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The Consequences of Open Innovation Model

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Abstract
This paper explores the concept of open innovation as a key driver for competitive advantage in a volatile business environment. It seeks to answer the question: Should companies embrace open innovation as a business model considering the wealth of opportunities that it may enhance as evident in IBM, P &G, and Air Products case? Whilst this paper does not totally contend with the notion that, the involvement of other parties in developing new products and technologies (i.e. open innovation) can add value to companies, considering the fact that, an open platform increases adaptability while providing numerous benefits to companies and also, to its customers, namely: Products and services better adjusted to the market; Flexible cost structures; Increased creativity and; Mitigation of business and financial risks. However, there could be instances when openness may turn from virtue to vice, common challenges in this instance are: Protection of intellectual assets and intellectual property (IP); Structural challenges; Contractual complexities; Competitive implications etc**.** Thus, it will be crucial for companies to clearly understand the capabilities, skills and knowledge that make them unique in the market, so that they can clearly define what they need to outsource in their innovation processes. It is also important to ensure intellectual property rights and minimised knowledge lead risks through appropriate protection strategies.
Keywords: Open Innovation, Closed Innovation, Technologies, Intellectual property rights

1.0. INTRODUCTION

It is believed that innovation is the main drivers for companies to prosper grow and sustain high profitability (Drucker, 2007). Consequently, companies that adopt innovative strategic options while investing in their dynamic capabilities will fare best in a competitive business environment. In the old model of closed innovation, firms believed that successful innovation requires control. In other words, companies must generate their own ideas that they would then develop, manufacture, and market, distribute and service themselves (Mayle, 2007). However, a new model for the management of innovation called open innovation, in contrast argues that as a result of the rising research and development (R&D) costs and decreased product revenues, it is necessary for companies to open up their innovation processes and combine internally and externally developed technologies to create business value (Chesbrough, 2003a). Chesbrough provides successful case examples of three companies that operate in different industries with vastly different technologies and products, namely: IBM, P&G, and Air Products. Each used to function with a very internally focused, closed business model, and each has since migrated to a business model that is substantially more open.

As a point of departure, considering the wealth of opportunities that open innovation may enhance as evident in IBM, P &G, and Air Products case; should companies then embrace it as a business model? While subsequent arguments in this paper does not totally contend with the notion that, the involvement of other parties in developing new products and technologies can be of great value added to companies, considering the fact that, an open platform increases adaptability while providing numerous benefits to companies and also, to its customers, namely: products and services better adjusted to the market; flexible cost structures; increased creativity and mitigation of business and financial risks. However, there could be instances when organisation's openness may turn from virtue to vice, common challenges in this instance are: protection of intellectual assets and intellectual property (IP); structural challenges, contractual complexities; competitive implications etc**.** Thus, it will be crucial for companies to clearly understand the capabilities, skills and knowledge that make them unique in the market, so that they can clearly define what they need to outsource in their innovative processes. It is also important to ensure intellectual property rights and minimised knowledge lead risks through appropriate protection strategies. Successive sections of this paper explore the key drivers of open innovation and also its challenges.

2.0. EXPLORING THE CONCEPT OF INNOVATION

2.1. Innovation and creativity

Innovation could be seen as an attempt to improve organisational performance and growth, by introducing new method, technique practise in product or service. (Dodgson, Gann and Salter, 2008). Innovation could be incremental or radical. Incremental innovation can be achieved through improving an already existing thing or reconfigures an existing form of technology to serve some other purpose. (Harvard Business Press, 2003). For example, Intel's Pentium IV computers represent an incremental innovation over its immediate predecessor,

