

STOCKHOLM GASES' APPROACH TO INNOVATION

The plasma cleaning project

Developing Innovation and creativity for business advantage (BMSK6002)

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Stockholm Gases

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A report about Stockholm gases' approach to innovation-the plasma cleaning project

Introduction

This report analyses the approach taken by Stockholm gases regarding the teeth whitening project referred to as the plasma cleaning project. The clarity of the limitations regarding this study concerns the depth of the Stockholm gases' case study. The direction of the research herein takes the empirical guidance from informed variables such as the experience and organizational knowledge of the product development manager; whose part if successful is a critical determinant as to whether a £10 million investment recommendation should be made to the board of Munich Gases to develop and put to the market the teeth whitening product. The report takes an in-depth look at the analysis and application of both the open and closed innovation models to be used in the plasma cleaning project. Furthermore, the report makes justification of the best applicable model for the success of the project by evaluating the need for innovation in the toothpaste industry and the best process to facilitate the success of the plasma project.

1. Approach to innovation: A Stockholm gases case study

Stockholm gases has survived over the years by providing products such as carbon dioxide and liquid oxygen to the beverages and drinks industry. Running an effective R & D has been at the forefront of their core competence for over eight decades and having a massive number of people provide human resources and a considerable presence worldwide may be one of the factors sustaining the company's £100 million R & D budget. The recent discovery of the possibility of plasma as the teeth whitening agent presents an opportunity for the company's R&D to ascertain the viability of teeth whitening as one of the company's products. This innovation emerges as a result of changes in the external market such as gap in the market and internally from the company's R& D which led to the discovery of the teeth whitening component. As based on the product development managers' report, a gap exists in the market for a product that is simple and can be used for teeth whitening. The opportunity this presents is very lucrative and growing business opportunity

1.1 The concept of innovation

Anything of value that comes into existence as a result of a group of knowledge-based activities is referred to as an innovation according to De Sousa (2006). This may be in form of a process, system or product created in response to market changes (Marques, 2014). As opposed to invention, which is limited to discovery and creation, innovation involves the introduction of a new system, process or product into a market or industry. Although technology related innovation has been the most recognized forms of innovation, the concept of innovation is known to go beyond technology into improvement of process, products, activities, and structural changes in the organization in order to expand a company's market share. In brief innovation is a continues process of searching, learning, and exploring, resulting in new techniques, products, organizations, and markets according to Lundvall (1992, p. 8). In the case of Stockholm gases innovation means discovery of a teeth whitening product for the lucrative teeth whitening industry. An industry where there is a short supply of teeth whitening product in and limited competition.

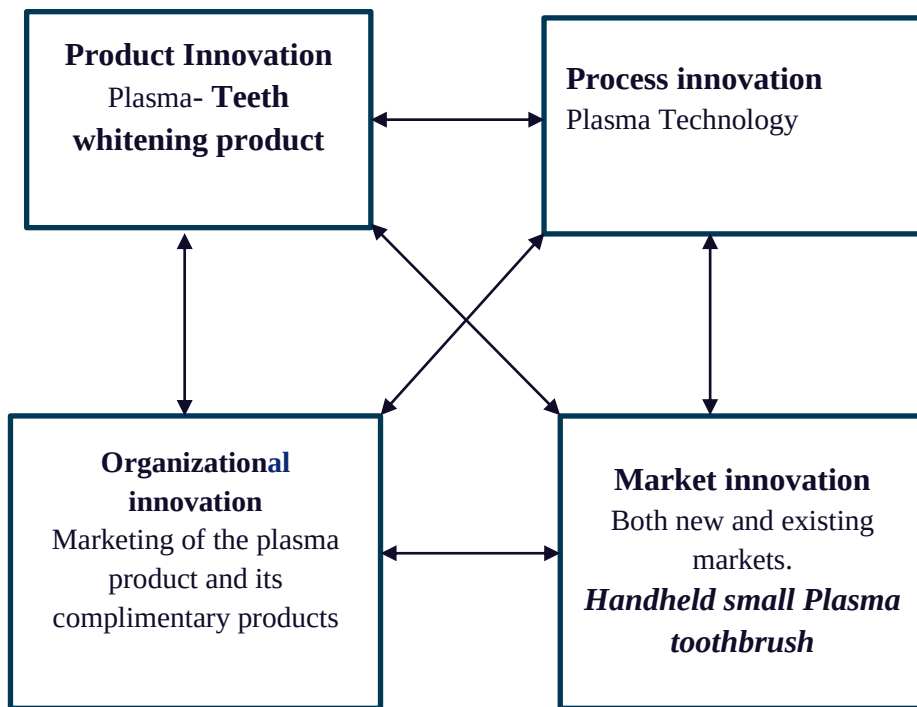
As stated in the Stockholm gases 'case study introduction of a better teeth whitening product is the foundation the plasma innovation project. This type of approach to innovation where a company focuses on the perfection of a production to make it better is referred to as incremental innovation. With

