A Case Study on how LEGO® uses design to add value

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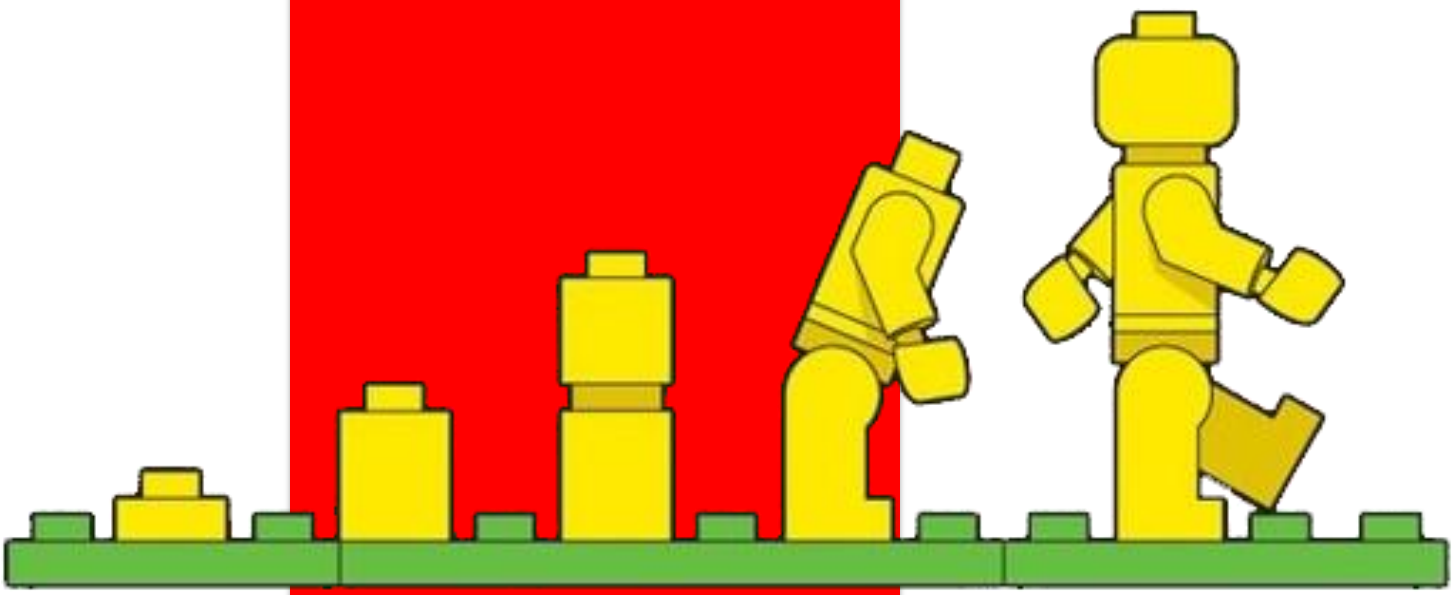


1 | Introduction

LEGO can be traced back to 1916…

… when founder Ole Kirk Christiansen purchased his carpentry workshop, concentrating mostly on house and furniture construction. In 1924, the workshop burned down, and Christiansen had to rebuild everything. He saw this as an opportunity to expand the business with a larger vision. However, the depression left Christiansen with few customers and pushed him to create "miniature versions of his products as design aids" (Wiencek, 1987). This is what inspired him to produce wooden toys such as piggy banks, pull toys, cars and trucks. Still, the occurring depression meant farmers sometimes "traded food in exchange for the toys" (Wiencek, 1987), making his business unprofitable. Christiansen was practical, yet creative. For instance, in response to the fad that had arisen in the mid 1930s, he used leftover yo-yo parts as wheels for toy trucks to reduce waste (Wiencek, 1987).

LEGO's name originates from the Danish phrase "leg godt" which translates to "play well".

In 1934 the company was named LEGO, originating from the Danish phrase "leg godt" which translates to "play well". Later, LEGO learned that it could be interpreted as "I put together" or "I assemble" in Latin. In 1947, plastic became available in Denmark and Christiansen discovered it was the "ideal material for toy production" (LEGO, 2012). Spotting this opportunity meant that LEGO purchased the first injection-molding machine in Denmark (LEGO, 2012).

In 1949, the LEGO brick prototype was developed and it paved the path to what "continues to excite countless children and adults to this very day" (LEGO, 2012). The brick was continuously perfected with occasional "adjustments in shape, color and design" (LEGO, 2012). Remarkably, today's bricks still fit those from 1958, when the LEGO coupling system was patented. A

new imaginative world came about as "the new coupling principle" (Ideafinder, 2005) provides an astonishing number of possible combinations for the bricks (Ideafinder, 2005).

