Crowdsourcing and Risk-Management

a survey based approach

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Abstract

The business world has become globally competitive. Innovation is less frequently undertaken in-house, in a closed and integrated way but transformed more into an open call where many actors are involved in the different steps of the innovation process. It is therefore, imperative for organizations to gain competitive advantage by adopting new technologies to apply in company operations. Crowdsourcing Innovation encourages companies in their effort to re-evaluate as well as re-design business processes and diversify a greater task to a heterogeneous group of people for a common goal. The principal objective of this thesis is to identify crowdsourced innovation models and examine the usage in a business context in order to evaluate and establish methods of managing crowdsourcing innovation risks in organizations. The increased potential of crowdsourcing as a tool for business development and innovation has prompted extensive research into this crucial field by academia. This thesis is an added endeavour to crowdsourcing investigative studies and makes a significant contribution to literature as well as commercial practice.

In an effort to outline the research objectives, the research questions seek to provide an understanding of the risks associated with crowdsourcing, the potential of the concept to improve business practices and possible strategies that can be used to manage the identified risks. An initial investigation of the extant literature traced the growth and development of crowdsourcing since its inception and revealed that the concept is marred with criticism and controversy such as economic constraints, social ramifications and ethical implications. An additional objective of the literature review was to critically scrutinise the assessment of crowdsourcing to enrich companies with near infinite problem

solving capacities, its ability to pay for solutions, not failures and most importantly, to solve problems possibly faster and with reduced cost of operations. To enable the development of a conceptual risk-framework the thesis gives a detailed analysis of risk management, while defining fundamental aspects of risk regulations.

The study encompassed a qualitative collective survey methodology, which was applied in form of a prepared online questionnaire template to a systematic random sample. A qualitative study with 151 globally sampled industry experts and customers of leading intermediary crowdsourcing platforms has been conducted over an eight-month period. In addition, one-to-one structured formal interviews have been recorded. The selection of participants has been defined by a systematic random sample. The analysis of the aggregated data revealed that the disruptive nature of innovation through crowdsourcing effects every department within an organization. This finding contributes to practice showing that crowdsourcing was particularly not only prevalent within Research and Development and Marketing and Sales, but also involved Human Resources, Logistics and Accounting among others. Even though the overall perception in favour for the opportunities to excel innovation was high, possible risks for adoption were identified. The thesis contributes to academic knowledge and practice by identifying those risks - especially turbulence risk as the most prominent source of risk, followed by organizational, societal risk and financial risk among others. In an attempt to provide a deeper comprehension of the applicability of crowdsourcing the study delivered potential strategic solutions to the risks identified.

The thesis provides a conclusion, which analyses the perceptions held about crowdsourcing by diverse stakeholders such as its immense contribution to sharing of business ideas, collecting business capital and involving customers to drive innovation.

Finally, the dissertation findings form a platform for a proposal of recommendations to identify limitations of crowdsourcing, which include effective risk management through ensuring anonymity of an organisations data, and restriction of access to sensitive materials, among other security measures. This exploratory research seeks to provide a multidisciplinary path for future academic research. From the viewpoint of practical use for managerial decision guidance the study provides new and valuable information on how the crowdsourcing concept advances business practices and how possible risks and restrictions can be managed. These findings are to encourage as a guide in recommending where future researchers could focus or advance the field of study.

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Certificate of Research

This is to certify that, except where specific reference is made, the work described in this thesis is the result of the candidate. Neither this thesis, nor any part of it, has been presented, or is currently submitted, in candidature for any degree at any other University.

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LIST OF ABBREVIATIONS

CIA	Crowdsourcing Incentives Activities
HR	Human Resources
HRM	Human Resources Management
ICT	Information and Communication Technology
ICC	Intraclass Correlation
IP	Intellectual Property
IPR	Intellectual Property Rights
IT	Information Technology
NDA	Non Disclosure Agreement
PC	Personal Computer
RBS	Risk Breakdown Structure
R&D	Research and Development
SLA	Service Level Agreement
SME	Small Medium Enterprise
USP	Unique Selling Preposition

1. Introduction

1.1. Research question

In the world of business and technology, the practice of crowdsourcing has become a valuable commercial tool for product development, idea generation and trouble-shooting (Howe 2008; Saxton et al. 2013). This research seeks to validate its use as a tool in a business context, while developing a risk framework addressing all organisational functions. In the United States of America and the European Union, policy makers have taken steps to include crowdsourcing as part of their decision-making processes (Hoover 2009). A recent competition held by software testers used crowdsourcing to successfully identify and isolate 600 flaws in popular search engines, such as Google, Bing, and Yahoo (Flinders 2009). Exploration on Mars has also been facilitated with crowdsourcing. NASA, with the assistance of Microsoft, uses crowdsourcing to help sort through the lengthy data analysis process of counting craters and matching high to low-resolution photos (Viotti et al. 2012). Although crowdsourcing is a relatively new phenomenon, organizations increasingly recognize its capability and potential deployment (Andriole 2010). This is perhaps due to the assertion that crowdsourcing saves both time and money by using the skills of a large, voluntary workforce to solve problems and to expedite research (Flinders 2009; Viotti et al. 2012).

In this thesis, innovations in crowdsourcing will be examined in order to determine its contribution to business settings and to analyse the risks involved. As Nolan observes, "*innovation is simply group intelligence having fun*" (cited in Libert and Spector 2007: 20). While a playful attitude towards crowdsourcing may be important, it is equally important to

assess its use and risks within the business context. Short product life cycles, high product failure rates, and the increasing heterogeneity of consumer needs have recently put considerable pressure on innovative activities (Motzek 2007).

As innovation projects grow and develop over time, the risks of managing the participating crowd have an impact. Goldman and Gabriel (2005: 174) expressed the risks to project managers in crowdsourcing projects, stating: "*project leaders and other managers advance by taking responsibility for a tough project and then deliver. But to some this can appear hard to do when control is relinquished to others*".

This dissertation will consider the risks and limitations associated with crowdsourcing, including the issue of trust and reliability. The aim of this research is to illuminate the possibility of mitigating risks associated with crowdsourcing innovation. The objective is to provide an answer to the question 'How to manage risks of crowdsourcing innovation in companies?'

The research will begin by tracing the development and growth of crowdsourcing practices. It will also provide a context for the use and application of risk management in a business context. Finally, it will consider the link between the two. This analysis will form the basis for the research conducted. Although there is a growing awareness amongst practitioners and academics alike regarding the relationship between these two areas, existing research has not caught up with current practices.

1.2. Background

Crowdsourcing is a relatively new phenomenon. It traces its roots in both technological developments, as well as with the growth of the Internet and the ubiquity of smart mobile devices (Howe 2006b). Howe (2006b:1) first utilised the term in the June 2006 issue of *Wired* magazine:

> *"Technological advances in everything from product design software to digital video cameras are breaking down the cost barriers that once separated amateurs from professionals. Hobbyists, part-timers, and dabblers suddenly have a market for their efforts, as smart companies in industries as disparate as pharmaceuticals and television discover ways to tap the latent talent of the crowd. The labour isn't always free, but it costs a lot less than paying traditional employees. It's not outsourcing; it's crowdsourcing."*

The above excerpt is an important one as it shows the main differences between "outsourcing" and "crowdsourcing."

While both, outsourcing and crowdsourcing are products of the current technological phase (Levinson 1998), crowdsourcing, unlike outsourcing, has a much broader application. It is apparent that crowdsourcing would not be possible without the Internet and the rise of mobile computing (Surowiecki 2004). The World Wide Web 2.0 plays a crucial role in supporting this function. Affordable and easy access to the Internet and its attendant technology means that organizations can reach more people than ever before. Just as one can market to millions with a click of a mouse, one can also potentially reach millions of experts, or at least

knowledgeable enthusiasts, in precisely the same way. As Howe (2009) points out, crowdsourcing enables businesses to collaborate with countless people in a relatively straightforward and cost-effective way. Oxford University adopted a crowdsourcing approach to its Galaxy Zoo project (Eaton 2009). In this approach, the public was able to provide input for a project to map the galaxy. As a result, the University was able to complete the task in four months, rather than the two years it would have taken, relying on internal staff and resources. Defining crowdsourcing as a new internet-enabled business model to harness the creative power of several individuals, Howe (2006b:5) offers the following definition:

> *"Crowdsourcing represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in form of an open call. This can take the form of peer-production (when a job is performed collaboratively), but is also often undertaken by sole individuals. The crucial prerequisite is the use of the open call format and the large network of potential labourers."*

Although Wikipedia (Wikipedia.org, 2012) is not considered a reputable academic reference, it seems particularly appropriate to use it in this instance because Wikipedia is a prime example of crowdsourcing and illustrates both the strengths and weaknesses of this practice. Wikipedia's entries are crowdsourced, which means they are written and edited by people around the world. As a result, some entries reflect original research and genuine insight while others are blatantly plagiarized from other sources. Many entries provide good overviews of specific subjects; however, others reflect either the ignorance or personal prejudice of an author (Antin and Cheshire 2010). In spite of its many flaws, Wikipedia remains a first stop

for many people wishing to learn about a particular subject. While it is generally accepted that information found on Wikipedia is not always accurate, most Web users trust the system of checks and balances to eliminate the worst inaccuracies (Lopes and Carrico 2008). The continued popularity of this website is a testament to both the power and shortcomings of crowdsourcing in a contemporary culture. Wikipedia even tends to be more accurate on dynamic and generally head-to-head with encyclopaedia Britannica (Giles 2005).

Although Howe's (2006b) definition provides a useful starting point, crowdsourcing may be defined in numerous ways. Aside from this, it must be noted that crowdsourcing is a phenomena arising of the globally interconnecting nature of the Internet, not academia. Therefore, one must consider how the term is used in this context. Wikipedia defines the concept as follows:

> *Crowdsourcing is a neologism for the act of taking tasks traditionally performed by an employee or contractor and outsourcing them to a group (crowd) of people or community in the form of an open call. For example, the public may be invited to develop a new technology, carry out a design task (also known as community-based design and distributed participatory design), refine or carry out the steps of an algorithm (Human-based computation), or help capture, systematize or analyse large amounts of data.*

Although it reflects an important shift in culture, the power of crowdsourcing is also limited by the gap in Internet access, since a significant portion of the world population is still not able to access the Internet (Fox 2005). Of those who do have access, many do not have high-speed connections that will enable them to participate in the same way as those with

broadband connections (Fox 2005). Furthermore, providing Web access to the disconnected does not guarantee participation (Winner 2003). Simultaneously, crowdsourcing has come to define our interaction with the world of knowledge. Internet users expect businesses to give them a place to voice their comments and share their views, whether it is an entry in Wiki, a book review on Amazon or a reaction to a new product. The question of whether to regulate crowdsourcing ventures therefore arises (Rossiter 2006).

Several authors trace the roots of crowdsourcing to an open source movement in software (Libert and Spector 2007; Bacon 2009; Howe 2009). Open source is defined as processes involving permission to access the essential elements of a product (such as source code for software) with the aim of encouraging collaboration to improve the product (Perens 2009). It is often linked with software development, though its application need not be limited to this context, but to product development in general. The philosophy behind open source is that providing several individuals access to the design stage and enabling them to develop a product outside of the constraints of traditional intellectual property law, will create an increasingly effective product that is not only developed collaboratively, but also freely available to everyone (Levy 1984; Himanen 2001). Open source grants the rich and the poor alike equal access to information.

In many ways, the open source movement is most effectively defined by its approach, rather than its specific activities (Weber 2005). While corporations such as Microsoft, IBM and Apple are all in the business of producing software; their approach to the process tends to be slightly different than those of the open source movements. Each corporation closely guards its developments and considers details about its applications to be trade secrets. These

corporations create software to be sold and marketed as a product (Dalle et al. 2005). In contrast, the open source movement recognizes that software is a product; however, it does not seek to profit from its development. Instead, it suggests that software is a common need and, as such, its development and use should be available to all who need it (Weber 2005). Linux is one of the best-known exemplars of open source software. Over the years, Linux has been developed and refined by a collection of individuals working collectively on a global basis. These individuals come from a wide range of occupations and backgrounds. Generally, there may be those who are enthusiastic to work from home while others may prefer to work in a laboratory or in a professional environment. The systems they have created are widely acknowledged as being highly effective and efficient (Weber 2005). Judging by the number of Personal Computers (PC) in both the home and office, it is clear that Microsoft has won the marketing war. However, few people would argue that Microsoft created a superior product. Windows and its many variants are known for a wide range of glitches and crashes (Krapp 2011). The open source movement succeeded in achieving more than the creation of more effective operating systems. According to Howe (2009: 8), it:

"*revealed a fundamental truth about humans that had largely gone unnoticed until the connectivity of the Internet brought it into high relief: labour can often be organized more efficiently in the context of community than it can in the context of a corporation*."

Crowdsourcing, Howe (2009) argues, could provide varying structures for compensating contributors. Thus it may be seen as a hybrid that combines the transparent and crowd-harnessing elements of open source into a profitable model for doing business, enabled through the Internet. Howe's observation is an important one for several reasons. Firstly, it

challenges our preconceived notions about work. Many political and social theories have been devoted to the study of work and motivation (Steers et al. 2003). Howe's (2009) observation challenges the basic assumptions of many of these theories, as well as those of corporate employers. While several theorists would agree that motivation is not solely based on wages or compensation, few would have predicted the willingness of people to work for free in these online projects (Herzberg, Mausner and Bloch-Snyderman 1993; Frey and Jegen 2001; Pinder 2008; Lanfranchi, Narcy and Larguem 2010). It is important, however, to consider the nature of these projects.

Secondly, Howe's assertion defines the importance of community in this type of work activity. In the open source project, a variety of specialists, albeit with differing levels of education, accomplishments, and experience, were united by a shared goal, namely the creation of the open source software. These individuals shared a fascination with technical matters and were intrinsically motivated. The challenges of creating software appealed to them on an intellectual as well as a practical level. In addition, there was a sense of community that drove this project. The individuals involved share a genuine desire to create the optimum system and they believe that this could best be achieved through the collaborative efforts of all involved (Postigo 2003: 597).

Thirdly, it highlights the importance of the Web to crowdsourcing. The connectivity of the Internet plays a crucial role in the organization and motivation of the collaborative workforce. It would be physically impossible to gather a workforce of this size and scope without the use of the Web. In a crowdsourced project people from around the world are able to

communicate quickly and work at any time. New ideas are instantly exchanged, and changes or recommendations could be made in real time.

In many respects, crowdsourcing evidenced in early projects such as the open source movement is anathema to corporate culture. While these movements are largely apolitical, the fundamental principles underpinning open sources of information are in direct opposition to a purely commercial framework (Perens 2009). Businesses seek to sell products at a profit while open source movements focus on research and development as well as production. Furthermore, any profits generated are usually devoted to defraying some of the costs involved. Thus, the non-profit nature of the open source movement appears to inspire many individuals to contribute their time and efforts. In addition, the most successful open source projects have elements of both capitalism and communism (Perens 2009). It is a challenge for businesses to provide a framework for crowdsourcing that can promise the same rewards. Working toward a collective goal has much more appeal than working for the benefit of a multinational corporation. Alternatively, there is also a need to acknowledge that active contributors come from many different walks of life, and their motivations differ widely. Therefore, the overall strength of a crowdsourced project results from the diversity of its users and participants rather than their homogeneity. This diversity of interests leads to the generality of the results, the development of useful pathways that might never have been considered, and the continued support of the project when business falters (Perens 2009). The following subsections describe the development of crowdsourcing by identifying examples of both current and early practices. In a next step, the limitations of crowdsourcing will be considered and some of the drawbacks and existing controversies identified. Finally, the

relationship between risk management and crowdsourcing will be outlined to provide a useful context for the discussion and analysis that follow later on in this dissertation.

1.3. Early practice

As outlined in the previous section, crowdsourcing can trace its origin back to collaborative efforts such as the development of the Internet as well as the open source movement. The examples given stressed the collaborative nature of crowdsourcing as well as its tendency to promote the public good over profits. It is important to note, however, that crowdsourcing has been used in a number of commercial settings. In this subsection, early examples of crowdsourcing will be discussed. These examples will be drawn from several sources, including knowledge-based projects such as the Galaxy Zoo initiative, and commercial endeavours such as those that took place with apparel companies, like Threadless.

First launched in 2007, Galaxy Zoo had a simple objective. Users were invited to survey and classify data, making simple determinations. The data consisted of approximately one million images taken by a robotic telescope as part of the Sloan Digital Sky Survey (Source: GalaxyZoon.org). Participants would take a small section and review the images. They looked for galaxies in these images and assigned them to one of two categories: elliptical or spiral. While the task itself was not difficult, the sheer volume of data made its completion by ordinary means overwhelming. Response to the project far exceeded the expectations. Initially it was predicted that the project would take three to four years to complete; however, it was finished ahead of schedule and a second phase was recently launched (Charman-Anderson 2009). The high level of respondents has confirmed the accuracy of the data.

While project coordinators initially anticipated a risk for low participation to the extent that each image would receive a maximum of 10 views, or 'clicks,' the project generated 10 million views in its first month and overall exceeded expectations. Dr Chris Lintott, a researcher overseeing the project noted: you can have confidence, as we can say, *"100% of people think that's a spiral galaxy, so it's really, really spirally"* (Charman-Anderson 2009: 2). The response to this project was overwhelming, and enthusiastic volunteers from all over the world were flocking to the site to vet data.

Wikipedia may be controversial however, it is undeniable, that close to five million people use it every month (Libert and Spector 2007). Based on the traditional format of an encyclopaedia, it is a web-based document that is created and maintained by a community of volunteers and readers. While the number of entries continues to grow daily, at present, it is estimated that there are just over three million entries on a wide range of topics, which includes everything from pop culture to history, and theoretical concepts to political discourses. Wikipedia employs only five people; however, its volunteers number in the hundreds of thousands - if not millions - worldwide (Howe 2009). Due to the anonymity of its volunteers and the ability for any visitor to edit most entries, the reliability of Wikipedia has been brought into question. The site, however, has implemented a number of protocols in order to ensure that its entries are accurate and guarded against vandalism. For example, some entries are closed in order to prevent tampering. The entry for a public figure, such as presidents of countries, is semi-protected in order to prevent additions that might be libellous.

