Research Article

Minhazur Rahman, Ummeh Habiba Faria Benteh Rahman*

How Do Norwegian Technology Start-ups Use Open Innovation Strategies to Gain Access to New Business Ideas?

Abstract: Open innovation (OI) strategy includes inter-company processes and activities i.e. networking, management, communication etc. The intention of this paper is to present examples on how open innovation performs within these start-ups. This paper is a descriptive study that discusses how to implement open innovation strategies in order to gain access to new business ideas in Norwegian tech companies. Throughout the study and analysis of appropriate literature, this research aims to deepen the understanding of the initial question and provide direction for further research. This improved understanding of using open innovation strategies will help entrepreneurs, as well as policy makers involved in idea evaluation. This study deals with the OI strategy implementation in small companies and start-ups, both of which are almost untouched fields of study. It contributes recommendations for reality thinking, social media involvement, and planned versus arbitrary strategy. This qualitative research paper forms a case study based on structured interviews with four anonymous Norwegian tech start-ups. Twenty to twenty-five articles about "startups, open innovation and networking" have been selected and analysed for the purpose of this paper. This study outlines a clear method for reviewing the theories of open innovation and networking which are discussed in the objectives. Unlike previous research, this paper will highlight loopholes and common mistakes typically made by start-ups and instead will implement smooth open innovation strategies for their company's benefit. After conducting successful interviews with start-up, the results have been combined with literature reviews and related theories with empirical evidence to support the proposed question. Finally, the findings are categorised in the table below and organised according to interviewee answers.

Keywords: Network Theory Innovation; Closed Versus Open Innovation; Communication Networking; Technology Exploration; Role of Start-Up Networks.

1 Introduction

In an era of digitalisation and modern technology, open innovation is a concept of how newly formed or small enterprises access their innovative ideas beyond their boundaries, by exploiting both inbound and outbound knowledge flows (Chesbrough, 2003). Open innovation is concerned with the wide variety of both "inter and intra" company activities. This strategy helps extend and combine both the internal and external ideas into platforms, architectures and systems which ultimately brings success. Usman & Vanhaverbeke (2017) suggest the need of research on the process of implementing open innovation strategy in start-ups. It's a notion that discusses if a small size firm should use internal open innovation policy, which refers to the acquisition of external technology in open exploration processes. Tech start-ups deal with new technological products and services which will potentially contribute to economic growth in the

*Corresponding author: Ummeh Habiba Faria Benteh Rahman, Norwegian University of Science & Technology, Oslo, Norway, E-mail: rah-manhabiba26@gmail.com
Minhazur Rahman, Norwegian University of Science & Technology, Oslo, Norway

long run. When start-ups launch, they must go through innovation strategies in the same way large and medium size organisations do, in order to secure bright futures. The subject of open innovation is more restricted in start-ups, even if it has been discussed, and the ways of implementing this strategy have been overlooked by previous researchers.

Although research by West (2014) divided the inbound open innovation into three different phases; obtaining, integrating and commercialising functions; there are still some opportunities that remain for new researchers to apply other levels of analysis and to examine unexplored phenomena by offering more accurate measurement.

This paper reports the results from semi structured interviews with four different Norwegian tech start-up companies, all of whom intend to follow the open innovation strategy. With this foundation, this qualitative research investigates how start-ups actively utilise networking in order to capture and evaluate new business ideas. To address this question, a theoretical foundation is provided followed by research design. To conclude, the findings will be presented after analysis of the data and followed by the author's recommendations.

2 Theoretical foundation

2.1 Network Theory Innovation

Networks are more than just relationships that create strong connections between firms and stakeholders. That is why the twenty-first century is known as an era of globalisation where organisations are open to each other and can communicate easily via networking technology (Huggins & Thompson, 2015). In this theory, networks are means which are intended to be shared amongst various stakeholders in an organisation.

In an open innovation process, most firms are involved in networking because they generate ideas for coordination, collaboration and value. These capabilities lead to market and generate rent that is subject to private requisition. It is through an understanding of networks that knowledge encoding coordination, both within and between specialised firms in specific cooperative and competitive structures, that the "missing" sources of value can be found (Kogut, 2000).

Levén et al. (2014) present a framework for management of innovation that focuses on how a hub that acts as a coordinator can improve the outcome by facilitating interactions between the firms and institutions involved. This framework addresses the essential process-structure duality that defines a network's ability to facilitate innovation. In fact, the outcome is as equally dependent on the interactions between independent members of the network, as it is on the network's structure, as detailed below.