In 1963, LEGO started producing bricks with Acrylonitrile Butadine Styrene (ABS), a matt-like thermoplastic. ABS has a number of advantage as it creates a "scratch and bite-resistant surface" which is also "ideal for keeping the bricks connected" (LEGO, 201). This enhances performance, quality and durability which are important elements of the design mix (Kotler & Rath, 1984).

LEGO's Target Market

When LEGO was first established, it had a focused target market of "middle-school age boys" (Watters, 2011). Today, LEGO products are purposefully designed to follow a child through their full development cycle (infants, children and teenagers) to adulthood. LEGO also targets special needs, classrooms and companies (for team-building and innovation fostering). (Dacta, 2009; Education, 2011; Seriousplay, 2011). LEGO excels in creating value for all their different target users; this will be discussed further in "Meaning and Value Proposition".

Ole Kirk Christiansen establishes carpentry business in Denmark

1932

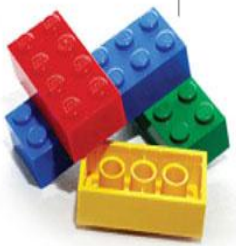
1934
LEGO is born

LEGO buys plastic injection-molding machine

1947

Original LEGO brick patent is filed

1958

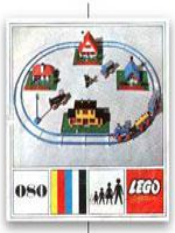


1955
First ancestor of modern LEGO sets

1961
LEGO wheel

First LEGO train system and electric moror (4.5V)

1966



1967
LEGO Duplo

LEGO brick figures

1974

1978
LEGO minifig

1979
LEGOLAND Space

1984
LEGOLAND Castle

LEGOLAND Pirates

1989

1977
LEGO TECHNIC

LEGO BIONICLE

2001

LEGO MINDSTORMS

1998

LEGO MINDSTORMS NXT

2006

1999
LEGO Star Wars

1996
Google use LEGO bricks as expandable casing for hard disks

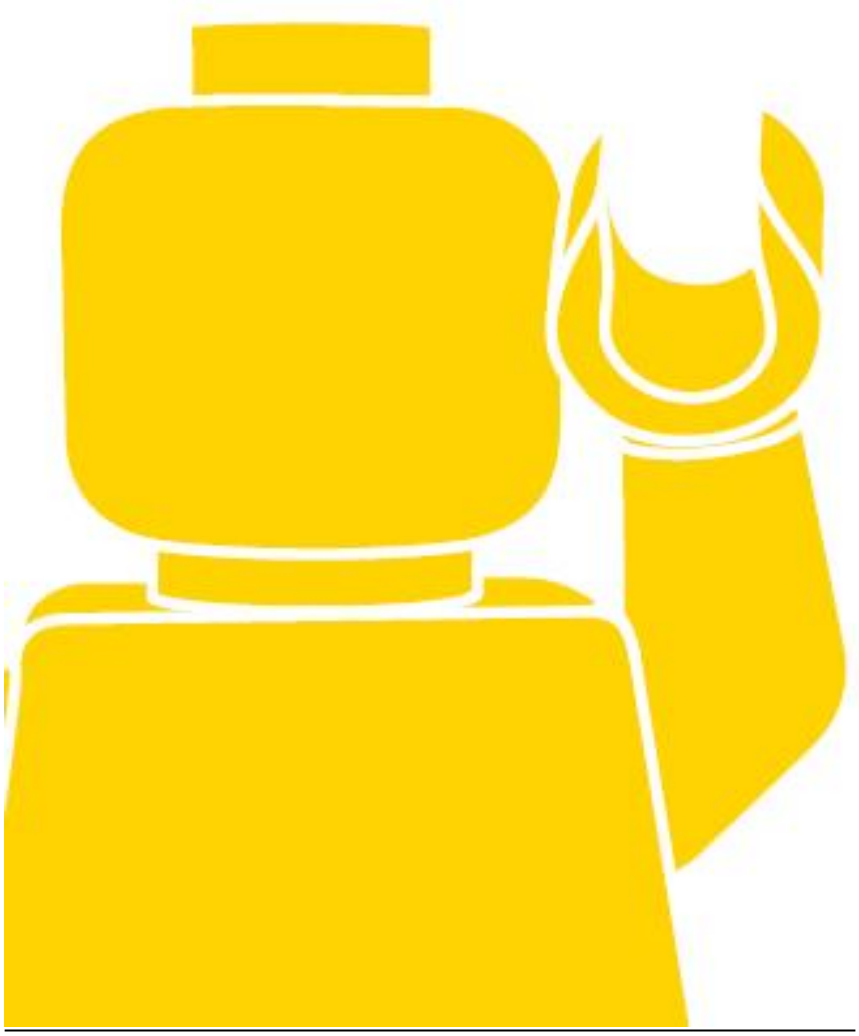
LEGO's basic philosophy to add value to a child's development and its subsequent adulthood has been reflected in its product range for over 50 years.