Wikipedia´s founder Jimmy Wales is aware of the risks and limitations of the site and states (Denning et.al. 2005:2):

"Wikipedia contains no formal peer review process for fact-checking, and the editors themselves may not be well-versed in the topics they write about."

To prevent risk, a background editorial process has been established. However, no one guarantees the accuracy or the authenticity of any information provided in it. To date, there is yet no process for subject-matter experts to review the articles. Although it provides processes for the addition of facts into an article by others, it does not ensure that the full range of human knowledge, past and present, is represented. One of the processes used by the system is that anonymous users cannot make changes to an entry, but well-respected users within the community are allowed to do this. The criteria are as follows: a user must have a confirmed account, as well as record of having made edits previously to Wikipedia. In addition, users are able to make feedback about entries. Wikipedia may flag other entries, which are not protected. These flags will indicate that users have raised some questions about the content of the material. The warning may indicate that the information is either not reliable or may be biased. While the user still needs to use his or her discretion, this method does help guard against potential abuse. Critics often accuse Wikipedia of letting down our culture; however, as Howe and others point out, Wikipedia has succeeded where traditional encyclopaedias have failed. Wikipedia lets users cut out the middleman and access the information they want freely (Howe 2009).

Amazon is acknowledged as one of the pioneers in the field of crowdsourced consumer feedback and recommendation (Libert and Spector 2007). While the company revolutionized the face of retail, both on and offline, it has made an important contribution to the practice of crowdsourcing. Amazon's online reviews have become a crucial source of information to

countless users. Nothing demonstrates a product's flaws or failings quicker than several poor reviews on Amazon. Accordingly, a cautious consumer who is looking to purchase a new camera may be dissuaded from purchasing a particular brand or model if they see that ten users have reported the item as being defective. The reviewing process also allows the community to share its experiences and insights. This process is one that appeals to an innate part of our humanity. As Godin (2008: 63) points out in his survey of online reviews:

> *"I don't know about you, but I want in [...] I want to post my own reviews; I want to join this tribe. If they ask me to pitch in, I will. I'm in. Others will scoff and move on, wondering what the obsession is all about. That's what makes it a tribe, of course. There are insiders and outsiders."*

It is clearly apparent that crowdsourcing appeals to an innate desire to belong and share (Kleemann et al. 2008). In a world that is becomingly increasingly fractured and isolated, it is easy to see the appeal of posting online reviews. The retail clerk may not care what one thinks of the product, but there are others who do. One feels kinship with others who face the same problems. If one's view is voted as being helpful, there is a feeling of accomplishment or acceptance. While it is possible that this process can be subverted, it is surprising how astute most users and commentators are at identifying bias.

Amazon's 'Mechanical Turk' is a successful example of the human intelligence test (Ipeirotis, Provost and Wang 2010). With this platform, a certain pay amount is offered to those who successfully complete tasks. Registered users who have logged in can claim tasks and complete jobs (Tapscott and Williams 2006). Casares-Giner et al. (2011) believes that the implementation of web 2.0 technology and the rise of mobile ubiquity through modern smart-

phones have greatly impacted businesses of today. Previously, top managers, or specific research and development departments, were responsible for generating ideas to initiate progress within the business (Cassiman and Veugelers 2002). This hierarchical approach was challenged with the advent of web 2.0 technologies, namely the introduction of social networking sites (van Zyl 2009). These sites led the way to open innovation, replacing the prior 'closed process' approach that had been used in business for a significant duration. This process has changed, giving an up-lift to business practices (Casares-Giner et al. 2011). Kleemann et al. (2008) investigated the phenomena of crowdsourcing and the outsourcing of work to the public over the Internet.

This phenomenon is made possible by technological innovations, but the proof of important change is in the relationships between organizations and their customers. During the initial stages, the customer is the reactive influencing factor. Ultimately, that particular process is under the control of commercial firms. It ends with the negative and positive outcomes of crowdsourcing for the future work of the organization.

In his book-length examination of crowdsourcing, Howe (2009) identifies an early example of the phenomenon in a T-shirt company Threadless (www.threadless.com 2012), which was established by two friends. Their business plan was simple: they liked to wear cool T-shirts, and they knew that there was a market for them. The challenge was to design and promote desirable apparel.

The Internet made this possible. Designers were invited to post their designs on the website, and users were invited to vote on them. The voters were drawn from the community. Designers would enlist their friends and supporters to vote for the products, but the audience

continued to grow exponentially as the reputation of the company grew. Consumers liked what they found on the Threadless website and told their friends. People enjoyed the collaborative process. While consumers always had the choice of voting with their wallets, Threadless offered a real opportunity to provide feedback. As Howe (2009: 6) observes, "*Threadless really isn't in the T-shirt business, what it sells is community*". Threadless was able to identify its target audience and sell to the audience successfully, using the basic principles of crowdsourcing, while turning a steady profit.

Cambrian House, a Canadian-based company, was established in 2006 as a platform for crowdsourcing. While the business model proved ultimately unsuccessful, the company had 50,000 members at its peak (source: CambrianHouse.com). Cambrian House recognized that there was a gap in the market and sought to address it. Their strategy was to provide a clearinghouse for crowdsourcing. Businesses that were unable to conduct crowdsourcing could hire Cambrian House to do the work for them. The business failed, because Cambrian House was unable to sustain sufficiently high levels of input. Many of the ideas generated were either unworkable or poorly conceived. Ultimately, the business did not manage to build an appropriate community. Howe (2009) acknowledges that this failure is not surprising and places it in the context of the "tech and web" boom of the 1990s, where initiatives launched and failed with great regularity. Hence, when an idea is implemented, there are always two possibilities, success or failure. The element of surprise is inevitable.

1.4. Current use

The examples given in the previous section were selected to illustrate the earliest uses of crowdsourcing. While the phenomenon of crowdsourcing is still a new one, it can already be

defined by certain characteristics. The projects initiated by Oxford University reflect the spirit of volunteerism and intellectual curiosity that many crowdsourcing participants possess (Eaton 2009). Threadless and Amazon have set examples and have demonstrated that crowdsourcing can shape and drive commercial ventures. This subsection will focus on the innovative uses of crowdsourcing and how crowdsourcing has shaped the way that individuals approach news and political stories and identify the actual changes that crowdsourcing has made. In addition, new web ventures, including social media, will be examined. Finally, the relationship between Google and crowdsourcing will be considered in order to help to identify emerging trends that are taking place due to crowdsourcing. It will also provide context for the discussion and analysis that follows later in the chapter.

The 2008 US presidential campaign demonstrated not only the power of the Internet, but also the power of crowdsourcing. Voters were able to raise issues and questions through various media platforms, and the immediacy of the web helped to shape issues and politicians' responses. Obama and his administrative team have become innovators, and have used crowdsourcing and new media during and after their political campaign. One example of this is the website Change.gov (2010), which was established during the transitional period between Obama's election and inauguration (Howe 2009). The website allowed visitors to submit questions to the new president. Administered in part by the Google Moderator tool, the "Open for Questions" section gave people the opportunity to raise their concerns and to address their most pressing issues (Schonfeld 2009). The feedback received on a wide range of topics, including healthcare and military reform, continues to impact the President's approach to the issues. In addition developments are currently underway to adopt a

crowdsourcing approach to policy making (Hoover 2009). While administrations have typically sought input from the public through a number of means, technologically-supported crowdsourcing is likely to yield far more meaningful results than traditional methods; i.e. town hall meetings (Herzog 2009). Crowdsourcing has also been adopted as a grassroots democracy movement. For example, in the 2008 election, NPR used Vote Report, which was hosted on Twitter, as a way of reporting on problems around the country. The posts formed an interactive map that identified where there were long lines, broken voting machines, or other problems (Source: www.npr.org/votereport). These reports helped draw attention to problems within the electoral system, which were brought to light during the 2000 election following the "hanging chad" fiasco. It would have been impossible for any news agency, either individually or collectively, to cover every voting station. However, by enlisting reports from users all over the country, it was possible to identify where the problems were. This use of crowdsourcing is invaluable, as it provides transparency in the country's electoral processes. Similar initiatives to Voter Report are being considered around the world (Hoover 2009; Howe 2009). The impact of crowdsourcing has been felt in news media and reporting – also known as citizen journalism, helping to shape the way events are reported (Howe 2009). For instance, breaking events, such as terrorist attacks or natural disasters, are often communicated by eyewitnesses through a variety of mediums, including telecommunications and the Internet. There is a growing tendency amongst newspapers to give their readers an increased scope to submit articles for publication (Howe 2009). While these items may range from first-person accounts to press releases, the focus on the individual is the important change. While newspapers were once dismissive of such contributions, they now recognize their importance (Howe 2009). As Roberts from Guardian´s crowdsourced news desk describes:

"We're constantly trying to tweak the different ways we communicate with readers to make these things work and it has to be said the ones that work best are the focused ones".
(McAthy 2012: 2)

Crowdsourcing not only provides them with access to breaking news and ensures a higher degree of relevancy for readers, but it also helps to provide a more inclusive and representative view. While traditional media reflect the perspective and concerns of a largely homogenous professional class, crowdsourcing allows for different voices to be heard as Shirky (2008: 65) points out:

"The mass amateurization of publishing undoes the limitations inherent in having a small number of traditional press outlets".

In many respects, social media have evolved alongside crowdsourcing as a means of providing a context and format for the generated content. Tapscott and Williams (2008: 47) observe, the current generation differs significantly from previous generations:

"This is the collaboration generation for one main reason: Unlike their parents in the United States who watched a tremendous amount of hours of television per week, these youngsters are growing up interacting".

Moreover, Tapscott and Williams (2008: 47) argue that this generation has a very different set of expectations:

> *Rather than being passive recipients of mass consumer culture, the Net-Generation spend time searching, reading, scrutinizing, authenticating, collaborating, and*

> *organizing (everything from their MP3 files to protest demonstrations). The Internet makes life an on-going collaboration, and this generation loves it. They typically can't imagine a life where citizens didn't have the tools to constantly think critically, exchange views, challenge, authenticate, verify or debunk. While their parents were passive consumers of media, youth today are active creators of media content and hungry for interaction.*

Those among the net-generation have grown up with the expectation that their opinions, views and thoughts will be heard. This is one of the reasons why social media have become so important. Sites such as Twitter (twitter.com 2011) and Facebook (facebook.com 2011) provide users with the opportunity to share their opinions and articulate themselves on the issues that are important to them. Although the extent of such media is broader then ever before, and therefore even more demanding of our analytical attention, radical alternative media express an alternative vision to hegemonic policies, priorities, and perspectives.

As businesses begin to recognize this, companies have developed a presence on social media websites and other networking sites in order to provide consumers a method to demonstrate support and provide valuable feedback (Qualman 2012). In addition, platforms such as blogs provide users with an opportunity to share their views through posts or comments, which are then sourced by businesses via search engines. In many respects, social media has been responsible for refining the process of crowdsourcing. For example, a movie executive need only enter the name of his or her latest film to access the most up-to-date consumer feedback on Twitter or collaborative filter approach on a website like Rotten Tomatoes (Amatriain et al. 2009).

A common example of this is Google (google.com 2011) according to Tapscott & Williams (2008: 41) does Google represent the embodiment of crowdsourcing:

"*Google is the runaway leader in search because it harnesses the collective judgments of Web surfers. Its PageRank technology is based on the idea that the best way to find relevant information is to prioritize search results not by the characteristics of the document, but by the number of sites that are linking to it*". Howe (2009: 279) describes it as the "*best indicator of the long-term viability of the practice*".

Google and it´s academic pendant Google scholar (scholar.google.com 2011) has a long tradition of crowdsourcing — it not only offers cash rewards for new ideas, but also tests most of its developments, from Gmail to Google Documents, using input from the public. Google has released a new crowdsourcing initiative. It has been determined that the company will make use of public input to develop its map data (McGee 2009). There are several initiatives underway, the first is to invite users to submit data for 3D mapping and the second is to encourage users to identify any elements of the map that require editing. Both of these initiatives will draw on local expertise and interests to ensure the mapping project is completed quickly and efficiently.

1.5. Limitations of crowdsourcing

The use of crowdsourcing is not without criticism and even controversy (Peng 2011). This subsection explores the ethical implications, economic aspects and social ramifications of crowdsourcing. The discussion will be augmented by an analysis, which is presented later in this section.

Crowdsourcing involves a host of ethical concerns, of which some are not generational. The validity and reliability of a document is derived in part from its authorship; therefore, an identifiable author who can verify the authenticity and originality of a specific document provides proof of its reliability. Furthermore, the creation of a document from multiple unaccredited sources is comparable to plagiarism. In fact, some might suggest that crowdsourcing devalues the contribution of the individual and makes it more difficult to support traditional research. Moreover, the cost-effectiveness of crowdsourcing potentially devalues both the work of researchers and other professionals and Intellectual Property (IP), which becomes subject to abuse. Most importantly, crowdsourcing further disenfranchises people on the margins of society (Scholz 2012).

A person's access to the Internet, computers, and other forms of technology determines the level to which he or she can participate in crowdsourcing. Thus, the economically advantaged often have a disproportionate amount of influence over the process (Stern, Alison and Shaun 2009). Furthermore, the economics of crowdsourcing are not always straightforward. In a project such as Galaxy Zoo, crowdsourcing was a highly successful method of processing the available data in a timely, cost-effective manner. Volunteers enjoyed the prestige of being involved in this project; for many, their contribution was a secondary activity, similar to a hobby (Raddick et al. 2009). The failure of Cambrian House in 2006 shows that the concept of crowdsourcing can be a costly venture. The business was unable to develop a model that generated meaningful results for minimal financial reward. The ideas Cambrian House tapped into were largely worthless; no one could be convinced to provide useful ideas for free. Most importantly, the successful management and integration of data obtained from crowdsourcing

has proved too much of a challenge for many businesses. As the Gartner Research findings (quoted in Libert and Spector 2007: 5-6) indicate:

"*Many businesses do not have the time or resources to make good use of crowdsourcing initiatives*".

Finally, the social implications of crowdsourcing are still being assessed (Rushkoff 2005). While crowdsourcing promises greater transparency, it fails to engage with all members of society. Crowdsourcing is chiefly the domain of the privileged and educated classes (Lenhart and Madden 2005; Van Dijk 2006). Moreover, the views represented by this group are not necessarily accurate. If there is overrepresentation of a particular group or point of view, crowdsourcing runs the risk of clouding the issue in many instances. In order to eliminate such risk, specialized intermediary companies such as Crowdflower provide a leveraged representation of crowdworkers.

1.6. Risk management

Risk management may be defined as an organized process that identifies, analyses, and responds to risk (Crockford 1986). It does so by applying risk-management principles and strategies to a specific process or project. In this context, the process or project may refer to either an on-going or specific instance of crowdsourcing. According to the classification provided by Krantz (quoted in Tusler 1996: 1),

"*Risk is characterized by a combination of constraint and uncertainty. These usually manifest as limitations and are faced by most businesses and corporations during the development of*

new projects or implementation of current ones. Limitations can be created by social, environmental, technical, and logistical factors."

Because limits exist in every context, organizations need to find ways to limit the consequences of these constraints and develop strategies in order to reduce uncertainty. Risk management is a multifaceted process (Crockford 1986). The first step is to measure or assess the risk factors. The second step is to develop a strategy to manage or control the risks identified. Once the risks have been assessed, it is necessary to develop a prioritization process to determine what risks carry the greatest loss, and which risks have the greatest probability of occurring or recurring. Risks with a high probability of occurring are a top priority and are dealt with first, while risks with a lower probability of occurring and fewer possible losses are secondary. The level of a risk is determined by the law of large numbers. This principle simply states that a situation outcome becomes more predictable as the number of instances increase. Implementing this system of prioritization may be a difficult course of action. It can be complicated to choose between risks with a high probability of occurring and lower loss, and risks with a high potential loss, but a low probability of occurring.

1.6.1 Aspects of risk management

Alexander and Sheedy (2005) define four aspects of risk management as follows:

Avoidance: The avoidance technique consists of refraining from potentially dangerous activities. With this approach, any activity that carries a risk of injury or loss would be avoided. For example, a school or community may choose to adopt the avoidance approach when developing a playground. Certain pieces of equipment, such as slides, may be

prohibited since their use carries a high probability of injury. Users may fall off the sides, slip on the ladder, or hurt themselves when they land at the bottom. Considering these risk factors, it may seem sensible to prohibit slides in favour of safer equipment. Avoidance may appear to be a fail-safe approach to eluding risk; however, excessive avoidance sometimes results in missing potential gains. Returning to the example of the slide on the playground, this equipment might help children develop their sense of balance and build strength. Some might argue that exposure to moderate levels of risk would ultimately benefit the children by allowing them to learn from the situation. Therefore, it is important to carefully weigh the advantages and disadvantages before adopting the avoidance approach.

Reduction: This approach relies on finding methods to reduce the risks or the severity of any potential loss. Since almost every situation carries a certain amount of risk, this technique allows people to minimize the consequences while still pursuing a wide range of activities. For example, any motorist risks injury or even death every time he or she gets behind the wheel. It is not feasible, however, for most of us to stop driving, as many of us depend on our vehicles for both our personal and professional activities. Therefore, we take certain measures and precautions in order to ensure our safety. For example, we can reduce the potential hazard to our health and well-being by avoiding unsafe activities, such as consuming alcohol or speeding. While we cannot control what other drivers do, it is possible to develop our own skills and learn to drive defensively. This approach depends on developing a full understanding of the existing risks and a carefully thought-out plan to minimize them.