Stockholm gases engaging in incremental innovation, the company can sustain its market position and leverage sales against the competition (Morris, 2013). Just as in most companies, innovation ,improvements and change tend to be a threat to middle management, we see the difference of opinion when it comes to Wether to introduce the product as a teeth whitening product or just a cleaning product, however due to the structure of the Stockholm gases, middle management is tasked with the duty of exploring the potential of the product through the R & D department, analysis of the industry and how the product behave based on competition, exploration of the licensing opportunities and making sure that the marketing manager aligns the product with the existing business model.

Making today's company product better is the backbone of innovation. It can also be referred to as incremental or continuous innovation. For a company like Stockholm to match its competitors, it is crucial that the company engages in incremental innovation activities as most innovation activities fall under this category. These types of innovation facilitate progress in the organization to a level where the organization can match the competition and maintain the company position within the market (Morris, 2013).

Furthermore, he added that several innovation opportunities are presented to every company daily, requiring employees to take keen interest in the customer feedback in order to improve company effectiveness. However contrary to this notion, most organizations are not innovation focused, making innovation exceptional in nature since most people are trained to maintain their jobs rather than come up with various ways to, I improve work processes. This may be because innovation, improvements and change appear to be a threat to the kind of managements that often just maintains a status quo.

Figure 1. Illustration of Stockholm gases' innovation concept.



Designed by author

As seen in figure 1 above, the Stockholm Gases product innovation took up the form a good called the plasma (a teeth whitening product) as posited by (Caraca et al., 2009). This innovation was stimulated by both internal changes such as discovery of the Plasma in the R& D department and external changes such as the emerging teeth whitening lucrative market leading to the development of the teeth whitening technology. This has also created a complimentary product market for the plasma handheld toothbrush.

1.2 The innovation process in Stockholm Gases

After confirmation of the feasibility of the innovation in this case plasma cleaning project, the focus is then geared towards dealing with enhancements and competition. However, skepticism remains ever present throughout the whole product development life cycle as proposed improvements continue to come up both internally and from the competition. Moreover, an innovative process which does not incorporate improvements, has adverse effects on the credibility and hence the rewards as well as futures prospects of innovation (Demaria, 2013). Sometimes when companies fail to make breakthroughs the R& D department engages in a relentless struggle to keep the competition under control. As for Stockholm Gases, the plasma may be a breakthrough which makes it to the market despite the obstacles in the industry and this may earn the company a significant market share. It is therefore inevitable for Stockholm's team to focus on the relevant areas to unsure success of the Plasma project, as this innovation breakthroughs come from strategic thinking (Morris, 2013).

1.3 Why businesses need to innovate

As suggested by Vieira, & Filipe (2018) innovation within Stockholm Gases is a representation of the implied need to identify the best ways to manage the process of innovation. Although there is limited identical literature expressing the effect of a meta view when it comes to integrating the company's core competences with additional knowledge adopted from the competition (Gassmann and Enkel, 2004). Furthermore, it is important for businesses to cooperate with the changes in industry in order to improve their competitive edge, minimize risks although not necessarily reducing the time spend on development. Kolk and Puuman (2008) when a company fails to concentrate in open innovation strategies, it becomes more difficult to reduce the costs of development for products with short life cycles and hence the limitation in justifying the need to invest in innovation.

In the teeth whitening industry, there are so many forces at work that warrant for innovation or the apparent threat for closer of business. Some of these forces include the market pull and research and development push. For Stockholm Gasses to have repeat customers in the ever-increasing global competition, the need to distinguish itself from the competition is eminent in order to create a competitive advantage. The bigger the company, the more access to capital a company like Stockholm gasses has. As Morris (2013) would urge, Stockholm gasses' innovation capability gives it an opportunity to maintain the company's existing business advantage, aswell as creating new ones.