Pentium III, since both are of the same fundamental technologies. A radical innovation in contrast is where new innovations in effect lead to the destruction of established practise (Morgan, 2006). A good example is the decision of Microsoft and Intel to create new technologies that transformed existing computer market and destroyed many mainframe computer companies. The latter instance is deeply rooted in a concept called; *disruptive innovation* because it suddenly improved computer products in ways that the market did not expect. (Dodgson *et al*., 2008). While innovation implies doing new things, *creativity* means thinking up new things (Weber, 2004) Thus, creativity could be seen as the process of conceiving a new invention while innovation is making it real in one's own unique way. Therefore, creativity incorporates both innovation and the task of problem solving. Of note here is the fact that creative/innovative drive is not restricted to a particular industrial sector or size, but cuts across all spheres of industries and sizes. Some of the world's most successful firms such as P&G, Wal-mart, Google, etc. were recognised as creative/innovative companies (McGregor, 2007). In light of above definitions, and the stated company examples, it is evident that creativity and innovation are not a side issue; they are the central tenets of business survival.

2.2. Closed Innovation Versus Open Innovation

It will be worthwhile to define the 'closed innovation' paradigm before appraising open innovation model. Closed innovation is a process whereby firms are required to generate and develop ideas internally, nurture and market them until they are launched as a new product or business (Vanhaverbeke and Peeters, 2005). *Figure I* below depicts the situation of a system that operates in a closed model, it shows how ideas flow to the firm on the left and flow out to the market on the right. They are screened and filtered during the research process, and the surviving ideas are transferred into development and then taken to market. Chesbrough (2003a) argues that the blocked line in *figure I* represents the boundaries of the firm. This analysis shows that the strategy in closed innovation is an internally focused one where the innovating company relies on capabilities within the firm boundaries to successfully innovate.

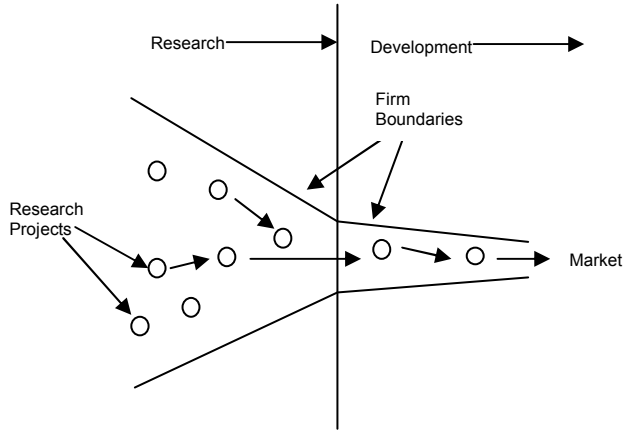

Figure I: Closed Innovation Model

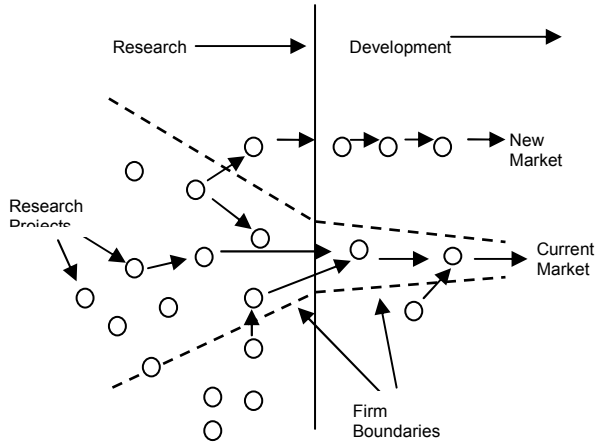

Figure II: Open Innovation Model

Source: Chesbrough (2006)

Chesbrough (2003a). challenged the closed paradigm on the bases of the following deficiencies: (1) Increased mobility of skilled workers, thus leading to large amount of knowledge in existence outside the research laboratories of large companies; (2) Access of venture capital, this makes it possible for good and promising ideas and technologies to be further developed outside the firm; (3) Possibilities to further develop ideas and technologies outside the firm are growing. This could happen in the form of spin-offs or through licensing agreements, and (4) Other companies in the supply chain play an increasingly important role in the innovation process. Consequently, Chesbrough made case for a new model that centres on the need for companies to open up their innovation processes and commercialise technologies to enhance business value. The source of this latter model could be seen as knowledge push because, it creates opportunities for companies through the promotion of R&D (Tidd and Bessant 2009).This model is referred to as Open Innovation.