Prevention: As with the above-described approach, the prevention technique seeks to minimize risks through careful planning. This method identifies measures that will prevent

loss or risk. Returning to the example of the playground slide, this technique would consider the inherent risks and develop a method of addressing them. For instance, there is a possibility that a child might jump or fall from the top of a slide. One way to prevent this from occurring would be to install a cover at the top of the slide. This would control the environment and prevent users from being injured in a fall. Although children would no longer be able to stand at the top of the slide, the cover would not interfere with their ability to use the slide. It is important that preventative measures do not interfere with the activity itself; otherwise, the positive effect would be mitigated.

Separation: The separation technique identifies risk and seeks to minimize hazards by separating them. For example, divided motorways reduce the risk of head-on collisions. This solution exemplifies the nature of the separation technique. It recognizes that motorists driving at high speeds may misjudge the distance and time needed to safely overtake another vehicle. Creating divided roads diminishes the potential for risk. The two directions of traffic are divided, which greatly reduces the possibility of a head-on collision.

1.6.2 Stages of risk management

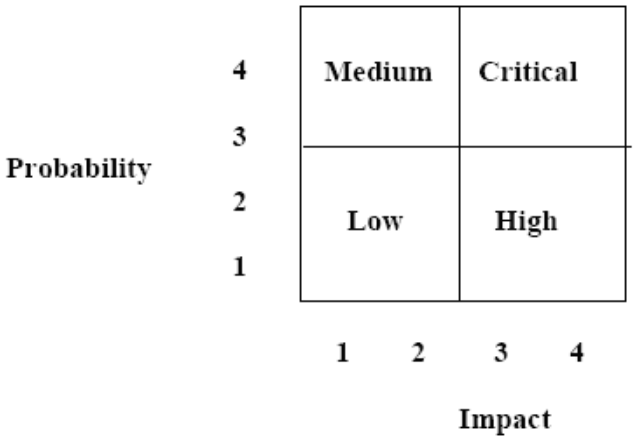
This section will identify and discuss the four stages involved in preparing for effective risk management (Alexander and Sheedy 2005). These include risk identification, risk quantification, risk response, and risk monitoring and control. As indicated previously, risk management has changed significantly since its emergence in the 1970s when the primary focus was the conservation of resources (Tye 1980). The impetus behind risk management has shifted to the development of an effective strategy that allows organizations to not only protect themselves from loss, but also to grow and adapt to a changing marketplace (Egbuji

1999). Risk management is not only the responsibility of specialists and consultants. Managers at every level within an organization need to develop effective strategies in order to identify and mitigate the effects of risk on operational activities (Robinson and Robertson 1987). In this post 9/11 era, our understanding of risk management has expanded far beyond the fiscal security of board members, executives, and investors (Mundy 2004).

Risk Identification: In the risk identification stage, as its name implies, people involved identify and name the risks. Risk identification is a basic step in the risk management process, but it plays an essential role in effectiveness of any management approach (Tchankova 2002). A workshop approach can, as one choice of strategy, involve and engage different levels of management. This approach would allow for an open discussion and has the potential to either identify or avoid potential biases. Ideally, the views and experience of the group would be diverse enough to ensure that a balanced outcome is achieved. Brainstorming or listing risks are two strategies often used. It should be noted, however, that some research suggests that risk identification needs to evolve beyond the production of lists (Hillson 2003). The risks identified can often seem overwhelming. Hillson recommends using a risk breakdown structure (RBS). RBS is hierarchical and allows an organization to identify common themes and the distribution of risk (Hillson 2003). Different types of risks are usually involved in the businesses. As Turbit (2005) points out, generic risks exist in all types of projects, as they are inevitable to every company. Early risk identification, in conjunction with a comprehensive mapping of risk factors, enables an organization to overcome biases and to identify the appropriate measures to take in order to avoid or minimize the consequences of risk.

Risk Quantification: The risk quantification stage follows risk identification. It is in this particular stage where the different risks and their impacts on the project are assessed. The quantification of risk may adopt either a common sense or a rigorously scientific approach. Equally, the approach falls somewhere between the two. Many managers conduct these functions during the course of their daily activities. Although most of them have overcome their resistance to management science, a preference for common-sense approaches persists (Leaman 1987; Galloway and Funston 2000).

Figure 1. Risk impact matrix



Source: Turbit 2005: 2

Turbit (2005) provides the matrix illustrated in Figure 1, which helps determine the effect of potential risks. It is important to consider both the probability and the consequences of a risk factor in order to effectively determine its importance. According to Turbit's matrix, a probability factor of 1 or 2, coupled with an impact factor of 1 or 2, would result in a low-level

risk assessment. However, when coupled with an impact factor of 3 or 4, a probability factor of 2 or less would result in a high-level risk assessment.

Many project managers rely on some sort of matrix in order to help them assess and evaluate risk (Cervone 2006). One must consider the probability and impact when determining whether something presents a low, medium, high or critical risk. This process enables the project manager and the organization to respond appropriately to different risks and assess the level of harm they may cause to a project.

Risk Response: Once the risks have been identified and quantified, it is necessary for the project manager to develop a suitable response. The most effective project managers develop strong working relationships with stakeholders and maintain open lines of communication (Cervone 2006). This helps to ensure not only that the organization's needs are met but also that all stakeholders are involved and committed to the process. Turbit (2005) as well as Alexander and Sheedy (2008: 19) identify four possible strategies for developing an effective response to risk:

1. Avoid the risk
2. Transfer the risk
3. Mitigate/ reduce the risk
4. Accept the risk

When adopting the avoidance strategy, a company would seek to excise the risk factor from the project. Alternatively, the company may choose the second strategy, which is to transfer the risk to someone else. For example, the ruling government would be made responsible for

providing stability and penalized for any disruptions to the company's activities in the country. Another alternative would be to mitigate the effects of the risk, which would consist of taking steps to ensure that the impact or likelihood of a particular risk could be reduced. In such an instance, an organization may choose to delay its decision to move into a politically volatile territory instead of waiting until the situation stabilizes. The fourth and final strategy consists of accepting the risk. In such an instance, the political instability would be accepted as a project risk. It is important to note, however, that risks should only be accepted if the consequences are minimal or if the potential benefits far outweigh the potential losses. Regardless of the strategy adopted, it is important that the project manager develops a risk-response plan, which will allow him or her to clearly identify the strategy adopted and what actions are needed. This process must involve all stakeholders and should list exactly what an organization needs to do, as well identify individual responsibilities and time guidelines.

Risk Control: The final stage in planning risk management is risk control. In this stage, the project manager and other stakeholders monitor the identified risks and consider how they are affecting the organization. Whether the project is in the field of construction or medicine, an effective risk strategy can help maintain both the efficacy and reputation of an organization (O'Donovan 1997; Mills 2001). It is essential that corporations within the industry develop appropriate responses to risks and effectively evaluate the possible effects. In this instance, it is especially important to guard against bias. An organization's long-term interests are not served by inward-looking strategies. It is important that organizations recognize the importance of public perception. It is equally important that corporations recognize that their stakeholders stretch far beyond the executive board members and investors.

1.7. Dissertation aims and objectives

The central aim of the research is to provide an answer for the question on 'How to manage risks of crowdsourcing innovation in companies' and to identify those risks that are involved with the use of crowdsourcing in a business context. In pursuance of this aim, the thesis will seek to provide answers the following research questions:

- What risks are involved with the use of crowdsourcing in a business context?
- How does the crowdsourcing concept advance business practices?
- How has risk management been incorporated with the use of crowdsourcing in a business context?
- What measures have been taken to keep track of any risks realized with the use of crowdsourcing?
- How has the use of crowdsourcing affected the business processes and outcomes generally?

The dissertation has the following objectives:

1. Identify current practices of the commercial use of crowdsourcing innovation;
2. Determine the level of risk involved in the practice; and,
3. Identify possible strategic solutions for dealing with this risk.

The following steps lead towards the achievement of these objectives. The first objective will be addressed in the literature review and findings chapter, which will provide a more detailed overview of the history and use of crowdsourcing in a range of organizational contexts. The second objective will also be addressed in the literature review and findings chapter, which

will provide a more detailed overview of risk management and its application to crowdsourcing in a variety of organizational contexts. The third objective will be realized in the analysis chapter. The findings of the research will be carefully considered and best practices identified. Chapter five and six will provide a series of practical strategies for mitigating risk in crowdsourcing.

1.8. Theoretical and organizational context

In order to reap the rewards of crowdsourcing, it is important that businesses take an active role in overseeing and managing the process. As practitioners and theorists, Libert and Spector (2007: 5) observe, "*If collaboration isn't done right, it had best not be done at all*". According to research conducted by Gartner Research (Erickson and Gratton 2007), over half of all Fortune 1,000 companies have made some attempt to integrate crowdsourcing into their marketing approach by 2010; however, Gartner Research also predicts that most of these efforts will be so poorly managed that the results will be of no use to anyone (quoted in Libert and Spector 2007: 5-6). In order for a business to successfully integrate crowdsourcing into any aspect of its business, whether research and development or marketing, it is important that it lays the groundwork from the very beginning.

Firstly, it is essential that the objectives be clearly defined. For example, the company may want to gauge consumer reaction to a new product or advertising campaign. As recent developments in marketing have shown, the Internet has all but replaced the traditional focus group. The organization needs to consider the context and form for this feedback, (i.e., whether the analysis should be superficial or more in depth). In this instance, crowdsourcing may be a useful way of achieving this type of detailed response. It is important, however, for

the business to consider the limitations of this type of project, as well as the ability to see the project through to its end. Secondly, it is important to identify the appropriate crowd. While much of crowdsourcing is random and chaotic, it is worth noting that the most successful approaches rely on pre-existing communities. As Howe (2009: 28) points out, "*Crowdsourcing efforts generally attract people both with and without professional credentials*". While both groups may be capable of providing meaningful input, there is no guarantee that they will find the project on their own. It is important that business knows how to target and market to their desired audiences, or else, the feedback obtained will be of minimal use. Thirdly, the business needs to determine what it can offer participants in order to minimize the risk of low response rates. Input obtained through crowdsourcing can be paid or unpaid. Successful crowdsourcing generally involves individuals with a sense of community. For some people, this sense of community comes from having shared interests or professional curiosities. Other individuals or organizations wish to benefit from the perceived prestige of the project, such as those launched by Oxford University and NASA. The business needs to be clear about what it is offering participants. Although the offer does not have to be monetary, it is important that the offer is one that participants will value. After listing these challenges, one question remains: "*Why is crowdsourcing worth the effort?*" (Livingstone 2007). If managed properly, crowdsourcing can have a dramatic impact on a company's potential profitability. It is a model capable of aggregating talent and leveraging ingenuity, while reducing the costs and time formerly needed to solve problems. Finally, crowdsourcing is enabled only through the Internet, which is a creative mode of user interactivity, and not merely a medium between messages and people (Rossiter 2006).

1.9. Contribution to the field of knowledge and practice

This dissertation is designed to make an important contribution to the field of knowledge and practice. While the application of crowdsourcing for business use is on its way to being widely acknowledged and valued, its relationship to effective risk management has been overlooked. As shown in the examples cited previously in this chapter, crowdsourcing can help an organization to spot weaknesses or failures.

Crowdsourcing is particularly useful on a large project, which would be unwieldy for a small team of paid employees to address, as in the example of the Oxford project. Consequently, a successful protocol for the development of crowdsource risk management best practices would have tremendous value in the business world.

1.10. Dissertation outline

This dissertation consists of six separate chapters. Each plays a unique role in communicating the findings of the researcher and establishing the dissertation's conclusions. In this section, a brief overview of each chapter is provided. This overview will identify the chapter's prime objectives, as well as its contribution to the research project as a whole.

Introduction

This introductory chapter lays the groundwork for the following discussion. It begins by introducing the research question within the larger context of the study. It will briefly outline the practices of crowdsourcing and risk management. It identifies the project's aims and objectives, as well as its potential contribution to the field of knowledge and practice.

Literature review

In this chapter, the author demonstrates both awareness and engagement with the current research in this specific field of study. The chapter will outline approaches to crowdsourcing and risk management that have been drawn from a number of reputable academic sources. These will be vetted by peer reviews. These sources include, but are not limited to, journal articles, monographs, and textbooks. This chapter will provide the critical context for the findings and analysis that follow in the next two chapters.

Methodology

In this chapter, the research methods adopted for this project will be identified and evaluated. It has been decided that the research will make use of qualitative primary data (interviews through an online survey) and also of secondary data (i.e. published material, and benchmarking). Benchmarking will provide a useful framework for identification and categorization of the best practices around the world.

Results

In this chapter, the findings of the study will be presented. The author will identify a number of different contextual outcomes and discuss their respective approaches to crowdsourcing. The findings will be applied to the context of risk management. This chapter will provide the basis for the following analysis and discussion of the research.

Analysis

In this chapter, the findings will be subjected to a rigorous analysis. The objective of this chapter is to identify best practices within the industry and identify workable approaches. The analysis will identify both strengths and weaknesses of these approaches and suggest possible solutions. This process of benchmarking will pave the way for the recommendations that follow in the final chapter.

Conclusion

The final chapter provides an opportunity for reflection and assessment. It will first provide a concise summary of the research. Next, it will identify the key findings of the project. Following this, it will provide conclusions for academia and practice based on the findings and on the analysis conducted earlier in the report. Finally, it will reflect on the project's overall contribution to the field of knowledge, discuss various limitations and identify possible avenues for future research.

1.11. Summary and conclusion

The practice of crowdsourcing has grown up alongside developments in the Internet and technology. Crowdsourcing would be impossible without the immediacy of the web, and likely unnecessary without the relatively recent boom in technological advancement. At its best, crowdsourcing succeeds because it builds communities and enables them to contribute in a meaningful way to the development of knowledge. Crowdsourcing is often an economic and efficient way to tackle data that might otherwise overwhelm an organization. The examples cited involving NASA and Oxford University indicate that crowdsourcing can

quickly mobilize a large group of geographically and culturally diverse people to tackle a specific problem.

It can assist software developers to identify and overcome flaws that might only emerge after months of testing. It can also help to ensure that local knowledge of an area can be captured and attributed. Crowdsourcing has a number of commercial applications as well. It can help businesses to narrow their focus and become more responsive to consumer demands. In the public sector, it can help policy makers to quickly identify the issues that matter most to people. Crowdsourcing gives people a voice and a method of interacting with one another. This research anticipates that the application of crowdsourcing will be beneficial throughout different departments in a business context, as long as a proper risk management approach is applied. It aims to identify the benefits through a targeted study of best practices within this business sector. In order to establish a contextual theoretical framework and define key terminology, appropriate secondary literature will be identified and articulated in the next chapter.

2. Literature Review

2.1. Introduction

In the previous section, the concepts of crowdsourcing, risk management, and innovation models have been introduced. From its first usage in 2006 the term "crowdsourcing" has been explored and redefined by multiple researchers. The on-going momentum and growing usage of social networking websites as well as the steady evolution of the mobile Internet, adapted by smart-phones has prepared the infrastructure to the increasing popularity of crowdsourcing (Tapscott and Williams 2008). The evolution and growth of the concept of crowdsourcing, various crowdsourcing approaches, and the characteristics and forms of crowdsourcing are discussed in first section of this chapter. The second section evaluates the different forms of innovation and risk management involved in the process of crowdsourcing. The final section considers the latest studies and developments of crowdsourcing, which include risk management procedures and innovation models.

2.2. Crowdsourcing

The evolution of information and communication technology (ICT), coupled with the growth of the Internet and social networks, has transformed business models in recent years (Buhalis and O´Conner 2005, Garrigos-Simon 2012). In the new arena, both firms and customers want to jointly participate in almost all the processes of business development. One of the most innovative developments being used by organizations is crowdsourcing, "*a participative distributed online process that allows the undertaking of a task for the resolution of a problem*" (Estellés-Arolas, and González-Ladrón-de-Guevara 2012). Crowdsourcing can be

defined as an open call to provide contributions where human intelligence and interaction is required or provide solutions to problems (Kazai 2011). Yang et al. (2008) defines crowdsourcing as the discipline of outsourcing tasks to a large Internet community. The concept of crowdsourcing has recently received great attention from academia (Alonso et al. 2008; Brabham 2008a; Boches 2009). Whitla (2009: 15) defined the concept of crowdsourcing as the "*outsourcing of activities by a firm to an online community or crowd in the form of an open call*". Organizations employ the crowdsourcing approach to complete task-related objectives concentrated in miscellaneous areas of business, such as idea creation, product innovation and development, marketing and user-integrated support and promotion (Whitla 2009). Benkler (2006) presents crowdsourcing in his research as an activity that uses a larger pool of talent that does not depend on any outside market signals or managerial commands. Crowdsourcing also impacts other specific areas, such as cost reduction or quality improvement (Howe 2006b; Whitla 2009). Whitla (2009: 15) states: "*Any member of the crowd can then complete an assigned task and can be paid for their efforts in crowdsourcing*". However, crowdsourcing is still in its infancy; thus, it is a challenge to define this concept or outline its process as easily as one can with already established concepts like user innovation, open innovation or open source (Howe 2006b; Whitla 2009). Crowdsourcing allows a company to complete work, called tasks, faster by using the crowd than it could by using its employees (Garrigos-Simon 2012). Tasks that can be accomplished through the use of crowdsourcing range from rather uncomplicated business activities to complex project scenarios (Tapscott and Williams 2006; Whitla 2009). The rise of "*Wikinomics"* is an example of the commons-based peer production approach (Benkler 2006). There are other use cases, such as Wikipedia and the development of the Linux operating system, both not being

depended on any kind of market signals and have progressively, established their reputations and positions in the marketplace (Benkler 2006). Tapscott and Williams (2008) tried to inaugurate a relationship between an existing online community and the success of crowdsourcing in this environment. Modern and responsive websites have made it easy to access intermediaries for crowdsourcing and the crowd from multiple end-user devices such as mobile phones, smart-pads or laptops.

