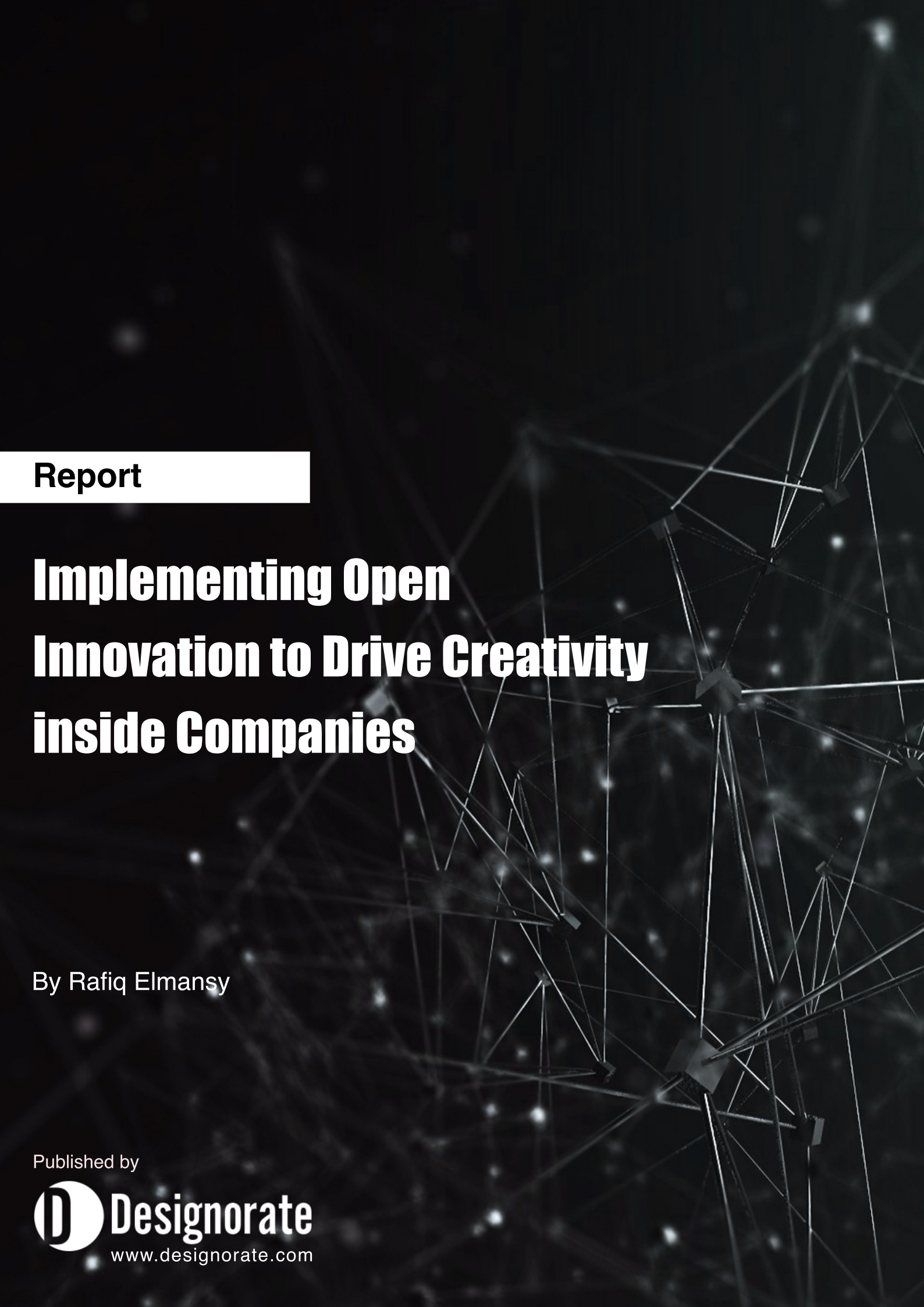

Report

Implementing Open Innovation to Drive Creativity inside Companies

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Published by

Designorate

www.designorate.com

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Abstract

Innovation and creativity play an essential role to improve a company's position in competing markets. The open innovation model is one of the strategies that can improve the company's ability to innovate on both the process and product levels. The different levels of the open innovation model can combine with both closed and open business models to achieve different types of innovative output. One of the key examples of applying the open innovation model is LEGO, a leading company in the toy making industry. Through open innovation and creativity, LEGO was able to improve its innovation and creativity profile through applying an open innovation model.