1.4 The innovation process in business

After confirmation of the feasibility of the innovation in this case plasma cleaning project, the focus is then geared towards dealing with enhancements and competition. However, skepticism remains ever present throughout the whole product development life cycle as proposed improvements continue to come up both internally and from the competition. Moreover, an innovative process which does not incorporate improvements, has adverse effects on the credibility and hence the rewards as well as futures prospects of innovation (Demaria, 2013).

For a company like Stockholm gases, failure to create a breakthrough with the plasma project may lead to a long-term defensive struggle with the competition in the teeth whitening industry. In addition, making a breakthrough with the plasma project means going through the many hurdles in the industry in order to attain a market share and there fore a substantial reward in waiting. Thus, for Stockholm gasses to attain the necessary breakthrough, the management must adopt a different mindset as to apply an approach that is beneficial to the business as Morris (2013) suggests.

1.5 The pros and cons of innovation for Stockholm gases

To negate the pros and cons of innovation and the impact it will make on the company would be a direct misrepresentation of the company's management team. Open innovation requires an aggressive technology and strategy where they work to lead in both technology and development of new products such as the plasma, leading with the superior know how of how to pursue the goal of leading in the teeth whitening product. For Stockholm gases to take on an aggressive innovation strategy, the company needs to open it innovation processes to majority of the stake holders in the innovation funnel.

Open innovation requires more investment compared to closed innovation and hence the substantial difference in strategies applied. In the case of Stockholm gases, carrying out an open innovation fits within the current set aside budget for the Research and development to invest in the plasma project.

Stockholm gases staff would enjoy the opportunities that come with investment in internal competences as a means of increasing the company's absorptive capacity and thus exploiting the company's ability to collaborate with both internal and external partners during open innovation (Gassmann and Enkel, 2004).

Open innovation is more likely to have more of an input focused organizational structure when it comes to research and development as opposed to closed innovation. Companies involved in open innovation enjoy benefits such as knowledge integration, flexibility, and creativity increase, and lastly the excellence in the production of knowledge. On the other side, closed innovation focuses on reduction of costs and innovation risks by spreading the costs with other departments. Furthermore, during open innovation, the organizational structure is modified alongside the management techniques involving the introduction of routines, roles and dedicated tools for the design and facilitation of development and collaboration among innovation partners (Gassmann and Enkel, 2004).

2 The product development manager's perspective

The product development manager takes on the role of gathering competitor information to specifically identify the need for the teeth whitening product in the industry. His findings would demonstrate application of porter's five forces to analyze the threat of entry, power of buyers, power of suppliers, power of rivals and threat of substitutes, thereby identifying the limited supply of the teeth whitening product. The product development manager also analyzes the industry and to find out about the possibility of substitutes on which he reports back insufficiencies in products averting tooth decay. These findings represent an opportunity for Stockholm gases to invest in plasma project as this will fill in the gap for a tooth whitening product among tooth paste products.

Using the power of new entrants, and the power of rivals, the product development manager found out that, big players in the market like Procter and Gamble, and Colgate-Palmolive would make it hard for a company like Stockholm gases to enter the tooth paste industry in general as they can afford to make very huge investments in order to continue to compete. Also, the product development manager believes that the existence of these rivals in the industry creates room for a new product development whereby Stockholm gases would invest in the technology for purposes of licensing to the bigger rivals rather than making and selling the plasma.

2.1 The role of the product development manager, organizational knowledge, and experience

Upon establishment, a company like Stockholm gases would need to employ a certain business model to map out the architecture or design of creating value through out the product development to the

delivery. Inevitably the management of the organization should use the company’s business model to streamline ways in which the company’s customer get value from the goods and services as their payments for the same are converted into profits. Therefore, in the case of Stockholm gases, the business model reflects the knowledge, experience, and assumptions of the management team regarding the customers’ wants, channels of delivery of the goods and services to meet the presupposed needs. Most importantly, monetizing the delivery to make profits for the company (Teece, 2010).

