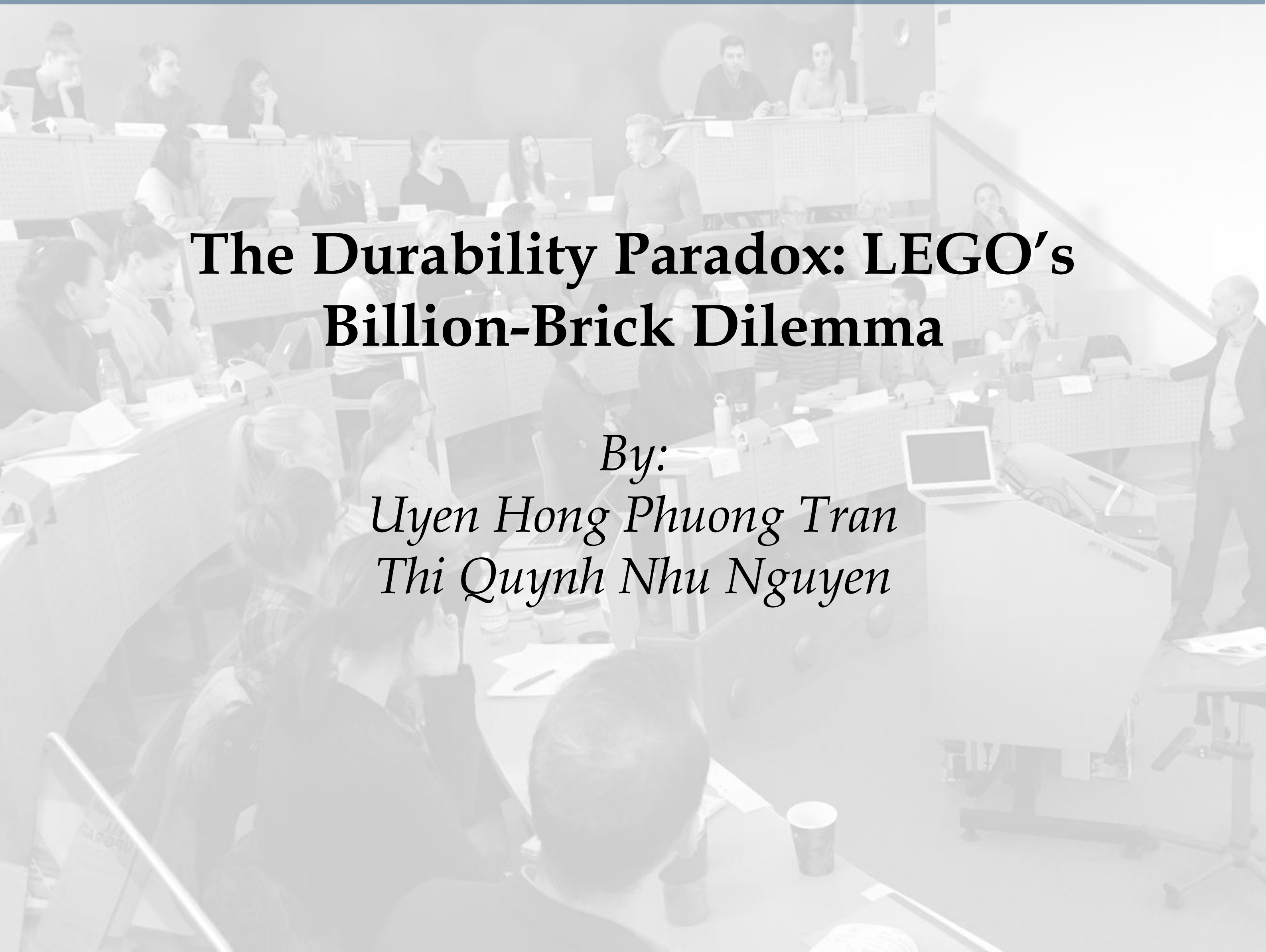
CORPORATE BRAND MANAGEMENT AND REPUTATION

MASTER CASES



The Durability Paradox: LEGO's Billion-Brick Dilemma

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Corporate Brand Management and Reputation: Master's Cases

The "Corporate Brand Management and Reputation: Master's cases" is a case series for applying the case method of teaching and learning in higher education. The cases are relevant to brand strategists in private and public sector organizations, as well as academics and students at universities, business schools, and executive education.

