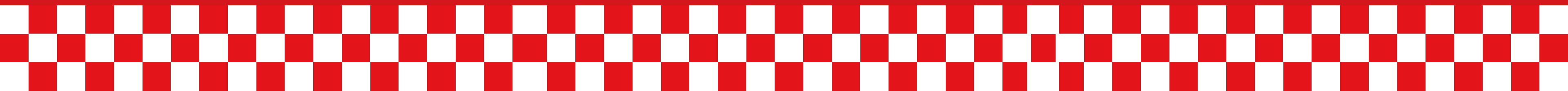




Group 16B:

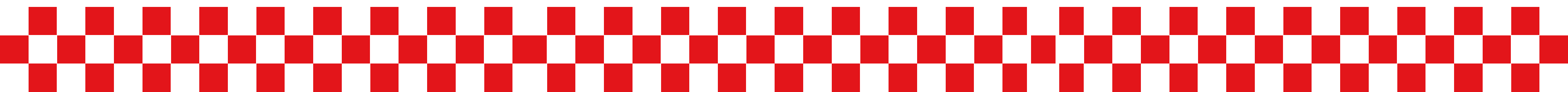
Uyen Hong Phuong Tran
Thi Quynh Nhu Nguyen

THE DURABILITY PARADOX





1. CASE INTRODUCTION
2. DISCUSSION
3. MANAGEMENT DECISIONS
4. TEACHING NOTES





CASE INTRODUCTION

DISCUSSION

MANAGEMENT DECISIONS

TEACHING NOTES

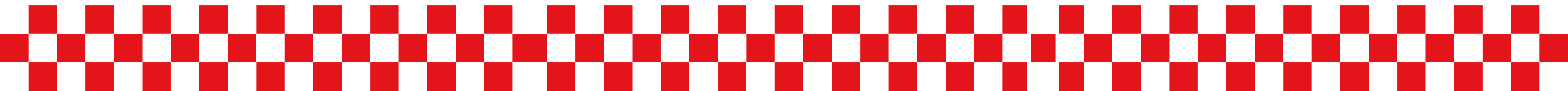


1. CASE INTRODUCTION

Background and History

The Struggle

The Paradox



CASE INTRODUCTION

ORIGINS & PHILOSOPHY

- Founded in **1932** in Billund, Denmark
- **Founder:** Ole Kirk Christiansen (carpenter → toy maker during Great Depression)
- **Name** = “Leg godt” (“Play well”)
- **Core philosophy:** “Only the best is good enough”
- **1947:** First plastic injection molding machine
- **1958:** Patented stud-and-tube coupling system → modern LEGO brick
- **1960:** Warehouse fire → exit wooden toys → full plastic commitment

→ **Durability and system compatibility were intentional strategic choices.**



CASE INTRODUCTION

GLOBAL EXPANSION

- **1968:** First Legoland park
- **1978:** Introduction of Minifigure
- Licensing strategy: Star Wars, Harry Potter
- Expansion into video games & movies
- Built a “LEGO System in Play” → cross-set compatibility
- Sustainability narrative = Design for Longevity