Business model

Figure 2 The business model canvas

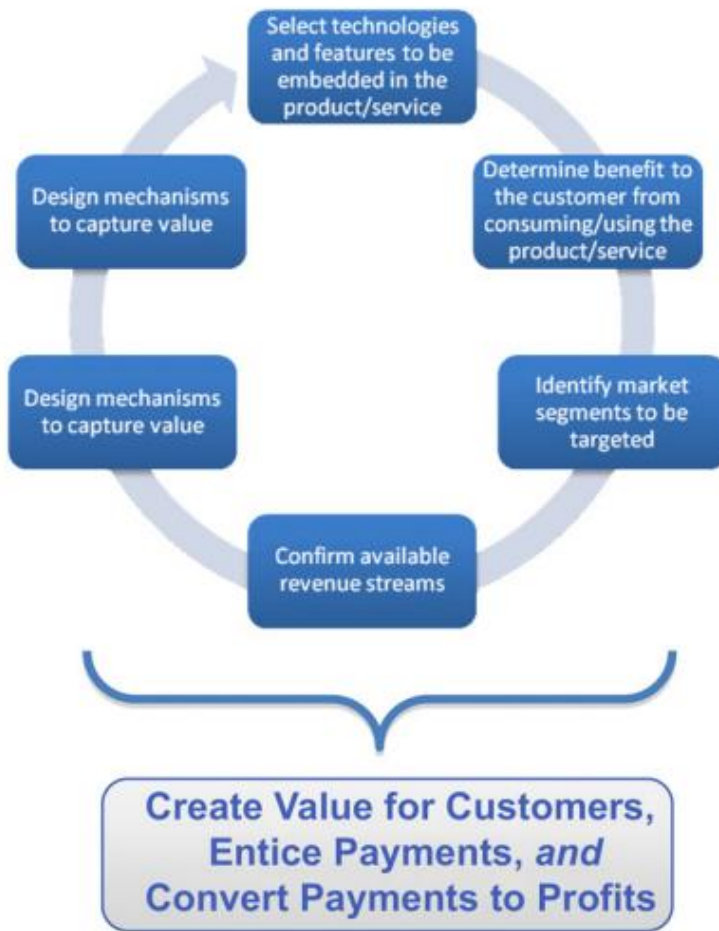


Osterwalder and Pigneur (2010)

Researchers argue that Business models do not have a clear concept (Osterwalder & Pigneur, 2010). In addition, as shown in figure 2 above, Stockholm gases would adopt it business model the canvas above where there segments would be divided into key partners, resources, activities and a cost structure aswell as other resources to show how Stockholm gases would deliver its goods and services aswell as the costs involved. On the right side of the canvas, the model would comprise of customer segments, relationships, revenue streams and channels to show how Stockholm gases would sell its products and services and the means of delivery onto the market.

As suggested by (Teece, 2010), a business model like in the case of Stockholm gases, should articulate evidence in form of logic and data to support the value proposition, a feasible revenue structure and the cost of delivering this value to that customers. In addition, it shows the customers’ expected benefits, Stockholm’s model of delivery of this value and the means of capturing this value.

Figure 1. Business model design elements



Adopted from Long Range Planning (2010)

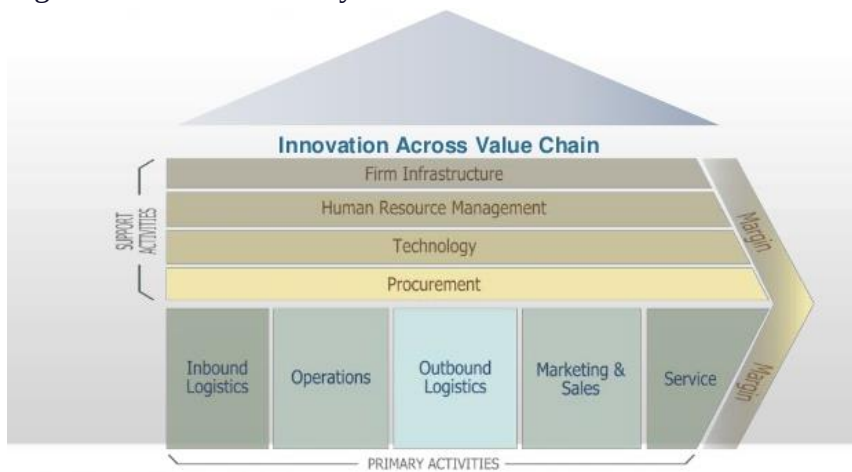
To the product development manager, a business model should be able to deliver customer value and generate a substantial amount of revenues for the business. However, a business model on its own does not guarantee competitive advantage. Therefore, after implementation, the overall business model elements are often transparent enough to allow for generation of a successful model by replicating the existing model. Furthermore, in practice, the most successful models are often replicated by the competition from time to time (Teece, 2010).