2.2.1. Theory of crowdsourcing

The enormous increase in active contributions by human individuals on the Internet have brought several social developments: individuals and teams now work together in large groups that share no other background or interest than the ones related to the problem they are currently collaborating on. Recent findings have shown that, in a group or crowd, there are even more aspects relevant to "intelligent" behaviour. Woolley et al. (2010) have identified three important factors that distinguish "group or collective intelligence" from "general (individual) intelligence". General intelligence as measured, e.g., by the general intelligence factor "g" (Herrstein and Murray 2010) is defined as the inference one makes from the observation that people who do well on one task tend to do well on other tasks - in addition to separate, non-correlated abilities associated (Deary 2000). Equality of contribution, social perception and low or moderate cognitive diversity are the factors identified that seem to facilitate the transfer from general to collective group intelligence (Woolley et al. 2010). The researchers called this new collective intelligence factor "c" and found converging evidence that it is not strongly correlated with the average or maximum individual IQs of group members, but is correlated with the average social sensitivity of group members, the equality

in distribution of conversational turn taking, and the proportion of gender in the group (Aggarwal et al. 2011). Crowdsourcing, an instance of collective intelligence (Brabham 2008, Robu et al. 2009, Buecheler et al. 2010) emerges from decentralized actions of a community of users.

The wisdom of the crowds and their collective rationality has been cited by a large number of scholars and practitioners alike (Surowiecki 2004). Although recent critical publications focus on the "error-correcting" non-biased and estimates of a large number of uninformed individuals (e.g., Lorenz et al. 2011), Surowieki included many more aspects that make large groups collectively strong when it comes to solving problems and lists four prerequisites necessary in order to enable the wisdom of the crowd:

- Diversity of opinion: each crowd member needs some form of own information, even if it is just another point if view or interpretation.
- Independence from other crowd members or their direct influence.
- Decentralization: crowd members are able to specialize and utilize locally available information.
- Aggregation: a mechanism to bundle the individual inputs into a collective decision.

One of the forms of the crowdsourced wisdom often used in examples of success, namely estimating a number that is hard to estimate for an individual, is explained by Condorcet´s theorem. This basic insight can be applied to other scenarios as well, e.g. the "Many Wrong Principal", which states that navigational accuracy increases with group size if all individuals

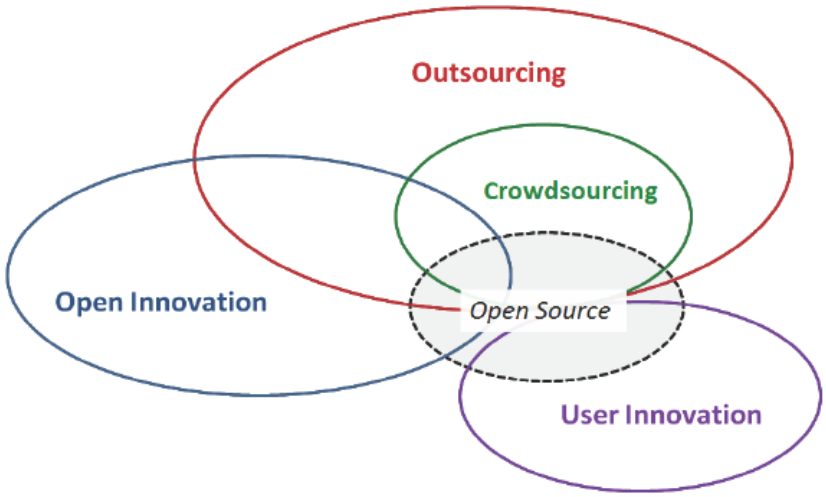
have a common target destination that they want to reach but that each individual navigates with some error (Simmons 2004).

2.2.2. Evolution of crowdsourcing

Jurvetson first coined the term "crowdsourcing" and a journalist of Wired magazine, Howe popularized it in 2006 (Brabham 2013) and defined it as "*the act of taking a job traditionally performed by a designated agent (usually an employee) and outsource the task to an undefined, generally large group of people in a form of an open call*" (Howe 2009). This term gained global recognition due to the expanding adaption of crowdsourcing in numerous industries, varying from consumer driven concepts (e.g., B2C Grid and Threadless) to pure business-to-business idea-jams and distributed knowledge (e.g., Chaordix and Crowdicity) (Vukovic et al. 2009). However, the phenomena of collective solution origins in the year 1714, when the British Government used crowdsourcing to develop a solution to a longitudinal problem that was responsible for the death of many sailors at sea (DiPalantino & Vojnovic 2009). Marsden (2009) provided evidence that crowdsourcing occurred as early as the 1800s. In the search for extended knowledge and outside perspectives the publishers of the Oxford English Dictionary relied on the contributions of hundreds of volunteers, who wrote definitions on slips of paper. Even this adaption of crowd-based knowledge collection seems rather primitive (and tedious) it has proven to provide for an extensive knowledge pool at this point of time. Today the real-time Web and the ubiquity of mobile consumer devices stimulate the overall development to an advanced stage (Marsden 2009). There have been various studies to help understand this concept (Brabham 2008; Carruthers 2010), its relationship to innovation (Boches 2009) and its implications on the business environment (Boutin 2006;

Alonso et al. 2008). While there exist similarities between Open Source, Open Innovation, User Innovation and Crowdsourcing Figure 2 visualizes the intersection areas of these concepts. According to Schenk and Guittard (2009) is Open Source an application field rather than a theoretical concept and is represented as a dotted line.

Figure 2.
Conceptual intersections of crowdsourcing



Source: Schenk and Guittard (2009: 13*)*

Howe (2006a: 6), suggested in his first article in Wired Magazine a definition of crowdsourcing, indicating how the defined work of an individual within an organization or a corporate team was assigned to a undefined and large community of people in form of an open call. Later Howe amended his definition to explain that the act of crowdsourcing involved some type of payment or recognition to make a distinction from established peer production e.g. when unrelated people jointly developed Linux (Howe 2006a).

Whitla (2009: 16) argued that crowdsourcing "*first started by computing sectors and businesses, to use it for a diverse range of tasks that they find can be better completed by members of a crowd rather than their own employees*".

At first, crowdsourcing made a distinction from open source in terms of payments that workers and crowd contributors received or expected (Howe 2006). However, some corporations adapting crowdsourcing eventually began compensating those individuals whose ideas they perceived to be acceptable and useful (Whitla 2009). Crowdsourcing shares an overlapping conceptual basis with open source software development, where individuals can also easily participate and exhibit their specific skills.

In contrast, paid crowdsourcing has been established as a concept in which individuals are mainly motivated by monetary reasons to contribute for a common goal (Brabham 2008a). Research discussing the question of fair payment and sustainability for all stakeholders is controversial and due to its final conclusion (Kittur et al. 2013). Some have argued that it was an exploitation of workers, as it allowed companies to receive commercial benefits from the workers' ideas (Boches 2009). However, one stream of authors and researchers argued that crowdsourcing was a platform that utilized creative skills in order to achieve satisfaction (Boutin 2006). Estellés-Arolas and González-Ladrón-de-Guevara (2012) analysed existing definitions of crowdsourcing to extract common elements towards an integrated crowdsourcing definition. Appendix A reflects their findings from 40 original definitions of crowdsourcing out of a final document repository of 209 documents.

2.2.3. Approaches to crowdsourcing

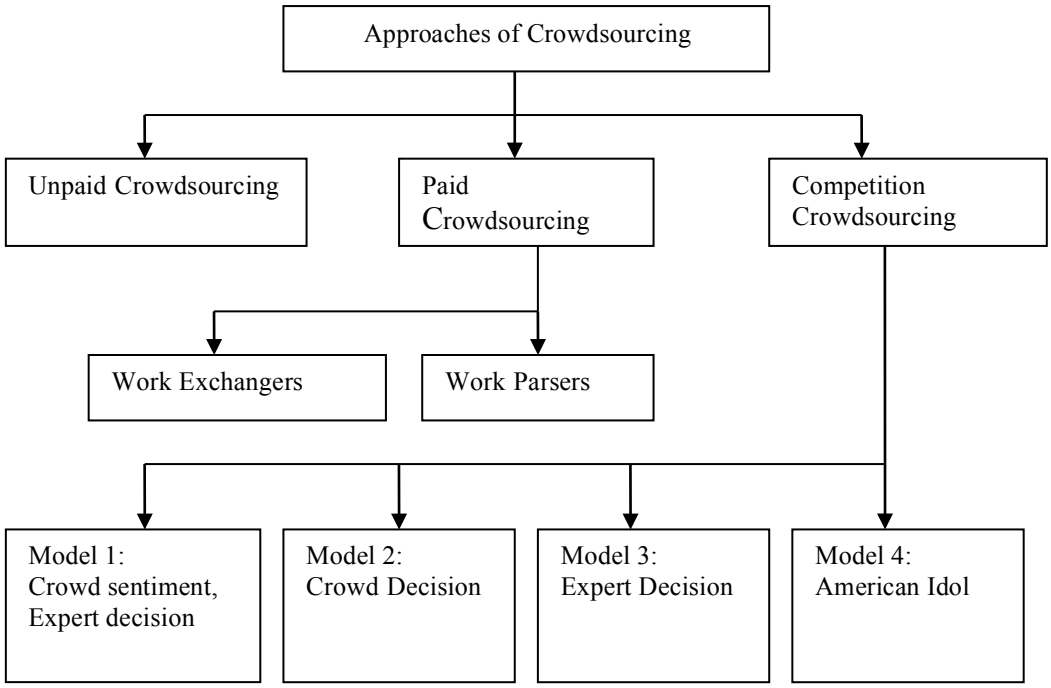
Schelske (2008) noted that the concept of open innovation has both qualitatively and quantitatively amplification in crowdsourcing. Crowdsourcing is conducted to the crowd by an open call through the Internet rather than through channelled approaches within companies (Schenk and Guittard 2009). The phenomenon of crowdsourcing can be still described as emerging and evolutionary (Markus and Robey 1988). Crowdsourcing indicate three categories of collaborators with vested interests:

- Providers (Individuals forming the crowd).
- Companies benefitting from the crowd.
- Links between crowds and client companies (mostly in form of specialized intermediaries).

These categories are due to the disruptiveness of the topic still under constant development; its meaning is not yet fully defined (Raasch et al. 2009) and has been distinguished with other open-innovation, user-innovation or open-source concepts (Schenk and Guittard 2009).

There have been numerous evolutions and adaptions in the crowdsourcing practice that have been used in real time scenarios with several different approaches of crowdsourcing based on the aspects of level of payments, behaviour of competition, and selection of strategies (Hugh 2010). Figure 3 refers to the main approaches as described by Hugh.

Figure 3. Approaches to crowdsourcing



Source: Hugh (2010: 4)

2.2.3.1. Unpaid crowdsourcing

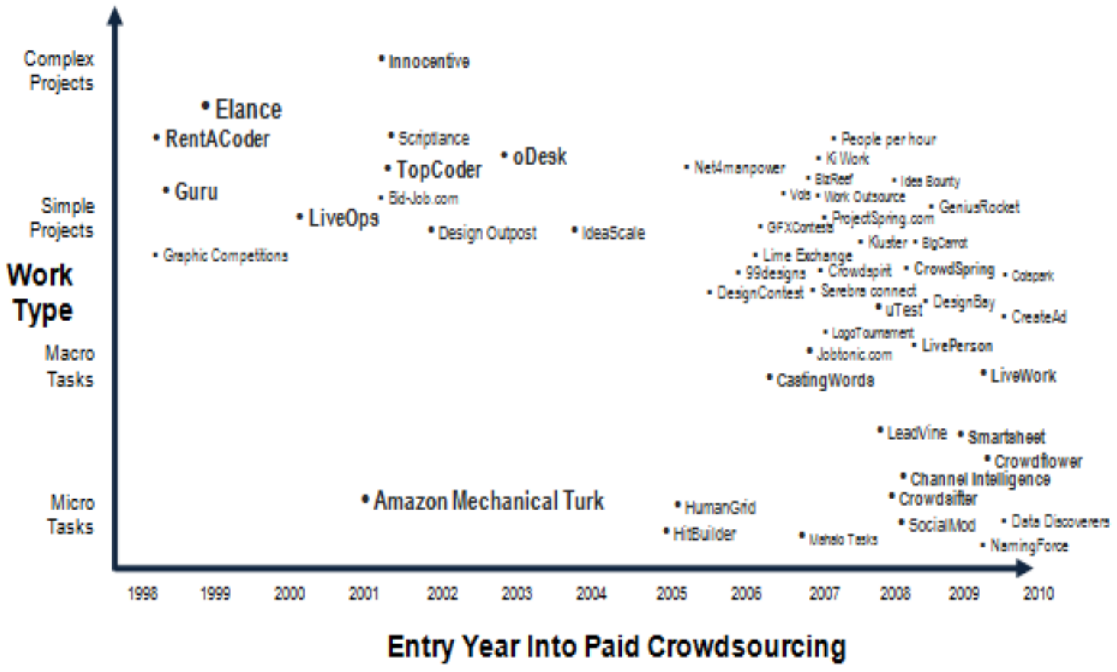
The reasons for participation and sources of motivation for these types of crowdsourcing are mostly socially (Antikainen and Väätäjä 2010). Motives can include personal satisfaction, knowledge sharing, ego boosting, utilization of creative skills, and more. The most common forms of this crowdsourcing type include idea jams and knowledge pools along with unpaid participation in online surveys (Kleemann, Voß and Rieder 2008).

2.2.3.2. Paid crowdsourcing

The present sequences of professional adaptions indicate a significant market for paid crowdsourcing work (Frei 2009; Horton and Chilton 2010). Frei predicts in his research to pass the one billion dollar mark for a combined US-focussed revenue by 2013, accelerated by maturing technologies, global connectivity, productivity pressures and access to a global workforce with speciality skills. These jobs range from software projects to academic and media writing and are defined as follows (Frei 2009: 1):

> *Paid crowdsourcing is the act of outsourcing paid work of all kinds to a large, distributed group of workers using a technology intermediary that helps the definition, submission, coordination, acceptance, and payment for the work done.*

Figure 4. Paid Crowdsourcing and work type



Source: Frei (2009: 4)

Paid crowdsourcing provides huge opportunities to millions of full-time freelancers or part-time workers (Groysberg, et al. 2011). Companies like Elance or oDesk offer various opportunities to businesses through their platform, allowing them to post their requirements and having individuals bid on or request to work on them (Frei 2009). The revenue generated in this market of intermediary enabling companies is considerable. In his research Frei aggregated selected statistics on crowdsourcing labour platform as listed in Table 1.

Table 1. Companies, registered workers and gross payments

Company	Registered Workers	Gross Payments to Workers
Elance	97,500	$210,000,000
LiveOps/LiveWork	40,000	$150,000,000
Rent A Coder	266,754	$140,000,000
Guru	1,000,000	$100,000,000
oDesk	331,000	$ 90,000,000
Amazon Mechanical Turk *	200,000	DND
GetAFreelancer	-	$ 41,000,000
TopCoder	217,145	$ 7,000,000
99designs	45,000	$ 6,531,977
Innocentive	180,000	$ 4,420,000
Totals	**2,377,399**	**$748,951,977**

Source: Frei (2009:5)

The paid form of crowdsourcing has two types of primary vendors: (a) work exchanges and (b) work parsers (Alsever 2007). Work exchanges allow people who work for hire to leverage their existing skills and contribute to developing projects. Elance, oDesk, Scriptlance, GetAFreelancer are examples of this type of crowdsourcing (Doan et al. 2011). Most of these intermediary platforms act as a community driven workroom to facilitate the meeting of service providers and seekers. All job proposals are posted by the service seekers including a job bid, project plot and profile. Workers or Service seekers can apply for the jobs individually

or aggregate in private talent clouds (Cândida and Ramos 2011). Once both parties agree on terms and services the work begins. According to Frei (2009: 3), work parsers are companies that provide a technological platform to handle the "*logistics of sourcing workers, processing results and managing payments*". The majority of intermediary companies provide programmatic interfaces (API interfaces) and an extensive set of communication and collaboration tools to coordinate the work of the involved parties. Paid crowdsourcing is a growing trend, and its complexity has increased as a model being capable of aggregating talent, leveraging ingenuity while reducing the costs and time formerly needed to solve problems (Brabham 2008b; Frei 2009). Examples of crowdsourcing cases are presented in Table 2.

Table 2. Cases of crowdsourcing

Case	Purpose	Launch	Remuneration
OpenStreetMap	Geographic content	University College London, 2004	None
ReCaptcha	Digitize archives	Carnegie Mellon University, 2008	None
Mechanical Turk (MTurk)	Content analysis and artificial intelligence	Amazon, 2005	Micro-paiements (< 1$)
Humangrid	Data analysis	Start-up, 2005	Remunerated (approx. €10/H)
Designenlassen.de	Graphical design	Start-up, 2007	Remunerated (€150-300)
Wilogo	Graphical design	Start-up, 2006	Remunerated (approx. €300)
Atizo	Innovative concepts	Start-up, 2007	Remunerated (> CHF2000)
InnoCentive	Problem solving and innovation projects	Eli Lilly, 2001	Remunerated ($1 000-1 000 000)

Source: Schenk and Guittard (2009: 7)

2.2.3.3. Competitive crowdsourcing

Competitive crowdsourcing is a term that is still in its early stages but it is gaining acknowledgement in terms of corporate interest (Carpenter 2010). Competitive crowdsourcing has its own set of activities for gathering, filtering and selecting among submissions of contributors with altering motivations of certain incentives (Carpenter 2010). One of the most prominent examples of competitive crowdsourcing is the television show *American Idol*. Two main sources of motivation drive the crowd in competitive crowdsourcing: a promoted fund and the opportunity for members to test their talent or specific skills. The success of a competitive crowdsourcing campaign is largely depended on a well-planned and executed communication strategy to transport the theme about a specific contest and reach to the invited crowd. Contestants provide their submissions by presentation, upon then can be judged by the crowd or by the public in general (Carpenter 2010). Feedback on submitted tasks or performances is evaluated by using tools like "up-down votes, star ratings, comments and buying into ideas with virtual currency". Evaluations by experts and votes of the general public determine the winner of the competitive crowdsourcing contest. Carpenter (2010) developed four models of competitive crowdsourcing as elaborated below:

Model 1: Crowd Sentiment, Expert Decision

This model is ideal for cases where a collaboration spirit can refine and improve submissions. Experts from the controlling organization consider the feedback and ratings provided regarding the submissions. These are considered while making the decision to select the optimum answer that matches the experts' requirements. Cisco employed this model when seeking $1 billion ideas through its I-Price (Barlow and David 2010).

