



OPEN INNOVATION: BENEFITS, IMPLEMENTATION AND COSTS

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Abstract

Open innovation (OI) breaks the original closed innovation model of organization and includes suppliers, customers, partners, and other external experts in the process of product, service and even process Innovation. The concept of OI has become a catchword in the recent years – as more and more companies seem to realize that innovation can no longer be restricted to the R&D departments within the company, especially with tremendous competition, fast changing market place and advancement in connectivity. Openness is about companies making use of external brainpower for its product, service and process innovations. This is the only kind of openness which is unique in terms that, a company opens up its ideas and technologies to be used by other companies, even sometimes competitors. Today, we see large companies investing into OI as they realize, based on the observed fact, that useful knowledge today is extensively distributed, and no company, no matter how able or how big, could innovate adequately on its own¹. In this paper we look at the benefits that OI has to offer for companies that are large and small, how some well-known companies have successfully implemented OI to harvest knowledge of experts spread throughout the world and finally, what is the flipside of OI, that were ascertained during Implementation.

Keywords: Innovation, Open Innovation, Cumulative innovation, user innovation, mass innovation, know-how trading, distributed innovation, P&G, CISCO, Lego, NASA, GrabCAD, Mindstorm.

1. INTRODUCTION

Dr. Philip Kotler, the undisputed heavyweight champion of marketing quotes marketing as “Creating, Communicating and Delivering value to a target customer at a profit”. He was of the view that “Creating value” is called product management, “Communicating value” is called brand management and “Delivering value” is called customer management. Therefore, when one looks at marketing as a whole it deals with three major business functions: Product Management, Brand Management and Customer Management.

All these three functions have drastically changed over the last couple of years and it is important that companies acknowledge and welcome these changes to stay innovative. If one examines product management, as Dr. Kotler mentions, it used to be producing a product and asking sales people to get rid of them, it is referred to as “production orientation of companies towards market place”. In this case, products are innovated by the companies R&D department, they are then manufactured and sold to customers. Dr. Kotler mentioned that, this has now changed, as we have drifted from a supply to a demand driven economy and highly competitive marketplace. Companies are required to move beyond their shores to innovate and grow, which led to the development of Open Innovation (OI). Companies are now connecting with Engineers and Scientist from all across the world to take their help in developing and improving products, services and processes²The concept of OI is developed and evangelized by Dr. Henry Chesbrough, Executive Director of the Program in OI at UC Berkeley. The term refers to the use of both inflows and outflows of knowledge to improve internal innovation and expand the markets for external exploitation of innovation³. The concept is also related to cumulative innovation, user innovation, mass innovation, know-how trading and distributed innovation. Executives in a number of companies are now considering OI as next big step in this trend toward Innovation⁴

1.1 Definition

OI 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.”⁵

Mr. Kotler in his talk mentioned about how ‘Pringles’ a snack brand from Kellogg wanted to imprint on crisps, and could get this technology from an Italian cookie maker who was already doing the same rather than making huge investment in to R&D and invent a way to do it themselves.

The core idea behind OI is that, in a world knowledge is distributed extensively; companies cannot rely completely on their internal research, but should instead work with other companies, competitors, specialists and academicians. In addition,



inventions which are internal are not being used in a firm's business should be taken outside the company through authorized licensing, JV's or spin offs.⁶

Companies are looking at ways to delegate more of innovation to suppliers, independent specialists and customers that interact with each other to co-create products and services. If a company could use technology to link these outsiders into its innovation process they could come up with better ideas for new products and develop those ideas more quickly and cheaply than it can by depending on the closed model.