2.2 Closed versus Open Innovation

Table 1: Contrasting principles of Closed and Open Innovation (Chesbrough, 2003).

Closed Innovation facts	Open Innovation facts
Smart people in the same field work with us.	Not all smart people work with us. We try to work with smart people inside and outside of the company.
To make a profit from R&D we must discover it and ship it to ourselves.	External R&D can create significant value, internal R&D is needed to claim some portion of that value.
If we discover it ourselves, we will get it to market first.	We don't have to originate the research to profit from it.
The company that gets an innovation to market first will win.	Building a better business model is better than getting to market first.
If we create the most and the best ideas in the industry, we will win.	If we make the best use of internal and external ideas, we will win.
We should control our IP, so that our competitors don't profit from our ideas. IP whenever it advances our own business model.	We should profit from others use of our IP, and we should buy others

2.3 Communication Networking

Historically, organisations used to be formed in places where events would be held by stakeholders because there was not the technology to meet virtually. Today, however, at the dawn of a new decade, communication networking technology makes it possible for people to attend the same event at the same time, anywhere in the world. Distance is no longer an obstacle. Connecting networks for start-ups are rapidly growing in the twenty-first century which is proving to be cost effective.

Now people are generating virtual meetings by using communication and computer technology. This allows companies to work virtually as though they are in the same place at the same time. Communication network patterns use multiple settings called "Network forms". A theoretical paper by Carrol & Burton (2000) based Lewin's Psychological Field Theory identified a number of small groups of communicating networks that formed organisations, including; the circle, wheel, chain and "comcon" (completely connected). The research theorised how the different network forms processed information. These network forms varied in the degree to which they prioritised organisations. One of the best communication networks is known as the star network where the communicator sits in middle and contacts others in the same flow. In circle networks the flow is equal, yet in chain networks "C" is located in the middle and acts as the principal character in order to communicate with stakeholders. The Y network shows the best degree of centralisation. Finally, the ComCon network form has an extreme degree of centralisation that positions this form of communication in a better way than the circle network.

2.4 Technology Exploration

Huizingh (2011) hypothesizes that to inform internal innovation, a company should involve their clients in the process. If customers are not satisfied by the development of certain products or services then they often provide useful feedback. The lean start-up model, which is a popular model used by entrepreneurs, is closely related to this principle. It is important to focus on maintaining connections with external sources i.e. individuals and organisations, and both informal and formal networks because a strong network connection might help to create an alliance or partnership with another company, potentially leading to a useful way of acquiring technological capabilities.

Typically, start-ups have a limited number of resources and often a shortage of funding, making it difficult for them to invest their resources in another start-up. However, these funds can provide access to social, technical and commercial competitive resources by forming effective alliances towards different networks (Baum et al., 2000). To take advantage of external innovation opportunities, companies require licensed IP. There is usually potential for start-ups to have an unused IP license and as such, this could potentially be used to further their growth.

2.5 The Role of Start-Up Networks

Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation and expand the markets for external use of innovation. Open innovation is a paradigm that assumes companies can, and should use external ideas as well as internal ideas, and internal and external paths to market, in order to advance their technology (Chesbrough, 2003, pp. 15).

Open innovation is a broad concept where companies can utilise their resources both internally and externally. Before advancements in technology most large organisations were strict with closed innovation processes, however as technologies have changed the whole world is accessible to the business industry. Companies are approaching stakeholders with their ideas and getting feedback from them for future developments. For startups, as well as other companies involved in innovation process, it is important to understand how the structure and processes of the networks affect the outcomes.

3 Methodology

For the purpose of this research, tech start-ups in Norway have been selected for analysis. A systematic review has been undertaken according to the guidelines suggested by Tranfield, et al. (2003):

– Building scope of the study;
– Identification of research;
– Discussion of the literatures;
– Study quality assessment;
– Data monitoring.

This paper focuses on specific keywords and analyses the responses to the initial research question. Both inclusion and exclusion criteria are also analysed and the following discussions have been supported by literature and studies previously published online. The discussion topics have been collected from different scholarly articles, however many of the publications used for the basis of this research were generic and failed to provide the necessary data. To retrieve the relevant articles, specific keywords were used, i.e. "inbound open innovation", "Norway tech start-ups", "challenges of open innovation", "best practices of innovation strategy" etc. These keywords narrowed down the number of articles that were relevant. As such, articles and journals consulted were then based on open innovation strategies and their implementation within small enterprises and start-ups. From the search results, twenty to twenty-five of the more relevant articles were selected. These articles have been selected because they clarify how best to deal with open innovation in tech start-ups in Norway and the benefits they provide.