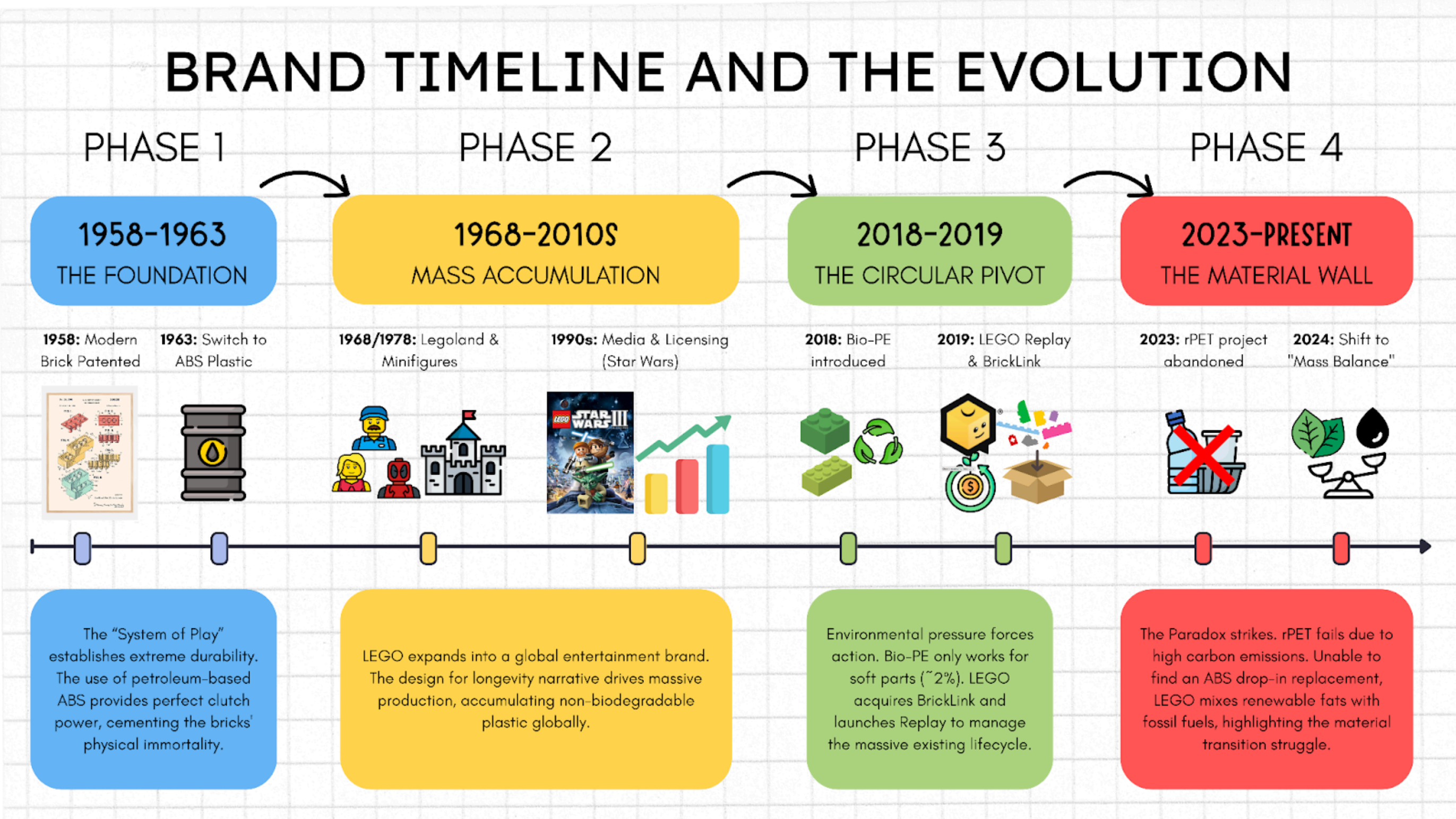
→ **Critical transition point:**

Durability = Brand strength

But durability = Idle inventory accumulation



CASE INTRODUCTION



CASE INTRODUCTION

ABS PLASTIC

- **Why ABS?**
 - Non-toxic
 - Color stable
 - Warp resistant
 - Maintains “clutch power”
- **Bricks from 1960s still interlock today**
- **Environmental implications:**
 - Petroleum-based
 - Non-biodegradable (100–1,300 years)
 - 98% emissions = Scope 3 (supply chain + end-of-life)



rPET PLASTIC

- **Why rPET?**
 - Extra drying & processing
 - Higher total lifecycle emissions than virgin ABS
- **Pledge:** 100% renewable/recycled materials by 2032
 - Tested 600+ material grades
 - “Bottles-to-Bricks” (recycled PET) prototype
 - 150 experts, 250 variations, 2 years
- **Conclusion:**
 - Abandoned in 2023
 - No drop-in replacement for ABS at scale



