How can we generate innovative ideas for new product development?

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Abstract: Competition is fierce and intense in the contemporary global marketplace. Companies today face immense pressure to innovate when they seek to develop and introduce new products in order to fight competition and ensure business survival. However, generating new ideas is not easy and the continued capability and capacity to do so is even more challenging. In light of these challenges, this paper endeavours to shed light on how companies can generate innovative ideas for new product development. In particular, this paper makes clear that innovation in new products and services helps companies in meeting and exceeding customer expectations. Generation of ideas for innovation in new product development may come from a number of sources and by applying a number of creativity techniques. Companies may generate innovative ideas by interacting with customers, employees, outsiders, and other stakeholders. Ideas may also be generated by analysing competitors. Companies may adopt a number of creativity techniques like brainstorming, role-playing, forming forced relationships, morphological analysis, reversing of assumptions about usage of products, mind mapping of individuals, and lateral marketing for generating innovative ideas. Companies are encouraged to apply these techniques and create a culture of innovation to generate ideas, implement them, exceed customer expectations, and succeed in the competition.

Keywords: innovation; idea generation; creativity technique; brainstorming; crowdsourcing; morphological analysis; mind mapping.

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1   Introduction

Innovation in new products and their development build and develop the future of a company. Innovation in new products and services can maintain or build sales. Innovation can transform industries and companies and change lives (Crawford and Di Benedetto, 2011). Companies that challenge industry norms and apply imaginative ideas and solutions will delight and engage customers (D'Attoma, 2016). Innovation requires generating, identifying, and evaluating ideas and working with R&D and other areas for implementation of the ideas (O'Reilly and Binns, 2019). In this age of competition, innovation is an imperative for success because companies require continuous innovation to meet and exceed customer requirements, delight them, and move ahead of their competitors, thereby contributing to their sustainability in the marketplace (Lim, 2016, 2019a). This paper focuses on the important aspect of generation of ideas for innovation. Companies adopt a number of approaches for generating ideas for innovation. This paper discusses some of the approaches in details. In this regard, the objective of the paper is to discuss how companies can pursue the generation of ideas for innovation in new product development. This paper is predicated on conceptual arguments of the strategies and initiatives adopted by companies involved in product innovation. The methodology adopted is a conceptual analysis of the literature on generation of new ideas for innovation in new product development. The rest of the paper is structured as follows. First, the paper provides an overview of the processes which companies can consider to generate ideas for innovation in new product development. Next, the paper discusses the generation of ideas based on interactions with employees, outsiders, and customers respectively. Following that, the paper discusses about the importance of competitor analysis to generate ideas for product innovation. Building on the discussion, the paper introduces various creativity techniques that companies can consider to generate innovative ideas for new product development. Finally, the paper concludes with a summary of the salient points herein this paper, including its implications, limitations, and directions for future research.

2   Generation of ideas for innovation

Innovation in new product development starts with the search for ideas. Marketing experts believe that the most effective ideas for innovation can be generated by analysing the best possible set of unmet consumer needs or technological innovation (Abdel-Razek and Ubaid, 2019). Ideas for innovation can come from various sources and by using creativity-generating techniques (Aboulnasr et al., 2008).

Companies can run informal sessions with customers. Customers may discuss their requirements with company engineers and designers. They may discuss their problems and needs and brainstorm potential solutions (Mishra and Rane, 2019). It is more effective to discuss and generate ideas for innovation in such informal sessions. Many companies focusing on research in new products allow time off for their employees so that they are able to invest time and energy for their own pet projects. Google allows 20% time off, 3M allows 15%, and Rohm & Haas allows 10% time off for their employees for generating ideas of their own (Dotzel et al., 2013). Companies sometimes arrange customer brainstorming sessions and make such sessions a standard feature of plant tours (Ardito and Petruzzelli, 2017). One of the easier ways to generate ideas for innovation is

to survey customers. Companies require finding what customers like and dislike in their products compared to that of their competitors (Moorman et al., 2012). Companies may try putting themselves in the shoes of their customers and realise the issues from the customers' viewpoints. They may undertake 'fly-on-the-wall' or 'camping out' research with customers. This is done by companies like Fluke and Hewlett-Packard (Rubera and Kirca, 2012). Several iterative rounds of discussions are required for generating ideas. A group of customers may be asked to discuss and identify their problems in one room. A group of technical people may listen to those problems in another room. They brainstorm the probable solutions. The proposed solutions are tested immediately with the group of customers to evaluate their effectiveness (Gielens, 2012). Companies may define certain keywords and search for those keywords in trade publications in multiple countries for new product announcements (Srinivasan et al., 2009). Trade shows may be considered as intelligence missions where companies can understand the new developments happening in the industry (Barone and Jewell, 2013). Technical and marketing people from a company may visit its suppliers, interact with the technical people of suppliers, try to find out the new developments, and generate new ideas (Rubera and Kirca, 2012). To encourage innovation, companies may set up an idea vault. The vault may be made accessible to the employees. Employees may be allowed to review the ideas and add constructively to them (Rothaermel and Hess, 2010). Apart from the above processes, companies employ several other techniques for generating ideas for innovation. Some of those ideas are highlighted.