In addition, a business model should be more generic compared to a business strategy, and thus conducting both the business model and strategy analysis in the case of the Stockholm gases would be essential in order to protect the obtain results from the product development as well as the business model, that would give the company competitive advantage. But the combination of the analysis would mean that, the market has to be segmented and value proposition created for each segment, determining the mode of delivery of the value created in the plasma and finally copyrighting the business model/strategy to prevent imitative competition from undermining them. Therefore, for the product development manager, it is essential that he carries out a strategy analysis for Stockholm gases to develop a business model that is sustainable (Teece, 2010).

2.2 Evaluation of the value chain

However, the main building block is the value proposition which directly shows the goods and services offered by Stockholm gases specifically showing what is being offered to its customers.

Figure 3. value chain analysis



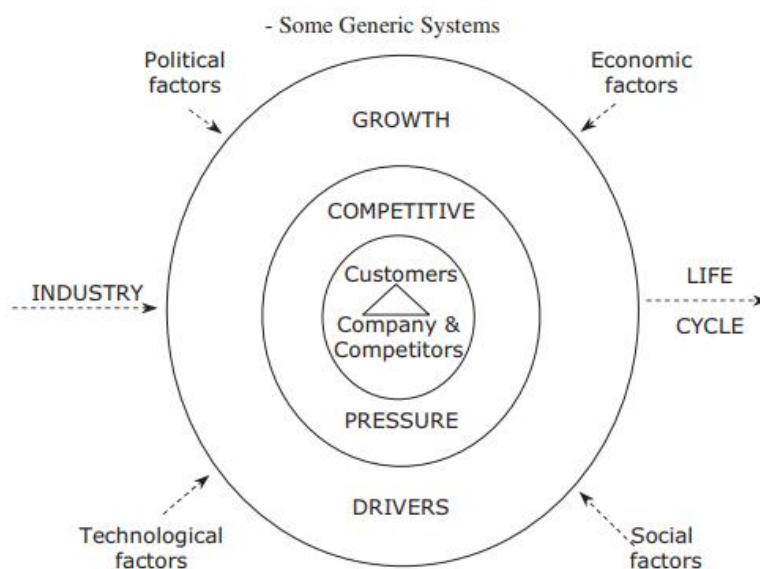
(Grundy, 2006)

According to Brandenburger and Stuart (1996), a company like Stockholm gases' competitive advantage would stem from its capability to create value that is more and at a rate that is quicker than the competition. However, value creation is benchmarked on the company's innovation success. For Stockholm gases to create greater value than the competition, it would require the company to strive harder to be the leader in the plasma technology in the teeth whitening industry. Moreover, innovation does not stand on its own, it requires constant adaptation to the business environment by the company. All the changes more so external changes must be implied in all other factors affecting the ecosystem of the Stockholm gases' interdependent innovation as suggested by Adner (2006).

2.3 Evaluation of the industry

Figure 2 below shows in an onion model the main areas of the competitive environment to be carefully analyzed by the company to again competitive advantage. These include factors such as associated with PEST, driver of growth, the competitive position, and Porter's five forces (Grundy, 2006).