Image adapted from: (Diaz, 2008)

2 | Meaning & Value Proposition

LEGO has built its solid reputation by providing an experience that encourages creativity and self-expression. The power of LEGO's design is the building blocks that enable imagination and self-creation, where the user can be the design manager, creator and manufacturer. LEGO understands "the value and the ways of encouraging free-play in children" (LearningInstitute, 2011) and designs products accordingly.

LEGO is successful at satisfying their customers through sustainable value creation strategies and customer focus. LEGO's value proposition differs for each customer segment.



"Inspiring and Developing the Builders of Tomorrow"
(LearningInstitute, 2011)

Children

LEGO is designed as a fun toy offering fruit for thought and new, endless possibilities. (Honoway, 2011).

(Mason, 2011)

Parents

LEGO is a 'disguised educational tool' that encourages their children to become more imaginative and expressive of their thoughts. Additional value is added to the brand through online resources available to parents, including 'LEGO parents' and 'Learning Institute' research papers (on child development produced from collaboration with experts in the field). (Osterwalder, 2006).

Educational Institutions

Educational Institutions LEGO is increasingly used in classrooms to enhance learning and develop skills in specific subject areas such as robotics, programming, creative thinking and social skills. To support educators, LEGO provides training resources (Education, 2011).

Others

Others "The LEGO system is frequently cited by many leading organizations... as a specially creative play material used in learning contexts by institutions… throughout the world" (LEGO, 2009). LEGO adds value by enabling team building and problem solving in environments such as the workplace (through LEGO SERIOUSPLAY®, a consultancy tool).

3 | Innovation and Design at LEGO

Design Team

"[LEGO] considers design to be a key element in the development of their products [and] has used design as a competitive weapon".

(Design Council UK, 2011)

Currently, LEGO employs approximately 120 designers of 15 nationalities and has small design offices in the UK, Spain, Germany and Japan, who develop products specifically for those markets (Design Council UK, 2011).

LEGO understands cultural differences in play, education and design. For example, a LEGO employee notes Japanese children enjoy games with fearsome creatures whilst American children prefer those with fast cars. This represents their social constructs (Ask a Designer, 31 Aug 11).

"We are all big kids"

JH, Lego Designer

(Ask a Designer, August 31 2011)

LEGO fosters an atmosphere that is highly imaginative. It is important to couple this creative big kid philosophy with a structured process to support it. Without a process to facilitate this, LEGO produced many commercially unviable products (further discussed in LEGO's Design Failures) and is the reason they recently introduced Design For Business.

Design For Business

Design For Business (D4B) is a new design system that completely changed LEGO's innovation process (Fisk, 2010). Its aim is "to improve the contribution of design to business by increasing its effectiveness and efficiency (without losing creative power) with a series of related tools and processes" (DME Team, 2011).

Designers anticipated this structure would restrict creativity, but LEGO found a way to maintain strong innovation; in addition to the mainstream customer-centric innovation process, LEGO has a "Concept Lab" that has a separate design team focusing on more stretching opportunities (Espinosa, 2009). The figure below shows the main tools and processes used in the D4B system. The following observations can be made in the design process:

- Material artifacts and practices
  - Coloured post-its
  - Mood boards to facilitate idea communication (Ask a Designer, 5 Oct 2009)
  - Frameworks (e.g. innovation model, foundation process, roadmap)
- Design practice tool cards are used to help designers maintain best design practice standards
- LEGO offices are very colourful and modern, with LEGOs dispersed everywhere