Model 2: Crowd Decision

This model provides a platform for companies to more effectively understand the meaning that is associated to their products or services (Carpenter 2010). The crowd submits and decides upon the optimum answer possible for the company. The crowd purely decides on the rating and the winner. The feedback on a submission signals the intensity of feelings for an individual interpretation of meaning. This model is mostly adapted to enable firms to use customers as testimonials for a product or service and to uplift the activity for their social media outlets.

Model 3: Expert Decision

In this model, the company asks for solutions from the crowd. However, experts review, rate, and decide upon the optimum possible submission due to the proposed goal of the contest. To ensure a high standard of privacy of information, the crowd has just a permit to view their individual posts, but not evaluate, engage or filter the wider output.

Model 4: American Idol

For this model, the selection of the optimum answer and the final winner is inspired by a TV-show. As soon the general public (crowd) submitted the answers or votes, a predefined panel of experts select the most appropriate posts or possible solutions to the posted problem. The highest vote for an answer defines the winner at per-contest level, and the overall winner is selected at the final stage (Gomes et al. 2012).

2.2.4. Crowdsourcing strategies

According to Howe (2006b), there are four types of crowdsourcing strategies: the collective intelligence, crowd creation, voting, and crowd funding. These are as follows:

2.2.4.1. Collective intelligence

In the need of evolving together for a common cause collective intelligence is one of the most significant and distinguishable factors of the crowdsourcing process (Howe 2009). Collective intelligence leads in a more practical term to crowd wisdom. Its emergence is mainly based on intrinsically motivated behaviour (Antikainen and Väätäjä 2010). The ideology for participation originates from the desire for intellectual challenges and interesting objectives (Lakhani and Wolf 2005) or purely out of enjoyment, fun and recreation (Osterloh et al. 2004). Howe (2009) identified three adaptions of collective intelligence in a crowdsourcing environment: the prediction market for future behaviour or information, problem solving through crowd casting and innovation evaluation through idea jamming.

The prediction market (i.e. recordedfuture.com) is based on a collective outcome predicted for the future, like a predicted stock price for a certain commodity, prize and market development, or effects and causes of information. The problem solving approach of collective intelligence is based on the problem solving approach (i.e. zendesk.com where people from diverse backgrounds provide answers and archived support for individual problems). Individuals with expertise on specific areas of interest share their experiences; in many cases, the person raising the query provides more than just one solution for the posted problem. The concept of idea jamming as form of collective intelligence invites people to express their views on a

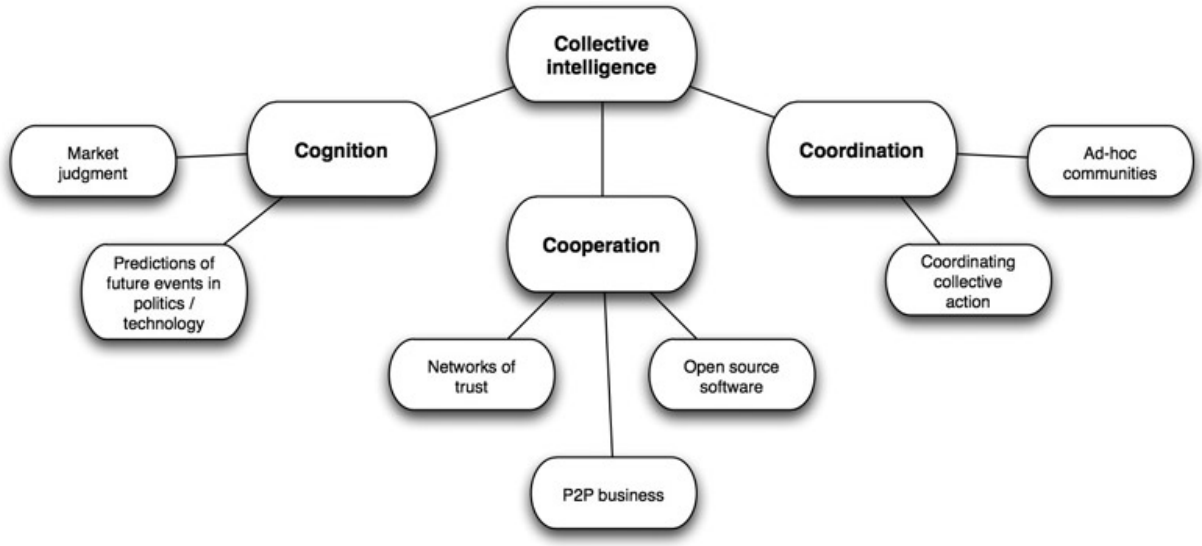
particular topic in an online brainstorming session. For this specific adaption of crowdsourcing, Ebner, Leimeister and Krcmar (2009) have analysed the use of collective intelligence for open research. In their researched open innovation environment for development professional users of the SAP (SAPiens) were involved in "designing, implementation and evaluation of an IT-supported ideas competition within the SAP University Competence Center (UCC) User Group. This group consists of approximately 60,000 people (lecturers and students) using SAP Software for educational purposes" (Ebner, Leimeister, and Krcmar 2009).

2.2.4.2. Types of collective intelligence

Extensive research has been conducted by Lane (2010) to analyse collective intelligence and its development and adaption in a business context from literature issued between 1985 and 2009, focussing on definitions, functions of collective intelligence linked with crowdsourcing and open innovation as well as detailing the competitive advantage (Lane 2010). Collective intelligence refers to a group of individuals that create synergy, which is more than any one individual. Within highly competitive and global market environments organizations increasingly realize that they will never able to have all the existing talent in a particular marketplace. Crowdsourcing and collective intelligence is defined by a large number of individuals working collectively and provides for promising results in the context of business profit (Lane 2010). Using the crowd collective intelligence methods can enable the process of filling this perceived gaps of knowledge for constant benchmarking and innovation. Lane (2010: 8) described it as a "*revolutionary change in thinking, the products, the procedures and the organization*". Lane (2010) subdivided the phenomena of collective intelligence in the

context of crowdsourcing into cognition, cooperation and coordination. Figure 5 illustrates the forms of which collective intelligence applications can be expended.

Figure 5. Expanded form of collective intelligence



Source: http://www.thefullwiki.org/Collective_intelligence (2010)

Lane (2010) listed four issues that encompass the different alterations of collective intelligence in context to crowdsourcing. The first issue is correlate to possible problems within an organization, the second discloses the problem solving crowd, the third provides an account of the way the crowd tries to solve a problem and the last reveals the importance of incentivizing the crowd for finding a suitable solution to a problem (Lane 2010). In the present scenario the use of crowdsourcing associated with collective intelligence provides various examples. Arguably, the best known example might be Wikipedia, which sets skilful users in charge to share, add and edit information on the portal. Experts and amateurs alike join the same set of rights to share and furnish information. Therefore, the reliability of the sources of information

has been questioned (Adler 2008; Halavais and Lackaff 2008; Magnus 2008). Tapscott and Williams (2006: 30) used the term "*Wikinomics*," explaining this phenomenon as "*openness, peering, sharing and acting globally to support collective intelligence as a new force that is bringing people together on the net to create a giant brain*." Nevertheless, Wikipedia has empowered people from around the world to jointly share their knowledge in a robust and effective manner, which has gained global cultural acceptance.

2.2.4.3. Crowdcreation

Leimeister (2012) defined crowdcreation as a crowdsourced process that engages companies to approach communities for creative and design related tasks. These needs can include processes such as the designing of logos, business cards, corporate profiles, letterheads, hairstyles, cards or clothes; examples include Threadless and 99designs. Companies can use their own websites, or they can use other intermediary platforms such as Elance to post their needs, budgets, incentives, or prizes. Designers then approach the companies with designs, and the companies select the best submissions from a pool. The use of a crowdcreation platform widens the perspective for additional creative interpretations for the corporation seeking new inspiration – being not dependent on an individual designer or a specific internal creative department or team. Even Crowdcreation is open to a global pool of talents; the selection process of a best-fit design or creation from a large pool of submissions can be a challenging task. In particular, this process requires multiple bias free viewpoints.

2.2.4.3. Voting

Voting enables a crowd to respond to a specified product or service with a pre-defined feedback mechanism. Corporations like Amazon, Zalando, and eBay integrate feedback templates to every transaction undertaken by the customer (Geiger et al. 2011). Consumers are incentivized to provide feedback and share experience. Crowdsourcing companies like Clickworker ensure the authenticity of feedback and voting choices by checking for human and bias-free interactions (Vakharia and Lease 2013). Rigby (2011) notes that individual and authentic customer reviews are gaining importance for prospective buyers to make a decision whether or not to purchase a product or service.

2.2.4.4. Crowdfunding

According to Sullivan (2006: fundavlog), Crowdfunding is "*about the financing of projects or business operations by mostly large group of people, acting as investors or supporters*". In this model of crowdsourcing, the crowd, through investment, sponsorship, financing, or donation, funds projects or even seed-fund companies. This is essentially based on trust, particularly since its platform is usually the Internet. Sullivan (2006: crowdfunding wiki) backs this view by stating:

"*Many things are important factors, but funding from the crowd is the base of which all else depends on and is built on*".

One of the basic requirements for crowdfunding is that companies need to disclose their business conceptual idea and project details during a project's initial phase. This may provide for the risk that the idea may be copied in this early stage or pre-developed by others

(Drummond 2011). Crowdfunding enables founders and top management the flexibility to interact directly with possible investors or shareholders. Since the communication is personally directed to the founders or idea creators the chances that management will receive new investment opportunities for their company or project are alleviated (Sullivan 2006). Another potential positive effect identified by Surowiecki (2004) is the propensity of groups to "*produce an accurate aggregate prediction*" about market outcomes.

2.2.5. Benefits of crowdsourcing

2.2.5.1. Cost

Low cost is one of the major advantages of crowdsourcing. Crowdsourcing projects often attract a specific crowd out of amateurs, students or individuals who simply wish to make use of their skills and commit within a joint endeavour in their spare time. Schenk and Guittard (2009: 194) state, "*Most of the time, crowdsourcing is considered a good source of additional income for individuals.*" Von Hippel and von Krogh (2003) argue that crowdsourcing offers service providers and work seekers the ability to work on their own individual terms. However, the average pay per task can be relatively low, and for individuals that try to make a living through crowdsourcing doing the work by choice is not the rule. The non-financial motives and incentives for participation include intellectual challenge, knowledge exchange, peer recognition or skill signalling (von Hippel and von Krogh 2003). The relevance of low cost can be an important reason why companies and individuals are evaluating the use of crowdsourcing to enhance task performances. Since every intermediary platform is providing individual payment plans and rates, the minimum payment is often fixed by the legal minimum pay of the country where the individual worker is resident. If the country of

residency is not setting the minimum hourly wage by law, the minimum wage of the country where the intermediary platform origins rules. In general the cost of crowdsourced work is lower than that of traditionally outsourced or part-time hiring solutions (Horton and Chilton 2010).

2.2.5.2. Quality of output

Measuring the quality in crowdsourcing refers to the amount and complementarity of tasks completed at a specific task-related timeframe. According to Schenk and Guittard (2009: 20) *"crowdsourcing provides access to countless contributors, and with that, positive network effects can be observed"*. It enables companies to profit from individual ideas, which are sorted by preference. In addition, Schenk and Guittard (2009: 24) note, *"Quality refers to the originality of the solutions proposed and to the way they match with user tastes and expectations"*. They also refer to the characteristics of a solution in relation to a complex task.

2.2.5.3. Ease of use

Service seekers post jobs that cannot be executed by permanent staff members. However, job seekers can be first time or experienced professionals. Comprehending a project is easier for an experienced person, so he or she may perform the job at a higher rate, while an inexperienced person would perform the same services for lower pay (Frei 2009). Even intermediary platforms provide a toolset to ensure ease of use and quality of output significant challenges and risks are associated with work being done by an international workforce with altering levels of experience.

2.2.6. Obstacles in paid crowdsourcing

In his research Frei (2009) identified three main obstacles in paid crowdsourcing:

- Crowd Responsiveness
- Satisfactory Results
- Security and Privacy

2.2.6.1. Crowd responsiveness

With paid crowdsourcing, companies generally hope to solve a problem. Alternatively a large investment would be necessary to pay an in-house workforce. However, given the variability in labour pool, educational level, age group, the results of completed crowdsourced tasks are frequently less than ideal. Although entities could utilize crowdsourcing to have tasks completed for a reasonable cost, the responsiveness of the crowds is highly variable on intrinsic, extrinsic and social motives.

2.2.6.2. Satisfactory results

Companies considering the adaption of paid crowdsourcing could refuse its use as a variable outsourcing option because the question of quality may not be defined (Wong 2010). In general, crowd workers are investing time and effort to provide for trial and draft work through a paid, crowd-based intermediary platform, which is mostly generous to give second chances when results are below expectations or not matching. Sources for failed crowdsourced projects are not solely depended on the crowd or the individual worker but can also range from limited service provider capabilities to faults in job descriptions.

2.2.6.3. Security and privacy

Sensitivity of financial account details and proprietary of work relevant to the company are crucial when crowdsourcing work is considered. Due to these security and privacy concerns companies are currently cautious to post IP or sensible information open to the public that could easily identify specifics about the firm's business strategic interests (Frei 2009; Horton et al. 2010). The main risks for a corporation are related to the level sensitivity of it´s data and information, the abundance of a developed market, limitations of employee productivity, highly variable customer and consumer preferences, obsolete or ubiquitous technology, and other adjustments in the business environment. Five specific types of innovation risks have been identified namely organizational and societal, technological, market, financial, and turbulence risks. A properly installed risk management strategy ensures direction for the overall project and shows how non-productive actions can be bypassed (Brennan 2009; Burger-Helmchen and Penin 2010; Garry 2010; Lebkowsky 2010; Williams 2010).

2.2.7. Key insights

Crowdsourcing is an online distribution, problem-solving, and production model with various advantages. The most important benefit is that it gives firms access to a large number of skilled workers who are prepared to complete tasks within a specified time frame (Howe 2006a).

- "*It is a Web-based model that supports individuals in a distributed network through an open call*" (Howe 2006a: 4).

- Many online websites are recruiting individuals to assist firms to complete these tasks (Tapscott and Williams 2008).
- Crowdsourcing helps to reduce costs and achieve enhanced quality output (Howe 2006a; Whitla 2009).
- Crowdsourcing a large talent pool does not require the use of market signals (Benkler 2006).
- Companies concentrate on product development, marketing, and promotion, and use crowdsourcing as their means of fulfilling their objectives (Whitla 2009).
- Wikipedia and Linux are good examples of crowdsourcing. They do not rely on market signals, but have strong visibility and presence in the marketplace.

2.3. Innovation

Various scholars and researchers have analysed innovation, and many believe that it originates from a need or a problem. According to Hassan and Chairman (2008), innovation helps to sustain business growth and satisfy customers. It helps to provide value to stakeholders and effects the overall development and growth of a business in a positive way (Rogers 2003). Innovation identifies characteristics, such as relative advantage, compatibility, complexity, trialability, and observability, which affect the adoption of an innovation (Leadbeater 2006). The traditional approach to innovation in an organization relying on internal sources, such as in-house product development teams (Bessant and Howard 1995). The models discussed are the strategic models of innovation, the profit chain model, the complex system model, the volume-operations model, the linear model of innovation, and open source innovation (Chesbrough 2003; Everett 2003; Moore 2005).

Open innovation incorporates a variety of arrangements that act like innovation societies in open source and social networking websites (i.e. LinkedIn or Facebook). According to Cooper and Edgett (2008), innovation can occur any time and in any department across the organization. Innovation is crucial to the continuing success of any organization. Innovation is synonymous with risk-taking and firms that create revolutionary products or technology take on the greatest risk because they create new markets. Various studies have been conducted in the past to explore diverse aspects of an innovation. According to Cooper and Edgett (2008) has innovation a major relevance on the success and sustainability of an organization and its business scenario, its organization of innovation (Hassan and Chairman 2008), the level of collective intelligence and innovation (Lane 2010), the speed and adaptation of change, business models and innovation (Lindgardt et al. 2009), innovation in small and medium-sizes enterprises (SMEs) (Rahman and Ramos 2010), open innovation in SMEs (Roth 2008), and others. Innovation empowers organizations to emerge and attract attention with in the crowd of competitors. This supports the act of creating and developing something that does not exist or developing a product or service that is more effective than the previous/existing product or service. The source of inspiration for innovation can be an individual, a group, a department, the competition, or direct consumer needs. Amabile et al. (1996: 1154-1155) proposes that innovation is

> "*the successful implementation of creative ideas within an organization. In this view, creativity by individuals and teams is a starting point for innovation; the first is necessary but not sufficient condition for the second*".