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1.0 Introduction

Many researchers have provided evidence that innovation and creativity are essential factors for companies to improve their position in competing markets. This can be achieved by implementing innovation strategies (Wang et al, 2009). The characteristics of the open innovation model have been highlighted and how it contrasts with the closed innovation model. This report compares the practice of implementing an open innovation strategy in organizations based on three creativity levels; inbound; outbound; and coupled through research on the output expected from each level on both closed and opened business models. This comparison tries to identify the rule of open innovation on the process and product creativity inside the organization and how the three levels contributes to the innovation process.

This report highlights LEGO as a case example for implementing open innovation in one of the leading companies in the toy making industry known for its innovative profile (Lauwaert, 2008). The case example studies how LEGO implemented open innovation on both the process and production level.

The research in this report depends on the social media as a research tool. The research and investigation process have utilized a number of research social media resources such as researchgate.net, academia.edu, linkedin.com, slideshare.net, and scholar.google.com.

2.0 Theme and Issues

Innovation and creativity are essential factors to achieve competitive advantages in market. Innovative companies adopt strategies that aim to improve both the input and output sides of the innovation equation through reducing the input costs or increasing the production volume (Wang et al, 2009). Innovation can be applied on four main levels inside the company; business model innovation, product & service innovation, process innovation, and technology innovation (Osterwalder, 2007). However, the innovation process is faced by obstacles on those four levels. For example, the product development process is faced by hinders such as a short product lifecycle, high innovation costs and increasing product complexity through a different release. These obstacles should be overcome by the R&D team inside the company (Nerone, Osiris & Liao, 2014).

Open innovation is recognized by many companies as a method to overcome the NPD (new product development) obstacles (Nerone, Osiris & Liao, 2014). Chesbrough (2003a, p.XXIV) defined open innovation as a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as firms look to advance their technology." The figure 1.2 represents the diagram of an open innovation model. While the innovation process is divided into two main stages: research and development stages, the research phase includes inputs from outside boundaries of the company (Simic, 2013). Many companies provide a successful example of implementing the one innovation model to innovate and solve problems such as IBM that patterned with other companies to develop semiconductor technologies (Beroi, Haon & Freitas, 2014). Apple and P&G implemented open innovation to develop new products such as the early iPad and Swiffer. Other companies used the open innovation model to build new business models such as Facebook, Salesforce.com, IBM, and Linux (Vanhaverbeke & Chesbrough, 2014).

2.1 The Closed versus Open Innovation model

In the traditional closed innovation model, the R&D process depends on internal laboratories and resources, while new ideas and technologies are investigated and presented by internal resources (Panduwawala et al. 2009; Westergren, 2010). The closed innovation model in figure 1 represents the flow of creative ideas inside the R&D process. The dashed line represents the boundaries of the company where all the creative ideas are produced from inside

the company body. Creative ideas flow to the research stage where selected ideas are filtered and selected during the research process. Selected ideas are moved to the next development stage. Winning ideas are presented to the market in form of new innovative product or service (Simic, 2013).

