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Playing with Business Models: Emerging Technologies at LEGO, Hasbro, Mattel

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Abstract: This study examines how leading toy manufacturers LEGO, Hasbro, and Mattel reconfigure their business models in response to emerging digital technologies in the toy industry. Using a multiple case study approach, we analyze 18 products across media integration, video game integration, and Augmented Reality. Building on Foss and Saebi's business model innovation framework, we compare changes in value creation, value delivery, and value capture according to scope and novelty. First findings show that LEGO mainly implements architectural innovations new to the firm. Hasbro combines modular and architectural changes and delivers several products new to the industry, providing the only complex business model innovation in the sample. Mattel is characterized primarily by modular innovations, with some new-to-the-industry cases. Initial analysis suggests that a refined framework may more accurately classify BMI across the three firms. Such a framework may reveal, for example, that LEGO can be characterized as a strong fast follower.

Keywords: Innovation Management; Business Model Innovation; Emerging Technologies; Digital Transformation; Toy Industry

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1 Introduction

The toy industry, historically perceived as a low-tech sector, is undergoing a fundamental transformation driven by emerging digital technologies. Firms are increasingly required to integrate smart features, digital experiences, and cross-platform storytelling while preserving the physical and tactile appeal of traditional play. This creates strategic challenges for established companies such as LEGO, Hasbro, and Mattel, which must decide which technologies to adopt and how to adapt their business models in a rapidly evolving market. While some innovations, such as video game integration and transmedia storytelling, are widely adopted, others, including Augmented Reality (AR), remain uncertain. At the same time, consumer expectations are shifting toward hybrid play experiences that combine digital and physical elements.

This study examines how leading toy manufacturers adapt and reconfigure their business models in response to emerging technologies. Emerging technologies are characterized by novelty, rapid growth, and disruptive potential (Rotolo et al., 2015) and are understood here as developments that firms selectively translate into new products, organizational changes, and business model adaptations. While prior research has explored digitalization in the toy industry, often focusing on single cases such as LEGO (Gurcaylilar-Yenidogan and Gul, 2021), and recent work has examined strategic responses of incumbents (Maul et al., 2025), less is known about their impact on business models.

Business models describe how firms create, deliver, and capture value (Osterwalder and Pigneur, 2010), and innovations can differ in scope and novelty (Foss and Saebi, 2017). Unlike other traditional industries where digitalization disrupts existing models, toy manufacturers must integrate innovation while preserving core play experiences. This tension makes the industry a relevant context for studying business model innovation (BMI). Accordingly, this study addresses the following research questions:

(1) What changes to their business models do LEGO, Hasbro, and Mattel implement in response to emerging technologies?
(2) How do scope and novelty of BMI differ across these firms?
(3) What recurring typologies can be identified?

The study applies a multiple case study approach (Yin, 2009; Eisenhardt and Graebner, 2007). It analyzes how LEGO, Hasbro, and Mattel respond to three emerging technologies: media integration, video game integration, and AR. For each firm, six product lines are examined to ensure comparability across technologies, focusing on changes in value creation, delivery, and capture (Foss and Saebi, 2017). A subsequent cross-case analysis identifies common patterns and firm-specific differences. Data triangulation is ensured through multiple secondary sources, including company reports, product portfolios, investor presentations, and industry publications.

The remainder of this paper is structured as follows: Section 2 presents the theoretical background. Section 3 outlines the research design. Sections 4 and 5 present the case studies and cross-case analysis. Section 6 discusses the findings and implications. Section 7 concludes.

2 Theoretical Framework

Advancements in digital technologies are a central driver of digital transformation, fundamentally reshaping how firms create, deliver, and capture value. As a result, companies are increasingly required to adapt or innovate their business models to remain competitive (Verhoef et al., 2021). However, BMI is inherently complex and uncertain.

Even firms with strong innovation capabilities may fail when introducing new models, highlighting the challenges of aligning technological opportunities with viable business strategies (Christensen et al., 2016).

Despite growing scholarly interest, BMI lacks a uniform definition. A widely adopted conceptualization defines BMI as "designed, novel, nontrivial changes to the key elements of a firm's business model and/or the architecture linking these elements" (Foss and Saebi, 2017, p.201). Business models themselves describe how firms create, deliver, and capture value (Osterwalder and Pigneur, 2010). Accordingly, BMI involves changes to these value dimensions and may require adjustments in organizational structures, resources, and strategies (Teece, 2018; Cozzolino et al., 2018). BMI can be understood both as a process, involving experimentation and organizational transformation, and as an outcome, referring to the resulting configuration of the business model (Foss and Saebi, 2017).