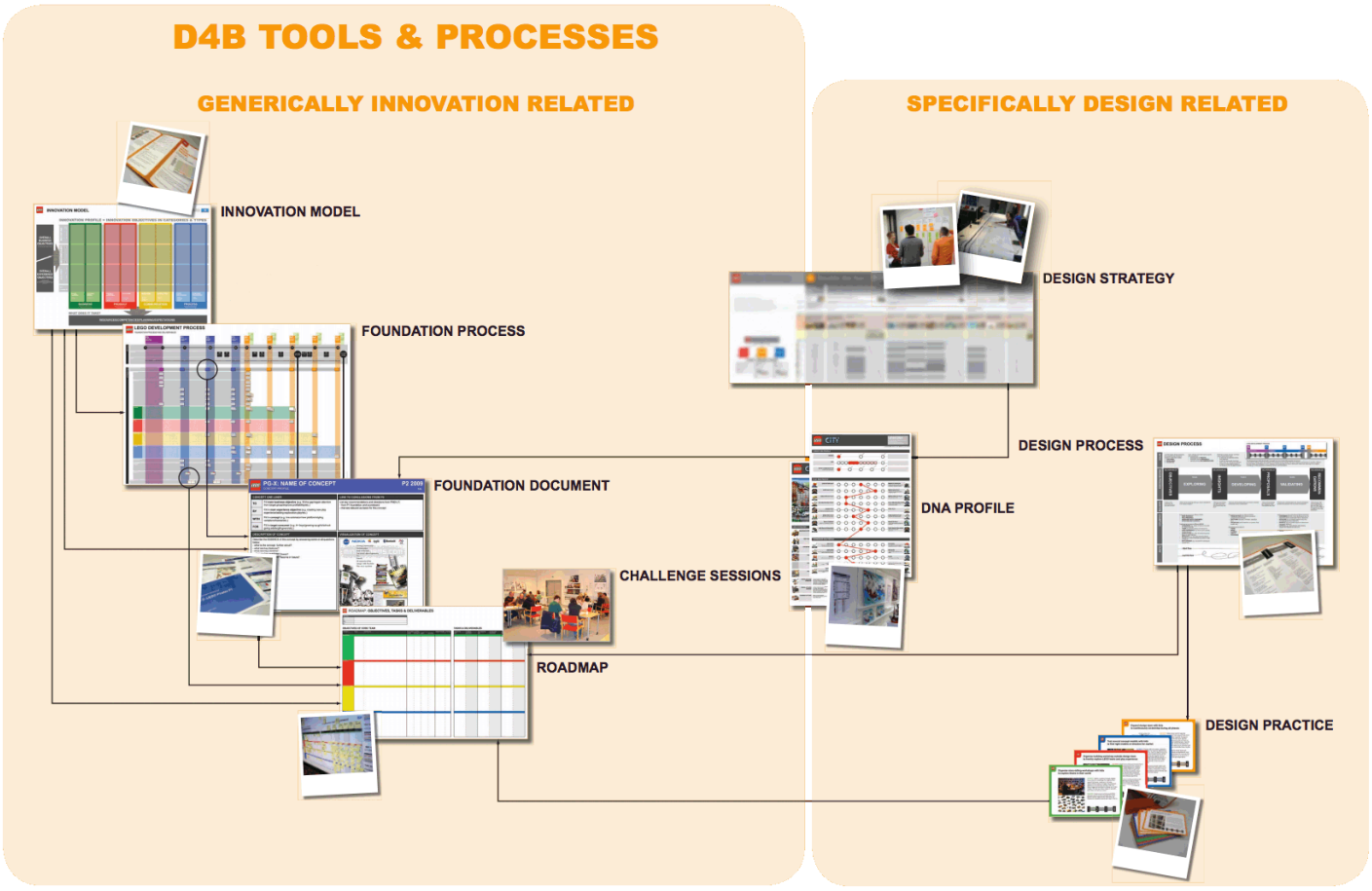


Image adapted from (DME Team, 2011)

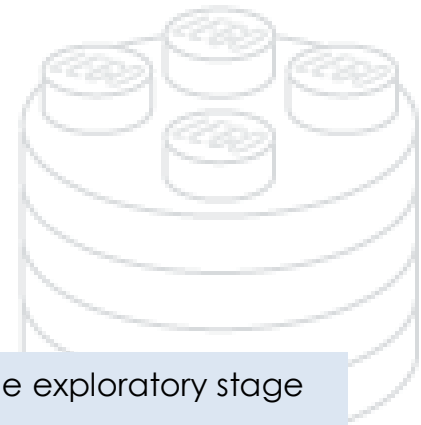
LEGO's Office: modern with LEGO models everywhere *(Future Trends Magazine, 2011)*

The Design Process

The design process is the main part of the D4B system. It is a 9-12 month development period (cut down from the prior 24-month period) that consists of two phases: prototyping and manufacturing.

The prototyping phase follows an idea generation process to help designers follow a logical sequence of steps. The cycle can be broken down into three stages: Exploring, Developing and Validating.

The Exploring stage is where market trends and developments are identified; designers explore and learn the market, for example through interviews with children or the observation of their behaviour in toyshops.



The Developing uses the findings from the exploratory stage to actually design and develop the products. The team uses 3D-modeling software to develop initial design sketches into CAD drawings. A stereo-lithography machine (3D printing) is then used to create the prototypes. (Scroobal, 2011)

Finally, the Validating stage is when the design is presented and commented on by senior management, parents and children. For instance, LEGO designers invite children to play with newly developed toys so that they can observe how they

play and what the prototype weaknesses are (Ask a Designer, 31 Aug 2011).

It can take up to 6-months to reach the decision of whether a project enters the manufacturing phase. The prototype designs are compiled in the Foundation Overview document that aids the comparing and selection of designs to manufacture (Design Council UK, 2011).

Designing for consumers

Halo Segments

Halo customer segments are customers "whose needs are similar to those of existing customers" (Selden and MacMillan) LEGO actively scans for shifts in needs of core and halo segments. Conscious of the skew towards boys, one important direction the company is taking is to target girls. They have developed products that provide the "right balance of creativity" and a lesser degree of "constructability" to the female users (Bawden, 2011). LEGO uses its expertise in child development and learning psychology to uncover the different gender patterns and play-styles. Already, they have introduced the LEGO Friends line, emphasizing the "Beauty of Building", centered on character collectibles similar to the Barbie series.