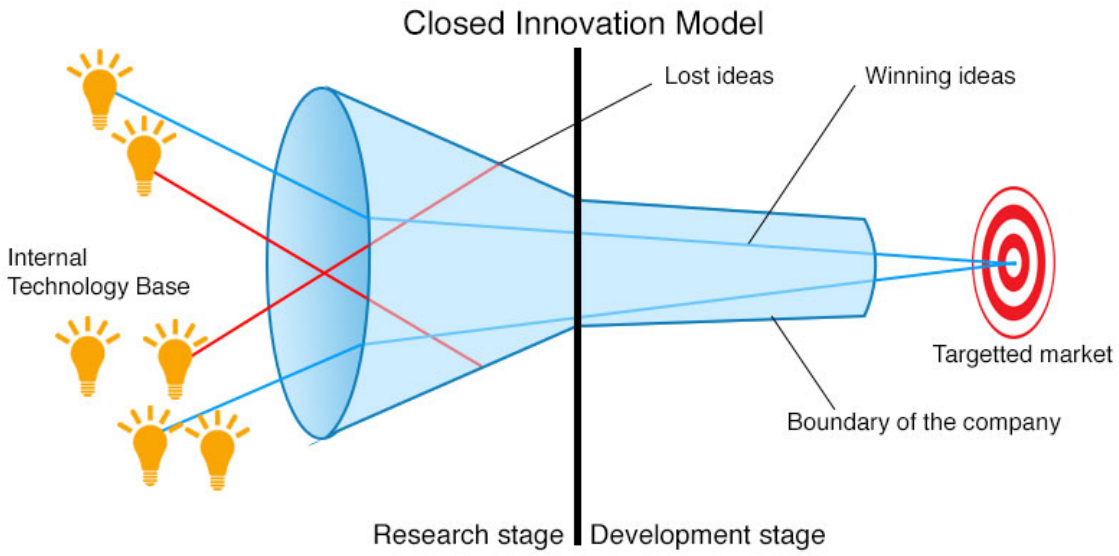

Figure 1. Ideas flow in the closed innovation model

The open innovation model, on the other side, aims to combine both internal and external ideas and technologies to provide a larger or possibly more efficient flow of ideas to the research stage as compared with the close innovation model (Marques, 2014). Figure 1 presents the open innovation model and show that creative ideas are drawn from both inside and outside the company's boundaries (Simic, 2013). Both the closed and open innovation models indicate a strong correlation between research and development (Chesbrough, 2006). Open innovation is also introduced as an attempt to combine both short term financial interest and long term innovation requirements inside the firm. The profit that can be gained from external knowledge can reduce the internal investment in long term research process (Wit, Dankbaar & Vissers, 2007).

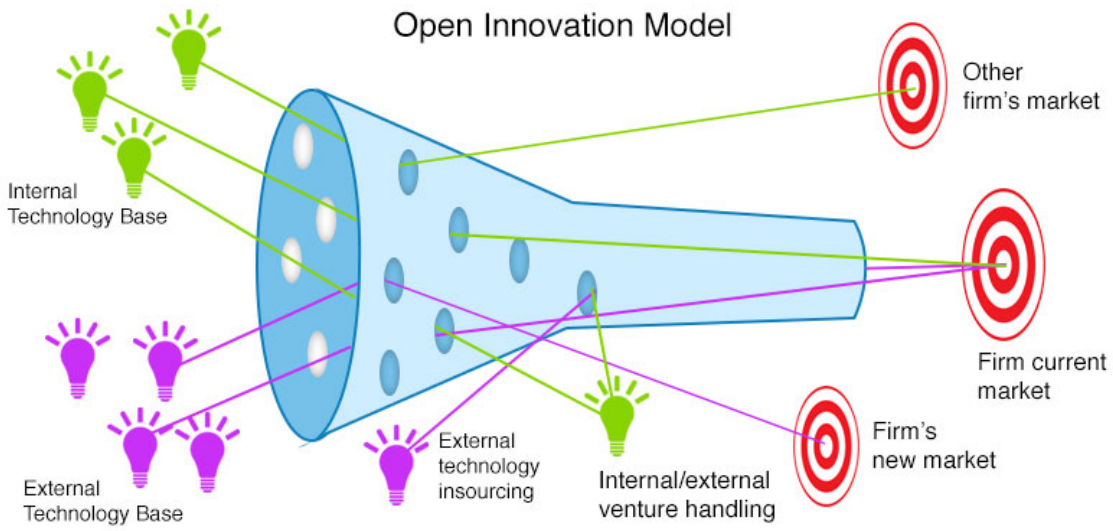

Figure 2. Internal and external ideas flow in open innovation model

2.2 Characteristics of the open innovation model

Chesbrough (2003a; 2003b; 2004) developed the open innovation model to enable companies to combine both internal and external ideas as well as technologies in order to achieve product innovation. In contrast to the closed innovation model, six characteristics can be identified (Marques, 2014):

- While the closed innovation model assumes that the resources and employees who are able to reach innovative ideas are located inside the organization, open innovation points out that innovative ideas are not locked inside the company's boundaries. The ideas can be driven from outside sources in additional to internal sources.
- The closed innovation model assumes that in achieving the targeted profit from innovation, the ideas should be discovered and managed by internal employees. However, the open innovation model values the external ideas and is open to the values that can lead to the target's profit and market advantages.
- While the traditional innovation model is based on the ideas that should be discovered and managed by internal resources in order to achieve the market lead, open innovation aims to merge between external innovative ideas and internal management.
- While the closed innovation model depends on priority in leading the market with new ideas, open innovation indicates that a company should be involved in the basic research in order to benefit from it.
- The closed innovation model depends on the assumption that internal resources need to produce the most innovative ideas in order to lead the

market. Open innovation, on the other hand depends on utilizing both internal and external ideas and merging them both.