3   Interaction with employees

Employees are the individuals who are involved in the process of production and manufacturing. Also, frontline employees interact directly with customers. In this regard, employees may be a source of ideas for improving production, products, and services (Caloghirou et al., 2018). Companies focused on innovation undertake several initiatives to generate ideas from their employees. Toyota encourages its employees to submit innovative ideas. The ideas are analysed carefully. Employees of Toyota submit two million ideas annually (about 35 suggestions per employee). From the ideas received, more than 85 percent of them are implemented (Machlis, 2009). LinkedIn has an in-house incubator. It encourages its employees to organise a team and suggest a project to a group of executives. LinkedIn has also created 'hackdays'. It takes place on one Friday each month where the employees work on creative project (Chaey, 2012). Pricewaterhouse Coopers has started an innovation competition called 'PowerPitch'. The winning team is awarded $100,000. The team is allowed to implement its proposal for a new line of business that could eventually be worth $100 million in revenue. The company also encourages live chats and an online platform for discussions. Voting is done which results in a five-team finale televised internally from the company's New York headquarters (Overholt, 2011).

Ideas about innovation can also come from the top management. There are several company leaders, such as former CEO of Intel, Andy Grove and former CEO of Sony, Akio Morita who took personal responsibility for introducing technological innovation in their companies (King and Lakhani, 2013). Ideas about innovation may also come from outside sources. However, those ideas must receive attention, acceptance, and importance

by the employees responsible in the organisation who take the role of product champions (Osman et al., 2016).

4   Interaction with outsiders

Generating ideas for innovation should not remain bounded within the company. Innovation requires an open culture where ideas may come from external sources (Zhao et al., 2018). Firms try to target external sources for new ideas. Ideas may be generated from customers, scientists, engineers, patent attorneys, university and commercial laboratories, industrial consultants and publications, channel members, marketing and advertising agencies, and even competitors (Raassens et al., 2012).

Procter & Gamble developed a new approach for generating ideas. It is called 'Connect + Develop Approach to innovation' (Dishman, 2012). Through this approach, P&G has made innovation in new product development more externally focused. Procter & Gamble is one of the fastest growing companies in the 21st century in terms of both revenue and profit (Brown and Anthony, 2011). This fast growth is made possible because of its successful new products such as Swiffer, Mr. Clean Magic Eraser, Olay Regenerist, Pulsonic toothbrushes, and Actonel, prescribed for osteoporosis. P&G created a culture of innovation with the support of CEO, A.G. Lafley. He identified innovation as 'the core' – core markets, categories, brands, technologies, and capabilities (Lafley and Charan, 2009).

P&G has undertaken a 'Connect + Develop' model to gather ideas about innovation from outsiders also (Huston and Sakkab, 2006). P&G has tie-ups and collaboration with organisations and individuals all over the world. Through them, the company searches for proven technologies, products, and packages. It improves upon them, scale up, and market on its own or in partnership with other companies (Dishman, 2012). P&G also maintains close relationships with external designers. The designers help P&G to distribute product development around the world. This process also allows P&G to understand its customers better and P&G calls the process as 'consumer sensing' (Huston and Sakkab, 2006).

P&G studies customer needs carefully and identifies the top ten customer needs (Mandal, 2019). It then identifies closely related products that could satisfy the needs and at the same time could leverage or benefit from existing brand equity. P&G then focuses on the adoption of technology across different product categories (Dishman, 2012). It consults government and private research laboratories, academic and other research institutions for generating more ideas. For funding purposes, it connects with individual entrepreneurs and venture capital firms. It connects with its suppliers, retailers, competitors, and development and trade partners. P&G uses online networks to reach thousands of experts worldwide (Brown and Anthony, 2011).

P&G has finalised on three core requirements for a successful Connect + Develop strategy (Lafley and Charan, 2009). P&G is cautious in the process of generating ideas for innovation. It never assumes that 'ready to go' ideas found outside are truly ready to go. P&G knows that it needs to do a lot of development work, including risking scale-up before considering an idea as truly 'ready to go' (Dishman, 2012). P&G also understands that it is important to generate ideas from internal sources. A full-time senior executive from the organisation is required to run any connect-and-develop initiative (Huston and Sakkab, 2006). P&G also makes sure that the program is launched with the approval of

CEO. Connect + Develop cannot succeed if there is no support from the top management. The project must not be shelved at the R&D stage. So, it must be a top-down and company-wide strategy (Lafley and Charan, 2009).

P&G receives 4000 submissions annually at its connect-and-develop program (Dishman, 2012). It also solicits innovation ideas from a larger network of individuals and businesses with a past history of working with the company. Due to its initiatives taken through Connect + Develop, P&G had improvements in product cost, design, and marketing. This helped P&G in increasing its R&D productivity nearly 60% between 2000 and 2010. The innovation success rate has more than doubled, and costs have fallen (Brown and Anthony, 2011).

5 Interaction with customers

Customers are the individuals who will finally use the product. Also, companies require satisfying and delighting their customers to develop and grow their businesses. So, it is imperative for companies to understand customer needs, wants, and preferences (Mishra and Rane, 2019). Griffin and Hauser suggest that companies should conduct depth interviews with customers to understand their requirements better (Griffin and Hauser, 1993). They suggest that conducting 10 to 20 in-depth experiential interviews per market segment provides companies with deep insights about customer requirements (Griffin and Hauser, 1993). One marketer-sponsored café in Tokyo tests products of all kinds with affluent young Japanese women (Inada, 2008).