Trends

LEGO is actively trend-spotting (LEGO Annual Report, 2011, p.9) and designing accordingly. In each generation, children grow up immersed in different fads, identify with different characters and use different playing methods. Therefore, since inventing the plastic brick, LEGO has created hundreds of sets with many themes and concepts:

- Licensed themes: cartoon and film franchises (Harry Potter, Toy Story, Star Wars…etc)
- LEGO-specific themes such as ARCHITECTURE® and NINJAGO®

Technology Trends

In a world where a kid's attention is increasingly captivated by consumer electronics, LEGO has to go beyond creating new combinations of components and make improvements through the marrying of technology with physical play. This is done through LEGO's strategy of seeding new concepts (Paternoster, 2012). One example is Life of George, a LEGO game with a companion iPhone app that gives the player instructions on what to build, where you and your friends race against the clock to build using physical LEGO bricks. You then take a picture of it and the app checks for accuracy and speed. This introduces a competitive element into playing LEGO (Chan, 2011). Through partnerships with Intel, LEGO is looking to enhance the play experience through the development of augmented reality technology (O'Dell, 2011).

Video Game Era

To maintain defensiveness, LEGO scans for disruptive threats from competitors. With the arrival of the video game era in the 1990s, competition grew stronger, putting much pressure on LEGO to overcome its "passé design" (Colaizzi, 2010). LEGO therefore developed and released MINDSTORMS®, a new brick design equipped with technology allowing for programmable movements.

Open Innovation

Within weeks of launching MINDSTORMS, over 1000 hackers had created modifications to the software allowing for new functions. Despite this being illegal, LEGO identified the value of community insights and decided to embrace open innovation. This improved MINDSTORMS and "resulted in many more units being sold" (Arnold, 2011).

LEGO also launched LEGO CUUSOO®, a platform where fans can submit original designs subject to voting by the community. Once a design garners more than 10,000 votes, it is considered for production. This is important as it elevates LEGO from a mere product to potentially become an artifact created and affirmed by the collective. Complementing CUUSOO is ReBrick (Castera, 2012) LEGO's very own social media platform for sharing creations that effectively democratizes design.

Design Discourse

LEGO appears to utilize a "free-floating community" (Verganti, 2008) to learn indirectly about their customers. Designers do this, for example, by looking for inspiration "on the internet… [and] visit[ing] car shows, air shows and zoos" (Ask a Designer, 31 Aug 2011). This less conventional method encourages originality and enables consumer information access.

The LEGO Experience

Store Design

LEGO uses a specific layout in their stores worldwide. To gain a further understanding of the design, the team visited the LEGO store in Westfield Shopping Centre, London. The store visited is called a Yellow store. In contrast to Grey stores, Yellow stores are playful, lively and, most importantly, interactive (LEGO store-attendant).

The stores have a chosen color scheme: red and yellow. The team speculates that the colours are gender-neutral and create an atmosphere of warmth, power and joy (exploiting the traditional meaning of the 2 colours), which appeals to both children and parents. The idea of building is omnipresent in all aspects of the LEGO brand. For example, the furniture and decorations come in LEGO brick shapes.

The "Living Room" (the centre of the store) is reserved for five interactive workstations which are designed for "hands-on, minds-on

play" (LEGO Stores, 2012). For example, the Star Wars section challenges the visitors to "rebuild the Star Wars Universe and Death Star trench chase". The workstations enable parents to observe their child in play. With the exception of the back wall (where children pick their own bricks – see figure below), walls are arranged by product-line using colour coordination.

Creative displays are dispersed amongst the products. The "kid chic design", "innovative displays" and "in-store family events" (LEGO Stores, 2012) contribute to the appeal of the store, adding to the value proposition.

Community, Events & Marketing

LEGO's does an exceptional job at involving the community (Lindegaard, 2010), which is not only valuable to customers but also for developing open innovation. See below for examples:

- The store organizes events to promote new interactive ways to play with bricks:
  - Monthly Mini Model Build
  - A three day grand opening celebration often occurs at new LEGO stores where a large statue is created with the help of children. For example, YODA in the Raleigh store (Stock, 2009)
- "Building the Future with Lego Bricks"
  - LEGO collaborated with local Japanese authorities to organize a 40,000-person event to imagine and create future city landscapes (GPlusMedia Co., 2012)
- LEGO-driven online communities:
  - LEGO club: "three million kids that receive the LEGO magazine and participate
  - Creator portal: enables children to communicate with designers (Ask a Designer, 2011)
  - LEGO Club Parents
  - Learning Institute
  - MINDSTORMS: open innovation and challenges (Mindstorms, 2012)
- Fan-driven online communities:
  - Brick journal: website for LEGO enthusiasts (Brick Journal Media, 2012)

LEGO's Design Failures

Design has not always benefited LEGO. In the late 1990s, LEGO started to encounter difficulties. An overemphasis on creativity and free reign of the designers resulted in many commercially unviable products being introduced into the market. A design free-for-all was replaced by the D4B initiative described in the Design section. LEGO also made sure their designers worked with noncreative staff, such as marketing managers, in the earliest stages of product development. This guided the development process by incorporating research about what kids wanted (Greene, 2010).

