterprises.

7. REFERENCES

Abbas, R, & Munoz, A 2021. 'Designing antifragile social-technical information systems in an era of big data'. *Information Technology & People*, vol. 34, no. 6, pp.1639–1663. https://doi.org/10.1108/itp-09-2020-0673 .

ABI Research 2020 'As Expected, Streaming and SVOD up During COVID-19 Pandemic—Networks Mostly up to the Task'. https://www.abiresearch.com/market-research/insight/7778296-as-expected-streaming-and-svod-up-during-c/

Ahokangas, P & Myllykoski, J 2014 'The practice of creating and transforming a business model'. *Journal of Business Models,* vol. 2, no 1

Altig, D, Baker, S, Barrero, JM, Bloom, N, Bunn, P, Chen, S. Davis, S, Leather, J, Meyer, B, Mihaylov, E, Mizen, P, Parker, N, Renault, T, Smietanka, P, Thwaites, G,2020 'Economic uncertainty before and during the COVID-19 pandemic', *Journal of Public Economics* 191: 104274. https://doi.org/10.1016/j.jpubeco.2020.104274.

Alvarez, S, Afuah, A, & Gibson, C 2018 'Editors' Comments: Should Management Theories take Uncertainty Seriously?', *Academy of Management Review,* vol. 43, no 2, pp. 169-172.

Alvarez, S, &Barney, JB 2020 'Has the Concept of Opportunities Been Fruitful in the Field of Entrepreneurship?' *Academy of Management Perspectives,* vol. 34, no 3, pp. 300-310.

Amankwah-Amoah, J, Khan, Z, &Wood, G 2021 'COVID-19 and business failures: The paradoxes of experience, scale, and scope for theory and practice', *European Management Journal,* vol. 39, no 2pp. 179-184.

Anker, TB 2021 'At the boundary: Post-COVID agenda for business and management research in Europe and beyond', *European Management Journal,* vol. 39, no 2. pp. 171-178.

Barnes, B 2020 'Disney Lays Off 28,000, Mostly at Its 2 U.S. Theme Parks' The New York Times. [online] 29 Sep. Available at: https://www.nytimes.com/2020/09/29/business/disney-theme-park-workers-layoffs.html.

BBC News 2020 'Coronavirus: Disney delays blockbuster films due to pandemic', [online] 24 Jul. Available at: https://www.bbc.com/news/business-53517252.

Bloomberg 2020 *Zoom Video Communications Inc*. Available at: https://www.bloomberg.com/profile/company/ZM:US (accessed 25 November 2020).

Brandom, E 2020 'Zoom CEO apologizes for security problems on public live stream'. (accessed 25 October 2020). https://www.techtimes.com/articles/248694/20200408/zoom-ceo-eric-yuan-aplogizes-to-the-public-and-its-users-for-security-problems-in-a-live-youtube-stream.htm

Braun, V, & Clarke, V 2006 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, vol. 3, no 2. pp. 77-101, https://10.1191/1478088706qp063oa

Business Wire 2020 *Tractor Supply Company Reports Record Third Quarter 2020 Financial Results and Details Life Out Here Strategy*. Available at: https://www.businesswire.com/news/home/20201022005182/en/ (accessed 25 November 2020).

CNBC. 2020a. Shanghai Disney shuts to prevent spread of virus. [online] Available at: https://www.cnbc.com/2020/01/24/shanghai-disney-shuts-to-prevent-spread-of-virus.html.

CNBC. 2020b Tokyo Disneyland to close through mid-March on coronavirus concerns. [online] Available at: https://www.cnbc.com/2020/02/28/tokyo-disneyland-to-close-through-mid-march-on-coronavirus-concerns.html.

Corvello, V, Verteramo, S, Nocella, I &Ammirato, S 2023 'Thrive during a crisis: the role of digital technologies in fostering antifragility in small and medium-sized enterprises', *Journal of Ambient Intelligence and Humanized Computing*, vol. 14, no 11 pp.14681-14693.