- The closed innovation model aims to limit the innovation profit to the company by having full control over the innovation process. On the other hand, open innovation aims to utilizing all available resources that can lead to an efficient process.

The open innovation model provides a non-traditional model for a company to utilize creativity from both internal and external resource, this model drives researchers to believe that this model can lead to more creativity inside the organizations. However, the open innovation model is faced with several challenges that could lead to inhibit creativity inside organization as a reversed impact for these challenges. Therefore clear understanding to the company's boundaries and identity has to be taken not consideration in order to evaluate the creative potential inside organization (Yström, 2014).

2.3 Creativity Levels in Open Innovation

While many companies adapt innovation strategies to compete in the market, few of them are able to achieve success. Companies with fewer resources were able to achieve success compared with others with a higher resource profile. Many concepts and types of innovation have been introduced and result in a broader understanding to the innovation concept (Strazdas & Cernevicuite, 2015). The R&D team should have a clear vision about the innovation strategy inside the company in order to improve the development process in a way to achieve the business target. In the early development process, the R&D team faces a number of questions about "what should be innovated?" and "how to innovate it?". Answers for similar questions can be provided by understanding the different creativity levels inside the open innovation model that can be classified into inbound, outbound, and coupled as shown in figure 3 (Liao et al, 2014).

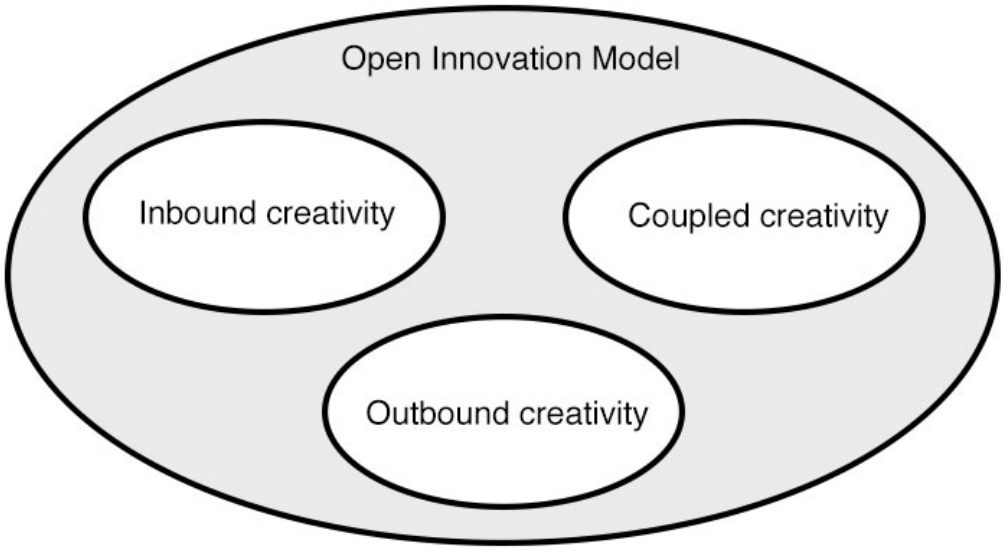

Figure 3. The creativity levels in the open business model

2.3.1 Inbound creativity

When the company does not know what to innovate, inbound creativity can inspire the R&D department with answers based on researching the external resources such as the customer feedback and needs. This external knowledge is used to guide the innovation process inside the organization to develop innovative products and services that meet with end consumer expectations (Strazdas & Cernevicuite, 2015). The Deutsche Telekom for example, uses insights collected about the consumer in their own environment to develop innovation inside the company (Rohrbeck, Hoelzle & Gemünden 2009). Procter & Gamble developed innovation models such as (connect and develop), and every year, the company identify the top ten of its consumer requirements and needs. The R&D department used this collected information in the research and innovation process (Huston & Sakkab, 2006). Inbound creativity improves the innovation inside the firm by monitoring the operating environment and collecting information from its partners (Bucic & NGO, 2012).