The cases are written by groups of master's students as a course project. The specially developed case format is defined as: *"A management decision case describes a real business situation leading up to a question(s) that requires assessment, analysis, and a decision reached by discussion in class. The alternative approaches and recommendations from the class discussion are followed by a description of the choices made by the case company. This description is then discussed by the class."*

The student groups select the topics of their case providing updated and relevant insights into the corporate brand management. The cases can be used as "written cases" (handed out and read in advance, later to be discussed in class) and/or as "live case" (presented by the teacher following a discussion in class). Each case includes teaching notes, visuals with speaker's notes, learning objectives, board plans, and references.

The mission of the series is *"to develop cases for discussion providing insights into the theory and practice of corporate brand management and reputation, with the intent of bridging the gap between academic teaching and managerial practice."*

The series is a result of co-creation between students and teachers at the elective course Corporate Brand Management (BUSN35 – five-credit course/eight-week half-time studies), part of the master's program International Marketing and Brand Management at Lund School of Economics and Management, Sweden. The cases represent the result of the intellectual work of students under the supervision of the head of course.

Although based on real events and despite references to actual companies, the cases are solely intended to be a basis for class discussion, not as an endorsement, a source of primary data, or an illustration of effective or ineffective management. The cases are free to be used and are to be cited following international conventions.

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The Durability Paradox: LEGO's Billion-Brick Dilemma

The LEGO Group, the world's largest toy manufacturer, stands at a critical strategic juncture defined by its own success. Known for the "System of Play", the company faces a unique "Durability Paradox": its bricks are designed to be indestructible and last for generations, yet this very longevity creates massive idle inventory that persists in the environment for centuries. As the global toy industry grapples with generating vast amounts of plastic waste, LEGO has committed to transitioning toward a circular economy to eliminate waste and pollution. However, this shift presents a fundamental managerial dilemma: Should LEGO continue its traditional growth model driven by the sale of new virgin-plastic bricks, or should it aggressively integrate circular economy practices such as resale and reuse, even if it risks cannibalizing the demand for its own new products?

Background and History

The LEGO Group was founded in 1932 in Billund, Denmark, by Ole Kirk Christiansen, a carpenter who turned to manufacturing wooden toys during the Great Depression. The company's name is derived from the Danish phrase leg godt, meaning "play well". Guided by Christiansen's motto, "Only the best is good enough", the company initially focused on high-quality wooden products before purchasing its first plastic injection molding machine in 1947.

In 1949, the company launched "Automatic Binding Bricks" inspired by a British interlocking design. The pivotal moment came in 1958 when LEGO patented the modern brick design featuring a stud-and-tube coupling system, which dramatically improved stability and locking ability. Following a warehouse fire in 1960 that destroyed its wooden inventory, the company discontinued wooden toys to focus exclusively on the plastic LEGO system.

Over the decades, LEGO expanded into a global entertainment brand: opening Legoland parks (1968), launching the iconic Minifigure (1978), signing strategic licensing partnerships (Star Wars, Harry Potter), and entering the media landscape with video games and movies. Historically, the brand's sustainability narrative was built on "design for longevity", creating a product so durable it could be passed down through generations rather than thrown away. However, this historical strength has now evolved into an environmental liability as the sheer volume of non-biodegradable plastic accumulates globally.

(See **Exhibit 1** for the timeline of how this historical strength evolved into an environmental liability).

LEGO Materials

Since 1963, LEGO bricks have been manufactured using Acrylonitrile Butadiene Styrene (ABS), a petroleum-based plastic that replaced the less stable cellulose acetate. LEGO selected ABS for its superior properties: it is non-toxic, resistant to discoloration and warping, and, crucially, maintains "clutch power", the unique grip that allows bricks to stick together firmly yet pull apart easily. Currently, ABS accounts for approximately 85% of the resin used by the company to mold its bricks. While this material ensures that bricks from the 1960s still interlock with those made today, it creates a massive environmental footprint. LEGO bricks are non-biodegradable and can persist in the environment for an estimated 100 to 1,300 years[1].

The reliance on fossil-fuel-based plastic means that LEGO's environmental impact is heavily skewed toward its supply chain. A staggering 98% of the company's greenhouse gas emissions are categorized as Scope 3 (supply chain and product end-of-life). This dependency poses a direct conflict with growth. For instance, between 2020 and 2021, LEGO's total carbon emissions surged by 30% due to increased sales demand, even as the company reduced its internal factory emissions (Scope 2) by 40%.

LEGO has pledged to make its products from renewable and recycled materials by 2032, but the path has been fraught with challenges. In its pursuit of sustainable alternatives, LEGO tested over 600 different material grades. However, abandoned a high-profile "Bottles to Bricks" prototype made from recycled PET (rPET) plastic in 2023. Despite a team of 150 experts testing 250 variations of PET over two years, the lifecycle analysis revealed that the extra drying and processing required to make rPET durable enough resulted in higher total carbon emissions than using virgin ABS.