The role of innovation is increasing due to increasing competition in the business environment. An innovation helps in sustaining the business's growth, satisfying customers, and providing value to the stakeholders. This helps to bring about the overall development and growth of the business (Hassan and Chairman 2008). Mootee (2010: mootee.typepad.com) clarifies:

> *"Innovation is hard, it is not about getting the idea at all, it is about managing ideas. So you've had a few great ideas; so what? There is a lot of art and science behind moving ideas along a corporate decision chain as well as managing unknowns. The future is never about the future; it is about now."*

An innovation can be made because of a need for improving the quality of existing products and services, the need for replacement of a product, the creation of new markets, improvements in the production process, improvements in overall efficiency, and the reduction in cost and environmentally sustainable projects. Rogers (2003) identifies characteristics of innovation, such as relative advantage, compatibility, complexity, trial-ability, and observability, which affect the adoption of innovation. An innovation that can offer something new, or that has relative advantage over the existing options available, will be easily adopted. An innovation should have a degree of visibility over the other options available. It should be simple and available for trial among the target user group (Tidd 2006). According to Tidd et al. (2005), five generations of innovation models have been identified. The first and second were based on linear models, specifically on the pull and push strategies, and were followed by the third-generation model, which "*required interaction between different elements and feedback loops between them*", also known as the coupling model (Tidd

2006: 4). The fourth-generation model is known as the parallel lines model. Tidd (2006: 4) describes the fourth generation model as: "*The parallel lines model, integration within the firm, upstream with key suppliers and downstream with demanding and active customers, emphasis on linkages and alliances.*" Tidd (2006: 4) argues in description of the fifth´s - generation model as the "*systems integration and extensive networking, flexible and customized response, continuous innovation.*"

Gorodnichenko et al. (2010) explained that an innovation is not limited to researching one aspect that needs to be updated or changed, but rather expands its area with a futuristic approach. It involves experimenting in different directions and experiencing an inexperienced path leads to new growth and development (Diener and Piller 2009). Open innovation has changed the thought processes of companies, their operations, and their actions and reactions to the process of change (Gassman and Enkel 2004; Lindgardt et al. 2009; Lane 2010). Lohr (2009: nytimes online) states, "*Open innovation models are adopted to overcome the constraints of corporate hierarchies.*" With a growing number of ideas coming from people outside of their organizations, businesses must be equipped with the best tools and methods for managing these new ideas. Ideas are the starting point of any big innovation (Turrell 2010). Alternatively, Chesbrough (2007: frontendofinnovationblog.com) argues, "*in business, it is not how many ideas you have… what matters is how many ideas you translate into products and services.*" The companies must now take the process of innovation more seriously in order to keep a hold in the market (Cooper and Edgett 2008).

Open Innovation is a concept developed by Chesbrough (2003, 2007), based on his study of large multinationals such as Procter & Gamble and IBM. Chesbrough further argues that

companies should not only rely solely on their own research and development, and that outsourcing some R&D functions through purchases from other companies may be a smarter move than closed innovation or relying solely on own employees for innovation.

Crowdsourcing suggests ideas to R&D processes through the web 2.0 infrastructures. Crowdsourcing implements a new type of agreement, one designed to govern, coordinate and supervise the actions of the globally connected peers in an open workforce environment. The development of these new rules of coordination, coupled with the exchange in hybrid organizational forms, combines open innovation, cooperative work with the innovation society, and market commercialization (Mulgan et al. 2012).

2.3.1. Open innovation

Chesbrough (2003, 2007, 2006) as well as Chesbrough and Appleyard (2007: 58) explain this concept as, "*Open innovation logic provides novel ways to create value along with alternative paths for value capture*" (Trompette et al. 2008). In an open environment of globally distributed knowledge, the concept of open innovation emphasises the notion that corporations should not rely merely on their own internal research and resources. Schenk and Guittard (2009) recommend to outsource part of their research and development functions for IPR (Intellectual Property Rights) to other firms. Even Chesbourgh and Appleyard (2007) indicate numerous possible tensions that may arise in implementing and running an open innovation framework, it provides for the basis to participate in a constant value creation process and to take advantage of the ideas originated outside of their organization by communities. Penin et al. (2011:15) supports this view, stating: "*Patents play a special role for knowledge acquisition and financial valorisation of knowledge that cannot be used internally*". Relying

on various steps and procedures, the implementation and success of social networking websites like Tumblr and Facebook, and innovation-based communities such as Hyve and Linux, are knowledge-based cases of crowdsourcing (Trompette et al. 2008). According to Schenk and Guittard (2009), in crowdsourcing knowledge is shared and the dismantling of the firm's formerly closed R&D processes can be the cause of a sizable competitive advantage.

The main characteristics that differentiate crowdsourcing from open innovation are, first, crowdsourcing does not focus exclusively on innovation processes while open innovation does; and second, open innovation represent the interaction between firms while crowdsourcing calls for links between a firm and the crowd as collective workforce. Open innovation is defined as a district embodiment of outsourcing, as it is a two-way process of selling and buying knowledge and processes accordingly. Consequently Füller, Matzler and Hoppe (2008) research states that in crowdsourcing projects initiated by well-known and bigger brand names the chances of getting more individuals participating would be higher than for projects of SME´s or new entrants like Start-Ups. Schenk and Guittard (2009) listed the financial rewards of technological interests as a source of motivation for the open source projects. There are various examples of crowdsourcing where the impact of these motivational factors can be seen (Schenk and Guittard 2009). Piller (2007) argues that contributors can see economic benefits in the form of lower costs of problem-solving or higher levels of integration in the work. Lower problem-solving costs mean that solvers have specific knowledge or experience relevant to the solution. This enables them to provide the solution at a considerably lower cost. High amounts of motivation can come from involvement,

challenge, and greater satisfaction in doing a particular task. To be more explicit Piller (2007: 22) states:

"*Interactive value creation is based on self-selection of a problem by potential contributors. That means no cost for screening, identifying and allocating tasks to actors is borne by the organization. Self-selecting actors are motivated either by their knowledge that solving the problem demands little effort or by regarding the task as challenging and worth solving. A open call for participation in not restricted. A broad network overcomes local search bias and taps into knowledge sources not known to the task's originator. Open interaction also fulfils desires for social interaction* ".

2.3.2. User innovation

The user innovation approach as new form of producer-customer interaction (Sharma and Sheth 2004) was initially researched and first developed by von Hippel (1998). Users who are forced by the market to bear the costs and risks associated with innovation drive this model of innovation; for example, sports equipment for sky surfing becomes like open source software. Von Hippel (1998: 629) states, "*Community phenomenon is an important feature of user innovation"* and listed user principles and innovations originating from a firm and user. Table 3 summarizes the characteristics of user innovation principles.

Table 3. User innovation principles

Firm centered Innovation	**User centered innovation**
Firms identify customer needs.	Lead users innovate in order to satisfy their own needs.

Firms invest in new product and developments. 	Lead users disclose their innovations.
Firms make profit though IPR and selling their products.	

Source: Schenk and Guittard (2009: 10)

Crowdsourcing outlines a different perspective to utilize external skills and knowledge from a mostly heterogeneous group of people by corporations. With the use of this approach, the work that was commonly conducted and fulfilled by internal teams or specialized departments or was routinely outsourced is now made available via an open call to an unidentified, large group of individual work seekers and problem solvers. In a second description, communities as a source in open supply are highlighted, which opens another viewpoint for defining crowdsourcing. Crowdsourcing is in place, when individual globally present work seekers connect through a intermediary platform using the Internet as IP-layer to fulfil given tasks and then split profits or receiving a wage by segment without any personal relationship or face-to-face interaction. The primary principle of crowdsourcing is to open the innovation process to an undefined globally present crowd of work seekers. At the same time, the open innovation process is started either by organizations or by the society. The planning, controlling and processing of crowdsourcing projects are mainly performed by specialized enterprises as intermediaries to achieve best possible work outputs and gain from the value produced within the crowdbased communities (Bonaccorsi et al. 2006; Chesbrough and Appleyard 2007). Due to the concept of open innovation trends and future market behaviours can be predicted more effectively over time. Closed innovation focuses on specific mostly IP based areas like patenting, whereas open innovation is focussed on the market and its dominant signals first to

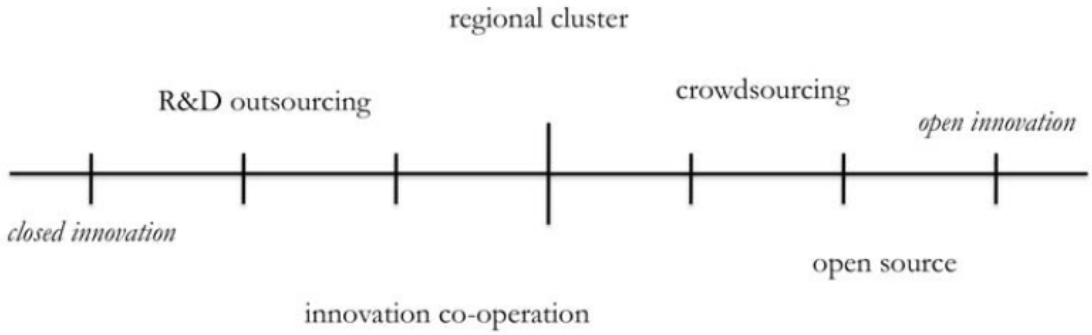
achieve a possible knowledge based first mover advantage. According to Penin et al. (2011: 12), the Open innovation approach is "*particularly iconoclastic for firms to naturally prefer the closed-innovation model based on processes that limit the use of internal knowledge within a company and use little or no external knowledge. Patents play a special role for knowledge acquisition and financial valorisation of knowledge that cannot be used internally*". Open innovation includes a variety of open source programmes, such as innovation societies, and social networking sites and also incorporates R&D strategies to the external aggregation of ideas and knowledge through personal talent pools (i.e. elance.com). At the core of the crowdsourcing concept lies a transparent distribution of ideas to the R&D processes through tools that the Web 2.0 infrastructure provides. In their study, Trompette et al. (2008) suggested that organizations should extend their involvement in open-innovation processes, as it is evident that the use of crowdsourcing as a concept for idea creation and innovation is evolving, especially for disruptive ideas driven by vital Internet communities.

2.3.3. Dimensions of innovation

Roth (2009) listed three dimensions of innovation as robust novelties, robust change and robust competitive advantage. Robust change refers to the participation of the employees who lead organizational changes. An integration of customers and stakeholders can help the company achieve a sustainable competitive advantage. Customer involvement in the innovation process helps consumers when they begin developing new products and services while at the same time, increases the level of acceptance for the product or service. According to Chesbrough (2007), innovation was linked with the heavy investment in internal research laboratories and hiring of most gifted people. Roth (2009) referred this form of innovation to

be closed innovation. Gradually, innovation moved towards innovation co-operation. Figure 6 reflects the paradigm of innovation over time towards an open innovation environment.

Figure 6. Innovation continuum



Source: Roth (2009)

Chesbrough (2007) and Piller (2007) investigated the extent of usage and effect of open innovation to an organization with respect to the selected intermediary enabler InnoCentive. This firm represents one of the market leaders of crowdsourced innovation intermediaries (existing customers include BASF, Dow, Eli Lilly and Procter & Gamble) with more than 100.000 workers and scientists registered that act as a gateway and bridge between seeking corporations encouraging scientists and innovative talent pools of workers. The reasons and motives for participation can be variable, but mostly origin in social participation or intrinsic encouragement (Antikainen 2010). In case of a successful project finalization the seeking firms reward the participating workers with monetary pledges or a stage-based reward program. Piller (2007) argued that even when no human interaction would be needed to complete a project, the individual idle CPU resources could contribute to collaborative projects without fixed infrastructure investments. Adapting the same principal intermediary

enablers like InnoCentive engage IP-based solutions to mostly scientific or technological challenges that reach outside the traditional internal R&D teams and development structures. Crowdsourcing intermediaries anonymously post challenges and problems to be solved by a crowd workforce onto their community websites to build ideal talent solving pools of workers that match the individual task requirement. The work tender is mostly accompanied by a financial rewards scheme for the best solution or team submission delivered within a given timeframe (Piller 2007).

Moreover, Piller (2007) identified altering basic motivations for these "solving" scientists and workers - from self-fulfilment to financial incentives, however Antikainen (2010) and Carpenter (2011) extended this finding to patterns of intrinsic, extrinsic and social motives (Table 7: p. 108). Intermediate organizations like InnoCentive assist the progress of "*problem formulation and posting, solution screening, confidentiality, intellectual property agreements, and award payment*" (Piller and Hilgers 2009: 4). The rapidly developing adaption of crowdsourcing and the use of open innovation within firms has its justification also due to the ease of use; easy access to a large pool of talents while, simultaneously, innovation workers and individual workers are being enabled to utilize their existing knowledge and skills while freely choosing the projects of choice *(*Piller 2007).

In the research conducted by Cooper and Edgett (2008) the development processes for new products and services conducted by SMEs and highly profitable market leaders were benchmarked. SMEs fell off in the level of productivity and profitability mainly because the completion has enforced and established basic guidelines, rules and principles. Cooper and Edgett (2008) study researched specific important requirements within a corporate culture and

executive action for success and innovative development. Besides being customer-focused, front-end loaded, supporting spiral development systems, a holistic approach driven by effective cross functional teams and metrics accountability were most accountable for successful outputs.

Understanding possibly as many customer requirements and needs define a customer-focused organization, where idea creation and a product development processes are not only customer oriented but solely driven by the needs and requirements of the customer. Integrated feedback loops at every step of the critical development path generate the demanding perspective that is required to generate an atmosphere of constant improvement (Cooper and Edgett 2008). The concept of front-end-loading supports the product development by preforming early on market analysis, adaptive technical and resource supply checks, integrated financial analysis and open feedback customer acceptance testing environments. Employing a spiral model for development enables development teams to understand potential risks and act on them prior a possible product launch or market entry. Combined with strategically positioned cross-functional team and departments, equipped with the necessary executive to power a holistic approach for change and development can be performed. This concept of open innovation provides for a transparent work environment, where teams originated from different departments join a project oriented talent and expert pool (Hassan and Chairman 2008). Successful corporations focus on the ideal mix and deployment of resources, technological innovation, adapted tools and methods, and a flexible and open work environment. All these factors contribute to the success of the projects undertaken in the innovation process (Cooper and Edgett 2008).

2.3.4. Types of innovation

There are several different approaches of innovations and developments in innovations been described in research and academia. Some of the common classifications and important developments are listed in Table 4 below:

Table 4. Development of innovation

Year	Authors	View	Approach and Innovation Types
1933	Dewey	Making decisions about best ideas	Innovation
1939	Schumpeter	Size of firm	Large firms, more innovation
1974	Tichy and Sandstorm	Increase in the number of workers, involvement in decision making about factors affecting their job	General organizational innovation
1984	Ettlie, Briggs and O'Keefe.	Empirical-data based	Radical Incremental
1992	Cyert and March	Extra resources needed for innovation	Vicious cycle of innovation based on antecedent of innovation
1998	Marquis	Size and technological changes	Innovation archetypes
1998	Afuah	Functionality and circumstances	
1990	Henderson and Clark	Degree of innovation and its impact on existing concepts and components	Incremental, modular, architectural, and radical
1996	West and Altink	Distinction of innovations in technical and social aspects	Technical innovation, administrative innovation
1997	Christensen	Slow process of adoption, sustainability	Disruptive innovation
1998	Rice et al.	Game changers	Continuous and discontinuous
2002	Cooper, Wootton and Hands	Disarray illustration	Invisible innovation
2002	Trott	Explained innovation in manufacturing context	Innovation is combination of theoretical conception, technical invention and commercial exploitation.
2003	Chesbrough	Source of idea of innovation	Open innovation
2004	Moore	Areas of innovation	Application innovation, Experiential innovation, Marketing innovation and Business mode innovation
2005	Tidd et al.	Different ways and circumstances	Product innovation, process innovation, position innovation, and paradigm innovation

2006	Howe	Crowd based innovation	Crowdsourcing
2008	Tapscott and Williams	Many people sharing ideas through internet	Ideagoras
2008	Penin	Voluntary participation	Open source innovation

Source: own research

Innovation is not a new concept for the present business environment (Bons et al. 2010). There are a number of innovation models available for various industries, product categories, and services (Chesbrough 2003, 2007; Cooper and Edgett 2008; Bons et al. 2010). Traditionally, companies have used their internal resources, i.e., in-house product development teams (Cooper and Edgett 2008), which were considered sufficient to fulfil the organizations' innovation requirements. However, transitioning economies, developments of new technologies, and growth and changes in the business environment have resulted in a shift in consumer and stakeholder expectations (Diener and Piller 2009). These changing expectations have been one of the primary reasons for companies to adopt innovative practices to meet the needs and the desires of their customers (Füller et al. 2008). Some companies work proactively, developing new solutions and reaching out to their target consumers.

Innovation is a process (Pénin 2008) that requires a suitable environment within an organization (Hawkins 2007). Productive environments that offer open-minded thinking allow for the generation of more innovative ideas (von Hippel 2005). An organization and executive with the necessary foresight, an open mind, and understanding of what predictive possible future development and design will be ideal to support the business model (Hagel and Brown 2006) also promotes innovation. An organizational structure that supports business growth, transparency towards business objectives and a business model that suits the organization's needs are additional prerequisites for innovation (Lindgardt et al. 2009). Major global brands

such as Apple and Procter and Gamble have a venture or advisory board, which disseminates information and ideas from within the company; as well as from sources outside the company, through all departments (Lindgardt et al. 2009).

As noted by von Hippel (1986) and Pillania (2008), companies work on innovation that is based on factors of external business environment (such as competitors, suppliers, customers, government) and educational sources (such as private laboratories, universities, research laboratories and others). By contrast, according to Mohr (2010: mohrcollaborative.com), in order to be innovative, companies need to:

> *"…align disruptive innovation with the right customers by embedding the innovative project in a part of the organization (new if necessary) that serves the customers for the innovation and doesn't have to meet same revenue/margin demands as incremental/sustaining innovation. Be prepared to go through an iterative process that is failure tolerant because forecasting the market is impossible. This process should be a learning process that goes beyond focus groups to actual observation of new customers and new applications."*

2.3.5. User innovation vs. crowdsourcing

The main distinctions between user innovation and crowdsourcing include (Leimeister, Huber and Bretschneider 2009: 197-224):

- User innovation refers to user projects while crowdsourcing is a firm-driven activity.

- Users of the final product make advances in user innovation, whereas any individual can be involved in the crowdsourcing process.

Raymond (1999) highlights the

"*mechanisms that made the Bazaar production mode so efficient in open source software*."

Recognizing Krishnamurthy´s (2005) research paper, open source development conducted on the Internet is highly economical, agile and highly focussed for contributors and sets no financial reward for participants. Some researchers argue on the extended openness of crowdsourcing as compared to open source software (Raasch, Herstatt, and Balka 2009). Brabham (2008b) argues that software development is not restricted to crowdsourcing. Raasch, Herstatt, and Balka (2009: 390), alternatively, state:

"*Transferability of open source principles to other industries is the subject of on-going research*".