1.1.1 The Benefits: Leading the way in OI was P&G, an American multinational consumer goods company. In 2000, the new CEO, Mr. Lafley, expressed the vital idea that at-least half of the company's innovation output should include a major external contribution. This led them to embrace an innovation model called Connect + Develop. With this program P&G connects with externally developed intellectual property to use in its products and services while allowing its internally developed innovations and know-how to be used by others. It collaborates with individuals, laboratories, financial institutions, companies, research institutes, suppliers, academics, and R&D networks.⁷

P&G has had astounding success with its OI efforts, success that has inspired large number of corporations to follow its lead over the past couple of years in search of the benefits that build up from OI which include:

- Early involvement in new technologies that could be game changers or disruptive in nature.
- Faster product development and market launch, which will lead to first mover advantage.
- Improved success rate of new products as most of the people who contribute towards product innovation are customers and similar businesses in different geography.
- Opportunity to innovate exponentially without expanding your payroll. OI allows your organization to pick from the best innovators around the world, in many cases bridging multiple domain areas, leaving you to focus your resources on paying for successful solutions.
- The OI approach allows organizations to respond flexibly to new technological advances, accessing cutting edge external innovation and talent in key areas, without major internal investment.
- Delayed financial commitment.
- Early exits reducing the downward losses; and delayed exit in case it spins off a venture.
- It drives forward your company's business model in response to changes in the marketplace, through external and internal ideas.

1.1.2 Implementation: While closed innovation has been the way most companies have followed traditionally, especially previously to World War II, there are many examples of OI throughout history.

In many cases business corporations have used contests where individuals can win cash prizes for their innovative ideas and solutions, to a well-defined problem. For example in 1714, the British government, through an Act of Parliament, offered the Longitude Prize, to anyone who could develop a practical method for the precise determination of ship's longitude. In total, over 100,000 was given in the form of encouragements and awards, the significant winner was John Harrison who received 14,315 for his work on chronometers.⁸ And most recently, GE's notion for OI and a micro-factory where they work with outside innovators, came from the company's first crowdsourcing assignment to create a better jet engine bracket. In June 2013, the company organized a contest in partnership with GrabCAD, called "3D printing design quest." GE released their original design use for their titanium jet engine bracket and invited individuals from all across the globe to create a lighter version that would be 3D printed. In six weeks, more than 700 entries from more than 50 countries came in. The winner was a 21 year old research student from Indonesia, who was able to reduce the weight of the jet engine bracket by 84 percent.⁹

2. CASE ANALYSIS

Today OI has moved from being a contest to a more collaborative and structured approach for short and long term gains, as discussed in the following cases of CISCO, LEGO and NASA.

2.1 CISCO :Cisco is one company that is trying to make OI as a part of their DNA. Cisco believes that one of the key strategies for reinventing innovation at Cisco is to embrace openness.

CISCO has a program called Cisco Entrepreneurs in Residence (EIR) through which it is able to directly engage and support early stage startups working on path breaking ideas for the Internet of Things (IoT), cloud services, Big Data/analytics and other areas that are strategic importance to Cisco's future.



They engage several pre-Series-A startups for six months at a time and give them an opportunity to work closely with Cisco engineering, product and/or go-to-market teams – and co-create deeper synergies on new business models under the expert guidance of some of their best technical and business minds. They also extend funding, co-working space and access to the Silicon Valley startup community to help fuel each startup's growth trajectory.¹⁰

CISCO by and large does not integrate these companies with CISCO as these small companies will have some inherent advantage. These companies are more innovative as there are not many permissioning and other policies to be followed for every step. This makes them very flexible and quick to act. The same reason why some startups are the ones who are disrupting the market.

2.2 LEGO

In the 1990s Lego was on the brink of bankruptcy. With the arrival of the video games the plastic brick games offered by them were totally out of fashion and children were ignoring them. Things changed when LEGO started paying close attention to its relationship with customers and introduced LEGO Mindstorms – programmable Lego bricks equipped with sensors that allow consumers to create moveable Lego designs and robots. Mindstorm became the product that changed the fortunes of the company.

The company took a number of years to develop this product and it worked with external software developers and engineers at Massachusetts Institute of Technology.

Within three weeks of the game being launched thousands of high end users, in an unofficially designed campaign coordinated on the web, hacked into the Mind storm software that came with the construction toys to make unauthorized modifications with new functions. These designs were completely authentic and unanticipated Lego. Within a short span of time the hackers had improved the original product and the result being thousands of more units being sold, especially to customers over the age of 18, who was not a part of Lego's planned target market.