In an attempt to revive the brand, they introduced a wide spectrum of products, such as the Galidor action figure line that "could barely be taken apart and reassembled". They also differentiated into areas beyond their level of expertise such as the TV show 'Galidor: Defenders of the Outer Dimension". Over-extending into new segments (even before developing the capabilities), LEGO lost sight of their main strength – promoting building skills and imagination through toys (Greene, 2010).

Most recently, LEGO closed down a customization service called Design byMe, which allowed customers to order their own LEGO creations. It proved to be "too complex for children" and the production of myriad user designs failed to "live up to the quality standards for a LEGO service" (Huw, 2011). This underscores the importance of not just fulfilling the customers' wants but also taking into consideration customer limitations and product sustainability (Huw, 2011).

4 | The Future for LEGO

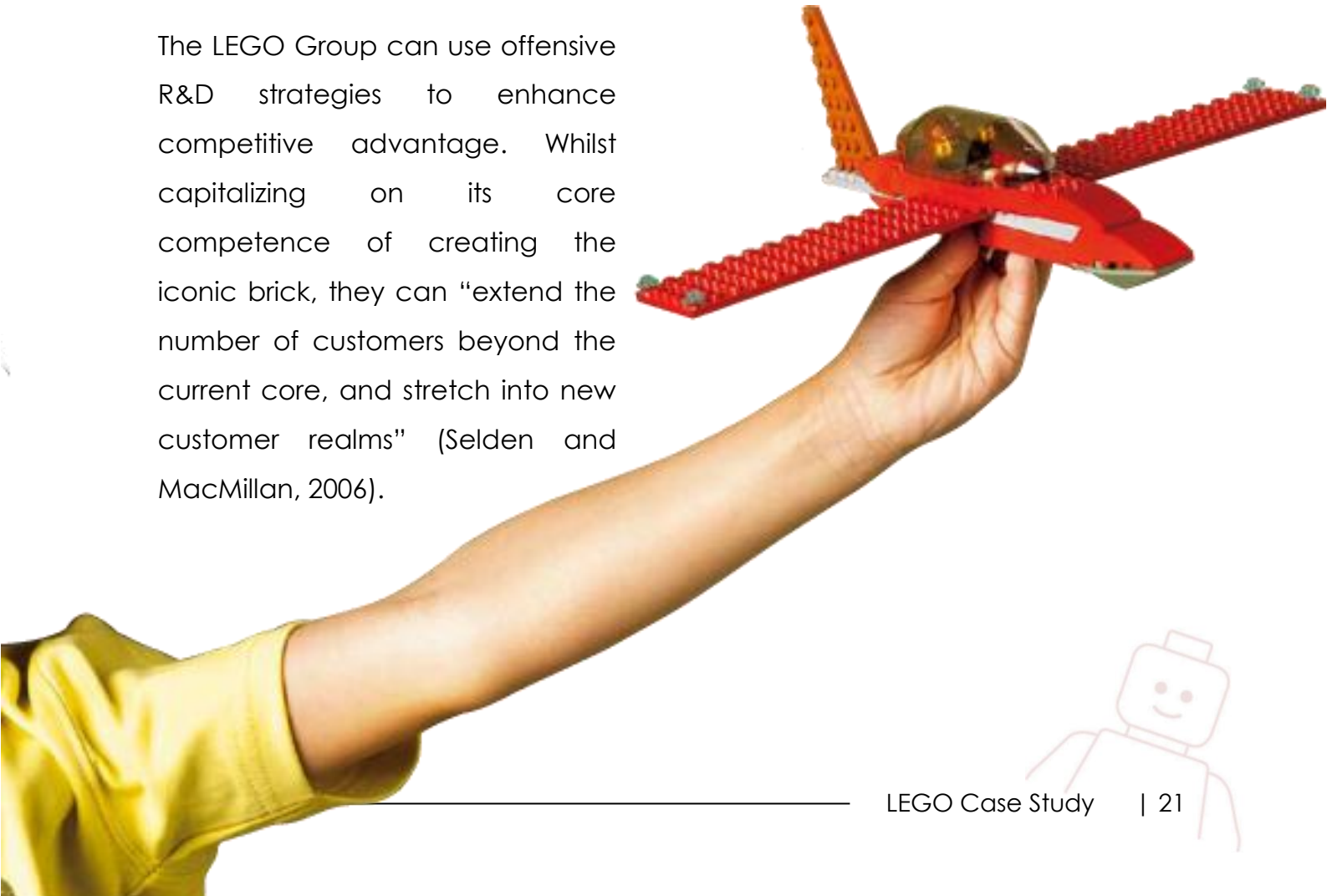
To fulfill its vision of "inventing the future of play", LEGO needs to constantly question itself. This is done by expanding its reach through creating new products for untapped market segments, and keeping attuned to the latest developments in technology.