Participation of skilled workers and programmers in open innovation projects is caused from diversified motivations such as financial reward or technological interest (Lerner and Tirole 2002; Bonaccorsi and Rossi 2003; Weber 2005). Finally, von Hippel and von Krogh (2003) empirically demonstrate the possibility that private returns and social consideration can coexist. While open source also borrows some innovation approach from user innovation, a "private-collective" model of innovation is feasible to provide an alternative way to explain motives (Haruvy et al. 2005).

2.4. Crowdsourcing as a business model for innovation

"*A business model describes ways of creating value for customers and the way business turns market opportunities into profit through a set of actors, activities, and collaborations*" (Rajala and Westerlund 2007: 118). A business model commonly includes the terms value-creation and a focus revenue generation (Al-Debi, El-Haddadeh and Avison 2008). Business model research includes strategies for a strategic e-business or adaptive information systems (Pateli and Giaglis 2003, 2004). The business model contains crowdsourcing as a value proposition, developing the concept of idea contexts (Walter and Back 2010). Table 5 summarizes the essential components of business models that use crowdsourcing as a key-source of innovation.

Table 5. Characteristics of business models using crowdsourcing as a key-source

Characteristics	Focus within Case Studies
Value creation by crowdsourcing	How does a crowd add value to the product? Which task does the crowd fulfil? Does the action match with the definition of the term crowdsourcing?
Crowd Description	What size is the crowd? How is the crowd assembled? Are there aspects of lead users?
Incentives	Which incentives are set up by the main authors to spur participation? What types of incentives are set up (monetary, acknowledgement, fame, learning)?
Hurdles	What are the hurdles to participation? How easy can the collaboration process be joined? Are there any strict limits to participation?
Technical solution	How is the crowdsourcing process backed up technically? What web-solution to leverage collaboration is applied?

Source: Walter and Back (2010: 558)

In their effort to create, gain and extend competitive advantage firms conceive innovative solutions to fulfil the basic market signals and requirements (Lane 2010). The use of technology is imperative for every modern corporation as it substantiates the responsibility for competitive advantage or affects the overall compromise of the industry or sector. In effect the concept of innovating through openness is an essential factor for maintaining and building a competitive advantage and the proper use technology has played a great role in the prosperity of crowdsourcing initiatives (Lane 2010).

The World-Wide-Web and IP driven services enable communities and talent pools to connect and co-work with each other, composing the compelling world of collective intelligence. Appointing a heterogeneous and undefined group of workers forming a talent crowd to solve complex problems becomes more economical and faster than using existing full-time employees. The connected systems mainly provided by crowdsourcing intermediaries (enabler) of professionals and sometimes low-to un-paid workers are connected through the technologically backbone of the Internet. Analysing the process of crowdsourcing, the consumers and producers of services and products are sometimes identical. When Lane (2010) studied the process by which executive leaders and their teams worked to maintain and stabilize the company's competitive advantage, the aforementioned perspective was adapted collective intelligence (especially using crowdsourcing and open innovation) to conceive competitive advantage and overcome possible hurdles of the firm.

2.5. Approaches to risk management

Literature describes the use of crowdsourcing as innovative and as a good tool for reducing risk, but sometimes also as a source for additional risk factors (Schenk and Guittard 2009).

The success of any business innovation process depends on the collective health of the internal and external actors that influence innovation (Iansiti and Levien 2004). Thus, in viewing the crowdsourcing process from a business perspective, it is expected that the benefits of crowdsourcing is mainly reluctant to contribution of its constituent actors (Iansiti and Levien 2004). For any corporation a risk of developing products or services that meet only the basic expectations is present; therefore crowdsourcing can enable value-creating actors to respond rapidly and effectively to market changes by capturing value (Adegbesan and Higgins 2011). The primary advantage of crowdsourcing in preserving risk is its inexpensiveness. In addition, typically, it is considered a valid source of additional compensation for talented workers (Schenk and Guittard 2009). In the purpose to minimize risk, it is important to control, maintain and manage the consistency of crowdsourced work right from the beginning of any project. Maintaining an ideal level of quality and control is of key relevance in crowdsourcing. The issue of problem solving is one of the compound matters in these processes (Hatchuel et al. 2005; Schenk and Guittard 2009). According to Schenk and Guittard (2009: 17),

"*Problem solving involves identifying a satisfactory solution or circumventing problem causing factors*."

Crowdsourcing may allow a firm that is facing a complex problem to fix the problem into a form and allow the crowd to select a solution best suited to the company's needs. A problem-solving process requires both time and skills from the people involved (Schenk and Guittard 2009). According to Trompette et al. (2008: 23) crowdsourcing is, "*one of the most important*

ways to activate and leverage the integration of heterogeneous resources in a structured flow of work".

Crowdsourcing may also reduce the risk faced by the client firm (Schenk and Guittard 2009):

- Since projects and individual tasks are not outsourced to a sole solution provider, the risk of the organization's dependence in relation to the provider are likely to be abandoned.
- Since a seeking firm issues tasks through an open call to an undefined group of workers with primarily monetary incentives, the risk of not obtaining any valuable response and work results appears to be diminished.

However, conducting a crowdsourcing campaign through an intermediary service providers can be of additional risk (Schenk and Guittard 2009):

- The dependency policy states that when crowdsourcing relies on a third-party platform like an intermediary service provider, the solution or innovation-seeking party is partially dependent on predefined policies and their possible changes.

Analysing existing literature, eight overall risk categories have been identified that are associated with crowdsourcing as shown in table 6.

Table 6. Main risk categories associated with crowdsourcing

Risk Category	Author	How crowdsourcing affects probability of risk
Complexity of relationship	Purdy et al. 2012	The increased number of participants and diversity within the crowd can increase the probability of risk in managing relationships within the crowd.
Crowd-Control/effectiveness	Koenig 2012	Control is less attractive in crowds. Referring to the effectiveness of the control measures, whether centrally located or distributed through an intermediary platform.
Coopetition	Koenig 2012	Refers to the effects or impact of co-innovating with competitors within a joined crowdsourcing project and a larger mix and diversity of

		participants.
Actor/Worker interdependence	Koenig 2012; Andner 2012	Crowdsourcing requires proxy, but not internal control. Risk arises due to the uncertainties that can occur while coordinating with contributing actors. In crowdsourcing, the company relies on the crowd as a supplier of ideas and solutions. The crowd has less at stake relative to the company.
Replication of business model	Koenig 2012	Crowds may gain access to business model data or related insights, due to a larger number and diversity of participants.
Loss of know-how	Elmquist et al. 2009	When the crowd is integrated in the innovation process,

		crowd actors may acquire some key know-how and use it for their own purpose or even sell it to the competition.
IP risks	Trompette et al. 2008; Felstiner 2010	Companies may encounter serious IP risks by assigning tasks to an anonymous crowd.
Loss of centainty in results	Felstiner 2010	The crowd actor has less at stake for not contributing to the innovation process and does not feel the responsibility and accountability for solving tasks.

Source: adapted from Kannangara and Uguccioni (2013: 37)

2.5.1 Risk management and crowdsourcing

Risk is a common aspect of any business (Bannerman 2007). Smith et al.(2002) analysed the business risk that need to be considered by firms and recommended a risk management strategy to be used. Business management research quantifies risk as a product of probability and impact of risk. In an organization, risk can result from the sensitivity of data and information, the lack of a developed market, the lack of employee productivity, changing consumer preferences, obsolete technology and other changes in the business environment (Burger-Helmchen and Pénin 2010; Lebkowsky 2010; Williams 2010). According to Osipova and Eriksson (2008), there are different models of risk management. These models differ from one another in complexity. There are three stages common in the models: identification of risk, assessment of risk and response to the risk. Potential risks are determined in the identification process. Risk assessment allows for a ranking of the identified risks based on vulnerability from a particular risk (Osipova and Eriksson 2008).

There are three basic functions of a risk management program, which together should be able to provide a picture of all the possible risk dimensions in the early stages of a crowdsourcing project. The first function will involve specifying the actors involved in each risk type (Stoneburner et al. 2009). Second, the definition of each action will help in identifying the circumstances in which a risk can occur. The third function of risk management is to design corresponding strategies for the management of risk at an early stage. These strategies may then be used during vulnerable times and after unforeseen circumstances occur. These solutions are usually agreed upon by the management and other concerned parties (Stoneburner et al. 2002; Polany 2006; Hubbard 2009).

The practicality of this well-accepted idea can become questionable after a period lacking any satisfactory results (Weiler 2008). It is important to recognize individual effort and understand how individual results may differ from the crowd. In the crowd, the growth of a person with the least experience is always greater than that of the most experienced person. In addition, cultural differences in the virtual communities are diminishing; alternatively, it becomes a hurdle for the development of creative ideas. Social aspects, morality and other issues are observed in the crowdsourcing process (Weiler 2008; McCluskey and Korobow 2009).

Cultural differences make every individual unique. Some habits may become socially unacceptable. Differences in social behaviour may be a cause of the failure to meet a project's deadline (Osipova and Eriksson 2008). Therefore, the company needs to ensure that it understands the social behaviour of crowdsourcing teams in order to keep the project on schedule (Frei 2009; Hubbard 2009). Although crowdsourcing has been widely accepted, many organizations involved do not adequately consider the pros and cons of implementing such projects and may spend more than the cost estimated by the traditional approach (Frei 2009; Hubbard 2009; Williams 2010).

Carruthers (2010) identified five factors that hinder any crowdsourcing project. One variable is the service providers' failure to comprehend the seriousness of a project. Evidence shows that crowdsourcing works most effectively when directions are clear and people understand the company's requirements and what is necessary to achieve the company's goals (Hubbard 2009; Qui et al. 2010). However, companies must clarify these points at the beginning of projects. Approaching the correct crowd, which includes people who possess the appropriate knowledge and required skill set, helps keep the project from losing its meaning, relevance

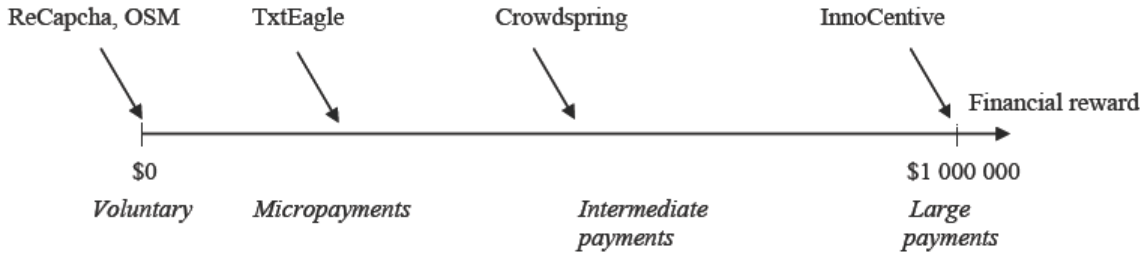
and significance. This also minimizes any risk associated with crowdsourcing and helps the company handle these problems effectively. Another important issue involves hiding information in order to increase excitement for the final launch (Hubbard 2009; Lebraty and Lobre 2010). Unlike in-house or traditional approaches of risk management, crowdsourcing cannot maintain the secrecy of a project at various levels of the organization (Burke 2000).

Organizations need to come up with measures to keep their plans secret, such as by granting access only to some parts of the information (Cleland and Gareis 2006). Crowdsourcing of a project needs to be planned in such a way that the volunteers would rise up to solve the problem (Deshpande et al. 2010) and make the project successful. Starbird (2011) draws attention to data refinement as being necessary to differentiate it from unstructured data. A leader combined with the selection of a correct business model, suitable payment method and proper project guidelines are necessary methods of managing people (Chesbrough, 2007; Hitson, 2009). There should be a way of tracking the participants by providing them with a unique identification number. As communication is found to be an important success factor to crowdsourcing (Chesbrough 2007), a timely communication with regard to progress, and the findings of the service providers and seekers should be considered and shared (Binder 2007; Küng, Picard and Towse 2008). A communication gap may affect the development of products or services. Crowdsourcing service providers work at their own pace and when it suits their schedule. This cannot be compared with the level of responsibility and dependency of internal people of an organization (Pénin 2008). Therefore crowdsourcing service providers especially need to be fully aware of company´s values.

Williams (2010) discussed the application of risk management to crowdsourcing and gives the example of Crowdcast, that has joined hands in a partnership with Jive Software (SAP's risk management group), to offer ideas to a diverse group of people, who comment, collaborate, vote on and score these ideas. The opening is understood in a narrower sense, as crowdsourcing firms usually make traditional use of IPR, e.g., by patenting their output. As considered by Raasch et al. (2009) is a possible copyleft to other industries a subject of on-going research.

According to Wu and Hubermann (2009), crowdsourcing is based on utilizing the attention needs of people by making them work in their areas of interest for considerably low pay. Based on the findings of Schenk and Guittard (2009: 22) Figure 7 outlines the cost of crowdsourcing for some projects being researched. The voluntary sum was nil for the ReCapcha project, which gradually moved to micropayments, intermediate payments, then large sums. The financial rewards gradually increased. However, the number of people working on the projects, work quality, and idea generation are some of the other important issues to be addressed when businesses start using crowdsourcing for innovation projects.

Figure 7. Continuum of crowdsourcing practices and cost



Source: Schenck and Guittard (2009: 22)

Crowdsourcing differs from the common co-production, where the consumers contribute to the production of goods or service. Usually, consumers perform these personally (Open innovators 2010). The phenomenon of crowdsourcing proves the working consumer theory (Kleemann et al. 2008). Society has witnessed the materialization of a new kind of consumer whose work is exploited for commercial purposes. The materialization of the working consumer is self-sufficient for particular technologies. The future outcomes of crowdsourcing for enterprises and for consumers are issues for conjecture. Distribution of profits and other economic consequences of crowdsourcing is an unidentifiable factor (Kleemann et al. 2008; Howe 2009). Outsourcing to the consumers holds an important potential for increased profits for the enterprise. However profits are not guaranteed. The enterprises realize that the benefit of economy from crowdsourcing depends upon several variables. Crowdsourcing schemes and policies need important investments and depend on and respond to the crowdsourcing calls (Kleemann et al. 2008). The investment relations with consumers are concentrated on cost, and depend on the involvement of different levels of complications. The consumers attain benefits from participating in crowdsourcing in the form of getting products that equate their needs, requirements and different financial and non-financial motivational aspects (Kleemann et al. 2008).

Crowdsourcing can influence also the design of products or services (Franke and Klausberger 2008). Participation of consumers in the product development process is not a new process for the companies. For years, companies have adopted various practices, which invite consumers or influencers to participate in the product development process through continuous feedback

and involvement (Franke and Klausberger 2008). Crowdsourcing offers an extended platform to the same challenge. Moreover crowdsourcing is mainly considered to be a more convenient, simple and reachable platform for the companies (Howe 2006b; Franke and Klausberger 2008; Kleemann et al. 2008). Consumers also have various advantages over the crowdsourced process (Romo 2010). Regarding consumer cooperation for the development and improvement of products, the company's main concern is to deal with pressure on the product design process. In successful cases, enterprises get excellent outcomes and profits with the help of consumers' skills and knowledge. Crowdsourcing offers a new opportunity to the consumers in regards to corporate decision making, allowing them to suggest new designs and influencing the public's opinions (Kleemann et al. 2008).

Furthermore, some researchers have argued that consumers are exploited by commercial enterprises as they give valuable ideas to these organizations for free – or, at least, for considerably lesser financial incentives. According to Kleemann et al. (2008), enterprises should pay well when they are implementing the crowd's ideas. The authors covered the working conditions and the quality aspects of crowdsourcing. It is very important to ask the enterprises whether the crowd truly sends a good quality of work. The process of sorting out quality work from a significant number of ideas becomes challenging for companies. Some consumers can be genuine professionals who do fully recognize the use of products and services for the enterprise. Their skills and knowledge have great potential value (Kleemann et al. 2008). However, there is a risk of participation with the amateur, but the amateurs can be a good source of new ideas. A regular employee of an enterprise has recognised qualifications and background that is the basis for his employment. However, the qualifications of working

consumers in crowdsourcing are usually unknown and uncertain. This means that the enterprises take a risk in giving work and transferring responsibilities to the crowd. The working consumers have very limited skills and knowledge related to the front stage of the corporations. Apart from that, very little is known about backstage functions as well. However, most employees of a company will have full backstage knowledge and experience, which will assist them deal with consumers (Bartunek 2007). There is no reliable way to calculate what the working consumers are doing and how the relationships between working consumers and the traditional employees will be organized (Kleemann et al. 2008). Some companies have adopted different strategies to select crowdsourcing service providers based on their knowledge, skill sets, and interest areas (Saxton et al. 2013).

2.5.2. Innovation risks

To address the central aim of the research to provide an answer for the question on 'How to manage risks of crowdsourcing innovation in companies' and to identify those risks that are involved with the use of crowdsourcing in a business context, this section covers the risks associated with the crowdsourcing concept and innovation as identified in the literature.

According to Keizer et al. (2002) as well as Miller and Lessard (2008), five categories of risk associated with radical innovation that have been identified:

- Financial risk
- Market risk
- Organizational- and societal risk
- Technological risk

- Turbulence risk.

The European Commission (2010: 40-41) study entitled 'Risk Management in the Procurement of Innovation' describes these risks as follow:

> "*Technological risks include those related to the non-completion of projects and tasks, underperformance, or false performance. Such risks usually arise from the selection of obsolete or wrong technology, and usually come from the service provider's side*".