Open innovation is defined as: 'the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation. Open Innovation is 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 the firms look to advance their technology. '. (Chesbrough, 2006: 1) Furthermore, West (2007: 2) states that **'**Open innovation means treating innovation like anything else - something that can be bought and sold on the open market, not just produced and used within the boundaries of the firm.'

In simple terms, open innovation is defined as, 'a situation whereby firms can no longer keep own

innovations secret unto themselves, and as a result decide to create an open platform around their innovations so that their customers, employees and even competitors can build upon it, and by so doing the company creates an ongoing, evolving community of users, doers and creators'. A network of firms that operates within the framework of open innovation model can be said to have an open innovation system. In alignment *with figure II* above, Chesbrough (2003a) argues that the open innovation model shows the necessity of both letting ideas flow out of the corporation in order to find better sites for their monetization and also flow into the corporation as new offerings and new business models. The dotted lines in *figure II* confirms the fact that there are numerous potentials ideas outside the firm, this is in contrast with the closed lines in *figure I*. Considering this fact, and drawing insights from the contention of West (2007), it is evident that open innovation use new market rather than the innovating company itself to source and to commercialise innovations. Notable examples of open innovation practise is Procter and Gamble which decided to transform it research and development process through an open-source innovation strategy called 'connect and develop' by embracing innovative ideas from small firms outside its own research laboratory. (McGregor, 2007) .

One of the questions in this paper is; to *what extent are firms really opened*? Gann and Dahlander (2007) argue that firms have always been open to some degrees and that the benefits differ depending on their line of business. Those using older technologies in this instance may benefit less and vice versa. Moreover, only 50% and not 100% of P&G's products originates from outside of the firm. Furthermore, Weber (2004) differ on IBM's claims that it is an open company, he argue that IBM is only open in markets, like software, where they it has fallen behind, whereas, in hardware markets where they have led, they are extremely closed for not just reason. Nevertheless, Pontiskoski, and Asakawa (2009) claims that the IBM's approach to open innovation is a best practise base a premise that companies need to focus on what they are good at and outsource what they cannot or need not do themselves. Thus, we can conclude that there are varying degrees of openness in practise, and companies may choose the options to adopt based on their corporate strategic intent and the market dictates.

3.0. WHY DO COMPANIES EMBRACE OPEN INNOVATION?

Open innovation paradigm is gaining grounds in many industries. For instance, open innovation is seen as the main trends in pharmaceuticals innovation today due to the fact that, it is too costly to have all competencies in-house, thus collaborations with the right partners is increasingly becoming important. (Gassmann & Reepmeyer, 2005). IBM, P&G and Nokia are also case example of companies that has so far exhibited a degree of openness. The benefits of open innovation which motivates companies to embrace the paradigm are discussed below:

3.1. Access to external ideas and technologies

Open innovation provides access to a larger base of externally developed ideas and technologies from which to derive internal innovation and growth. Munsch (2009) buttressed this view with the fact that, new ideas can be contributed from a much larger range of parties and from different perspectives than what might be contributed internally. Furthermore, Chesbrough and Crowther (2006). in a study, discovered that the most common reason for external technology acquisition was a common belief that it is critical to growth .Consequently, companies recognise open innovation as a strategic tool to explore new growth opportunities with less risk, open technology sourcing offers companies higher 'flexibility' and responsiveness without necessarily incurring huge costs. Flexibility advantage is not achieved automatically by any company in this instance, thus, it is essential for firms to learn new skills and routine required to make the new process work.