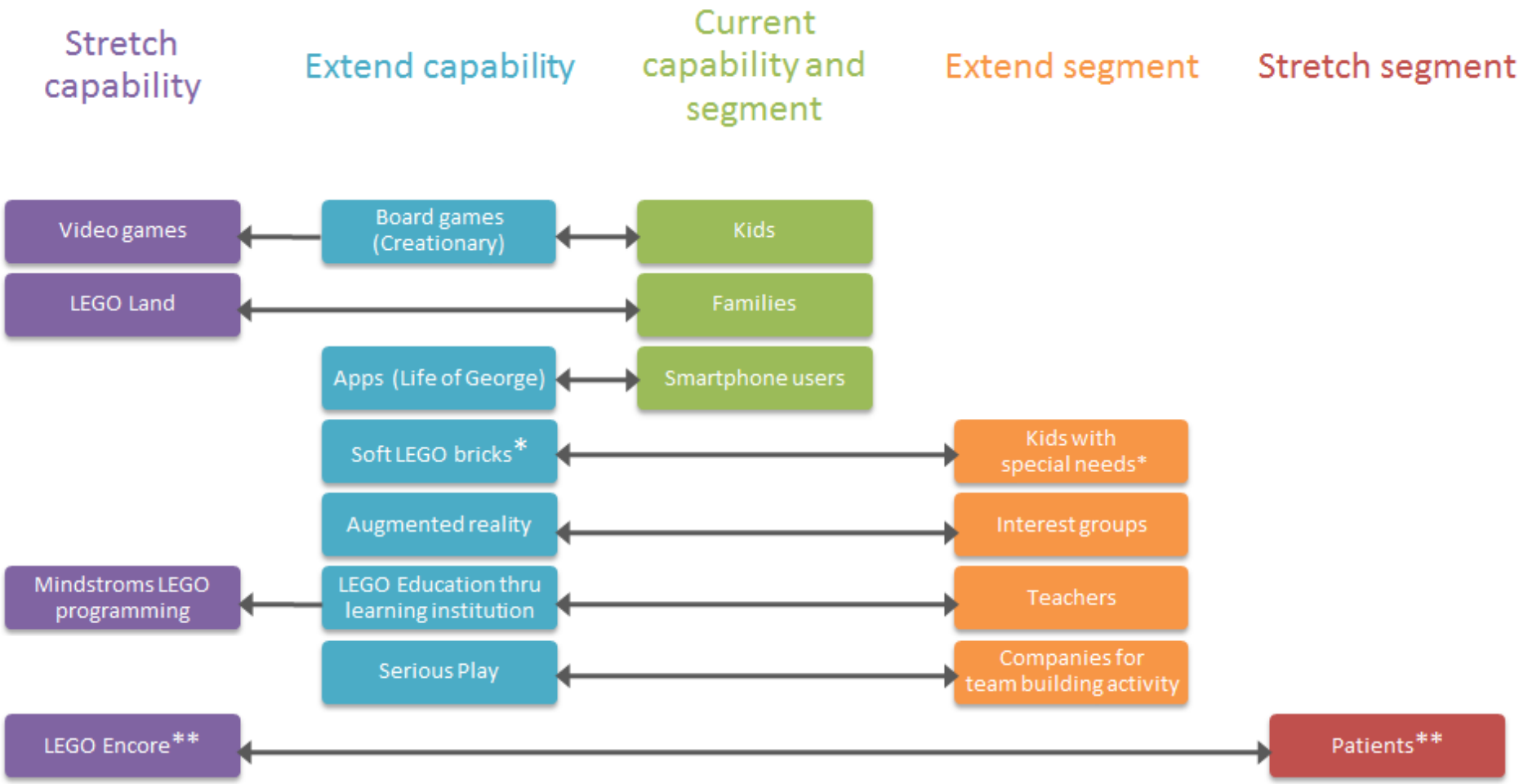
Licensing

LEGO's licensing reputation can be considered a strategic asset to them as film companies want to be featured in the LEGO Group. Having kids playing with toys from their movie is a prestigious marker of achievement for film-makers. However, it can be argued that LEGO could become too dependent on external themes. In terms of sustainability, the brand should promote its own LEGO characters more actively.

Customer-Centric Innovation

The LEGO Group can use offensive R&D strategies to enhance competitive advantage. Whilst capitalizing on its core competence of creating the iconic brick, they can "extend the number of customers beyond the current core, and stretch into new customer realms" (Selden and MacMillan, 2006).