Companies have found several ways to draw new ideas for innovation from customers (Alani et al., 2019). Some of them are highlighted below.

- Observation of usage of products by customers: Companies gain valuable insights into customer requirements by observing how customers use their products. For example, Medtronic is a medical device company which has market researchers and salespeople who regularly observe how spine surgeons use its products and also competitive products (MacCormack et al., 2013). Based on observations and further analysis, Medtronic learns how to make its products better. In another case, researchers from Procter & Gamble decided to live with lower middle-class families in Mexico City to understand how customers clean their clothes (Horovitz, 2011). Based on the insights gained, Procter & Gamble researchers devised Downy Single Rinse, a fabric softener that removed an arduous step from the partly manual laundry process there (Horovitz, 2011).

- Inquiring customers about problems in products: Companies require inquiring customers about the problems they face with products. For example, Komatsu Heavy Equipment sent a group of engineers and designers to the US for six months to ride with equipment drivers, discuss with them, and learn how to make products better (Wallace, 2010). Consumers were frustrated that potato chips break and are difficult to store once the bag is opened. Procter & Gamble recognised the issue and designed Pringles to be uniform in size and encased in a protective tennis-ball-type can (MacCormack et al., 2013).

- Asking customers about dream products: All products need to satisfy customer requirements. Companies require asking customers about their expectations from products and what they expect products to perform, even if the ideal sounds impossible. For instance, one 70-year old camera user told Minolta that he would like his subjects look better and not show their wrinkles and aging. Based on the feedback, Minolta developed a camera with two lenses, one for rendering softer images of the subjects (Horovitz, 2011).

- Employing customer advisory board: Companies may employ customer advisory boards to comment on the ideas generated. Levi Strauss receives suggestions from youth panels who are employed to discuss lifestyles, habits, values, and brand engagements (Raasch and Von Hippel, 2013). Cisco has customer forums which advise on how to improve its offerings. Harley-Davidson has its enthusiastic Harley Owners Group (H.O.G) members who are extremely passionate. The members suggest product ideas to Harley-Davidson and many of the ideas are implemented (Horovitz, 2011).

- Effective usage of the internet: Companies can solicit ideas for innovation from individuals who are online and use their products. They can also use specialised search engines like Technorati which helps in identifying relevant blogs and postings. Many companies like P&G have 'Share Your Thoughts' section on their corporate websites for gaining advice and feedback from customers (Dishman, 2012).

- Formation of brand community with enthusiasts: Companies can form exclusive brand communities consisting of enthusiastic and passionate individuals. Harley-Davidson and Apple have strong brand enthusiasts and advocates. Sony solicits suggestions from customers to co-develop its PlayStation products. LEGO collects feedback on its new products from kids and influential adult enthusiasts in early stages of product development (Raasch and Von Hippel, 2013).

- Encouraging customers for improvement of products: Customers are encouraged by companies to challenge the product ideas and concepts developed by them. Companies modify products based on suggestions received from customers. Salesforce.com encourages its users to develop and share new software applications using simple programming tools. International Flavors & Fragrances (IFF) gives customers toolkits to modify specific flavours. IFF modifies the flavours based on customer suggestions and manufactures the products accordingly (Horovitz, 2011). Some companies have 'do-it-yourself' toolkits for customers. For instance, LSI Logic Corporation encourages its customers to design their own specialised chips. BMW posted a toolkit on its website to let customers develop ideas using telematics and in-car online services (Schreier et al., 2012).

The above discussions underline the importance of co-creating products with consumers by soliciting their suggestions for improvements. Companies require shifting from the traditional company-specific approach to product innovation in collaboration with customers. BlankLabel.com allows customers to design and customise their own shirts by specifying the cut, size, collar, buttons, cuffs, and pockets (Seybold, 2006).

Crowdsourcing is an important tool for generating ideas. One form of crowdsourcing invites the online community to help create content or software, often with prize money or a moment of glory as an incentive. Wikipedia.org encourages individuals to contribute to and develop its Wikipages on diverse topics (Raasch and Von Hippel, 2013). When Baskin-Robbins ran an online contest to pick its next flavour, 40,000 customers provided suggestions. The winning entry came from a 62-year old grandmother of four. The suggested flavour combined chocolate, nuts, and caramel, and was launched as Toffee Pecan Crunch (Hoffman et al., 2010).

Crowdsourcing is applied effectively by Cisco. Cisco has initiated the Cisco Internet of Things (IoT) Grand Challenge (formerly the Cisco I-Prize) which is a worldwide initiative to bring the industry together and accelerate the adoption of breakthrough technologies and products that will contribute to the growth and evolution of the IoT (Jouret, 2009). The challenge offers awards of $250,000 in cash prizes. The prizes are shared among three winners. The prize money can be used to start new ventures. Cisco also provides winners with mentoring, training, and access to business expertise from Cisco and other supporting organisations. Cisco has a convincing logic for the inception of I-Prize. Cisco believes, "In many parts of the world, you have incredibly smart people with incredibly great ideas who have absolutely no access to capital to take a great idea and turn it into a business". Because of this philosophy, the challenge drew 2,500 entrepreneurs from 104 countries in the first year (Hopkins, 2013).