3.2. Mitigation of business and financial risks

Partnering through open innovation can help mitigate business and financial risk and also, greater market scale can also be achieved. Vanhaverbeke, Vrande and Chesbrough (2008) reinforced the above notion, they argued that the ability to access a broader range of technologies and market opportunities has financial value because there may be diversified opportunities, and some of these may be more uncorrelated with internally perceived opportunities. Nokia was cited as a typical example in this instance. Nokia is a company that is continuously identifying opportunities in its own ventures organisation; it systematically scans emerging trends and changes from the perspectives of technology, business and users. The knowledge gained from all this perspectives may as well help Nokia identify potential indicators of change or disruption, thereby taking steps to address change and disruption. Through the identification of the disruptors, and understanding their business models, Nokia would be able to develop its own response to unforeseen circumstances and changes.

3.3. Early exit advantage, and the ability to realize some value from projects that do not progress internally

According to Vanhaverbeke et al (2008) open innovation is characterized by chances that innovating firms can always license or sell technologies or spin-off ventures that are not promising enough and/or that do not align with their business model or core competencies. Considering this fact, a business project that do not have

prospects (but might be valuable as a complement to another part of the business) could be spun off to a supplier, a complementary or other third party. Strategic initiatives can thus be pursued through multiple firms, with multiple sources of investment, rather than exclusively through the firm's own capital. The positive impact of this is that, firm is able to pursue the same degree of innovative exploration with a lesser budget (Munsch, 2009), however, Garcia- Vega (2006) noted that there are two issues involved here. First, firms may have to trade part of their intellectual property rights in order to enlist the investment and support of other firms. Second, the financial benefits of this are more interesting in the early stages of the innovation funnel, because application-specific investments in the later commercialization phase may be sunk costs, and harder to recover or redeploy (depending on the contestability of the market).

3.4. Delayed exit advantage

Vanhaverbeke et al., (2008) states that the creation of corporate ventures culture externally allows firms to monitor its developments while delaying its exit decision. While corporate venture grows further and matures, the corporation can decide whether to spin in the venture or whether to sell it to external capital providers. However, this decision depends on the strategic fit and commercial success of the venture, for example, if a company chooses to partner with others in its own investment, the company also benefit financially from other joint- partners who are supporting the development of the venture. (Vanhaverbeke et al., 2008; Herzog, 2006). This latter argument amongst others reinstates the earlier argument that open innovation helps to mitigate business and financial risk. Although the implication of this development is that the company may need to relinquish its strategic control to external investors, nevertheless in this instance, open innovation gives room for companies to maintain flexibility while keeping their different venture options open.

4.0. CHALLENGES OF OPEN INNOVATION

Quite a few companies like IBM, P&G, Nokia, amongst others that enjoys to a considerable extent, most of the benefits discussed above (Herzog, 2006) While P&G recorded 6% growth annually between 2001 and 2006 and market capitalisation of $200billlion as of 2007 as a result of the strategy implementation, the open source software saves IBM $400m annually since it was executed.(McGregor, 2007). Nokia networks are also set to reduce its annualized operating expenses and production overheads by €500 million by the end of 2011 courtesy its open platform. However, it would be inappropriate to conclude that these companies are exempted from challenges that are common to an open system. Literature has so far made few attempts to explore these challenges, and moreover, scholars who explored it did it from their individual perspective. For example, while the challenges were classified as cultural, contract and competition by (Munsch, 2009); West and Gallenger (2006) sees them as maximization, incorporation and motivation. Pontiskoki and Asakawa (2009) in their own study classified them as cognitive, behavioural and institutional barriers. Of note is the fact that open innovation being a new concept, each of the scholars explored the challenges from different perspectives. Considering this fact, this paper decides to synthesize key points of different views and thus, evaluate the challenges of open innovation from a general perspective below:

4.1. Protection of intellectual assets and property

Innovation in a traditional sense is seen as something that must be kept in-house and the intellectual property generated through R&D used remains a trade secret (Pontiskoki and Asakawa, 2009). However, the growing interaction with external parties raises issues regarding the protection of intellectual assets and IP. This can create uncertainty about how to share the benefits of the collaboration. OECD (2008) identified IP theft as the greatest challenge in collaborating with partners. Consequently, in the area creating new technology and product innovations, there are challenges in addressing IP ownerships (Munsch, 2009). The reason for this according to (Pontiskoki and Asakawa 2009). can be traced to the fact that different parties are coming together to address some sort of perceived opportunity. Each brings its respective competencies and IP into the mix. However, the challenge partnering companies may face in the future would be in regards to the best approach to adopt for sharing IPs that are generated during partnership.

