How Companies Can Modify R&D for Integrating Social Media Activities into the New Products Development

Darius Pacauskas  
*Aalto School of Business, Finland*, darius.pacauskas@aalto.fi

Pradeep Durgam  
*Aalto School of Business, Finland*, Pradeep.durgam@aalto.fi

Vladislav V. Fomin  
*Vytautas Magnus University, Lithuania*, v.fomin@if.vdu.lt

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Darius Pacauskas
Aalto School of Business, Finland
Darius.pacauskas@aalto.fi

Pradeep Durgam
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Pradeep.durgam@aalto.fi

Vladislav V. Fomin
Vytautas Magnus University, Lithuania
V.fomin@if.vdu.lt

Abstract
Through past decade open innovation achieved enormous amount of attention from scholars and practitioners as well. We took one part of open innovation – customer innovation through social media, and looked into companies’ practices to more efficiently integrate information from social media into New Product Development (NPD). We used mechanism of coordination method to explore how moving from traditional product development to open one, affects changes in R&D. We found three types of changes, that affects product development related processes, and four important factors to which companies are paying attention while integrating social media into NPD process: (1) frequent interaction with customers, (2) open information flow, (3) building a unit for coordinating activities, and (4) dividing R&D into units for tackling with ideation, concept development, and actual product building separately.

Keywords: Social media, R&D, New Product Development, co-creation, open innovation

1 Introduction
For a long time vertical integrated model of R&D was the most commonly used model for developing the products. Products and services were developed inside the company, and customers were treated as passive users. But with the emergence of open innovation phenomenon, which describes usage of inflow and outflow knowledge to accelerate innovation (Chesbrough et al., 2006), customers started to be included into new product development process (NPD), and treated as value co-creators with the company.

In the past decade open innovation became a hot topic among management scholars. Vrande et al., (2010) presented different areas of open innovation research, which include open innovation in SMEs, open innovation and competition patterns the role of individuals in open innovation the relationship between open innovation and
entrepreneurship in determining the innovation performance, and how firms can profit from large-scale form of open innovation.

One part of open innovation area is customer innovation. Even that this phenomenon, which is called co-creation, is known for more than 15 years, companies only recently started to adopt co-creation procedures widely in new product development (NPD) process. With advent of social media platforms, like Facebook, Twitter, blogs, or virtual forums, companies got an opportunity to reach their customer in online environment, aiming at increasing a pace of the product development through this form of customers collaboration.

By the virtue of collaboration with customers, the open innovation approach can be considered as an antithesis to the traditional, vertical integrated model of R&D where products are developed internally (Schroll & Mild, 2011). Thus, with the increased usage of open innovation activities, some scholars even went as far as to question the role of the internal R&D (Schroll & Mild, 2011).

Even that open innovation and co-creation attracted lot of attention from the scholars, however it’s not yet clear how R&D is adjusted to deal with open innovation, and especially with customer innovation. This leads us to the research question:

How companies are adjusting their internal NPD activities in order to handle collaboration with their customers through social media?

- How R&D department structure is affected?
- What new processes are integrated within NPD process?

To tackle these questions we adopted mechanism of coordination method to focus on and explain the structural changes in R&D department processes. This research is based on qualitative data collected through interviews with product developers, managers and social media experts from different market leading companies in India.

2 Literature Review

The nature of global economic growth has been changed by the speed of innovation, which has been made possible by rapidly evolving technology, shorter product lifecycles and a higher rate of new product development. The complexity of innovation has been increased by growth in the amount of knowledge available to organizations (Plessis, 2007). Despite the role of knowledge as a key component for continuous innovation, the practice of dedicated knowledge management to support innovation has not yet become universally established in all companies (Chapman & Magnusson, 2006), due to the difficulty of integrating knowledge management process into the innovation process (Xu, Houssin, Caillaud, & Gardoni, 2010). Open innovation requires even more sophisticated approach to knowledge management, as knowledge can come from different sources including customers, government, third parties, or even competitors.