Corvello, V, Felicetti, AM. Troise, C.&Tani, M 2024 'Betting on the future: how to build antifragility in innovative start-up companies', *Review of Managerial Science*, vol. 18, no 4, pp.1101-1127.

Creswell, JW, & Poth, C, 2018 *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (4th ed.). Sage Publications.

CyberAware (2020) *Elon Musk and NASA ban corporate use of Zoom over privacy concerns*. Available at: https://cyberaware.com/elon-musk-and-nasa-ban-corporate-use-of-zoom-over-privacy-concerns/ (accessed 25 October 2020).

Das, JH, 2024 'Lights, Camera, Capital: Analyzing financial tactics in the streaming entertainment landscape', *International Journal of Science and Research Archive*, vol. 11, no 1, pp.1243-1251.

Deng, G, Shi, J, Li Y, 2021 'The COVID-19 pandemic: shocks to human capital and policy responses', *Accounting & Finance,* https://doi.org/10.1111/acfi.12770

Derbyshire, J, &Wright, G 2014 'Preparing for the future: development of an 'antifragile' methodology that complements scenario planning by omitting causation'. *Technological Forecasting and Social Change,* vol. 82pp. 215-225.

Duchek, S, 2020 'Organizational resilience: a capability-based conceptualization', *Business Research,* vol. 13, no. 1pp. 215-246.

Forte, M, Hoffman, JJ, Lamont, BT, Brockmann, E, 2000 'Organizational form and environment: an analysis of between-form and within-form responses to environmental change', *Strategic Management Journal,* vol. 21, no. 7pp 753-773.

Gaines, B 2024. Disney Plus Statistics 2024 - Subscribers & Revenue (New Data). [online] evoca.tv. Available at: https://evoca.tv/disney-plus-users-statistics/#:~:text=Disney%20Plus%20generated%20%248.4%20billion%20in%20the%20fiscal%20year%202023.&text=That%20displays%20an%20increase%20of.

Giordino, D, Troise, C, Culasso, F & Cutrì, L 2024, 'The operationalization of antifragility through organizational slack and the moderating effect of firms' reliance on collaborative networks', *European Journal of Innovation Management* https://doi-org.ezproxy.uow.edu.au/10.1108/EJIM-12-2023-1141

Gittell, JH, Cameron, K, Lim S, Rivas, V2006 'Relationships, layoffs, and organizational resilience: Airline industry responses to September 11', *The Journal of Applied Behavioral Science,* vol. 42 no 3, pp. 300-329. https://doi.org/10.1177/0021886306286466

Griffin, MA, & Grote, G 2020 'When is more uncertainty better? A model of uncertainty regulation and effectiveness', *Academy of Management Review*, vol. 45, no. 4, pp.745-765.

Größler, A 2020 A managerial operationalization of antifragility and its consequences in supply chains, *Systems Research and Behavioral Science,* pp. 896-905.

GuruFocus Research (2024) Tractor supply Co (TSCO) Reports Mixed Fiscal Year 2023 Results; Provides Conservative 2024 Outlook. Accessed: https://finance.yahoo.com/news/tractor-supply-co-tsco-reports-180908734.html

Hamilton, I 2020 Zoom's CEO apologizes for its many security issues as daily users balloon to 200 million. (accessed 25 October 2020). https://www.businessinsider.com/zoom-ceo-sorry-privacy-security-2020-4

He, Y, 2024 Walt Disney's Business Model, *Finance & Economics*, vol. 1, no. 6.

Hillmann, J &Guenther, E 2020 'Organizational Resilience: A Valuable Construct for Management Research?' *International Journal of Management Reviews,* vol. 23, no. 7, pp7-44. https://doi.org/10.1111/ijmr.12239

.

Howland, D 2023 Tractor Supply to expand its footprint aiming for 3K nationwide, Retail Dive, accessed: https://www.retaildive.com/news/tractor-supply-open-more-stores/689163/

Johnson, J 2024 Disney's Q1 2024 report: The magic behind the numbers, Disney's Q1 2024 report: https://www.entrepreneur.com/finance/disneys-q1-2024-report-the-magic-behind-the-numbers/469487

Jones, ST 2020 'How materials can beat a virus', *Journal of Materials Science,* vol. 55, no. 22pp. 9148-9151.