Lego bosses being traditional were initially against this idea of entertaining hacking as they thought that hacking was illegal. They subsequently realized how beneficial their activities could be and therefore opened up their software to see what customers would create.

Rather than rely solely on its own R&D department Lego thought it would be of great advantage to tap the innovations of others outside of the company. It's a very simple math. Engineers from Massachusetts institute of technology worked on the concept and came up with a great game changing product. But in comparison with to the brain power of thousands of specialist users it was meager. This initiative was so impressive that the later generation of Mindstorm products was developed with the help of user-designed parts.

2.3 NASA: NASA, even though has some of the world's best technical brains, sometimes still needs external help to create solutions. In July 2010 a contest had been conducted by NASA, TopCoder, Harvard Business School and London Business School that wanted participants to come up with new mathematical algorithms that could determine the optimal contents of medical kits for future manned missions. NASA was working on long duration visits to the International space station and moon, an extremely high level of in-depth planning was required. Physiologic modeling applications and Mission simulation programs that flight surgeons and mission planners use to prepare and deal with possible medical situations are all algorithm intense. Hence the need for unusual thinking.

In this program NASA received 2,833 distinct codes from users across the world and created an abundance of solutions that NASA is going to use on International Space Station missions. This was the first time that the space agency had OI with the help of TopCoder to access its network of more than 250,000 software enthusiasts from more than 200 countries. Submissions were compared with results from an existing computer model that had already simulated and on offer to the winners was \$24,000 in cash prizes as well as seats to watch remaining shuttle mission launches. The best solution providers were three participants from UK, Japan and Brazil. The adoption of OI is creating cost-effective solutions for NASA and helping it to tackle some of the toughest and most important challenges faced by US space program.

3. THE COSTS

In a 2009 article for the *Harvard Business Review*, Guido Jouret, Chief Technology Officer, Emerging Technologies Group at Cisco, mentioned several costs of operating an OI in a company¹¹. Jouret writes that, it calls for significant investments in terms of time, imagination and energy to unlock the true potential of OI. He went on to write that anyone who is looking at



OI as cheap way to innovate has to look elsewhere. Clearly stating that OI is not as cost effective a tool to innovate as it is perceived to be. Jouret also said that it is a challenge to draft legal framework around intellectual property management in case of OI.

Professor Ammon Salter, professor of technology and innovation management at the Imperial College in London points that Lot of companies fail to look at the internal world that needs to be done in case of OI. He mentions that the concept needs to be firstly marketed internally within the company to reap the full benefits, and this can be very challenging. He says most of the companies are focusing on setting up the external portal from where ideas will emerge, but fail internally to pick and make champions out of them¹².

That is the reason Salter Believes that there is no much evidence of OI being cheaper and results in faster time to market. While there have been very successful stories of some companies effectively using OI for innovative success, there have also been equal amount of failures as well.

Innovation intermediaries are appealing to large firms in part because they help to identify and define problems, something that large, inward-looking firms may have difficulty with. But even that may be an overstated benefit. Salter explained that part of the challenge is when one defines a technological problem well that he would often get close to the solution.

In nearly every sector, many of the ideas and technologies that create new products emerge from a number of players in the value chain. Boeing designs its aircraft, but suppliers many of the components that goes into making the final product. Similarly, HP's computers and Apple's iPod include hundreds of parts invented and manufactured by companies in many countries across the world. The benefits of specialization and collaboration seem obvious today.

While OI does seem promising, it is not entirely clear as to what capabilities the companies will need and how to structure these capabilities to make the best of it. Many of the answers will become clear as companies gain greater experience with various OI approaches. But a few challenges are already apparent.

4. CONCLUSION

There is no perfect model that has proved successful in case of OI. It is an area that is still in its nascent stages of development. Each company is trying to develop models which are best suited for their Industry. With large players putting in a lot of effort and sweat into it, we may soon have fascinating results. Though there are quite a few constraints in OI implementation, the benefits as off now far surpass the costs.

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