Despite the growing interest in open innovation there are still many unanswered questions. One of the most pressing for academics and practitioners alike relates to how open innovation can be implemented (Gassmann, 2006; Mortara & Minshall, 2011).

Some studies already tackled open innovation implementation inside of organization issue from different perspectives. Herzog & Leker (2010) looked into organizational culture and distinguished that there are different innovation cultures needed for closed and open innovation. Kuschel (2008) investigated ecosystem of company’s products and found information infrastructure’s importance in contextualizing the ecosystem and thus supporting open innovation. Wincent et al., (2009) researched how the boards should be organized to help improve the innovative status of network participants. Bergman et al., (2009) introduced group decision support systems as complementary to development process and support knowledge creation in Open innovation.
Although the aforementioned studies addressed a number of important issues, unanswered questions remain with regard to implementation of open innovation activities into companies. Chesbrough & Appleyard (2007) argue that the biggest challenge firms are facing is getting over the determinants of traditional business strategy. They need to embrace strategic approaches that address both the inside in and the outside out processes of open innovation (Giannopoulou et al., 2010). Hence, open innovation requires a different mindset and the need for a more expanded set of capabilities within companies (Vrande et al., 2010). More empirical research is needed on strategy, organizational culture and structure, and human factors in order to effectively execute open innovation (Vrande et al., 2010).

In order to tackle this gap, and to answer our research question we address one aspect of open innovation – customers innovation taking place in social media – and look into organizational changes, and especially changes in R&D department, which happen after integrating social media into the innovation process.

2.1 Social media

The term social media denotes highly interactive platforms via which individuals and communities share, co-create, discuss, and modify user-generated content (Piller et al., 2012). Examples of social media include social networks like Facebook and Twitter, various blogs, and virtual forums. The companies in social media platforms track individuals’ shared ideas for the new products, problems with existing ones, or just asking for customers’ feedback.

Approaches to harvesting the product-related knowledge form social media can also be more sophisticated than a simple gathering of customers’ feedback. E.g., customers can be equipped with design tools and be asked to implement their ideas. In any case, for successful collaboration with customers, (social media and/or design tools’) users have to be motivated, data gathered from the users needs to be managed, social media platforms have to be tracked. All of these activities require special approaches within R&D department, and might require special changes within its structure. In other words, if managers decide to adopt a certain “open” strategy, they need to establish the necessary organizational structures and processes and develop the relevant capabilities that will help in the pursuance of this strategy (Giannopoulou et al., 2010).

Companies typically set up separate functions, teams or individual roles specifically for the ‘inside-out’ process (Mortara & Minshall, 2011). Martinez & Jarillo (1989) found that the mechanisms of coordination used by multinational organizations vary from the most ‘formal and structural’ to the most ‘informal and subtle’ ones.

In order to understand structural changes in an R&D department, which is using knowledge acquired from social media, we will look into R&D through mechanism of coordination lenses.

2.2 Mechanisms of Coordination

A mechanism of coordination is any administrative method for achieving integration among different units within an organization (Martinez & Jarillo, 1989). Mechanism of coordination is needed as any organization has different (administrative/functional) units, running of which requires some sort of coordination effort across them (Martinez & Jarillo, 1989).

There are 8 mechanisms of coordination divided into two groups – structural or formal, and more informal, namely: (1) departmentalization, (2) centralization, (3) formalization, (4) planning, and (5) output control belongs to the first group, while (6) cross-departmental relations, (7) informal communication, and (8) socialization belong to the second group (Martinez & Jarillo, 1989).
3 Methodology

As our research questions seek to explain rather than to confirm the phenomena, we chose qualitative exploratory research methodology, namely multiple case study, to conduct this research. This is in line with other studies on open innovation (Vrande et al., 2010).