4.2. Structural challenges and contractual complexities

The theories of organisational structure were developed with a view that the organisation has firm boundaries and can relate dependent of their environments to a considerable extent. (Burn and Stalker, 1994).However, in open innovation, the boundaries are not longer stable; this has consequences, not only for the identity of the firm itself, but also for all its structural parts. Contractual agreement among the various parties involved in an open network may also have complexities. For example, unlike in a closed system where resources are provided by the organisation, employees are under contract (and therefore intellectual property owned by or assigned to the employer) and the risks are directly carried by the company (Munsch, 2009). However, an open system can be more complex contract wise. This may impact on employees morale, because large organisations that undergo

such collaboration may face discontent from employees who have gotten used to a specific style of functioning (i.e. organisational inertia).Moreover, as a result of integration of different technologies, industry borders are shifting and even disappearing (OECD, 2008). In this situation, companies will undoubtedly be posed with the challenges of how to enhance new business models and structures, including the effective management of human capital (i.e. open culture, diversity, priorities, etc).

4.3. Potential competitive implications

According to Munsch (2009), the business landscape has numerous examples of companies that were once open model partners, now competing head-to-head in the same markets (e.g. the original IBM PC with Microsoft providing the operating system subsequently competing when IBM launches PS2).These competitive implications can be specific to the likelihood of future direct competition between two or more of the open model partners, or more indirectly, by enabling a more structural change in the market such that one party establishes and commands a key position in the value chain and derives most of the benefits. (Clayton and Raynor, 2003)

4.4. Cognitive, behavioural and institutional challenges

According to Pontiskoki and Asakawa (2009). *Cognitive challenges* implies that most managers could be reluctant to change or may not realise the benefits of open innovation, but rather prefer continue running business in conformity with the traditional model. For *behavioural challenge*, managers may realise the potential and need for innovation, but do not act on it. This may cause organisational inertia in the organisation holding back new ideas until they just fade away. *Institutional challenge*, may also occur because two parties are working together will definitely have differing priorities and therefore resource commitments in advancing a new joint concept (Tidd and Bessant, 2009). As a consequence, the project may proceed in fits and starts as the parties continually seek to realign differing expectations (Munsch, 2009). Individual companies may also strive to innovate, in their strategy, but in practise the new processes, management, and incentives may not support such. Pontiskoki and Asakawa (2009) finally posit that there is a hierarchy in the challenges discussed above. For example, people cannot behave without cognition (awareness and perception). Thus, managers cannot expect desired respect from employees if people have not internalised the required values and norms necessary to enhance an open network.