* Suggested idea by IE&M group E

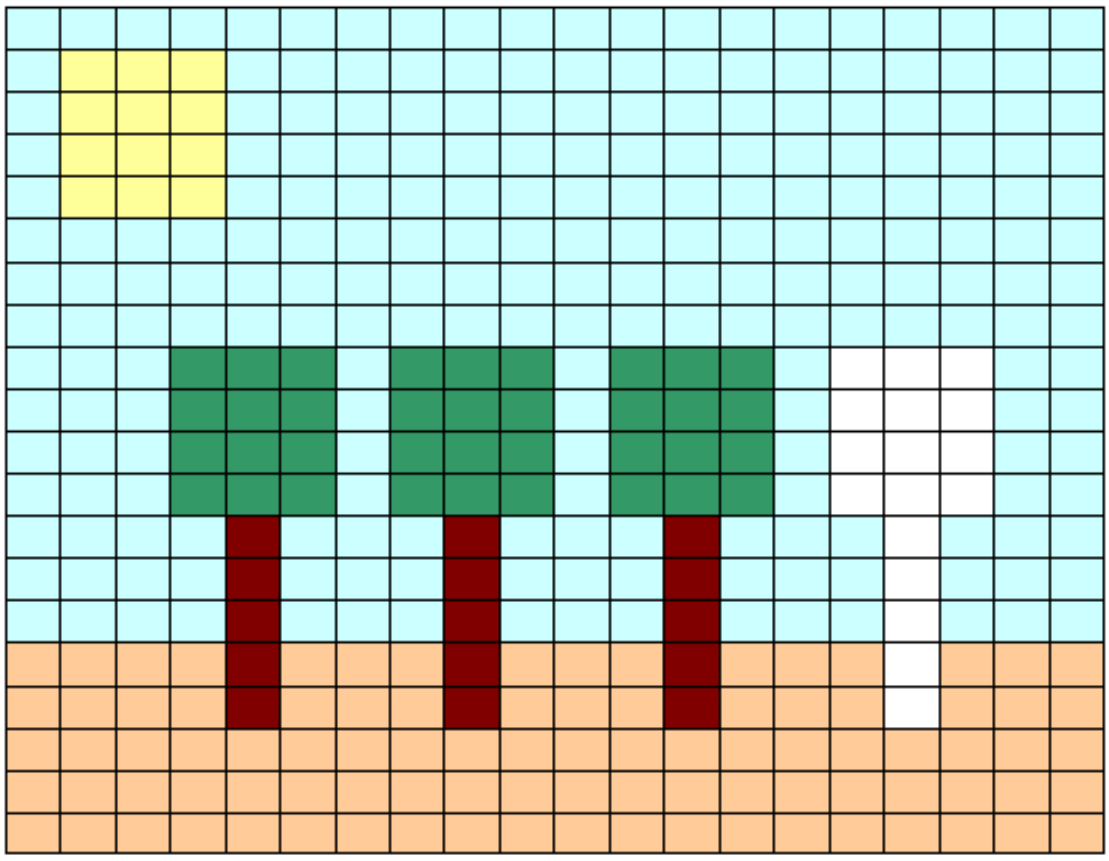
** Suggested idea by IE&M group E discussed in the next section

Medical Application A new halo segment worth evaluating is the elderly with the assumption that rehabilitation of degenerative diseases requires practicing motor skills, repetitive behaviors and establishing a routine. The imagination and creativity of LEGO can improve mental health and lower stress in elder patients. What LEGO is already reputable for may be just the solution to alleviating symptoms associated with mental and physical decline in old age. Imagine the creation of the "LEGO Encore" line, where the LEGO bricks are designed using classy colours and materials such as metallic, pearl and marble. This would leverage on existing resources, using the same mold but different material to create the desired look (i.e. textured looking effect). This is also viable because people enjoy revisiting those cherished moments in their childhood.

Corporate Social Responsibility

The LEGO Group's philosophy concerns inspiring and developing the builders of tomorrow, thus it is their responsibility to create a community that values and encourages future generations to think about others. Given LEGO's influence, they can shape children's perceptions and foster socially conscious behavior worldwide.

LEGO could offer a "Brick for Brick" set whose profit would contribute to the development of a new home, school, village… As the children build their LEGO set, they know they have also contributed to building the real-life version of it.



The image above is an example of an illustration that can be placed in the LEGO store, this indicates that if 400 boxes are purchased, enough money will be raised to help an African Village restore their soil's fertility.

The white spaces indicate that a further 17 boxes are needed to achieve the targeted donation.

The image below is an example of a 3D illustration. When an Individual purchases one of the boxes from the 'Brick for Brick' product line, a LEGO block would be added to a life-size LEGO statue of the product e.g. Save The Jungle: A Lion Statue or A Parrot.

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Pictures taken from Internet and LEGO sources.


Play Well