Following this initial research, a partially structured questionnaire was created and then presented to four different Norwegian tech start-ups. Due to data protection, the names of the Norwegian tech companies have not disclosed in this research paper.

The interview format began by discussing basic information about innovation process, where interviewees were encouraged to speak freely about their thinking regarding start-ups and evaluating ideas from within their organisations. The researchers continuously questioned the use of the innovation process and the challenges facing it. The primary aim of this interview was to detect ways of overcoming flaws in inbound innovation strategies. The interviewees selected were operation managers due to the nature of their roles looking after the chain of processes within their companies.

4 Analysis and findings

The study was constructive and well organised highlighting the importance of quality over quantity. The findings from the study of four different Norwegian start-ups is displayed in the table below, and shows their use of open innovation strategies and networking.

4.1 Basic Norwegian Start-Up's Information

Company A has a well-built network and connect with their existing and potential future customers primarily through e-mail and telephone calls. In comparison, Company B is an e-commerce based start-up and is far more dependent on their clients. They maintain strong networks with their stakeholders. Company C has a strong R&D sector and maintains marketing communications with their clients globally, whereas Company D actively networks with their stakeholders as well as with the community through events.

4.2 Relevant Questions for Technological Exploration

The table above shows that the participating tech firms have their own R&D activities for sourcing and evaluating ideas. Three out of the four companies are progressively innovative with the exception of Company A, which changed

Table 2: Detailed information on start-ups.

Company	What They Do	Age	Number of Employee
Company A	Digital Marketing, Multimedia Production, Media provider.	1 Year Content	5 Employees (3 full time & 2 Interns)
Company B	E-Commerce & Online product branding platform.	2 Years	15 Employees (10 Full time & 5 Part time)
Company C	IT & Software Solutions for retail service and private organisations.	2 Years	10 Employees (7 Full time & 3 Interns)
Company D	Entertainment Event Management, Software & Media Support Provider.	3 Years	8 Employees (5 full time and 3 freelancers)

its direction in their business since they first began operating. External participants are involved in every company, however, in the case of licensing patents, Company C has applied but the others currently have not. No company has been merged with another company; though all follow outsourcing ideas. Finally, it can be concluded that only Company A has other business involvement. Further analysis and discussion of the research questions is shown below.

4.2.1 How do tech start-ups actively utilise networking in order to capture new business ideas?

The results from the Norwegian tech firms' interviews shows that most of the start-ups hold positive attitudes towards their clients. It is common for start-ups to actively participate in events, workshops and table talks with experts as a way to build strong networks. Requesting constructive feedback from clients is important so that the development team may be able to fulfil their demands. A couple of start-ups feel their clients' demands are complex and there isn't an available option to make the changes and it's challenging to fulfil their requests. On the other hand, some start-ups have divided their clients in different groups in response to the feedback and as such interact with them accordingly. One company connects internationally with their R&D teams and they have implemented a direct dial in order to get feedback instantly.

According to the communication network theory, where previously companies used to connect in a wheel or chain circle, now time has changed, and they prefer to connect as a whole i.e. Completely Connected (com-con). Start-ups connect with international and local experts to source and develop ideas. Licensing IP is also important in creating and maintaining strong networks. Most start-ups have their own website which clearly demonstrates their services so that interested clients may gain a basic understanding of the brand while browsing their webpage. Historically, companies within the same sector used to act like competitors but now start-ups can build up partnership with their individual strength (Sarasvathy, 2001).

According to the interview results, most of the startups stated that due to the small size of the company, every employee is involved in the evaluation process. The consulted literature also states that the involvement of a whole team in the development process is normal for any start-up. Most of the time the CEO or board of directors of the start-ups are actively involved in this process. Team members claim that they follow orders from senior management when evaluating ideas because there is a demand for specific ideas and developers aren't given enough space to work individually. There are experts for future forecasting plans so it is important for the R&D team to make decisions quickly. The majority of start-ups have a limited infrastructure to use for their research and development process as they struggle to gain funding and as such most require a loan from "Innovation Norway".

From the interview results, it is clear that the companies consulted have efficient and dynamic teams who can build strong networks with external sources and as such use open innovation strategy. Most of start-ups are positive about the amount of customer involvement; two startups were satisfied just enough with the strategy, whilst the other two were fairly satisfied.

Table 3: Overview of sourcing and involving ideas.