5.0. OPEN INNOVATION - A CASE STUDY OF NOKIA

Nokia is a company that has taken steps towards greater openness with its 770 internet tablet based on Linux operating system. In this case Linux-based consumer handheld from Nokia and it allows everyone to share the code. Furthermore, Nokia N-3 innovation is another success story for Nokia in open network partnership. (OECD, 2008). It is glaring that the challenges of open innovation could be difficult to curtail. *How then was Nokia, able to open up their network without hesitation?* Firstly, Gupta, (2008) states that the need for a 'culture for mobility' (i.e. geographically dispersed R&D project) has led to an external strategic focus and flexible environment. Secondly, the structures adopted also have a role to play in the success of the restructuring exercise. Consequently, while the first reason stated above has ensured that even major changes in Nokia result in minimum discontent among employees. (i.e. organisational inertia) , the newer structures have also allowed for significant growth through external collaborations . Moreover, the outcome of a study by Pontiskoki and Asakawa (2009). Shows that Nokia overcame behavioural *challenges* by ensuring operational excellence through efficient and effective management of their R&D network especially during the development of its N-series. This shows the extent to which they focus on behavioural level. On a *cognitive level,* there are no notable challenges, because there was shared understanding within management and everyone could understand the need for open innovation, since the headquarters and main research labs was in Finland, the only way to acquire competent hands was through partnering with top research universities and intellectual communities (Gupta, 2008).Conclusively from an *institutional perspective*, it was recommended in the study that the focus of Nokia should be on how to combine internally generated knowledge from different sources, overcoming 'not-invented–here' syndrome. Essentially, Nokia's R&D and commercialisation management is about developing competitive advantage through process leadership, gaining resources through sourcing and then combine with internally generated knowledge.

6.0. CONCLUDING REMARKS

This paper starts with an argument that open innovation on balance attracts wealth of opportunities ranging from flexible cost structures; integrated technologies enabling products and services to be better adjusted to market; increased creativity and mitigation of business and financial risks. IBM, P&G, Nokia etc. were cited as companies that has since migrated to business model that is substantially open and are benefiting from its value added opportunities. The paper on the other hand also argued that opening up a system could also pose

challenges, ranging from; IP protection, structural and contractual complexities competitive implications, cognitive, behavioural and other institutional challenges to collaborating companies. Key drivers factors as well as challenges of open innovation, including the degree of openness in firms were thoroughly explored in the paper.. The question at this juncture is; *considering the overwhelming challenges later discovered in open innovation, does it mean organisations should stick to closed model in which they can control all the key components needed for new innovation or business model?*. The answer in this paper is No! The reason being that no individual company can always have the requisite R&D expertise , resources and competencies needed for competitive advantage. Each situation is different, thus, companies need to evaluate and understand their particular circumstances, strategic intent, skills and knowledge and capabilities, that makes them unique in the market, so that they can clearly define what they need to outsource or if need be open up through partnership with external collaborators. Companies that are aiming to open up there processes can also learn from the strategic intent and success stories of companies like P&G, IBM and Nokia as evidenced in preceding discussions. On the other hand, it is important for companies to realise the fact that open models are not a panacea unless it is properly managed. Further suggestions on effective management of open innovation networks are discussed below.

First, it is necessary for companies to be mindful of the technicalities involved in addressing IP ownership. The parties need to be prepared to document the pre-existing IP as they formalise the agreement as well as determining the value. They need to define in advance how new IP that is created by the joint effort will be owned as people and ideas merge as part of the collaborative work. Buttressing this suggestion, Munsch (2009) states that the organisation that will be assigned any patent and managing of patents should be spelt out in the agreement. Sublicensing rights and the distribution of benefits to be gained must also be considered.

Secondly, for companies that are intending to embrace open innovation, shared understanding within management: (small and peripheral home market setting context for strategy and implementation is essential to enhance cognition capabilities) Efficient and effective project management of global R&D network will consolidate behavioural capabilities. Combining internally generated knowledge from several sources, and overcoming 'not invented here syndrome' will foster institutional capabilities.

Thirdly, it is important to evaluate one's partner carefully when entering into an open network. The dynamic competencies and capabilities of the partner, and how such can be integrated into the collaboration must be considered. Although evaluation of potential partners may not be totally accurate, nevertheless, it is essential to ensure a careful partner choice.

Conclusively, open network does not need to last forever -sometimes they are created to achieve a highly specified purpose (e.g. new product development) and once this has been done the network can be dissolved (Tidd and Beesant, 2009). Thus, it is recommended that partnership, where applicable should to fostered on a terminal basis. However, in case there is a need to sustain the network, for as long as it is continually beneficial to parties involved. Periodic-review and re-targeting may be required in this instance to keep the motivation going.

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