Figure 4. The competitive climate/industry analysis



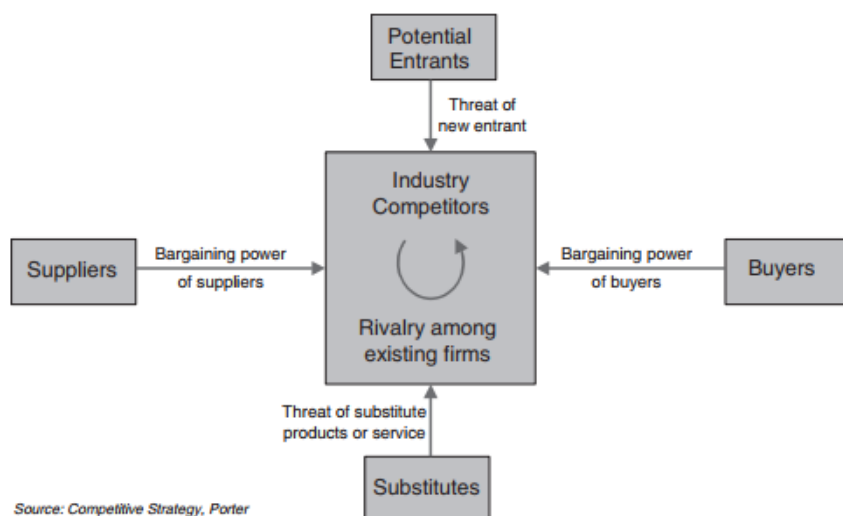
(Grundy, 2006)

According to the figure above, the onion layers in figure 2 are highly interdependent. When the PEST factors become hospitable, there is growth as porter's five forces impact less on the business. Contrarily, when the PEST factors are not hospitable, the growth drivers are negatively affected causing them to tighten and hence giving the buyers and threat of rivals more power. In addition, environments with high growth encourage more entrants and the reverse is true. As a result, the prices of the products like in the case of the teeth whitening industry may fall. Therefore, porters five forces are very interdependent with the other factors in the industry (Grundy, 2006).

2.3.1 Porter's five forces

As shown in figure 3 below porter's five forces account for the variances in the economic returns when comparing one industry with another. These variables determine the superiority of the different companies in terms of performance. These include the buyers' bargaining power, threat of entry, power of substitutes, supplier's bargaining power (Grundy, 2006). In the case of Stockholm gases, there industry is already occupied by two big players/competition as the main threat of competition, and there is a possibility of substitutes coming up even though the process of perfecting teeth whitening is still underway. This leave the company under the uncertainty of the buyers' bargaining power regardless of whether Stockholm gases will be selling a product as a tooth whitening product of as a technology from which they can obtain profits form the licensing. After the perfection of formula for the teeth whitening , it is essential for the company to establish whether the suppliers of the raw materials required will maintain steady and regular supply to avoid distractions in the value chain as this has direct implications on the profits .

Figure 5. Porter's five forces



(Grundy, 2006)

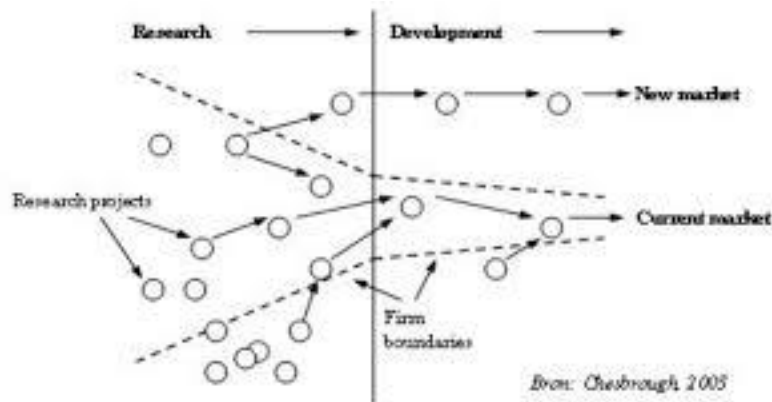
In the case of Stockholm gases, the figure 3 is an illustration of the growth drivers that directly or indirectly represent the forces that inhibit or cause market growth within a period. Although space may prevent development of porter's five forces, the forces can be used in conjunction with the model of the onion format as a key domain in the entire industry as Grundy (2006) states.

3 Innovation models in the Plasma project

Open innovation model

The research and development levels of intensity determining the levels of technology exploration according to Lichtenthaer and Ernst (2009). As Cohen and Levinthal (1990) state, there exists an assumption that companies tend to pursue external technology to complement their internal research and development as opposed to using it as a substitute. As for the case of Stockholm gases, this idea represents as opportunity for the plasma technology to be licensed and hence make more money from the licensing as opposed to the production of the teeth whitening product on the market. Due to the high costs associated with the development of the specialized structures, it is essential that firms get external expertise to manage the frequent exploration practices that companies tend to undergo according to Calantone and Stanko (2007).