2.3.2 Outbound creativity

Many innovated products or technologies developed by the R&D departments fail to achieve success in the market (Yström, 2014) or fit into the existing business model of the company. The failed products are replaced with new ones and considered a loss in the innovation budget (Liao et al, 2014). Chersbrough (2010) indicated that projects that fail inside the company's business model can find their way to success outside the company through marketing them through an innovative business model differently than the currently implemented model inside the company of origin. For example, the Ethernet network protocol

developed at Palo Alto Research Center from Xerox serves as an example. In order to reduce the costs, Xerox leased the technology to a former employee, whose spin-off named 3Com. Although the initial technology usage was limited to serve the company's business scope, the spin-off was able to achieve more success based on the new marketing strategy (Chesbrough, 2003).

2.3.3 Coupled creativity

Coupled creativity works in a similar way to the inbound creativity model. The difference is that coupled creativity aims to build a partnership that is used to collect information from the operating environment. This partnership can be either formal or informal. One of the examples of applying this model is the (Ecomagination Challenge) presented by General Electric in 2010. The community of organizations, research institutes, universities, NGOs and individuals were invited to present their ideas to create smart and efficient grid technologies. A committee evaluated ideas and the winner received a prize, investments or commercial relationship (Chesbrough, 2012). The example provided by GE indicates that the company used external knowledge in building an innovative product that met with the market needs (Liao et al, 2014).

The closed innovation model limits the ability to reach new innovative ideas as it only depends on the company's resources (Panduwawala et al. 2009) and (Westergren, 2010). In contrast, open innovation maximizes the opportunity to develop innovative ideas by expanding the company's creative capability through both internal and external resources and knowledge (Simic, 2013). As a result, the open innovation model leads to a better creative environment and maximizes the chances to reach innovative products that can achieve success in the market.

2.4 Open Innovation and Different Business Models

Both open innovation and business models applied within the company are connected. While the R&D department contributes to the research and innovation related to product development, the business model completes the production process to deliver the final product or service (Chesbrough & Vanhaverbeke, 2014). Business models are classified as either open or closed business models. Both the open innovation and open business models are closely related and presented by Chesbrough (2007). However, there is no clear definition to the term "open business model". Scholars have tried to provide a solid definition for the term (Weiblen, 2014). Teece (2010, p. 191) defined the open business model as: "A business model describes the design or architecture

of the value creation, delivery and capture mechanisms employed by a particular business." Chesbrough and Vanhaverbeke (2014) highlighted the relation between the open business model and the value of creating, capturing, and delivering new products and services to the market. In contrast, in the closed business model, firms depend on their own assets and chain partners through marketing transactions (Chesbrough & Vanhaverbeke, 2014).

Open innovation links to both closed and open business models based on the creativity level described earlier in the Creativity Levels in the Open Innovation section in this report; inbound creativity and outbound creativity. Coupled creativity can be considered a type of the inbound creativity (Liao et al, 2014).

2.4.1 Inbound open innovation

Using inbound open innovation to combine external knowledge to the closed business model is commonly applied by different companies. P&G is one of the companies that has its successful innovative ideas which were originally created by external partners and brought to market by P&G such as Swiffer Dusters, TidePods, and Olay Regenerist. In open business models, inbound innovation can be turned into a new business model. Apple iPhone provides an example to a product that was mainly developed in-house and released in June 2007. Opening the device to third party applications in March 2008 enables developers to use Apple Store to sell their mobile applications, which results turning the product to a new developing platform and add more value to the product with each provided application (Chesbrough & Vanhaverbeke, 2014).

2.4.2 outbound open innovation

In the closed business model, unused knowledge is transferred to others. This model is used in most of the licensing agreements and spin-offs. The technology is transferred from the original manufacturers to the recipient who completes the production process and introduce it to the market. The original innovator is not involved in the product development process after the technology is transferred to the new company (Chesbrough & Vanhaverbeke, 2014). Outbound open innovation can be also combined with open business models to make internal knowledge accessible to others to develop new business models. For example, IBM has supported Linux OS with patents and invested $100 millions a year in order to support its competition with Microsoft operating system (Henkel, 2006).