The challenge identified five main criteria based on which the submissions were evaluated:

1   Does it address a real pain point?

2   Will it appeal to a big enough market?

3   Is the timing right?

4   If we pursue the idea, will we be good at it?

5   Can we exploit the opportunity for the long term?

The submissions were uploaded online for the public to evaluate. Individuals provided detailed comments along with their evaluations. Cisco found the comments even more useful than the actual votes. Cisco received a plan for a sensor-enabled smart-electricity grid in the first year. The submission was judged as the winning entry (Jouret, 2009). The competition in the second year attracted even more submissions – 3,000 participants from more than 156 countries. The winning entry was from a team of five university students from Mexico. The submission was based on the idea of a 'Life Account' that gathered information about users through connected devices in the physical world and online data from the virtual world (Hopkins, 2013). Cisco targeted submissions from Russia in the next two challenges. Cisco had massive investment plans in Russia. One of the winning Russian teams developed a system that uses a mobile phone as a mediator for transmitting data from sensors to healthcare systems. The system is compatible with all major mobile phone platforms and also with more than 40 medical devices (Hopkins, 2012). At present, Cisco encourages submissions for Cisco IoT challenge for six categories. they include applications and applications enablement, analytics, management, networking, security, or things. Each submission is required to address issues in a variety of industries including education, energy, healthcare, manufacturing,

oil and gas, retail, smart cities, sports and entertainment, or transportation (Hopkins, 2013).

Customers feel important and closer to the company when a company requests for suggestions from customers. Co-creation also helps in creating favourable word of mouth (O'Hern and Rindfleisch, 2017). However, companies require selecting the right customers for providing suggestions (Seybold, 2006).

Users who are enthusiastic about a specific product can be a good source of input even when they innovate products without the knowledge or consent of the companies that produce them (Hamdi-Kidar et al., 2019). Innovation in mountain bikes resulted because of youngsters who rode to the tops of mountains and came back. When the bikes failed, the youngsters found solutions of their own by building more durable bikes and adding motorcycle brakes, improved suspension, and accessories. These youngsters, and not the bike companies, generated ideas and developed these innovations (Hoffman et al., 2010). Many companies involved in innovation are aware of such users. Companies who want their products to appeal to younger, leading-edge consumers invite such users into the product design process. Technical companies can learn a lot by studying consumers who make the most advanced use of the company's products and who recognise the need for improvement before other customers do (Lettl, 2020). In a business-to-business market also, insights may be collected from distributors and retailers who are not usually in close contact (Henke and Zhang, 2010).

Companies, in general, believe that customer insights are important for generating ideas. However, some companies believe that customer focus may not always create better new products (Goldenberg et al., 2003). For instance, Henry Ford famously said, "If I'd asked people what they wanted, they would have said a faster horse" (Fang, 2008). Critics also caution that sometimes customers themselves may not know what they really want. Customer focus in such cases may result in shortsighted product development and miss real potential breakthroughs (Goldenberg et al., 2003). Apple and IKEA incorporate customer insights with caution for generating ideas for innovation. Some other companies believe that focusing on enthusiastic customers leads to incremental and not breakthrough innovation (Skibsted and Hansen, 2011).

6   Analysis of competitors

Companies can generate ideas about innovation by analysing and researching the products and services of competitors and other companies (Pesqueira and Sousa, 2020). They can investigate what customers like and dislike in products of other companies. Companies can procure the products sold by competitors and analyse them carefully and develop further on them. They can also ask their sales representatives about ideas for innovation. Salespeople are the individuals who come in direct contact with customers. They will have primary idea about customer preferences and requirements. They also have knowledge about competitors better than others (Conner, 2020). Best Buy also checks with venture capitalists to find out about the start-ups and the projects they are working on (Raasch and Von Hippel, 2013).

To understand and establish the brand positioning required for the new product and the right points-of-parity and points-of-differences, companies require performing an in-depth analysis of their competitors (Fang, 2008). Innovation is sparked by competition

among companies. For example, innovation is sparked by the competition in the video game console among Sony, Nintendo, and Microsoft (Kain, 2013).

Companies who provide video game consoles to more than one billion gamers worldwide, have a tough competition among themselves and aim at winning the hearts and minds of customers. 220 million of the gamers live in the US (Kain, 2013). Microsoft's new Xbox One had a tough competition with Sony's PS4 for the 2013 holiday season (Sherr, 2013). The two game consoles added many new features to attract gamers. The features included motion-detection cameras to allow gamers to play using gestures and technology which linked the gaming console to a smart phone or tablet. Xbox One was priced $100 higher than PS4's list price of $399 (Kain, 2013). Customers were also dissatisfied with Microsoft because of its product policies like restrictions on the process of gaming and sharing games. Because of all these, Microsoft lost the early PR battle to Sony. Microsoft also had tough acts for gamers to follow. The earlier model of Microsoft Xbox 360 brought significant power and online functionality to gamers. The functionalities like Achievements and the gamer score were introduced to encourage competition (Sherr, 2013). Xbox 360 also had high sales of more than 75 million units. Because of all these, Xbox 360 attracted more than 40 million gamers into Xbox Live connected gaming service (Kain, 2013). Nintendo was the third major player which created impact in the market in 2006 with its Wii gaming system. Going against industry trends, Nintendo used a cheaper and lower-power chip with fewer graphic capabilities. However, the features allowed gamers to adopt a different style of play where physical gestures became more important. Wii also had a sleek white design and motion-sensitive wireless controller which made Wii more interactive and as a result, more engaging (Fackler, 2007). Nintendo also collaborated with external software developers to make new titles quickly available. All these initiatives helped Nintendo to attract non-gamers also. Enthusiastic gamers also aimed at mastering the new games. However, Nintendo could not maintain the same interest among consumers with its next innovation, the Wii U in 2012. As a result, Nintendo had a tough time to catch up with its two main competitors, Sony and Microsoft (Stone, 2010).