Figure 6. the open innovation model



Source: Chesbrough (2003)

For Stockholm gases to handle the plasma project and stay on course at the same time maintaining their core competences, it is necessary for the company to invest in external expertise to handle the further exploration of the tooth whitening project. This way the company will still be able to carry on with their daily activities while exploring the possibilities of new products or services such as licensing the plasma technology. The fact that innovation may come from both within and outside the organization makes the knowledge acquired from the outside frontier just as useful as the knowledge created from within the research and development team of the organization (Van Der Meer, 2007).

Thus, the definition of open innovation as the “intentional use of inflows and outflows of knowledge to accelerate internal innovation and expanding markets for external use of innovation, respectively” according to Chesbrough (2003, p. 1).

3.1.1 Teeth whitening open innovation model analysis

To be able to reduce the innovation costs, risks and extend skills as well, creativity and competences, the company needs to invest in open innovation as posited by (Huang et al., 2009). The current innovation landscape has changed to a great extent because of mobility of labor, existence of venture capital and wide knowledge sharing across both private and public enterprises as organizations now find it almost impossible to innovate on their own and therefore prefer to apply other innovation means. As Chesbrough (2003) states, companies such as Stockholm gases are now moving towards open innovation where they apply both external and internal means to explore various technologies such as the plasma project parallelly to achieve external knowledge. The inflows and outflows of knowledge would speed up the internal innovation process and cause the company to enjoy benefits of innovation respectively

according to Chesbrough and Crowther (2006). In the open innovation, knowledge and technological exploitation are allowed to flow outside the boundaries of the organization which in turn lead to technological exploration that flows into the organization from the innovation activities and hence these innovation activities benefit the organization in terms of technology development. When the innovation environment is fully open, a company's maximum value gained from internal competences and technological capabilities as a result of the combination of both technological exploration and exploitation (Lichtenthaler, 2008).

Exploration of technology in the case of Stockholm gases, would lead to gaining of profits from the knowledge acquired by the company during the open innovation process. The process would involve three main processes, namely, intellectual property licensing, venturing, and getting other people who are not part of the research and development team involved in activities related to innovation.

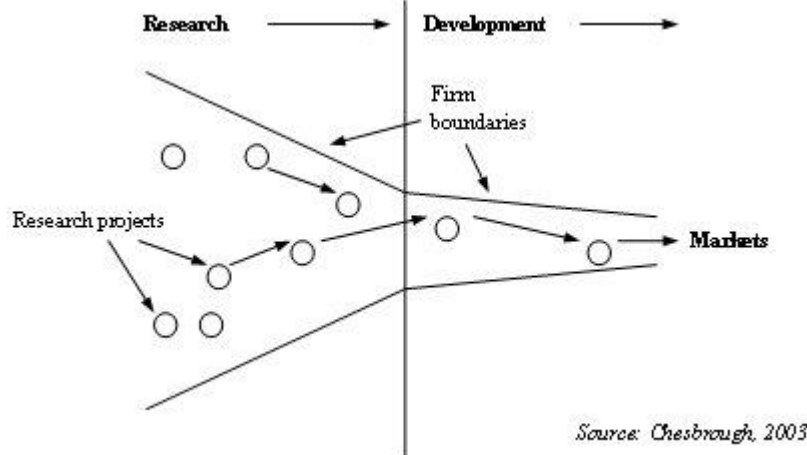
In the venturing stage, an organization such as Stockholm gases may invest in a small startup solely based on the knowledge; a process referred to as spin out and spin off. In this case Stockholm gases may provide capital in form of human resource, finances, administrative support, and legal support as suggested by Chesbrough (2003). The venturing activities tend to be enormous. The inflows and outflows of knowledge in open innovation make intellectual property very vital (Chesbrough, 2003), as it gives enterprises opportunities for business. In the case of Stockholm gases, licensing the plasma technology to the bigger companies would make the company gain more value from the technology as (Gassmann, 2006) suggested. Already existing companies which can afford to invest heavily in the technology would be able to break into the market making Stockholm gases to make profits from the licensing of the Plasma technology.