Klöckner, M, Schmidt, C. G, Wagner, S. M, & Swink, M 2023. 'Firms' responses to the COVID-19 pandemic', *Journal of Business Research,* vol. 158, 113664. https://doi.org/10.1016/j.jbusres.2023.113664

Kyngäs, H 2020. Inductive Content Analysis. In: Kyngäs, H., Mikkonen, K., Kääriäinen, M. (eds) The Application of Content Analysis in Nursing Science Research. Springer, Cham. https://doi.org/10.1007/978-3-030-30199-6_2

Lomas, N2023 Zoom knots itself a legal tangle over use of customer data for training AI models, accessed 08.08.24

https://techcrunch.com/2023/08/08/zoom-data-mining-for-ai-terms-gdpr-eprivacy/#:~:text=Rewinding%20a%20little%2C%20Zoom%20responded,content%20to%20train%20our%20artificial

Lynch, D 2020 In a bleak economy, these companies are flourishing. (accessed 25 September .2020).

Mackay, J, Munoz, A, & Pepper, M 2019 'Conceptualising redundancy and flexibility towards supply chain robustness and resilience', *Journal of Risk Research, vol. 23, no. 12*pp. 1541-1561. https://doi.org/10.1080/13669877.2019.1694964

Markey-Towler B 2018 'Antifragility, the Black Swan and psychology', *Evolutionary and Institutional Economics Review,* vol. 15, no. 2pp.367-384.

Marshall, MN 1996 'Sampling for qualitative research', *Family Practice,* vol. 13, no 6.pp. 522-526.

Merton, RK, &Merton, RC 1968 *Social Theory and Social Structure,* Simon and Schuster.

Miles, RE, Snow, CC, Meyer, AD, & Coleman, HJ1978 'Organizational strategy, structure, and process', *Academy of Management Review,* vol. 3, no. 3pp 546-562.

Morris, B 2020 Why does Zoom exhaust you? Science has an answer, *Wall Street Journal*.

Murphy, B 2024 Zoom privacy breach class action, accessed 08.08.24 https://www.murphybattista.com/practice-areas/class-action-lawsuits/zoom-privacy-breach-class-action/

Munoz, A, Billsberry, J & Ambrosini, V, 2022 'Resilience, robustness, and antifragility: Towards an appreciation of distinct organizational responses to adversity', *International Journal of Management Reviews*, vol. 24, no 2. pp.181-187.

Munoz, A, Todres, M &Rook, L 2021 'Empowering Organisations to Gain From Uncertainty: a Conceptualisation of Antifragility Through Leveraging Organisational Routines in Uncertain Environments', *Australasian Accounting, Business and Finance Journal,* vol. 15, no 3. pp 23-42.

Munoz, A, & Zhou, Q. S. 2023. 'An operationalization of antifragility in inventory management', *Management Decision,* vol. 61, no 9. pp 2809-2828. https://doi.org/10.1108/MD-01-2022-0063

Nikookar, E, Stevenson, M, & Varsei, M 2024 'Building an antifragile supply chain: A capability blueprint for resilience and post-disruption growth', *Journal of Supply Chain Management*, vol. 60, no. 1, pp13–31. https://doi.org/10.1111/jscm.12313

Nikookar, E, Varsei, M &Wieland, A 2021 'Gaining from disorder: Making the case for antifragility in purchasing and supply chain management', *Journal of Purchasing and Supply Management,* vol. 27, no. 3 pp 100699.

Novet, J 2020 Zoom's astronomical growth rate appears to be moderating; shares fall. (accessed 10 December 2020). https://www.cnbc.com/2020/11/30/zoom-zm-earnings-q3-2021.html?msockid=1d753801bb3b6fb32bd62d42ba3e6ea8

Paul, K 2020 Zoom will provide end-to-end encryption to all users after privacy backlash. (accessed 25 October 2020). https://www.bleepingcomputer.com/news/security/zoom-will-provide-end-to-end-encryption-to-all-users/

Pedersen, CL, Ritter, T & Di Benedetto, CA 2020, 'Managing through a crisis: Managerial implications for business-to-business firms', *Industrial marketing management*, vol. 88, pp. 314–322.