[1] Turner et al., 2020

Unable to find a direct drop-in replacement for ABS, LEGO has pivoted to a portfolio approach (see **Exhibit 2**):

- **Bio-PE:** Since 2018, flexible elements (botanicals) have been made from sugarcane-based bio-polyethylene. However, this material is not suitable for rigid bricks and accounts for only ~2% of total elements.

- **arMABS:** In 2024, the company introduced transparent elements containing 20% recycled artificial marble, projected to appear in 85% of sets.

- **Mass Balance:** The most significant shift is the "mass balance" approach, where renewable fats (like cooking oil) are mixed with fossil fuels in production. In 2023, only 18% of resin purchased was mass balance certified. By 2024, this figure jumped to 47%, translating to an estimated average of 33% renewable sources in the raw materials purchased.

Because a direct material substitute for ABS remains difficult to scale, LEGO has had to look beyond just “greener bricks” to solve its environmental impact.

The Struggle: The Strategic and Financial Toll of Material Innovation

LEGO has transformed from an operations issue to a significant business risk as a result of these technical challenges. As shown by the discontinuation of rPET and the company's substantial reliance on its transitional Mass Balance system, the company cannot separate its growth from fossil fuels without incurring massive financial costs. In order to make this transition and achieve renewable resin pricing parity, LEGO will need to raise its sustainability investment to $1.4 billion by 2025. However, management's reality is that they are paying a considerable premium to “green” their supply chain while still lacking a proprietary, scale-independent raw material solution to eliminate Scope 3 dependency. The search for the perfect, sustainable brick is painfully elusive.

The Durability Paradox & Strategic Threats

LEGO tried to solve this problem through circular business models in light of these challenges that make up the material deadlock; hence, the need for an environmental solution. Unfortunately for LEGO, the effort has created a new problem known as the “Durability Paradox”. While the extreme durability of LEGO bricks has contributed to the success of LEGO bricks, it has also created a physical challenge to collect and recycle LEGO bricks because of the logistical difficulties involved.

As a first step towards achieving physical circularity, LEGO established the LEGO Replay take-back program. LEGO leadership has acknowledged that the reverse logistics required to use parcel shipping of individual packages to collect similar lots of bricks, manually sort, and sanitize bricks is very expensive and also produces many additional Scope 3 transportation emissions through its operations today. Another challenge for LEGO regarding the LEGO Replay take-back program is that the total number of bricks collected by the Replay program has been very low in comparison to the total number of new plastic bricks LEGO produces: over the first five years of Replay, LEGO collected 300 million bricks, which is a tiny fraction of the more than ten billion new LEGO plastic bricks produced per year. LEGO's Replay take-back program is still an unscalable and expensive pilot program that does not yet offer a standardized systemic solution.

In 2019, LEGO acquired BrickLink in order to explore another potential solution to the significant challenges of physical and economic bottlenecks for Replay. The new strategy adopted by the company of "digital circularity" recognizes that outsourcing the expensive cost of reverse logistics should occur instead through the peer-to-peer adult fan community (see **Exhibit 3**). BrickLink effectively removes the cost of physically handling bricks, but it creates an additional aspect to this paradox: cannibalization. The bricks are perceived as virtually indestructible, so the secondary market remains robust, with retired sets appreciating at an average of 11% over a one-year period of time[2]. BrickLink can assist LEGO with controlling this "shadow inventory" through data mapping; however, it fails to reduce the company's need to continue producing new virgin plastic.

The two-pronged dilemma represents an existential strategic risk for LEGO and places the company at a decision point regarding the pathways available to move forward. The physical recycling option of Replay is both operationally and environmentally non-scalable, while the digital resale function of BrickLink maintains the integrity of market data but does not provide a solution to the underlying material crisis. As a result, LEGO's Board will continue to be pressed into an unyielding, constant search for a potential comprehensive pathway moving forward.