7   Adoption of creativity techniques

Companies can adopt several creativity techniques to facilitate the generation of ideas for innovation (Brem, 2019). They may conduct internal brainstorming sessions to generate ideas. Group brainstorming sessions require to be conducted properly so that such sessions are effective. If conducted correctly, such sessions may create ideas, insights, and solutions which may be impossible to obtain without a group effort. However, if brainstorming sessions are conducted incorrectly, they may prove to be a wastage of time, energy, money, and resources (Peace, 2012). Experts suggest a number of techniques to conduct group brainstorming sessions effectively. The facilitator conducting such sessions should be trained enough for guiding the sessions properly. Also, a favourable ambience is required for conducting the sessions (Tischler, 2007). Right individuals should be chosen to participate in the brainstorming sessions. Since diverse ideas need to be generated, individuals with diverse viewpoints are chosen for participating in the brainstorming sessions (Fisher, 2013). Participants may have diverse and conflicting viewpoints. However, they should provide constructive suggestions and

should work towards a common goal (Peace, 2012). Participants should also abide by the rules set up for such sessions. The rules are imposed so that the conversations are fruitful. Rules ensure some structure in the discussions. Also, it is very important to ensure that the discussions are flexible enough to encourage multiple viewpoints (Fisher, 2013). Individuals participating in the sessions should be briefed about the objectives of the sessions so that the discussions are focused (Peace, 2012). Individual sessions may be conducted for participants before and after the brainstorming sessions. Such sessions may help participants to think and participate freely and constructively. It may also be useful if participants are provided time to think and gather their thoughts based on what they have heard and listened to (Sutton, 2006). Participants should also be encouraged to challenge the viewpoints expressed by others in the discussions. They may be asked to role-play some aspects of the situation they are analysing. They may be encouraged to borrow ideas from other firms, even outside the industry (Myser, 2006). Brainstorming sessions based on constructive discussions and suggestions should result in a clear plan of action and implementation so that the ideas generated could be put into action (Fisher, 2013). Brainstorming sessions should go beyond only generating ideas. They should help in building teams and collaborations and leave participants better informed (Peace, 2012).

Experts suggest generating ideas based on creativity by making connections in ways that are not obvious. They suggest a number of techniques for stimulating creativity in individuals and groups (Dahl and Moreau, 2002). Some of the techniques are mentioned below.

- Listing of attributes for a product: The attributes of a product, for example a screwdriver, may be listed. Each attribute may then be analysed and modified based on critical thinking. For example, the wooden handle may be replaced by plastic handle. More torque power may be provided, different screw heads may be fitted, and so on.

- Forced relationships: Several ideas may be listed and companies may try to find relationships among those ideas. For example, in designing furniture for a room, desk, bookcase, and filling cabinet may be considered as separate ideas. A desk may be imagined with a built-in bookcase or a desk with built-in files in a bookcase with built-in files.

- Morphological analysis: Company may start with a problem. For example, the problem may be to getting something transferred from one place to another via a powered vehicle. The dimensions which are required to be considered in this case include the type of platform required (e.g., cart, chair, sling, bed), the medium (air, water, pipeline, rail), and the power source (compressed air, magnetic field, electric motor). A company may try a number of permutations and combinations to generate many solutions.

- Reversing of assumptions: A company may reverse the assumptions about a specific product. For example, instead of assuming that a restaurant has menus, charges for food, and serves food, it may be assumed that these normal schedules do not hold true. Instead, the restaurant may decide to serve only what the chef bought that morning, provide some food but charge for the time a person sits at the table, or design an exotic atmosphere and rent the space to people who bring their own food and beverages.

- New contexts for existing products: The contexts of familiar products and processes may be critically analysed and alternative processes may be thought of. For example, pets instead of human beings can be helped with day care service, psychotherapy, stress reduction, and funerals. Hotel guests need not register at the front desk of a hotel. The hotels can use wireless devices to register them.

- Mind mapping of individuals: Ideas may be treated in a hierarchical way to develop the whole process of idea generation. For example, if the idea starts with a car, the next idea may be of Mercedes, and its association with Germany. Such associations may be done with all words to materialise a whole new idea.

Two product ideas or concepts may also be combined to create a new offering. This is called lateral marketing (Kotler and de Bes, 2003). For example, cereal bars are a successful combination of cereals and snacks. Kinder Surprise combined candy with a toy to create a new offering (Boyd and Goldenberg, 2013).

8 Discussion

Innovation in new product development requires generating ideas as an initial step. A company cannot succeed in the competition unless it does continual innovation. Innovation helps companies to meet and exceed customer expectations. Innovation requires generating, identifying, and evaluating ideas. Generation of ideas requires an in-depth understanding of customer requirements and preferences. It also requires understanding the capabilities of a company and its motivation for researching new ideas.