A key contribution of Foss and Saebi (2017) is the distinction between two dimensions of BMI: scope and novelty. Scope captures the extent of change, ranging from modular adjustments affecting individual components to architectural transformations impacting the entire business model. Novelty reflects whether changes are new to the firm or new to the industry. Combining these dimensions yields four types of BMI (Foss and Saebi, 2017, p. 217): evolutionary (incremental, modular, new to the firm), adaptive (architectural, new to the firm), focused (modular, new to the industry), and complex (architectural, new to the industry). This typology (see Figure 1) provides a structured lens for comparing how firms differ in their responses to technological change.

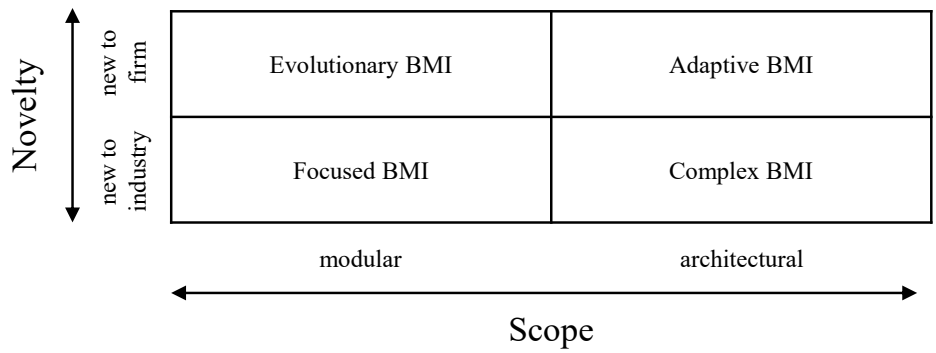

Figure 1 BMI Typology (Foss and Saebi, 2017, p. 217).

Beyond classification, BMI is embedded in a broader causal framework linking antecedents, moderators, and outcomes (Foss and Saebi, 2017). External drivers such as technological advancements, competitive pressures, and shifting consumer expectations, as well as internal factors such as capabilities and strategic orientation, can trigger BMI. These effects are shaped by moderating conditions, including organizational culture, managerial cognition, and institutional environments, and ultimately influence outcomes such as innovation performance and financial results.

In the toy industry, emerging technologies (specifically media integration, video game integration, and AR) represent key antecedents of BMI. At the same time, firms must balance digital innovation with the preservation of physical play experiences, creating a unique context in which business model changes are often constrained and incremental rather than fully disruptive.

Building on this framework, this study conceptualizes emerging technologies as drivers of business model change and analyzes their impact along the dimensions of value creation, value delivery, and value capture (Osterwalder and Pigneur, 2010). This enables the identification of specific business model adaptations implemented by LEGO, Hasbro, and Mattel (RQ1). The scope–novelty framework by Foss and Saebi (2017) is then applied to compare the extent and originality of these changes across firms (RQ2) and to derive recurring typologies of BMI (RQ3). By linking technological developments to patterns of business model transformation, the framework provides the theoretical foundation for a systematic cross-case analysis in a hybrid physical–digital industry context.

3 Research Design

Methodological Approach

This study adopts a qualitative approach to examine BMI in response to emerging technologies. It focuses on LEGO, Hasbro, and Mattel, the three leading global toy manufacturers, whose market leadership and engagement with digital technologies make them suitable for comparative analysis. A multiple case study design is applied following Yin (2009) and Eisenhardt and Graebner (2007), enabling the investigation of complex real-world phenomena. The unit of analysis is the product line, allowing for structured comparison across firms while capturing firm-level strategic patterns. The study focuses on three technological domains: media integration, video game integration, and AR.

Data Collection and Reliability

For our research-in-progress paper, we started with a selection of six products per firm, selected based on market relevance and coverage of diverse target groups. This enables us to compare across the three companies and evaluate the chosen framework. The study relies on secondary data sources, including company reports, product websites, press releases, and industry publications. Reliability is enhanced through data triangulation across multiple sources and researcher triangulation, whereby multiple researchers independently review, interpret, and validate the collected data. This reduces individual bias and increases the robustness of findings (Yin, 2009; Eisenhardt and Graebner, 2007).