Types of Questions	Company A	Company B		Company C	Company D
Does your start-up have R&D activities?	Yes	Yes	Yes	Yes	
How innovative is your start-up?	Innovative	Quite Innovative		Fairly Innovative	Very Innovative
Does your start-up ever change direction in business?	Yes	No	No	No	
Is there any external participation?	Yes	Yes	Yes	Yes	
Do you license any patents or IP?	No	Shared licensing IP Applied (Getting by 2020)			Not yet but maybe in future.
Would you consider a company merge or venture into a discussion about it?	No	Not yet	No		No
Do you outsource any of your ideas?	Yes	Yes	Yes		Yes
Do you have any other business involvement?	Yes	No	No		No

5 Discussion

Following the conclusion of a successful interview, it can be stated that Norwegian tech firms always try to improve their networking to expand their connection and source different ideas. Once the ideas have been sourced, entrepreneurs begin evaluating them. Afterwards, they connect with their existing clients and demonstrate their ideas in order to gain further feedback. Clients play a vital role in providing positive feedback which is important for startups. Using open innovation strategy, start-ups sometimes think they manage to source excellent ideas, however this is often not the case. Norwegian start-ups need a clear vision and plan for their businesses before they carefully source ideas. This is how the gap between expected and actual improvements by utilising open innovation strategy can be reduced.

Companies have to be clear about their own capabilities and affordability, so that they can manage to implement those ideas. This is the reason networking is important for every start-up so they can expand their connections, grow from their existing business and look at future developments. In this case study, social media plays a key role for the firms as these platforms aid startups to get closer to their stakeholders and help them to illicit responses about their products or services where they plan to implement these new ideas. All kinds of stakeholders, such as professionals and trade associates, are important for innovative performance and productivity for any entrepreneur.

6 Recommendation

6.1 Reality of Thinking

The findings show Norwegian tech interviewees are positive about the possibility of adopting one or more aspects of networking that they didn't previously use before. They believe that it could be good idea to create more connections for networking. They have visions for their future but currently lack the resources to implement them. Therefore, they require the appropriate research and development opportunities to measure capability, if they have to use the resources available from their existing network connections. Overall, the reality is, companies must prioritise the ways of properly implementing the open innovation system rather than being under prepared. Many firms in Norway have previously faced a loss and new start-ups must learn to adaopt solutions through proper planning and strategizing first.

6.2 Planned versus Arbitrary Strategy

After careful analysis of the findings, it appears that tech start-ups tend to have an arbitrary strategy, whereby they do what they think is right without implementing proper plans. Once they have obtained feedback from their clients, they begin changing and developing their services in response to customer demand i.e. provide on need. Entrepreneurs must know the strengths and weaknesses of their business i.e. need to perform a SWOT analysis before making decisions, either short term or long term. Sarasvathy (2001) suggests that making a clear and concise business plan is essential for new firms before they launch operations. It is often considered important for start-ups to analyse the success rate of well-established tech firms in Norway. This is how they will learn about potential mistakes and adopt a safer path.

6.3 Social Media Involvement

Norwegian tech start-ups disclosed that networking is important to them where they connect with stakeholders. Social media platforms i.e. Facebook, Instagram or Twitter are easy to approach potential stakeholders in the global era. Even though most of the start-ups haven't got the resources to obtain their own IP licences or to invest in R&D, they can use social media to build networks with potential clients and stakeholders. Start-ups should follow in the footsteps of other firms and use social media to engage with existing and future clients, as well as increasing their market growth and visibility. People are notoriously open with their opinions on social media, and the feedback they provide on potential services and products is crucial to a company in order for it to develop further.

7 Limitation

The theories highlighted in the review of the literature, including open innovation theory and networking theory are primarily focused on large organisations and it can be concluded that this research is often irrelevant and unhelpful for start-ups. As research was undertaken for this qualitative research paper, it soon became apparent that there was a lack of research work for start-ups. However, if there had been research and articles previously written about start-ups, it was not clearly outlined how these companies could successfully implement the open innovation strategy.

This study chose to focus on start-ups located in a relatively small geographical area like Norway, however there would be differences between start-ups in Norway and in other countries because the financial situation and networking facilities differ depending on the country. The demand for these strategies will not always be the same in the Norwegian market; it is constantly evolving and changing, therefore the findings will not always be relevant and will require regular analysis and updates.

8 Further study

This research has discovered that there are some differences in the openness of start-ups. In future study, it will be an area of interest to analyse these differences and the extended factors of start-ups based on their use of networking, especially for those companies that have already succeeded and gained substantial revenue. Another interesting study of work would be the arbitrary strategy. Many start-ups have small operations teams but it would be interesting to study the structure of their planning strategy.