Ideas for innovation can be generated from a number of sources and by using creativity-generating techniques. Companies are able to generate ideas for innovation when they understand their customers well. Informal sessions may be arranged with customers where customers discuss their problems, needs, and expectations from products. Ideas may be generated internally in the organisation from employees. Frontline employees and salespeople are the individuals who come in direct contact with customers. So, they have a better understanding about customers and their requirements than others. Ideas for innovation may come from the top management of the company. Also, innovation is not possible without the support and cooperation of the top management. Companies may interact with outsiders and stakeholders to generate innovative ideas. They may organise programs and competitions where participants share their innovative ideas. Companies may also apply innovative techniques like crowdsourcing where online communities may brainstorm and generate ideas. Companies invite enthusiastic customers to submit suggestions and help in generating ideas and in co-creating products. Analysis of competitors also allows companies to understand what others are doing to satisfy their customers. Urge for innovation is sparked by tough competition and many companies take advantage by performing a critical analysis of their competitors. Companies may adopt several creativity techniques for generating ideas. Brainstorming, role-playing, forming focused relationships, morphological analysis, reversing of assumptions about usage of products, mind mapping of individuals, and lateral marketing are some of the techniques. Companies require having an integrated approach including the above-mentioned techniques for generating innovative ideas.

8.1   Theoretical implications

The contribution of this paper lies in the fact that an in-depth discussion of the various techniques for generating innovative ideas was done. The discussions have both theoretical and managerial implications. Based on the discussions presented, academicians may conduct a further review of the process of innovation and the techniques adopted by companies to generate ideas for innovation, and suggest improved techniques. Efforts were made to include the relevant and the latest literature related to innovation. However, innovation is an ever-evolving field with developments happening regularly. Researchers and practicing managers require keeping themselves updated about the latest trends and developments, understanding customer requirements better, and implementing effective techniques for generating ideas for innovation.

8.2.   Managerial implications

The discussion herein will sensitise practicing managers about the importance of generating ideas for innovation, understand the techniques for generating innovative ideas, investigate about the techniques which are already in place in their organisations, and implement additional creative techniques for generating ideas. Managers will also realise that idea generation is an iterative process and may not always bring success initially. However, experiences gained from initial failures may be applied in fruitful ventures in future.

9   Conclusions

This paper discussed the various aspects of innovation and the techniques adopted by companies to generate innovative ideas. This paper reviewed various aspects of innovation. Ideas for innovation may be generated by interacting with customers, employees, outsiders and other stakeholders, and by performing an analysis of competitors. Innovative ideas may also be generated by adopting creativity techniques like brainstorming, crowdsourcing, role-playing, morphological analysis, and lateral marketing.

9.1   Limitations

This paper is limited to a conceptual analysis of the literature on generation of ideas for innovation in new product development. Empirical analysis was not done with the collection of primary data. Studies in future may aim at conducting empirical analysis based on the literature and arguments presented in this paper. Moreover, the paper was limited in its discussion of technology, which may be considered in future studies.

9.2   Future research directions

Based on the conceptual analysis and arguments presented in this paper, researchers may delve further and study the literature on generation of ideas for innovation in new product development. They may analyse the literature qualitatively and conceptually. They may conduct empirical analysis based on the analysis and arguments presented in this paper to

validate the arguments further. They may select and conduct an empirical analysis of specific industries in which innovation is happening at a fast pace, e.g., telecommunications, pharmaceuticals, and similar other sectors. Moreover, future research should consider further discussion of technology (e.g., technology acceptance; Lim 2018b, 2018c), including the ones that avail in Industrial Revolution 4.0 (e.g., big data, internet of things; Lim, 2019b), and new research techniques (e.g., neuromarketing; Lim, 2018a, 2018d) that may prove useful in uncovering nuanced customer insights to enhance the generation of innovative ideas for new product development.

References

Abdel-Razek, R.H. and Ubaid, A.M. (2019) 'Integrating innovation life cycle concept and innovation mapping technique to model industries' innovations', *International Journal of Quality and Innovation*, Vol. 4, Nos. 3–4, pp.232–250.

Aboulnasr, K.S., Narasimhan, O., Blair, E. and Chandy, R. (2008) 'Competitive response to radical product innovations', *Journal of Marketing*, Vol. 72, No. 3, pp.94–110.

Alani, E., Kamarudin, S., Alrubaiee, L. and Tavakoli, R. (2019) 'A model of the relationship between strategic orientation and product innovation under the mediating effect of customer knowledge management', *Journal of International Studies*, Vol. 12, No. 3, pp.232–242.

Ardito, L. and Petruzzelli, A.M. (2017) 'Breadth of external knowledge sourcing and product innovation: the moderating role of strategic human resource practices', *European Management Journal*, Vol. 35, No. 2, pp.261–272.

Barone, M.J. and Jewell, R.D. (2013) 'The innovator's license: a latitude to deviate from category norms', *Journal of Marketing*, Vol. 77, No. 1, pp.120–134.

Boyd, D. and Goldenberg, J. (2013) 'Think inside the box', *Wall Street Journal*, 14 June.

Brem, A. (2019) 'Creativity on demand: how to plan and execute successful innovation workshops', *IEEE Engineering Management Review*, Vol. 47, No. 1, pp.94–98.