Peters, J 2023 Zoom is laying off 1,300 employees, around 15 percent of its workforce, accessed 08.08.24 https://www.theverge.com/2023/2/7/23589524/zoom-layoffs-pandemic-growth-1300-employees

Pilkington, MW 2021 Tractor Supply 4Q Comparable-Store Sales Up 27.3% >TSCO. *Dow Jones Institutional News*, January 28, 2021.

Ramezani, J, & Camarinha-Matos, L. M. 2020'Approaches for resilience and antifragility in collaborative business ecosystems', *Technological forecasting and social change,* vol. 151, 119846.

Reuters 2022. Disney buys MLB's stake in streaming firm BAMTech for $900 mln. Reuters. [online] 30 Nov. Available at: https://www.reuters.com/markets/deals/disney-buys-mlbs-stake-streaming-firm-bamtech-900-mln-2022-11-30/.

Ritter, T &Pedersen, CL 2020 'Analyzing the impact of the coronavirus crisis on business models', *Industrial Marketing Management* vol. 88, pp214-224.

Robson, C, 2024 Real world research. 5th edn, John Wiley & Sons, Chichester.

Rodriguez, C, Eveslage, C 2024 Zoom Video Communications Reports Financial Results for the First Quarter of Fiscal Year 2025, accessed 08/08/24 https://investors.zoom.us/node/12416/pdf

Saebi, T, Lien, L & Foss, NJ 2017 'What drives business model adaptation? The impact of opportunities, threats and strategic orientation', *Long range planning* vol. 50, no. 5pp.567-581.

Sagala, G.H. &Őri, D 2024 'Antifragility, resilience and collaborative networks of SMEs: a theoretical foundation', *European Journal of*

Innovation Management, https://doi.org/10.1108/EJIM-09-2023-0797

Silva, E, Beirão, G, & Torres, A 2023 'How Startups and Entrepreneurs Survived in Times of Pandemic Crisis: Implications and Challenges for Managing Uncertainty', *Journal of Small Business Strategy*, vol. 33, no 1. pp 84-97. https://doi.org/10.53703/001c.72084

Singh, K, & Rastogi, S 2022 'Financial distress, COVID-19 and listed SMEs: A multi-methodology approach', *Vision*, 09722629221096055.

Statt, N 2020 Zoom says free users will get end-to-end encryption after all. (accessed 26 November 2020). https://www.theverge.com/2020/6/17/21294355/zoom-security-end-to-end-encryptoin-beta-release-july-2020-new-feature

Stoll, J 2022 Content spending by Disney and Netflix 2022. [online] Statista. Available at: https://www.statista.com/statistics/1299571/content-spending-disney-vs-netflix/.

Stoll, J 2024. Number of Disney Plus subscribers worldwide from 1st quarter 2020 to 1st quarter 2022. [online] Statista. Available at: https://www.statista.com/statistics/1095372/disney-plus-number-of-subscribers-us/.

Sukhanova, K2024 Disney Plus Statistics & Trends for 2023. [online] The Tech Report. Available at: https://techreport.com/statistics/entertainment/disney-plus-statistics/.

Taleb, NN 2012 *Antifragile: how to live in a world we don't understand.* Allen Lane London.

Tonneson, S 2020 Zoom Becomes Video Conferencing Leader During COVID-19. Why? In: zoominfo. Available at: https://blog.zoominfo.com/zoom-video-growth-coronavirus/.