Combining the different open innovation types with both closed and open business models can maximize the potential from the innovation and creativity process. Innovation cost becomes less risky as the innovated product or technology can be implemented in different channels based on the business model and the way open innovation is used in the R&D process. For example, Apple iPhone gained more value in the market by turning from an innovative product to a platform to develop third party applications (Chesbrough & Vanhaverbeke, 2014). On there other hand, investing in a partners' innovation process, similar to the IBM investment in Linux OS development, improves the competitive position in the market against existing strong competitors such as Microsoft (Henkel, 2006).

3.0 Case Example: Analyzing LEGO: Open Innovation Model

LEGO is one of the leading companies in the toy making industry that was able to lead the market through innovation and creativity (Council, 2007). The company was founded in 1932 by Danish carpenter, Ole Kirk Christiansen in the Danish village Billund. The company started by manufacturing furniture and small objects such as stepladders, ironing boards, and later wood toys. The word "LEGO" is constructed of the Danish words "leg godt", which means "play well". Also, the name "LEGO" means "I put together" in Latin. By the year 1960, wood was replaced by plastic in toy manufacturing (Lauwaert, 2008). During the 1950s, LEGO stablished branches in Germany, United Kingdom, Belgium, and Sweden. By 1966, LEGO was sold in 42 countries (Wolf, 2014). By the year 2006, LEGO was the sixth largest company in toy making industry with the revenues of £ 717 million and 5,000 employees around the world (Council, 2007).

3.1 Innovation in LEGO

The current innovation model in LEGo that has been established in 2004 as the company started a seven-year strategy called the Shared Vision. This strategy aims to rebuild the company's brand identity as a creative toy manufacturing enterprise. Part of the strategy in LEGO is to ensure that the innovation process and design activities are supported with a business plan. In order to achieve this goal a business model was applied known as the LEGO Design for Business (D4B) model (Council, 2007). The D4B plan is based on designing innovative related tools and actions such as 1) facilitate LEGO-wide discussion about innovation, 2) create a foundation document to build

communication between the creative lead, marketing lead, and project leader, 3) hold challenge sessions to sharpen the core team objectives, and 4) create a roadmap document to align objectives, tasks, and deliveries together (LEGO DME Award Poster, 2009).

The LEGO innovation model aims to help the company to achieve three main targets; participate in discussions during the early stage of production, understand the knowledge and resources required to achieve success, and assess the results against the company objectives in different stages of the project. Based on these goals, LEGO's approach was that instead of changing the their current process and product, the company needed to apply minor changes and optimization of the known issues in the products and process, reconfigure the existing parameters to meet with the consumer needs, and redefine new approaches to the product's level while modifying the existing process and products (Council, 2007).

3.2 The open innovation model in Lego

The open innovation strategy has been implemented in LEGO on both the process and production levels. Erik Hansen, LEGO Senior Director of Open Innovation, adapted both open innovation and crowdsourcing strategies to achieve company success. Erik's plan is based on assessing the existing opportunities, needs, and benefits for implementing open innovation in the company. LEGO's open innovation strategy focused on three main elements; learning from external companies through interviewing twelve of the leading open innovation firms, learning from internal practitioners through feedback and interview methods, and building micro pilots to test the company's capabilities as well as consumer culture and needs (Lindegaard, 2014). The innovation process is organized in LEGO through splitting it into eight types such as product development and business model innovation. The responsibility for the innovation process is shared between four function groups; the Concept Lab, the Product and Marketing Development, and the Communication, Education and Direct Unit (Robertson & Hjuler, 2009).

In addition to the process level, LEGO implemented the open innovation model to improve its products through new and fresh ideas from external resources. These resources can be linked to their existing clients or other companies with experience in open innovation (Lindegaard, 2014). In 2008, LEGO launched LEGO Ideas, which is a platform that is open for anyone to submit innovative ideas. LEGO received proposals from 10,000 users. These

ideas have been reviewed and the winning idea is moved to the product process. The original owner for the idea receives 1% of the selling royalties. LEGO Ideas was the reason from innovating new sets such as Big Bang Theory, Ghostbusters, and Back to the Future (Wilkins, 2015). LEGO IDEAS can be accessed through the domain name https://ideas.lego.com.