Brown, B. and Anthony, S.D. (2011) 'How P&G tripled its innovation success rate', *Harvard Business Review*, Vol. 89, No. 6, pp.64–72.

Caloghirou, Y., Giotopoulos, I., Korra, E. and Tsakanikas, A. (2018) 'How do employee training and knowledge stocks affect product innovation?', *Economics of Innovation and New Technology*, Vol. 27, No. 4, pp.343–360.

Chaey, C. (2012) 'LinkedIn launches an incubator to turn employees into entrepreneurs', *Fast Company*, 7 December.

Conner, S.L. (2020) 'Exploring best practices of new product development', in *Innovation Management*, Edward Elgar Publishing, Cheltenham, UK.

Crawford, M. and Di Benedetto, A. (2011) *New Products Management*, 10th ed., New York, McGraw-Hill.

D'Attoma, I. (2016) 'Evaluating the effect of public R&D subsidies on Italian firms' innovation activities: a subgroup analysis of 2008 CIS data', *International Journal of Quality and Innovation*, Vol. 3, No. 1, pp.67–90.

Dahl, D.W. and Moreau, P. (2002) 'The influence and value of analogical thinking during new product ideation', *Journal of Marketing Research*, Vol. 39, No. 1, pp.47–60.

Dishman, L. (2012) 'How outsiders get their products to the innovation big league at Procter & Gamble', *Fast Company*, 13 July.

Dotzel, T., Shankar, V. and Berry, L.L. (2013) 'Service innovativeness and firm value', *Journal of Marketing Research*, Vol. 50, No. 2, pp.259–276.

Fackler, M. (2007) 'Putting the we back in Wii', *New York Times*, 8 June.

Fang, E. (2008) 'Customer participation and the trade-off between new product innovativeness and speed to market', *Journal of Marketing*, Vol. 72, No. 4, pp.90–104.

Fisher, A. (2013) 'Why most brainstorming sessions fail', *Fortune*, 23 August.

Gielens, K. (2012) 'New products: the antidote to private label growth?', *Journal of Marketing Research*, Vol. 49, No. 3, pp.408–423.

Goldenberg, J., Horowitz, R., Levav, A. and Mazursky, D. (2003) 'Find your innovation sweet spot', *Harvard Business Review*, Vol. 81, No. 3, pp.120–129.

Griffin, A.J. and Hauser, J.R. (1993) 'The voice of the customer', *Marketing Science*, Vol. 12, No. 1, pp.1–27.

Hamdi-Kidar, L., Keinz, P., Le Nagard, E. and Vernette, E. (2019) 'Comparing lead users to emergent-nature consumers as sources of innovation at early stages of new product development', *Journal of Product Innovation Management*, Vol. 36, No. 5, pp.616–631.

Henke, J.W. and Zhang, C. (2010) 'Increasing supplier-driven innovation', *MIT Sloan Management Review*, Vol. 51, No. 2, pp.41–46.

Hoffman, D.L., Kopalle, P.K. and Novak, T.P. (2010) 'The 'right' consumers for better concepts: identifying and using consumers high in emergent nature to further develop new product concepts', *Journal of Marketing Research*, Vol. 47, No. 5, pp.854–865.

Hopkins, B. (2012) *Companies Increasingly Use Crowdsourcing Strategically: Cisco's I-Prize*, 8 October [online] https://www.yannigroth.com (accessed 20 November 2019).

Hopkins, B. (2013) *Mobile Medical Platform MedM Wins Cisco I-Prize*, 18 September [online] https://www.rusbase.com (accessed 20 November 2019).

Horovitz, B. (2011) 'Savvy marketers let consumers call the shots', *USA Today*, 24 March.

Huston, L. and Sakkab, N. (2006) 'Connect and develop', *Harvard Business Review*, Vol. 84, No. 3, pp.58–66.

Inada, M. (2008) 'Tokyo café targets trend makers', *Wall Street Journal*, 24 August.

Jouret, G. (2009) 'Inside Cisco's search for the next big idea', *Harvard Business Review*, Vol. 87, No. 9, pp.43–45.

Kain, E. (2013) 'Xbox One vs. PS4: why Sony is still the best choice for gamers', *Forbes*, July 25.

King, A. and Lakhani, K.R. (2013) 'Using open innovation to identify the best ideas', *MIT Sloan Management Review*, Vol. 55, No. 1, pp.41–48.

Kotler, P. and de Bes, F.T. (2003) *Lateral Marketing: New Techniques for Finding Breakthrough Ideas*, Wiley, New York.

Lafley, A.G. and Charan, R. (2009) *The Game Changer: How You Can Drive Revenue and Profit Growth Through Innovation*, Crown Business, New York.

Lettl, C. (2020) 'Lead users and the organization', in: *Managing Innovation in a Global and Digital World*, pp.111–119, Springer Gabler, Wiesbaden.

Lim, W.M. (2016) 'Creativity and sustainability in hospitality and tourism', *Tourism Management Perspectives*, Vol. 18, pp.161–167.

Lim, W.M. (2018a) 'Demystifying neuromarketing', *Journal of Business Research*, Vol. 91, pp.205–220.

Lim, W.M. (2018b) 'Dialectic antidotes to critics of the technology acceptance model: conceptual, methodological, and replication treatments for behavioural modelling in technology-mediated environments', *Australasian Journal of Information Systems*, Vol. 22, https://doi.org/10.3127/ajis.v22i0.1651.