Semi-structured questionnaire was prepared with the questions related to social media usage and changes in product development within the companies. In order to draw more insights, various social media experts, product development experts, and several different companies’ representatives were interviewed. Social media experts were chosen to capture main patterns that are happening in the market. Product development specialists – capture product development specific companies activities. Most of the companies were service providers and were chosen to capture service development related view with regards to social media. All participants were, or working with firms, that are one of the market leaders in India in particular area, and are using social media activities.

Overall ten people were interviewed. 6 of them were from 5 different social media consultancy organizations, 2 of them were from different insurance companies, and another 2 were product design specialist, one working as a freelancer for different kitchenware projects, and another working in one organization. Please look in Table 1 for detailed description.

<table>
<thead>
<tr>
<th>Position</th>
<th>Organization</th>
<th>Type of business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior social media consultant</td>
<td>“Social world”*</td>
<td>Social media consultancy</td>
</tr>
<tr>
<td>Social media consultant</td>
<td>“Social world”*</td>
<td>Social media consultancy</td>
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<tr>
<td>Social Media manager</td>
<td>“Media for all”*</td>
<td>Social media consultancy</td>
</tr>
<tr>
<td>Social Media technical and</td>
<td>“Breakthrough”*</td>
<td>Social media consultancy,</td>
</tr>
<tr>
<td>functional consultant</td>
<td></td>
<td>and tool development</td>
</tr>
<tr>
<td>Social media expert</td>
<td>“Other side”*</td>
<td>Social media consultancy</td>
</tr>
<tr>
<td>Social Media Expert</td>
<td>“We know the answers”*</td>
<td>Social media consultancy</td>
</tr>
<tr>
<td>Product designer</td>
<td>Freelancer</td>
<td>Kitchenware products</td>
</tr>
<tr>
<td>Product designer</td>
<td>“Groundbreaking house”*</td>
<td>Home appliances</td>
</tr>
<tr>
<td>Regional area manager</td>
<td>“Safe”*</td>
<td>Non-life Insurance</td>
</tr>
<tr>
<td>Insurance product manager</td>
<td>“Security for you”*</td>
<td>Health and Life insurance</td>
</tr>
</tbody>
</table>

Table 1: Interviewees

*Organization names are changed

Social media experts revealed their observation regarding various companies that showed successful cases for using social media in NDP process. Both product design specialists, and one insurance service based company have implemented social media processes in the organization as well. While another, insurance service based company, planned activities with the customers through social media in the near future, and started to implement changes in order to handle more efficiently the co-creation process. All participants express willingness not to publicly reveal their organizations identity, thus all companies names are changed, however are known to the authors.

Interviews took on average half an hour. All interviews were recorded, transcribed, and coded. As the analysis method we used theory driven qualitative content analysis. Qualitative content analysis is suitable for the purpose of classifying large amount of text into an efficient number of categories that represent similar meanings (Weber, 1990). Existing theory is helping to determine the initial coding scheme (Hsieh & Shannon, 2005), which we build on coordination mechanisms. Coordination
mechanisms were taken into account for understanding the changes in R&D structure and processes related to NPD. Transcripts were briefly read, afterwards reviewed carefully highlighting parts related to changes in NPD related processes, and lastly highlighted text was coded with predetermined categories.

There were three mechanisms found – (1) departmentalization, (2) centralization, and (3) cross-departmental relations (see table 2 for examples).

During the next step interviews were analyzed with regards to the found mechanisms values, in other words, how exactly it happens. In the data labeled as pertaining to departmentalization category structural changes were analyzed. In the data labeled centralization - departments layout involved in social media was analyzed. In the data labeled cross-department relations - information flow within departments was analyzed.

<table>
<thead>
<tr>
<th>Type</th>
<th>Departmentalization</th>
<th>Centralization</th>
<th>Cross-department relations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quotes</td>
<td>“it fits under NPD as part of at very beginning stage for collecting insights.”</td>
<td>“it is controlled by one team, like a corporate marketing or corporate communication”</td>
<td>“There has to be free flow of information between each department”</td>
</tr>
</tbody>
</table>

Table 2: Initial coding categories and examples

4 Results
In this section we examine the role of social media in the company’s NPD in general, and R&D restructuring in. We start by explaining why social media became an important part in product development, then – how social media affected departmentalization, centralization, cross-department relations, and lastly we explore the reasons preventing companies from integration of social media into their NPD and/or R&D processes.