Managerial Questions

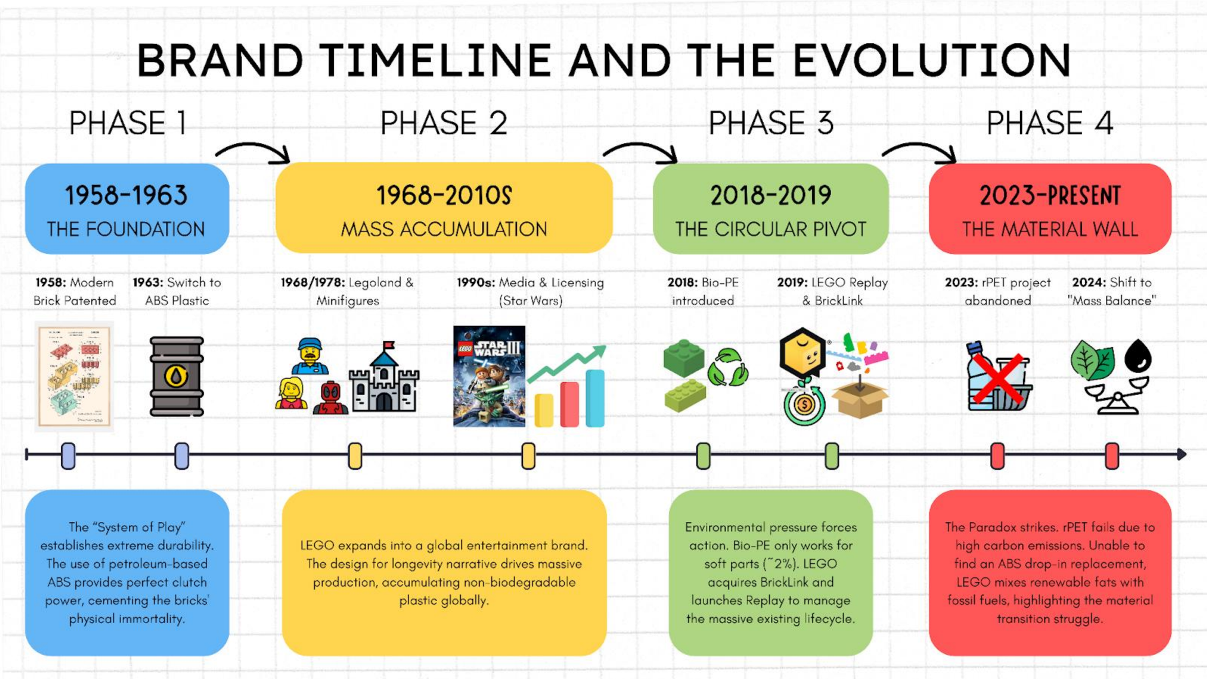
Should the LEGO Group continue its current circular efforts, as well as the return schemes?

[2] Dobrynskaya and Kishilova, 2022

a. If yes, how can the company restructure these initiatives to resolve the significant logistical barriers to continued operations (Lego Replay) and minimize the risk of cannibalizing core sales channels (BrickLink)?

b. If no, what other strategies should the board select to solve the "Durability Paradox"?

Exhibit 1 Brand Identity & The Evolution



Strategic Takeaway: As the timeline illustrates, LEGO's greatest historical asset: the extreme durability of ABS plastic has evolved into a severe environmental liability. With sustainable material replacements like rPET failing to meet durability and emission standards, the company is forced to pivot from material science to business model innovation, relying on circular ecosystems like BrickLink and LEGO Replay to manage its indestructible shadow inventory.

Exhibit 2 Replacement Approaches & Material Transition Pathways

Approach	Material Type	Technical Performance	Scalability	Environmental Impact	Strategic Limitations
Fossil-based ABS (Status Quo)	Petroleum-derived ABS	Excellent (≤10 micron tolerance, high impact resistance, color stability)	Fully industrialized	Fossil-based, non-biodegradable (50–100 years)	Increasing regulatory and reputational pressure
Bio-based PE (Plant-based Plastic)	Sugarcane-derived polyethylene	Moderate, suitable for flexible/non-structural parts (e.g., leaves)	Limited for structural bricks	Lower fossil carbon footprint	Cannot replace core brick system
Recycled Plastics (General)	Mechanically recycled polymers	Inconsistent precision, risk of long-term degradation	Limited	Reduces virgin plastic use	Quality instability threatens brand equity
Mass Balance Approach	Certified renewable/recycled feedstock allocation	Maintains ABS performance (drop-in equivalent)	High (uses existing infrastructure)	System-level fossil reduction	No physical distinction at product level, durability unchanged
rPET (Recycled PET from Bottles)	Recycled polyethylene terephthalate	Failed to meet long-term clutch power standards	Technically possible but discontinued	Utilizes waste stream	Suspended due to limited environmental gain and performance issues
Bio-ABS / e-Methanol-based ABS	ABS from bio-feedstock or CO_2-based methanol	High (chemically equivalent to conventional ABS)	Emerging, infrastructure dependent	Significant carbon reduction potential	High cost, long-term scale-up required
Recycled ABS (Internal Closed-loop)	Regrind/reprocessed ABS from production waste	Slight property degradation over cycles	Limited to small ratios	Reduces factory waste	Cannot support full circular loop at scale

Exhibit 3 The Material Innovation Trap