Tractor Supply Company 2023 Legendary Past, Bright Future, Annual Report. Accessed: https://s23.q4cdn.com/539497486/files/doc_financials/2023/AR/2023-Tractor-Supply-Company-Annual-Report.pdf

Tractor Supply Company 2024a Tractor Supply Garden Centers Reach Milestone 500 Locations. Accessed: https://corporate.tractorsupply.com/newsroom/news-releases/news-releases-details/2024/Tractor-Supply-Garden-Centers-Reach-Milestone-500-Locations/default.aspx

Tractor Supply Company 2024b Tractor Supply Company Reports Second Quarter 2024 Financial Results; Updates Fiscal 2024 Financial Outlook. Accessed: https://corporate.tractorsupply.com/newsroom/news-releases/news-releases-details/2024/Tractor-Supply-Company-Reports-Second-Quarter-2024-Financial-Results-Updates-Fiscal-2024-Financial-Outlook/default.aspx

Tracxn.com. 2024 List of 20 Acquisitions by The Walt Disney Company (Jul 2024) - Tracxn. [online] Available at: https://tracxn.com/d/acquisitions/acquisitions-by-the-walt-disney-company/__o0wanQHNSabE09VL3X0guQVuS4O4aAkCHmNxQNB87MQ#:~:text=List%20of%20The%20Walt%20Disney%20Company.

Turk, V 2020 Zoom took over the world. This is what will happen next. (accessed 30 October 2020). https://www.wired.com/story/future-of-zoom/

Yin, R.K, 2018. Case study research and applications; Design and methods, 6th edition, Sage Publications

Walker, W. E, Harremoës, P, Rotmans, J, Van Der Sluijs, J. P,Van Asselt, M. B, Janssen, P, & Krayer von Krauss, M. P. 2003 'Defining uncertainty: a conceptual basis for uncertainty management in model-based decision support', *Integrated assessment,* vol. 4, no 1 pp 5-17.

Warren, T 2020 Zoom faces a privacy and security backlash as it surges in popularity. (accessed 30 October 2020). https://www.theverge.com/2020/4/1/21202584/zoom-security-privacy-issues-video-conferencing-software-coronavirus-demand-response

Warren, G, &Grigaliūnaitė, S 2023 'Leveraging social capital to catalyse post-pandemic anti-fragility: the "Vilnius model"', *Journal of Place Management and Development*, Vol. 16 No. 4, pp. 577-601. https://doi.org/10.1108/JPMD-11-2022-0104

Wasko, J, 2016 The Walt Disney Company (pp.11-25). In Birkinbine, B., Gomez, R., & Wasko, J. (Eds.). (2016). Global Media Giants (1st ed.). Routledge. https://doi.org/10.4324/9781315682334

Wenzel, M, Stanske, S & Lieberman, MB 2020 'Strategic responses to crisis', *Strategic Management Journal* vol. 41 V7-V18).

Whaba, P 2021 How poultry and a pandemic put Tractor Supply ahead of the pack. *Fortune*. (accessed 21 December, 2021). https://www.bing.com/search?q=How+poultry+and+a+pandemic+put+Tractor+Supply+ahead+of+the+pack.+Fortune.&cvid=1dba35

ab9c3f46998f9e254f507afa13&gs_lcrp=EgRlZGdlKgYIABBFGDkyBggAEEUYOTIICAEQ6QcY_FXSAQcxNjBqMGo0qAIAsAIA&FORM=ANAB01&PC=U531

Whitten, S2020 Coronavirus shutdown cost Disney $3.5 billion in theme park operating income in the third quarter. [online] CNBC. Available at: https://www.cnbc.com/2020/08/04/coronavirus-shut-down-theme-parks-costing-disney-3point5-billion.html.

Williams, T. A, Gruber, D. A, Sutcliffe, K. M, Shepherd, D. A, & Zhao, E. Y. 2017 'Organizational response to adversity: Fusing crisis management and resilience research streams', *Academy of Management Annals,* vol. 11, no 2. pp733-769.

Withers, B 2020 *Tractor Supply Company Is Weathering This Pandemic Well*. Available at: https://www.fool.com/investing/2020/04/30/tractor-supply-company-is-weathering-this-pandemic.aspx (accessed 25 September 2020).

Worley, CG & Lawler III EE 2006 'Designing organizations that are built to change', *MIT Sloan Management Review* vol. 48, no 1. pp 19-23.

World Health Organisation 2020 WHO Director-General's Opening Remarks at the Media Briefing on COVID-19 - 11 March 2020. [online] World Health Organization. Available at: https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020.