4.1 Reasons for social media starting to play an important role
Collaboration with the customers through social media didn’t come unnoticed. There was a huge need for that. Traditional market research methods were not able to represent target market. Moreover, customers’ presence online made a possibility for creating communication tools, and starting to interact with them.

“There are two angles to it. Number one decision made in a cycle, and it became much faster in a social world. 10 years before I hardly used to share 10 things in a week, as the only thing I could do to go to telephone boot and call someone, but now as I have device and plenty of different application that facilitate communication I am sharing maybe 22 updates per day. Number second is question of complete authenticity of traditional companies brand. Traditional marketing research it is done in a very small data sample. How 1.1 billion people could be represented by lets say 7000 people? Now Facebook can give me data of 91 million people in India. You can listen to that real time and you can get 20000 feedbacks everyday” – “Breakthrough” consultant

The idea for the new products needs to come first. In many cases the idea, whether its radical or incremental innovation comes from the unsatisfied market needs, in the form of complaints, suggestions, or already prepared concepts.

“The need for the new product comes from some kind of market feedback. It’s not that we sit in office and think up something.” – “Safe” manager

Online communities created by social media users’, and their willingness to give feedback by itself increased companies’ participation in social media activities. Communication with the customers through social media platforms didn’t stop after the
first stage – getting the idea. Companies interact whenever they have possibility to reach customers for their feedback.

“You take different sketches and you upload to different design websites. There are users’ design specific websites like “behance”, also specific to India there is forum called “design in India”. Getting comments, getting feedback from consumers. And “Design community in India” is a very closely related community, you can get insights or you can get feedback, form that site. So that is the first intervention in social media, during the concept generation. After concept is generated then again you are going for online interaction. After marketing and sales approves concept, then we build the CAD, and then we build something we just call the product renders. When these renders are done they circulate through internal regional managers, and then regional managers circulate feedbacks to us. After this we also do survey of colors. Our products are distributed all over the India, so we developed India specific colors.” – freelance product designer

When time to market is crucial, as for technology products, concept is going straight to the sales, however the interaction with the customers is not terminated at this stage. Customers are used as testers and through achieved feedback from them companies improve products to fully functioning solutions.

“We follow AGILE model of product development. We quickly build something and putting online. And we keep on doing alpha testing, beta testing, everything while it is still online. We start selling and we keep making it better. And that is how most of the technology products are today built. Marketing pace is so fast, you can never make it good enough to go.” – “Breakthrough” consultant

4.3 Changes in NPD related activities
Centralization

For dealing with activities related to social media either a new organizational unit is created or already established unit becomes responsible for such activities.

“Mostly it’s lead by one team. In some cases there is a corporate marketing team, which collects that information and passes to the brand team and customer service and all those teams. In some cases there is social media team and there are also some companies coming up with chief social media officer. But the best model what we have seen is, that there is one central social media team, which has different people working for the different departments, and which is loosely connected to all these departments. It can be that some departments do not have a representative for social media, but department is connected to the social media team. Social media team act as a moderator.” – “Breakthrough” consultant

Maturity of the brand plays important role in deciding social media team’s structure, if the team is gathered from external media experts. Size of the company and the knowledge accumulated through the years affect the type of interaction. Bigger companies, have more rigid structure, where departments have clear responsibilities.