Lim, W.M. (2018c) 'Revisiting concepts and theories in information systems and technology', *Australasian Journal of Information Systems*, Vol. 22, https://doi.org/10.3127/ajis.v22i0.1733.

Lim, W.M. (2018d) 'What will business-to-business marketers learn from neuro-marketing? Insights for business marketing practice', *Journal of Business-to-Business Marketing*, Vol. 25, No. 3, pp.251–259.

Lim, W.M. (2019a) 'Ten years of the *International Journal of Quality and* Innovation', *International Journal of Quality and Innovation*, Vol. 4, Nos. 1–2, pp.1–67.

Lim, W. M. (2019b) 'To what degree is the fourth industrial revolution an opportunity or a threat for the ASEAN community and region?', *Modern Applied Science*, Vol. 13 No. 9, pp.105–106.

MacCormack, A., Murray, F. and Wagner, E. (2013) 'Spurring innovations through competitions', *MIT Sloan Management Review*, Vol. 55, No. 1, pp.25–32.

Machlis, S. (2009) 'Innovation and the 20% solution', *Computerworld*, 2 February.

Mandal, P.C. (2019) 'Managing and applying innovation in new product development-strategies and initiatives', *International Journal of R&D Innovation Strategy (IJRDIS)*, Vol. 1, No. 2, pp.21–30.

Mishra, N. and Rane, S. B. (2019) 'Business excellence initiative success prediction model based on logistic regression and artificial neural network', *International Journal of Quality and Innovation*, Vol. 4, Nos. 3–4, pp.132–166.

Moorman, C., Wies, S., Mizik, N. and Spencer, F.J. (2012) 'Firm innovation and the ratchet effect among consumer packaged goods firms', *Marketing Science*, Vol. 31, No. 6, pp.934–951.

Myser, M. (2006) 'When brainstorming goes bad', *Business 2.0*, October, p.76.

O'Hern, M.S. and Rindfleisch, A. (2017) 'Customer co-creation: a typology and research agenda', in: *Review of marketing Research*, pp.108–130, Routledge, Abingdon, Oxfordshire, England.

O'Reilly, C. and Binns, A.J. (2019) 'The three stages of disruptive innovation: idea generation, incubation, and scaling', *California Management Review*, Vol. 61, No. 3, pp.49–71.

Osman, S., Shariff, S.H. and Lajin, M.N.A. (2016) 'Does innovation contribute to employee performance', *Procedia-Social and Behavioral Sciences*, Vol. 219, pp.571–579.

Overholt, A. (2011) 'American Idol: accounting edition', *Fortune*, 17 October.

Peace, N. (2012) 'Why most brainstorming sessions are useless', *Forbes*, 9 April.

Pesqueira, A. and Sousa, M.J. (2020) 'Pharmaceuticals and life sciences: role of competitive intelligence in innovation', in: *Handbook of Research on Emerging Technologies for Effective Project Management*, pp.237–254, IGI Global.

Raasch, C. and Von Hippel, E. (2013) 'Innovation process benefits: the journey as reward', *MIT Sloan Management Review*, Vol. 55, No. 1, pp.33–39.

Raassens, N., Wuyts, S. and Geyskens, I. (2012) 'The market valuation of outsourcing new product development', *Journal of Marketing Research*, Vol. 49, No. 5, pp.682–695.

Rothaermel, F.T. and Hess, A.M. (2010) 'Innovation strategies combined', *MIT Sloan Management Review*, Vol. 51, No. 3, pp.13–15.

Rubera, G. and Kirca, A.H. (2012) 'Firm innovativeness and its performance outcomes: a meta analytic review and theoretical integration', *Journal of Marketing*, Vol. 76, No. 3, pp.130–147.

Schreier, M., Fuchs, C. and Dahl, D.W. (2012) 'The innovation effect of user design: exploring consumers' innovation perceptions of firms selling products designed by users', *Journal of Marketing*, Vol. 76, No. 5, pp.18–32.

Seybold, P. (2006) *Outside Innovation: How Your Customers Will Codesign Your Company's Future*, Collins, New York.

Sherr, I. (2013) 'Sony boosts initial internal sales estimates for its PlayStation 4', *Wall Street Journal*, 11 June.

Skibsted, J.M. and Hansen, R.B. (2011) 'User-led innovation can't create breakthroughs; just Ask Apple and Ikea', *Fast Company*, 15 February.

Srinivasan, S., Pauwels, K., Silva-Risso, J. and Hanssens, D.M. (2009) 'Product innovations, advertising, and stock returns', *Journal of Marketing*, Vol. 73, No. 1, pp.24–43.

Stone, B. (2010) 'Nintendo Wii to add Netflix service for streaming video', *New York Times*, 13 January.

Sutton, R.I. (2006) 'Eight rules to brilliant brainstorming', *BusinessWeek IN Inside Innovation*, September, pp.17–21.

Tischler, L. (2007) 'Be creative: you have 30 seconds', *Fast Company*, May, pp.47–50.

Wallace, A. (2010) 'Putting customers in charge of design', *New York Times*, 15 May.

Zhao, Y., Feng, T. and Shi, H. (2018) 'External involvement and green product innovation: the moderating role of environmental uncertainty', *Business Strategy and the Environment*, Vol. 27, No. 8, pp.1167–1180.