Co-creation is another tool for an inbound open innovation model to innovative product through a collaboration with external organizations (Strazdas & Cernevicuite, 2015). LEGO's executive team built a partnership between the company and MIT Media Lab to deliver programmable bricks, which was introduced as LEGO Windstorm. The new product was initially introduced as an education method to teach children robotics as they can build LEGO models that could move. At an early version of the product, its software was closed and can only be edited by unauthorized modifications to do more functions. Later, LEGO opened the software to expand the innovation space among consumers (Bughin, Chui & Johnson, 2008). Another innovation dimension can be observed in LEGO's partnership with MIT Media Lab, which is turning from closed to open software. Someone was able to hack though the LEGO software that comes with the motors in order to apply more functions. While this was considered illegible by many, LEGO opened the software in a way that any one can modify to observe what the end consumers can create. This open innovation approach has positive impact not only for the company but also for the curriculum developed in United States to teach student robotics. Although the product was initially introduced as an educational tool, it gained popularity and acceptance between both adults and children (Chesbrough, 2011).

LEGO provides an practical example of applying two levels of the open innovation model; inbound innovation through listening to ideas from external consumers and companies (Strazdas & Cernevicuite, 2015) and coupled innovation through its partnership with external organizations (Chesbrough, 2012) such as the MIT Media Labs . Both the inbound and coupled open innovation models helped the company to improve the internal process in the company and reach a solid linkage between creative and business targets inside the company on one hand, and present new products to the market that was not their original intention such as the programmable bricks on the other.

4.0 Conclusion

Both closed and open innovation models have been implemented into company business models to achieve competitive advantages in the market (Wang et al, 2009). While the closed innovation model depends on internal resources and assets to reach new ideas and technologies (Panduwawala et al. 2009; Westergren, 2010), the open innovation model extends the ability to create and innovate through the use of external resources and partnership capability of the company (Marques, 2014).

The open innovation model can be applied on different levels; the inbound creativity level, the outbound creativity level, and the coupled creativity level. The inbound creativity model identifies that the R&D department can inspire ideas and technologies from external resources to reach answers for early innovation stage questions such as “what should be innovated?” and “how to innovate it?” (Liao et al, 2014). Outbound creativity assumes that products that fail inside the company can find its way to success outside through marketing it using a different business model (Liao et al, 2014). Coupled creativity is similar to the inbound model, the difference is that coupled creativity aims to build partnership with other companies in order to achieve market advantages.

The report finds that while both closed and open innovation models aims to improve a company’s innovation process, the open innovation model extends the company’s ability to innovate through the usage of external resources and assets in the R&D process. On the other hand, the closed innovation model limited the company’s ability to reach more creative ideas and subsequently lower its ability to compete in the market.

The open innovation model is closely connected with the company’s business model. Inbound creativity is used within the closed business model to research new product ideas. In the open business models, open innovation can be used to create new business models (Chesbrough & Vanhaverbeke, 2014). On the other hand, outbound creativity works with the closed business model to transfer the knowledge to other companies, while it combines with the open business model to make the internal knowledge accessible to others (Henkel, 2006).

The report finds that the open innovation model can be combined with both closed and open business models in order to reach a wide range of output. The different results of combining inbound creativity and outbound creativity from one hand and the closed and open business models on the other can fuel the innovation process with more ideas and applications that works within and outside the company.

LEGO was presented as a case example to investigate the practical implementation of the open innovation model. This report finds that LEGO was able to implicate open innovation successfully. However, LEGO applied both inbound and coupled creativity with no evidence to apply outbound creativity. LEGO Ideas presents an example for inbound creativity through driving consumers to suggest new ideas, this type of innovation results new products such as Big Bang Theory, Ghostbusters, and Back to the Future (Wilkins, 2015). LEGO's co-creation is an example of coupled creativity through its partnership with MIT Media Labs (Strazdas & Cernevicuite, 2015). This type of innovation resulted in the release of LEGO programmable bricks.

This report concludes that implementing an open innovation model can drive innovation and creativity within the organization on both the process and production levels. Each type of creativity level inside the open innovation model has different characteristics and output when combined with the different business models.

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