“Which departments will interact with social media agency depends on maturity of the brand. If it is not a mature brand there would be entire chain, and all departments involved. A slightly more mature brand - the marketing team will be talking to this social media agency. Even more matured brand – PR team and the marketing team will be talking to. The most mature brand will create their own agency, develop tools, and will have the interaction with all of the departments.” – “Media for all” manager

Cross-department relations

The more structured organization, the more time is needed to have a decision and take some actions. However, in a more competitive environment with fast product development cycles, time is crucial resource.
“If its very flexible organization then almost every department will be involved on some extent in social media. If it is very structured organization with the closed doors, then the one department, information will flow from one to another. That also involves lot of time. If the department is very closely related, all the piece of information customer support interaction, all that data is used and analyzed, conclusions drawn and then it is passed to other departments. There has to be free flow of information between each department, and that there is no redundancy. The more departments there are connected to social media, the stronger the online space becomes, and there should be information flow among all of them” – “Other side” expert

Experts for social media that are employed within different departments form “social team” which ensures knowledge flow among social media team and particular department.

“Each department has a social media champion who is a part of this team and managing social media project. So this is the guy who takes initiatives and talks about them in the team. This guy is involved in social media activities, but works within some other department.” – “Media for all” manager

Whole company becomes more open, user centric and willing to share the information.

“Senior management also brings lot of insights into the product, for example international flavors. My CEO travels a lot, as he has family based all over the world. What happens, is that e.g. when new mixer was launched, CEO sent a link to look up, and after he commented that this kind of things need to be incorporated. This entire interaction happens on a Facebook page. I am able to see, and marketing guys as well.” – freelance product designer

**Departmentalization**

The ideas for the product design and/or features are coming from the market but not R&D department itself, in which afterwards the idea is converted to concept and product is developed. Due to this companies are trying to separate departments into units in such a way, that there are units researching the market and developing the product idea, and different units developing the real product based on the generated idea.

“Part of the ideation happens first. Then till recently we had the technical departments, which used to design the product. Now, we have separate R&D. One department will design the product, and then refer to the particular technical departments. The technical department will develop the actual product, because they have already the technical knowledge, legacy knowledge, which cuts a lot of time. Then you can start your publicity, tell the market about this new product you’ve got and start selling it.” – “Safe” manager

One more unit for tracking customers’ satisfaction with co-creation procedure is becoming important part in product development.

"There should be one more very important tool for identifying the grievances. There are clients who satisfied with your explanation, but the grievance might not get over. They felt that could be one in a particular manner. For example we have a policy conditions that state what are the limits for compensation available for a particular instance – disease. A customer will understand that this is all he is going to get because he signed the policy, but he might be not happy with it. He may have a grievance still, he may publish it through the social media and social media will also probably generate a discussion on this issue. The complaint is not over, the file is not closed at that point of time.” – “Safe” manager

**4.3 Issues preventing from usage of social media more frequently**
There are also concerns, which don’t allow to fully rely on social media when developing the product. One of them is intellectual property.

“Intellectual property is getting leaked out which is one of the reasons, why no conception is circulated very frequently. But we can generate the ideas and concepts a little bit differently. We can make idea, get a feedback about kitchen equipment, without its body embedded completely inside in the kitchen platform. You form a concept very rough from rough sketched and you put it on the web, and then you get a feedback after.” – freelance product designer

Some types of products need to be observed in reality, in order to receive proper feedback, as material, texture is important parts of product usage.

“We go to the shop, demonstrate our product get the feedback, as consumer likes the product, he wants to touch it, feel it, operate it, see how it works.” – freelance product designer

Target users are not yet online, and observing only consumers that are in social media, might not get right results.

“Our target consumer for kitchen appliances is mostly housewives, and they are not very online proactive.” – freelance product designer

Customers by themselves are not willing to interact in all phases of NPD.

“When the product reaches somewhere the middle of product development that particular for example product, it’s a very niche kind of period when you cannot interact with the consumers. Interaction with consumers in all phases would give us an advantage in making less mistakes in improving the product and making new product that is exactly designed for the consumer” – freelance product designer

Limited resources that company has need to be allocated wisely.