The study could focus on creating a clear hierarchy for the future of their operation should they want to expand in the market and make considerable growth. Through further study future researchers could discuss whether start-ups need to, or require the expansion of specific departments rather than the entire company in order to successfully continue running their operations.

9 Conclusion

Generally, open innovation strategy research has a tendency to focus on large companies and has been neglected in the research of small sized businesses for decades. Now, start-up companies are more digitalised than they were previously and to successfully complete these transformations from start-up to sustainable companies, open innovation plays a significant role. Therefore, practises for open innovation in start-ups needs to be considered and the purpose of this study was to focus on that issue. The research paper shows the proper implementation of open innovation strategy in the Norwegian tech start-ups. It focused on implementing the open innovation strategy in start-ups by collecting and evaluating ideas drawn on analysis from face-to-face interviews with four different start-ups in Norway. The business market is very risky for the adaptation of start-up companies and in order to overcome the challenges they face, open innovation is significant.

While conducting the interviews, most of the entrepreneurs mentioned the value of open innovation and its proper implementation in their own start-ups. This both important to the growth of the company and to helping it sustain its long-term goals within the market. Open innovation in start-ups helps chain the networking system i.e. ecosystems that the media of the communication depends upon. This research has shown that it is also important to the value chain as well. Open innovation is not appropriate in all cases and has been rejected by declaring 'failure'. Overall however, the process of the system is beneficial for start-ups using their own resources and capability.

Throughout the collection of data in this study, it can be concluded that the entrepreneurs found open innovation to match with their own strategies, aligning well with literature analysed as well. This shows the success of the research idea. The research strongly proves that start-ups are well versed in obtaining the benefits in the open innovation markets through networking.

Collaborating with all kind of stakeholders i.e. both internal and external, organisations can overcome their deficiency in certain areas. This study discusses several implications; firstly, it provides evidence that firms can perform well in open innovation market places by creating value. Secondly, the networking of the enterprises along with the stakeholders, create effective mechanisms where the most significant resources and ideas are interchanged or shared. Finally, the results of the activities of start-up companies was satisfying and claimed to be sustainable in the marketplace in the long term. In future, research must focus on the continuous adoption of the demand of start-ups within the market place and make use of suitable platforms for further technologies in the field of open innovation and networking.

References

Chesbrough, H. (2003). *Open innovation: the new imperative for Creating and profiting from Technology*. Cambridge, MA: Harvard Business School Press.

Carroll, T., Burton, R. M. (2000) Organizations and Complexity: Searching for the Edge of Chaos. *Computational & Mathematical Organization Theory 6*, 319–337. https://doi. org/10.1023/A:1009633728444

Huggins, R., & Thompson, P. (2015). Entrepreneurship, innovation and regional growth: a network theory. *Small Business Economics*, *45*(1), 103–128. https://doi.org/10.1007/s11187-015-9643-3

Huizingh, E. K. R. E. (2011). Open innovation: State of the art and future perspectives. *Technovation*, *31*(1), 2–9. https://doi. org/10.1016/j. technovation.2010.10.002

Kogut,B . (2000). The network as knowledge: generative rules and the emergence of structure. *Strategic Management Journal*, 21(3), 405–425 https://doi.org/10.1002/(SICI)1097-0266(200003)21:3<405::AID-SMJ103>3.0.CO;2-5

Levén, P., Holmström, J., & Mathiassen, L. (2014). Managing research and innovation networks: Evidence from a government sponsored cross-industry program. *Research Policy*, *43*(1), 156–168. https://doi.org/10.1016/j. respol.2013.08.004

Sarasvathy, S. D. (2001), *What Makes Entrepreneurs Entrepreneurial?*. Darden Case No. UVA-ENT-0065, retrieved from: https://ssrn.com/abstract=909038

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review. *British Journal of Management*, *14*(3), 207–222. https://doi.org/10.1111/14678551.00375

Usman, M., & Vanhaverbeke, W. (2017). How start-ups successfully organize and manage open innovation with large companies. *European Journal of Innovation Management*, *20*(1), 171–186. https://doi.org/10.1108/ejim-07-2016-0066

West, R. E. (2014). Communities of innovation: Individual, group, and organizational characteristics leading to greater potential for innovation. *TechTrends*, *58*(5), 53–61. https:// doi.org/10.1007/s11528-014-0786-x