REPLACEMENT APPROACHES & MATERIAL TRANSITION PATHWAYS

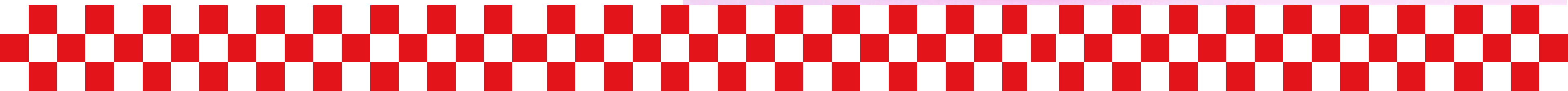
Approach	Material Type	Technical Performance	Scalability	Environmental Impact	Strategic Limitations
Fossil-based ABS (Status Quo)	Petroleum-derived ABS	Excellent (≤ 10 micron tolerance, high impact resistance, color stability)	Fully industrialized	Fossil-based, non-biodegradable (50–100 years)	Increasing 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

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

CASE INTRODUCTION

THE STRUGGLE

- **The Material Wall:** The highly anticipated recycled PET (rPET) prototype was abandoned after realizing it generated a higher carbon footprint than virgin plastic.
- **The Cost Premium:** Forced to rely on “Mass Balance” alternative resins, which incur an exorbitant 70% cost premium without fully solving the emission crisis.
- **Scope 3 Dependency:** The core linear production engine continues to generate massive supply chain emissions.

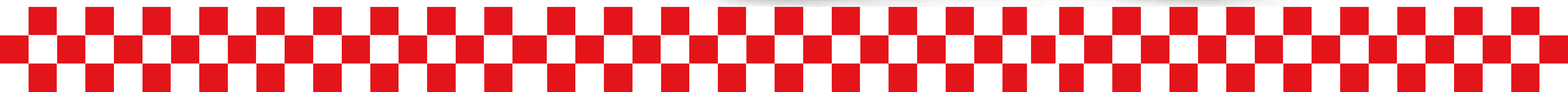




CASE INTRODUCTION

THE PARADOX

- **The Durability Paradox:** The exact feature that guarantees product excellence, indestructible plastic, creates a permanent environmental liability.
- **The Unscalable Physical Loop:** Bricks physically last for generations, but retrieving them is a logistical nightmare.
- **The Reverse Logistics Friction:** Fragmented take-back programs (like LEGO Replay) generate extreme operational costs and additional transportation-related carbon emissions.



CASE INTRODUCTION

DISCUSSION

MANAGEMENT DECISIONS

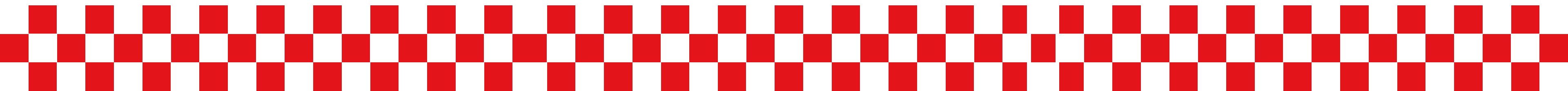
TEACHING NOTES



2. DISCUSSION

Main Question

Assisting Questions





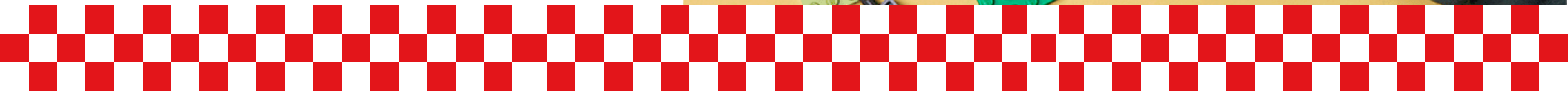
MAIN QUESTION

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

DISCUSSION

ASSISTING QUESTIONS

- *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)?*
- *If no, what other strategies should the board select to solve the “Durability Paradox”?*