Data Analysis

The analysis follows an iterative two-step approach. First, within-case analyses examine how each firm integrates emerging technologies into selected products. Business model changes are assessed along the dimensions of value creation, value delivery, and value capture (Osterwalder and Pigneur, 2010) and evaluated in the dimension of scope (modular or architectural), addressing RQ1. Second, a cross-case analysis compares patterns across firms. Identified changes are classified using the scope–novelty framework (Foss and Saebi, 2017), distinguishing between evolutionary, adaptive, focused, and complex BMI (RQ2). This enables the identification of recurring typologies (RQ3).

4 Single Case Studies

Case 1: LEGO

LEGO, founded in 1932 and headquartered in Billund, Denmark, is a privately held, family-owned company and the world's leading toy manufacturer. Its core product, the interlocking brick system, has remained central to the company since 1958. LEGO describes its toys as combining physical creativity and narrative play, reflected in the well-known statement that "half the toy is the child" (LEGO Group, 2024).

In media integration, LEGO primarily shows architectural BMI. Both the LEGO Ninjago TV series and The LEGO Movie transformed value creation through new partnerships and the development of integrated product–media ecosystems (LEGO Group, 2026; American Film Institute, 2014).

In video game integration, LEGO's BMIs range from modular to architectural. LEGO Island represents a modular innovation as a stand-alone PC game, whereas LEGO Dimensions reflects a more architectural innovation by combining digital gameplay with tactile physical play (Bertoli, 2017; Kennedy, 2022).

In AR, LEGO shows both modular and architectural BMI. LEGO Hidden Side added a digital experience to the physical toy, while LEGO VIDIYO involved broader changes to the business model, including a social media platform and a major music label partnership (LEGO Group, 2019, 2021).

Overall, based on the initial sample used in this research-in-progress study, LEGO appears to be characterized mainly by architectural BMIs, with some modular cases.

Case 2: Hasbro

Hasbro, founded in 1923 and headquartered in Pawtucket, Rhode Island, USA, is the world's second-largest toy manufacturer. In 2023, the company reported USD 5.0 billion in revenue and USD 418 million in net profit, and employed around 6,300 people across more than 35 countries (Hasbro, 2024).

In media integration, Hasbro introduced architectural BMIs through My Little Pony Tales (iMDb, n.d.), which leveraged synergies between television content and toy lines, and through Transformers, whose Hollywood film adaptation reactivated nostalgic interest in the brand and stimulated a broad product ecosystem (Hasbro, 2007).

In video game integration, Hasbro shows modular BMIs such as the PC game Monopoly and the mobile game Transformers: Earth Wars. Both were developed in Hasbro's own gaming studio and primarily extended the value proposition rather than transforming the overall business model architecture (MobyGames, n.d.-a; Molina, 2016).

In AR, Hasbro's BMIs include the Marvel Avengers AR Interactive Iron Man Helmet as an AR-enhanced toy and Transformers AR experiences as app-based brand extensions (PlayBox, n.d.; Hasbro, 2017).

Overall, based on the initial sample used in this research-in-progress study, Hasbro shows a balanced pattern of architectural and modular BMIs.

Case 3: Mattel

Mattel, founded in 1945 and headquartered in El Segundo, California, USA, is the world's third-largest toy manufacturer. As of 2023, the company employed approximately 33,000 people across 40 countries and reported USD 5.4 billion in annual revenue (Mattel, 2024).

In media integration, Mattel initially introduced modular BMI with He-Man and the Masters of the Universe, which was broadcast on television to support toys that had already been launched on the market. More recently, this approach became more architectural with The Barbie Movie, which was accompanied by a broader global brand repositioning (Netherby, 2001; The Numbers, 2023).

In video game integration, Mattel showed modular BMI through Barbie Fashion Designer, which used existing internal IP in a PC game format, and through the UNO mobile game as a direct adaptation of the card game (MobyGames, n.d.-b; Cassell and Jenkins, 1998).

In AR, Mattel introduced modular BMI with the Barbie AR app, which enhanced existing content through AR features (Spangler, 2023; Lam, 2018).