For Stockholm gases to decide whether to license its plasma technology or not, it would depend on the dissipation effects of profits and revenues (Arora et al., 2001) meaning that the although Stockholm gases may generate revenue from the licensing fees, continuous profits inflow may be affected when the company licensed to use the technology starts using the technology to compete with Stockholm gases. On the other hand as Lichtenthaler and Ernst (2007) suggest, the teeth whitening project may propel the Stockholm gases into a position where it is a knowledge provider with the intent to maximize the strategic and monetary benefits of licensing out the plasma technology.

3.2 Closed versus open innovation model

Conventionally, companies like Stockholm gases used depend on the internal research and development of the company to innovate new products and services. As the case was in several industries, companies would require large research and development labs which turned out to be a potentially big barrier for the small industry entrants as it requires heavy investment into the internal research and development labs. Therefore, large companies like Stockholm gases with the capacity to invest heavily into the research and development would then have their research and development capabilities extended and the large labs were a complementary asset which would facilitate the company to outperform the competing companies that did not have the capital to invest heavily in the research and development as posited by (Teece, 1986). The process used by large companies to commercialize the internally discovered and developed technology is referred to as the closed innovation model (Chesbrough, 2003). See figure 7 below for the illustration of the closed innovation business model.

Figure 7. Closed innovation model

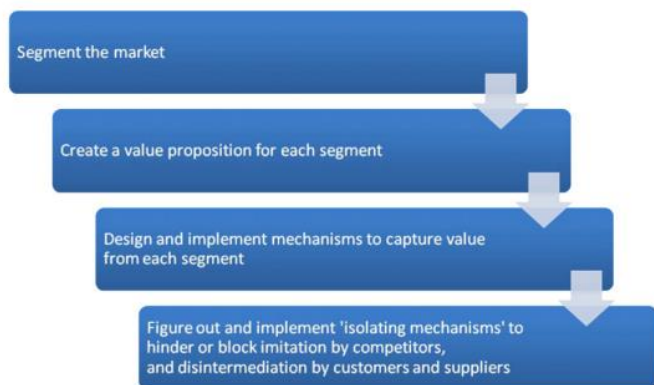


Source: Chesbrough (2003)

Trust and personal relationships are the basis for knowledge exchange. As Nelson and winter (1982) suggested, multiple solutions exist when it comes to problem solving due to the relationships and trust. During closed innovation, a company like Stockholm gases should develop ideas internally and establish the market and work in the distribution of the goods and services as well as provide support to maintain the customer satisfaction. The closed innovation model relies entirely on internal research and development and does not involve any external support of any type as the case is with open innovation where the company opens up its research and development department to the external expertise, some of whom some times come from the rival companies. In open innovation, both external and internal ideas are welcome for the purpose of opening the market for business (Chesbrough, 2003). This means as opposed to the case in closed innovation models, the open innovation model allows small companies to dominate the contemporary landscape of innovation.

4. Recommendations

Figure 8 achieving a sustainable business model



(Grundy, 2006)

As illustrated in figure 8 above, sustainable innovation requires the application of a strategically sustainable business model. This involves the segmentation of the market to fit the product and services. For the case of Stockholm gases, understanding the targeted market is of fundamental importance and therefore not deviating from their values. Stockholm gases then has to create a value proposition for the

various segments with respect to the values of the customer segment. The needs for systems to capture this value become more eminent especially if the company has applied an open innovation strategy where the plasma project has not only developed teeth whitening product but also licensed the technology. Memorandums of understanding or service user agreements between Stockholm gases should cater for provisions that seek to preserve the environment. Environmental preservation is one of the ways to capture value. Stockholm gases must then establish mechanism that protect the product from unlawful duplication by the competition as well as from being undermined by the power of suppliers and buyers.

5. Conclusion

All businesses regardless of how explicit or implicit they apply a business model, they still do since it serves as road map to the architecture or design of the idea of value creation, how to deliver and capture it as well (Teece, 2010). Since open innovation largely operates in a dual dimensions of technology exploitation and exploration, it would best if Stockholm gases invest in an open innovation model for the plasma project where the exploitation and exploration of knowledge is enjoyed by both their research and development staff and those that work out side the department. The exploration may even involve the presupposed customers in the process of innovation to get real time feedback during the market research and ensure that the right customer needs are being met.

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