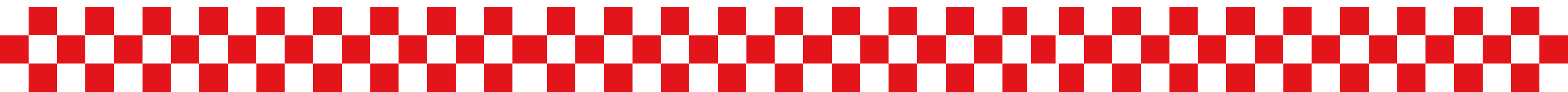




3. MANAGEMENT DECISIONS

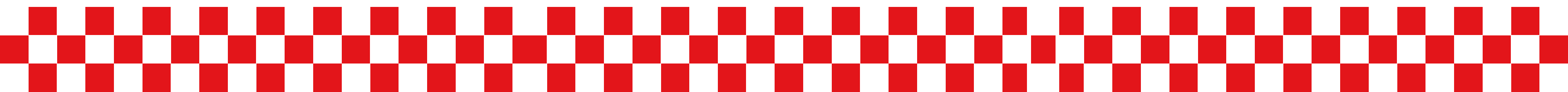
Action 1: CSR Integration

Action 2: Monetizing the Marketplace
Evaluation





ACTION 1: LEGO REPLAY





MANAGEMENT DECISIONS

ACTION 1: LEGO REPLAY



- Launched: 8 October 2019 (USA pilot)
- **Response to:**
 - The Durability Paradox
 - Growing plastic waste concerns
- **Strategic framing:** Core CSR initiative, not commercial line
- **Strategic Objectives**
 - Extend product lifecycle (reuse > landfill)
 - Address ABS plastic footprint
 - Shift narrative: from “selling new bricks” to “stewarding long-term material use”
- Align with circular economy ambition