Overall, based on the initial sample used in this research-in-progress study, Mattel appears to be characterized primarily by modular BMIs, with only limited architectural change.

5 Cross-Case Analysis

Across the three case studies, it becomes possible to compare whether the identified BMIs were new to the industry or merely new to the firm.

In the field of media integration, Hasbro showed a new-to-the-industry innovation with the Transformers Hollywood movie and its associated toy ecosystem. Mattel also introduced a new-to-the-industry innovation with the He-Man and the Masters of the Universe TV series.

In the field of video game integration, Hasbro again demonstrated an early new-to-the-industry innovation with Monopoly PC games, while Mattel did so with the UNO mobile games.

In the field of AR, Hasbro once more introduced a new-to-the-industry innovation through its Transformers AR experiences.

Overall, LEGO stands out as the most adaptive company, with four of the six analyzed products falling into this category. This is because LEGO frequently implements architectural innovations that are new to the firm, but not new to the industry. Hasbro shows the most balanced pattern, with two focused innovations and, as the only company in the sample, one complex BMI, that is, an innovation that is both architectural and new to the industry. Mattel shows the highest number of evolutionary innovations. Although Mattel also includes two new-to-the-industry innovations, most of its innovations remain modular (five cases), with only one architectural case. This pattern is illustrated in Figure 2.

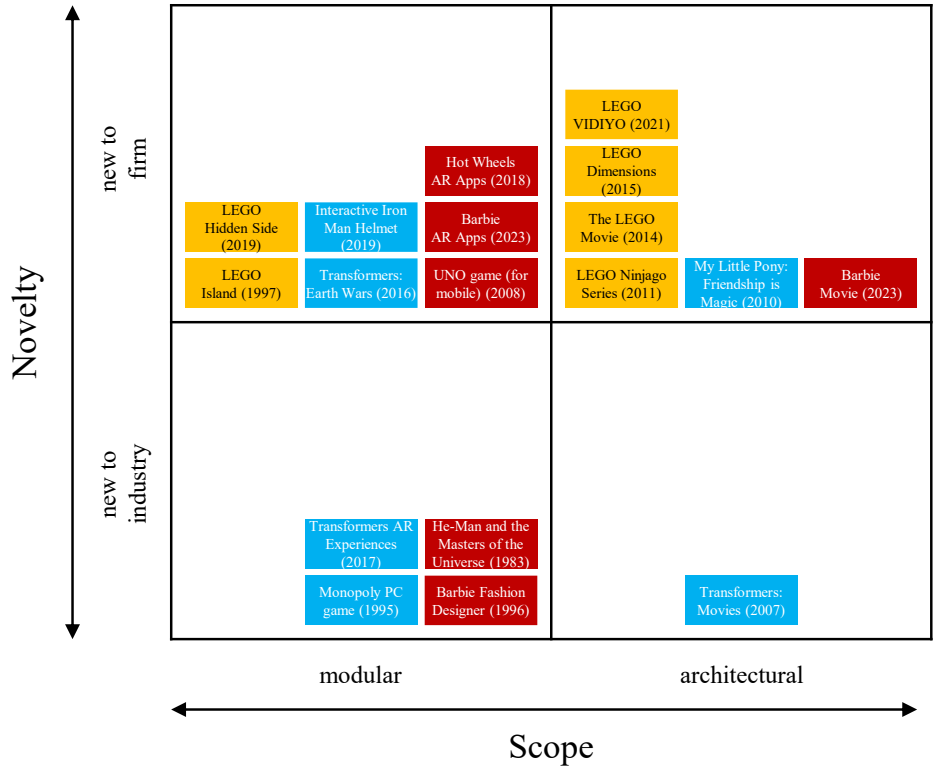

Figure 2 Cross-Case Analysis with data visualized in existing framework

6 Discussion, Conclusion, and Outlook

The current state of the data, based on this initial small sample, indicates that distinct firm-specific characteristics can already be identified and may allow preliminary conclusions about different strategic patterns. At the same time, the findings suggest that the existing framework could be further refined. In particular, it may be useful to differentiate not only between innovations that are new to the firm and those that are new to the industry, but also to consider whether certain strategies reflect a fast-follower logic (Lieberman and Montgomery, 1988). In addition, the distinction between modular and architectural innovation could be specified in greater detail. Rather than treating all non-architectural changes alike, it may be valuable to capture intermediate cases in which several business model elements are affected without amounting to a fully architectural innovation. Such an extended framework could provide a more nuanced picture of how firms respond to emerging technologies, as illustrated in Figure 3.