“Before you launch you are no one. You are absolutely no one, no one is talking about you, no one is giving you a feedback or giving you anything. But you can keep close track of competition before you even entering that space. However, you need to take a decision whether you want to spend a lot of time looking at the competition before you launch or just concentrate on building the product, as we have limited resources. But once the product is on the market, you can’t take away your eye from the competition at all.” – “Breakthrough” consultant

5 Discussion and Conclusion

Open innovation and especially co-creation became an important topic both for scholars and for practitioners. More and more companies are trying to implement such paradigm into their processes. However, to this day, no clear practices have emerged on how to efficiently utilize the open innovation in NPD. Due to this reason, we explore various companies’ practices to cope with social media integration into NPD. We focus our research on structural changes of companies’ R&D. We aim at providing insights rather than generalizing to any extent.

After analyzing interviews, outcomes can be generalized to three possible structural changes that affected departments related to NPD after adopting social media.

First one - social media doesn’t cause structural changes. Companies treating social media as additional communication tool reach the customers and collect their grievances. It can be also explained by Willcocks et al. (2013) findings, which relates to the beginning phases of technology adoption, where new technology is used to replace old one, however the processes around the technology in order to capitalize its potential, not changing.

Second change relates to adding one more department, which is responsible for the social media, and coordinating, or distributing information to separate departments
(please see figure 1). Even though collaboration among departments was encouraged, there was still a clear division of responsibilities between different units. However, there were cross-department relations, which were achieved by having combined efforts formed social media unit. Departments were having a representative within a formed unit for managing social media activities. The same representative was coordinating other departments and in this way there was forming the centralization mechanism of coordination. Such integration, in turn, was helping establish information flow within the company, and higher interest to social media related activities.

**Figure 1:** establishment of social media coordinating unit

Third type relates to completely new product or service development, where structure is changing in order to bring ideas from the users (please see figure 2). We found that companies in order to better use resources separated their R&D into more than one unit. Different units are used for each of these activities - gathering market needs, forming concept, and implementing the concept into the real product. Moreover, we found that companies after leaving their traditional product development model and engaging in cooperation with their customers in social media started more frequent interaction with customers through social media. Some of the observed companies are trying to get customers feedback on each product development stage.

**Figure 2:** separation of product development and intense interaction

Additionally in this paper we revealed some barriers to tighter integration of social media in NPD. Schroll & Mild (2011) proved that open innovation complements the existing vertical R&D processes. In this paper we elaborate that the culture of the
customers with regard to the use of social media determines the R&D practices of the firm - specifically, the company's decision to stay away from social media. Moreover, Huizingh (2011) notices that success of open innovation depends on internal and external environment. Internal context characteristics relate to company's demographics and strategies. Demographics were mainly studied with regard to the company size: large versus small. We would like to enrich this discussion with our findings, which reveal that success of innovation can be affected by maturity of the brand, and structure of social media management unit. The less matured brand the less departments interact with social media unit. The flexibility of the organization plays the same role. The more flexible organization the more departments involved in a communication with the social media unit.

Finally, we noticed users behavior related pattern. On general traditional product development has around 5 phases varying from ideation to go to market (Nambisan, 2002). In this study we found that users are willing to participate in the firsts and the lasts stages, however they are now burning with intention to contribute in the middle processes of the product development.

As a practical contribution, we reveal some insights, which can be useful for companies, which are willing to adjust their internal processes to deal with social media more efficiently. We argue that dividing the R&D into separate units for different purposes, where one unit responsible for gathering and evaluating ideas from social media, while another, implementing them in practice, allows the firm to gradually integrate social media into NPD. Moreover, developing a unit responsible for social media, which is communicating with and coordinating different departments with regards to information, which can be harvested from social media, helps foster information flow within the company – a factor that appeared to be important for NPD.

This paper has some limitations, which could be addressed in future research. Firstly, all companies in which interviews were conducted are based in India, and studies of innovation and social media related practices in different countries might produce different insights. Secondly, we addressed only limited amount of products and services, thus future research could look into different industries. Thirdly, we picked the practices of the companies regarding how they are dealing with social media, however there weren’t any measurements to prove that those practices lead to successful NPD strategies through social media, thus future research could develop and test hypothesis.

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