→ **Replay leverages LEGO’s core strength “durability” as a circular asset.**



+300M

bricks redistributed

+191K

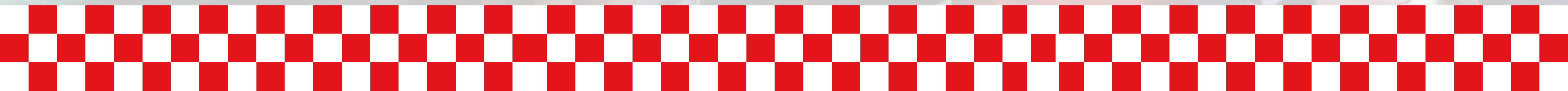
Replay boxes created

+10K

educators supported

400K

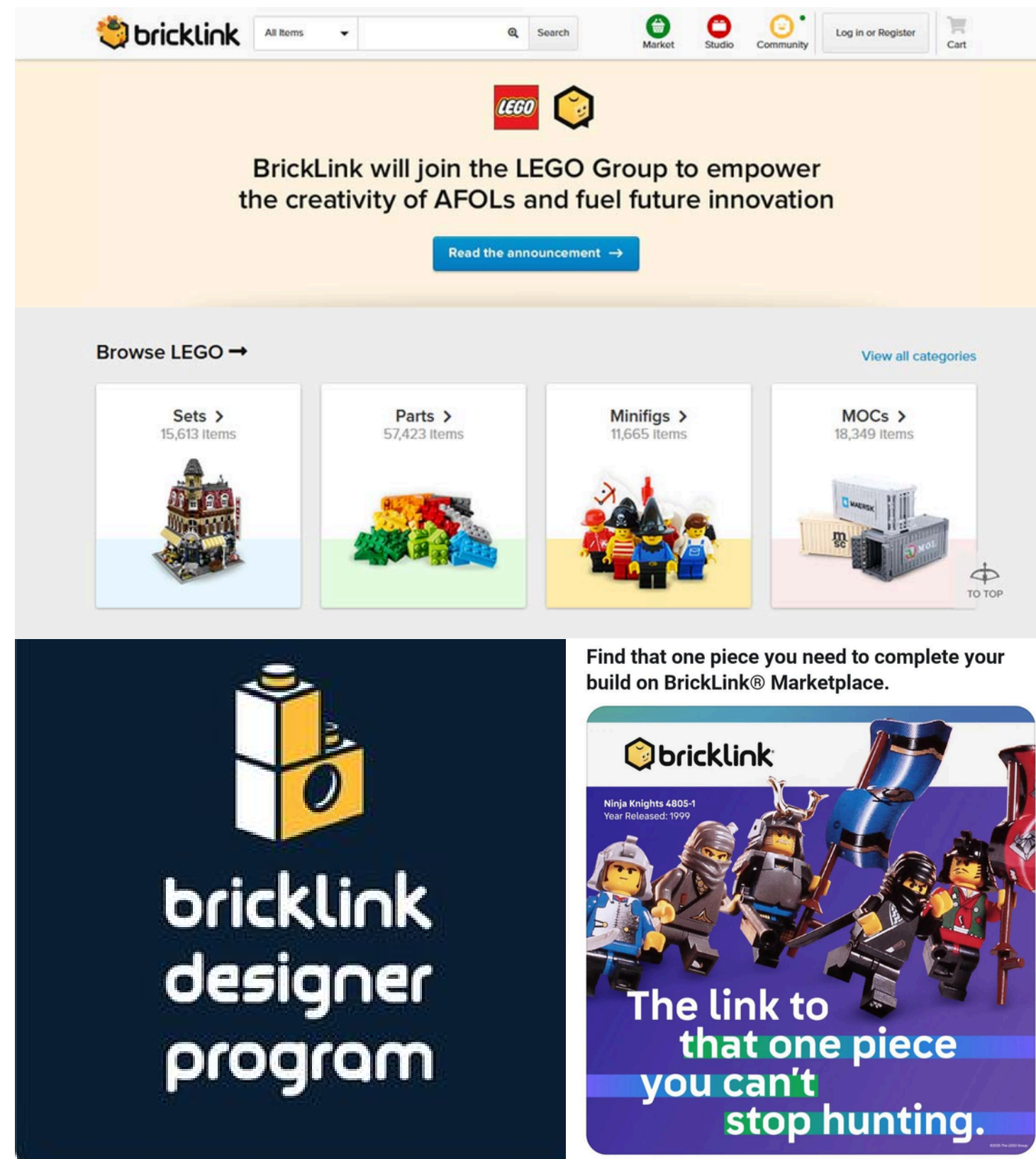
children reached



MANAGEMENT DECISIONS



ACTION 2: BRICKLINK



- **Strategic Acquisition:** Purchased BrickLink to dominate the world's largest secondary market without absorbing physical inventory.
- **Outsourcing the Friction:** Successfully shifted the immense physical burden of reverse logistics (sorting, cleaning, shipping) to the AFOL peer-to-peer network.
- **Platform Orchestrator:** Transitioned into a digital platform model to extract high-margin transaction fees and invaluable global market data.
- **"Managed Cannibalization":** Leveraging secondary market data to inform primary production, controlling the threat of old sets cannibalizing new linear sales.



4. TEACHING NOTES

Underlying models & theories

- Corporate Brand Identity and Reputation Matrix (Urde & Greyser, 2016)
- Triple Bottom Line (Elkington, 1994)
- Circular Business Model Innovation (Antikainen & Valkokari, 2016)

Key learning objectives

- Bloom's Taxonomy (1956)

Teaching suggestions

- Best-practice recommendations
- Time plan
- Board plan



THANK
YOU