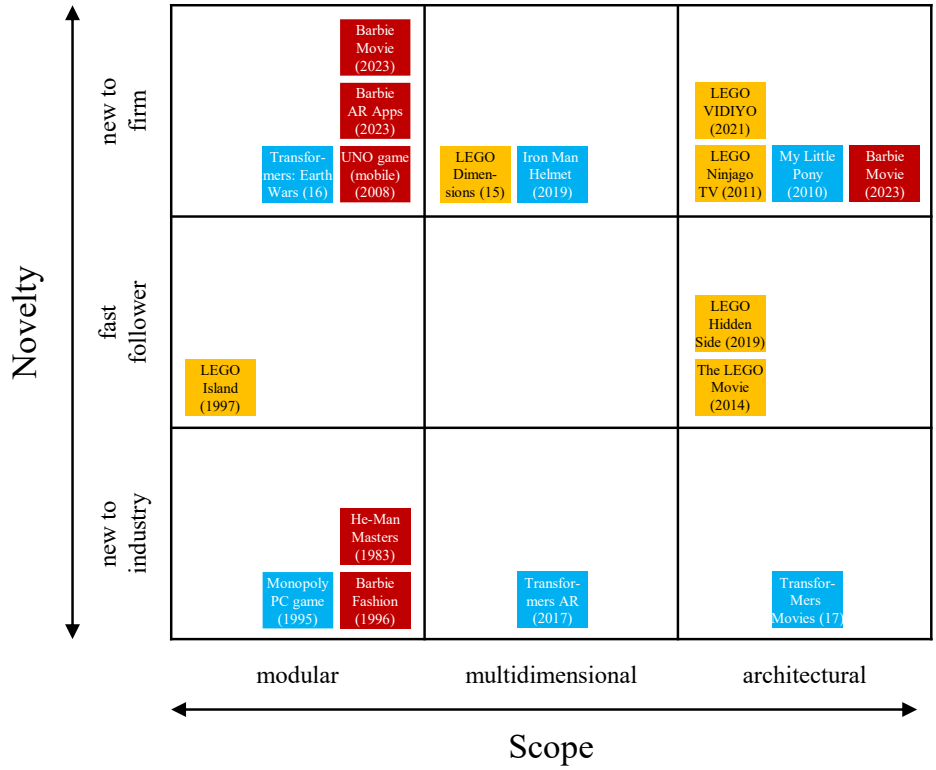

Figure 3 Cross-Case Analysis with data visualized in the new suggested framework

Building on this refined framework, future research could collect additional cases per firm and thereby distinguish more systematically between different strategic patterns. The initial analysis already suggests, for example, that LEGO may rarely be new to the industry, but often acts as a fast follower in the sense of adopting and integrating innovations after pioneers have established the field, while doing so in a comparatively comprehensive way at the business model level. These nuances could be made more visible through a more differentiated analytical lens.

Areas for feedback & development

Framework refinement

We welcome feedback on whether the framework should be refined beyond the current distinction between modular and architectural innovation and between “new to the firm” and “new to the industry.” In particular, we are considering whether it would be useful to capture intermediate forms of business model change, as well as additional strategic positions such as fast followers that are not industry pioneers but still integrate emerging technologies in a comparatively comprehensive way.

Scope of the sample

A further question concerns the empirical scope of the study. Although LEGO, Hasbro, and Mattel cover a large share of the toy industry, they do not represent it in full. We therefore welcome feedback on what would constitute a meaningful sample size for the next stage of the study and which additional firms should be included.

Emerging technology categories

Finally, we would like to discuss which categories of emerging technologies are most meaningful for the study. This includes whether our current three categories provide a suitable basis and what role AI and other more recent emerging technologies should play, particularly in relation to future developments and strategic relevance.

Notes

This paper presents selected findings from a broader research project on innovation in the toy industry. Other research aspects such as reaction strategies have been presented at the ISPIM 2025 and the EURAM 2025 Conference and dynamic capabilities are part of a poster presentation at this ISPIM 2026 conference.

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