In crowdsourcing, this could include quality risks, late delivery of a task or product, and high cost of maintenance (European Commission 2010: 40-41). Organizational risks are those that arise due to the client's organizational processes and resources, including lack of internal acceptance, compatibility of the innovation with organizational objectives, and absorptive capacity – or the capabilities of employees and the organizational structure to adapt to the innovation (pp. 44-45). Societal risks include lack of acceptance of the product by society or political and regulatory changes" (pp. 40-45). Financial risks involve monetary issues, including cost overruns, and failure of an innovation, thus incurring costs without financial rewards (p. 47). Market risks are demand- and supply-related risks, such as lack of demand for the product and lack of interest by suppliers (pp. 45-46). Finally, turbulence risks are associated with unforeseen events (mostly internally motivated), and thus could overlap with the other types of risks (p. 48). Bannermann (2007) pointed out that nature, origin, cause, and source of the risk as well as the probability of occurrence and consequences characterize risk. The cost linked with failure of risk management can be much higher than the precautionary measures. Risk management allows for the identification and reduction of risks, mitigation of potential problems, and costs and allocation of responsibility and accountability with respect

to these factors. The overall objective of a risk-management process is to minimize the burden of the stakeholders by minimizing the potential loss (Bannerman 2007). Risk management is an important strategic approach for an organization. It helps minimize the potential loss of finances, effort, and time. It provides direction to the overall project and demonstrates where less productive activities can be avoided. This helps with accessing which alternatives have low cost and effort implications but higher outputs. Martineau (2012) lists a set of guidelines to follow for successful crowdsourcing. This list begins with starting small crowd experiments in order to avoid bigger losses.

The rule of 90:9:1 is applicable in crowdsourcing (Nielsen 2006; Vowe 2012). This rule states that in most online communities, 90 per cent of users are lurkers who never contribute, nine per cent of users contribute a minimal amount, and one per cent of users account for almost all the action. The presence of lurkers in online communities appears to be highly variable (Andrews et al. 2004). However research by Li (2010) indicates that the engagement clusters have to be updated, ascending on the level of engagement into Watchers, Sharers, Commentators and Producers and diversified geographically.

Figure 8 illustrates the detailed results for specific engagement levels of Li´s findings.

Figure 8. Engagement pyramid

	Australia	Brazil	Canada	China	France	Germany	India	Italy
Watchers	72,8%	89,3%	81,9%	86,0%	75,4%	69,1%	89,6%	77,3%
Sharers	59,7%	79,3%	63,9%	74,2%	48,9%	46,3%	82,5%	63,6%
Commentators	33,0%	54,0%	35,5%	62,1%	35,6%	32,8%	61,4%	37,4%
Producers	22,8%	52,7%	26,3%	59,1%	20,2%	26,9%	56,0%	38,7%

	Japan	Netherland	Mexico	Russia	South Korea	Spain	UK	USA

Watchers	70,4%	72,1%	89,8%	88,1%	89,3%	82,2%	78,9%	78,1%
Sharers	29,2%	53,7%	69,8%	74,2%	64,6%	58,6%	61,8%	63,0%
Commentators	21,7%	35,7%	56,9%	41,1%	76,2%	45,1%	31,9%	34,4%
Producers	28,0%	18,3%	42,7%	56,9%	53,1%	30,3%	21,1%	26,1%

Source: Li 2010: charleneli.com

In order to achieve an optimized rate of retention, motivation is one of the key drivers of keeping a crowd active, whereas pure monetary reasons for participation are just secondarily beneficial (Benkler 2006). The motivating factors to get crowdsourcing to work are based on intrinsic, extrinsic or social motives and categorized into fame, fortune, fun, and fulfilment (Marsden 2009). All of these factors will call people to participate as volunteers for crowdsourcing. Previous research that has been conducted on the motives and motivations for participation is presented in .

Table 7. Research conducted on motives for participation

Motives	User´s main motivation	Authors
Intrinsic motives	Ideology	Lakhani and Wolf, 2005 Stewart and Gosian, 2006
	Enjoyment, fun, recreation	Lakhani and Wolf, 2005 Osterloh et al., 2004 Raymond, 2001 Ridings and Gefen, 2004 Torvalds and Diamond, 2001 von Hippel and von Krogh, 2003

Motives	User´s main motivation	Authors
	Intellectual challenges, stimulation, interesting objectives	Lakhani & Wolf, 2005 Ridings & Gefen, 2004
	Learning, improving skills and knowledge exchange	Antikainen, 2007 Gruen et al., 2005 Hars and Ou, 2002 Wasko and Faraj, 2000 Wiertz and Ruyter, 2007
Extrinsic motives	Company recognition	Jeppesen and Frederiksen, 2006
	Reputation, enhancement of professional status	Bagozzi and Dholakia, 2002 Lakhani and Wolf, 2005 Lernel and Tirole, 2002
	Sense of efficacy	Bandura, 1995 Constant et al., 1994
	User need, influencing the development process	Hars and Ou, 2002 Lakhani and Wolf, 2005 von Hippel, 2005
	Rewards	Antikainen and Väätäjä, 2010 Lakhani and Wolf, 2005 Harper et al., 2008 Kittur and Suh, 2008

Motives	User´s main motivation	Authors
		Wasko and Faraj, 2000
Social motives	Altruism, reciprocity, care for community	Kollock, 1999 Wasko and Faraj, 2000 Wiertz and de Ruyter, 2007 Zeityln, 2003
	Friendships, "hanging out together"	Hagel and Armstrong, 1997 Rheingold, 1993 Ridings and Gefen, 2004
	Peer regognition	Lerner and Tirole, 2002 Jeppesen and Frederiksen, 2006

Source: Antikainen 2010, Carpenter 2011

One of the important requirements of crowdsourcing is keeping a system ready to filter the contents and to maintain the brevity (Antikainen 2010). In order to yield good results, one must find and combine all experts working for him or her. The process should be as simple as possible. It is important to maintain the interconnectivity between the contributors and the crowdsourcing service providers. Existing communities may work in more effective coordination than new communities. However, progress has to be monitored during the process. Encouraging participation and offering feedback on ideas can greatly influence the process design. In this case, if participation involves any kind of transfer of legal property, a

terms and conditions clause may be required. Finally, crowdsourcing requires effective communication channels in order to be successful (Pénin 2009). This can start with advertising the initiative, online and traditional media.

Organizations seeking new innovative ideas from their internal team or outsourcing experts can discover various risks associated with these ideas. One of the most substantial risks to these closed innovation approaches is financial risk, as experienced by pharmaceutical companies. Crowdsourcing can provide a solution to deal with such risks, although as the projects become more complex, the crowdsourcing risks also increase in terms of impact (Schenk and Guittard 2009). In pursuance of central research aim, table 7 contributes to identify risks that are involved with the use of crowdsourcing and innovation in a business context and provide an overview of impact on practice:

Table 8. Risk to traditional innovation and innovation through crowdsourcing

Types of Risks	Impact on Innovation	Impact on Crowdsourcing
Technological risks	Service providers' risk, non-completion of projects and tasks. Underperformance of teams or outsourcing partners. False performance or outsourcing partners. Non-payments.	Risk of non-completion or disappearing of the service provider minimizes as many people might be working on the open call. The risk of underperformance of internal team reduces as the outsider works on the project with his/her own interest. A person interested may have better knowledge of technology or possess more

Types of Risks	Impact on Innovation	Impact on Crowdsourcing
	Risk associated with obsolete technology. Security risks.	relevant skills than the available skill sets of internal team of a company.
Organizational and societal risks	Cultural and social factors have a high impact.	The risk of innovation failure due to cultural and social factors is considered low (Weiler 2008; McCluskey and Korobow 2009).
Market and consumer risks	The cost of failure of acceptance of an innovative idea developed in-house or outsourced is higher. However higher risk is attached to the market failure of innovation.	The idea comes from the crowd and in many cases the idea with the highest votes among the users is selected. This minimizes the market failure risk of an innovative idea.
Financial risks	The financial risk is high in in-house innovation or outsourcing projects.	Minimum financial risks. Low cost. There are many innovative ideas, work and projects received by the company. The company gets the opportunity to evaluate different options and the cost implications are much lower than the in-house or outsourcing options (von Hippel and von Krogh 2003; Schenk and Guittard

Types of Risks	Impact on Innovation	Impact on Crowdsourcing
		2009).
Turbulence risks	These risks are usually experienced by large-scale businesses due to unforeseen factors (European Commission 2010).	No dependency on a single firm or agency reduced the risk of the service provider disappearing (Schenk and Guittard 2009). Higher chances of input when there is an open call for crowdsourcing (Schenk and Guittard 2009).
Creative Risk	This is a risk when a product or organization fails to remain competitive in the marketplace due to lack of (or failure of) creativity.	

Source: own research

2.5.3. Business risks

Innovation-related risks are not the only types of risks which businesses face. There are also business risks, which any crowdsourcing client needs to be aware of. Marr (2006) categorized business risks into strategic and operational risks. Strategic risks are defined as those, which could affect the organization's continued success and existence, and may result in failure to

achieve business objectives (Aron et al. 2005). Examples of strategic risks are competitor actions, market changes, disasters affecting physical resources, technological developments, employee sabotage, cash flow risks, theft of proprietary information, risks to reputation, and regulatory actions, among others (Marr 2006). To illustrate, technological developments become strategic risks when they cause products or services to become out-of-date, and in turn cause companies to fail. Companies such as Kodak, for instance, were severely affected when developments in imaging enabled pictures to be stored in electronic form (Lucas and Goh 2009).

Alternatively, operational risks are those, which affect day-to-day activities and are often related to internal resources and systems. Examples of such risks are equipment breakdown, attrition of key employees, and sales loss due to poor quality of service (Kumar, Aquino, and Anderson 2007; Dafikpaku 2011). Crowdsourcing could be a source of strategic risks such as risks of litigation or regulatory actions due to employment law, patent issues, and copyright ownership, and securities regulation of crowdfunding (Wolfson and Lease 2012), leakage of sensitive information, and risks to reputation (Keuschnigg and Ribi 2009). Operational risks related to crowdsourcing include low quality of work (Swan 2012), increased supervision costs, and failure to motivate a crowd (Kleemann et al. 2008).

2.6. Applications of crowdsourcing

Following the thesis objective to identify current practices of the commercial use of crowdsourcing innovation the following section investigates applications of crowdsourcing in a business context. According to Marsden (2009), crowdsourcing is one of the most talked-about terms in the present scenario. For companies, this gives access to new ideas and a much

broader talent pool. Crowdsourcing can be a timesaving option because specified time-critical tasks can be completed at much lower cost than they could be by an in-house team or contracted firm. Whitla (2009) explained the concept as having initially evolved through software developers and programmers, and later gaining acceptance in various other fields and markets. In the present scenario, crowdsourcing is used by all types of business operations in R&D, idea generation and manufacturing. Crowdsourcing provides a platform for information sharing and knowledge of any industry; any sector can be shared among the interest groups (Hitson 2009; Howe 2006b, 2008). According to Brabham (2008b), SMEs have realized that their efforts were limited to modifications of some part of the existing product. The new product development process was being ignored due to the perceived fear of losing out in the competition (von Hippel 1986; Afuah 2003; Brabham 2008a; Rahman and Ramos 2010). It is clear that the new product would hit the market only if it had a unique selling proposition (USP), good value for its purchase price and the ability to fulfil customers' needs and requirements (Rahman and Ramos 2010).

Rahman and Ramos (2010) claim that, this is possible when a company is aware of its customers' needs and requirements. This encouraged companies to undergo simultaneous interaction with their customers throughout the development process, conduct marketing research, and the proper testing of the products before their final launches (Cooper and Edgett 2008; Rahman and Ramos 2010). Companies can adopt different modes, methods, and approaches to understand customer needs, e.g., customer interviews, camping out or ethnography, lead user analysis, focus group problem-detection sessions, brainstorming group events with customers and crowdsourcing, and using online or IT-based approaches

(Nambisan and Nambisan 2008). Clarke and Aufderheide (2009) conducted a study to understand the idea behind the business model of companies that use crowdsourcing; the theoretical groundwork is connected with the work of Surowiecki, von Hippel and Tapscott. Clarke and Logan (2011) offered the theoretical ground to understand the combined knowledge and benefits from user interaction (Stewart 2007). The data collection has two qualitative approaches wherein the meetings and observational data are utilized to identify factors that are affecting the implementation of crowdsourcing (Suroweicki 2004; Swaroop 2008). The theoretical model has been developed to identify factors of the crowdsourcing business model.

2.6.1. Crowdsourcing in creative industries

Crowdsourcing has brought various changes to the creative industry, from designing to photography (Housewright and Schonfeld 2008; Sweeney 2009; Schenk and Guittard 2009). It has revolutionized the way businesses have operated and provided new ways of doing activities on the Internet. People can utilize their creative skills without having the need for degrees or professional qualifications (Winsor 2009; Woods 2009). According to Clarke and Aufderheide (2009), a person can make profits over the Internet by taking pictures and submitting them to the various portals. In order to make more money, it is very important for a photographer to learn how to take good pictures. The chances of getting better pictures and more profit are linked with the ability of a person to master his or her skills (Yang et al. 2008). People tend to spend more money and time taking pictures and making them available online for potential customers to purchase (Franke and Klausberge 2008). Furthermore people are

able to get agency representation and positively succeed as career photographers in order to optimize their talents and resources (Clarke and Aufderheide 2009).

Clarke and Aufderheide (2009) argue that very few people reach the level where profitable results are achieved. That is the reason their photographs are sold at higher prices. Digital photography has changed the overall market approach for the photography industry. During this cost-effective and convenient process, a number of pictures can be taken at the same time and transferred to a personal computer or instantly uploaded to the Internet. Old film cameras had the limitation of 35 snaps per roll. It was not possible to look at the image at the time the picture was taken. Developing the pictures required the employment of skilled professionals. The advent of digital photography helped overcome these limitations. This affected the total cost of pictures. Taking pictures is now very convenient. For example, some mobile phones come with excellent built-in cameras. The improvements in both cameras and mobile phones, over the past 10 years, are amazing (Shim et al. 2006). Stock photography has also gone through extreme changes, the business in which licensing images were previously shot. The supply of high-quality photographs is a major factor in maintaining profit margins for the stock photography industry. The best photographers provide these high-quality images (Clarke and Aufderheide 2009).

Franke and Klausberger (2008) have studied the perception of crowdsourcing among the designer community based on theories of fairness constructs. They considered distributive and procedural fairness to be important aspects affecting its outcome. A process is considered fair when it is transparent with regard to participation opportunities. There is a positive correlation between perceived fair decision-making processes and the “level of acceptance of the

outcomes" between the parties involved in successful crowdsourcing (Franke and Klausberger 2008).

2.6.2. Role of intermediaries in crowdsourcing

Intermediaries play a very significant role in successful crowdsourcing. There are various reasons for this. The intermediaries help cover crowdsourcing companies' and service providers' risk (Whitla 2009). Intermediaries provide common platforms to the service seekers and work providers. There are various types of intermediaries listed on Openinnovator.com or crowdsourcing.org, such as: research and development platforms; marketing, design and idea platforms; collective intelligence and prediction platforms; human resources (HR) and freelancers platforms; open innovation software; intermediary open innovation software services; creative co-creation; corporate initiatives; Product idea crowdsourcing; Branding and design crowdsourcing; peer- and peer to peer (P2P) production; and public crowdsourcing.

Each of these intermediary groups has a number of service providers focusing on certain areas of crowdsourcing in a specific industry or workgroup (Whitla 2009). This helps individuals or organizations deal with the risk of not being creative or innovative, the risk of failure to compete in the marketplace for availability of internal resources, financial risk and others.

2.6.2.1. Research and development platforms

This particular platform group consists of companies offering open innovation problem-solving solutions, an idea marketplace, crowdsourcing for research and development solutions, online problem solving, and a platform to research intermediary and social and technical problem solving (von Stamm 2004). This helps in dealing with turbulence risks,

financial risks, organizational or societal risks, and technological risks. For example: InnoCentive, IdeaConnection, Yet2.com, One Billion Minds, NineSigma and others (West and Lakhani 2008).

2.6.2.2. Marketing, design and idea platforms

This platform group consists of a large number of intermediaries involved in community co-creation, open innovative marketplaces, brand innovations, logo and website development, creative solutions, lead generation and many others (Battistella and Fabio 2012). Intermediaries offering student challenges in the area of marketing and creativity are also included in this category, including RedesignMe, Atizo, Ideaken, Brand Tags, Battle of Concepts, Brainrack, CrowdSPRING, 12designer, and LeadVine. These platforms help deal with creative, market, financial, and organizational risks (Hallerstede, Bullinger and Möslein 2012).

2.6.2.3. Collective intelligence and prediction platforms

These include intermediaries that provide platforms to apply the wisdom of the crowd in forecasting, prediction markets, collective intelligence markets, crisis information, online music, image labelling, and many others (Abrahamson, Ryder and Unterberg 2013). This helps in dealing with societal risks and turbulence risks (Geiger et al. 2011). This category includes websites such as Inkling Markets, Intrade, Ushahidi, Kaggle, We are Hunted, and the well-known Google Image Labeller.

2.6.2.4. HR and freelancers' platforms

This category includes competition-based software crowdsourcing, copywriting, online tasks, crowdsourcing recruitment, and low-cost crowdsourcing. Amazon's Mechanical Turk belongs to this platform group.

2.6.2.4. Open innovation software

This group includes idea management, collective intelligence regarding open innovation, connection with stakeholders, and suggestion services (Antikainen and Väätäjä 2010). This includes Napkin Labs (which connects consumers, experts and employees), FellowForce, and others (Trompette, Chanal and Pelissier 2008).

2.6.2.4.1. Intermediary open innovation software services

This category includes intermediaries that help in idea hunts and provide solutions for pharmaceutical and technical seekers (Gassmann 2012). These companies include the Big Idea Group, Pharmalicensing, Exnovate, and others.

2.6.2.5. Creative co-creation

These intermediaries allow seekers and providers to come together to create something new—it can be a new product, design, gift idea, or something else. This helps overcome the creative and market risks. I.E.: Spreadshirt, Jujups, Threadless, Selband, Dream Heels, Zazzle and many others.

2.6.2.6. Corporate initiatives

These are the initiatives by major corporate houses in order to build their own community and utilize their crowd for various innovative ideas and purposes. This includes two types of crowdsourcing: product idea crowdsourcing as well as brand and design crowdsourcing. Product ideas help companies to extend their product line, diversify, modify and upgrade their products and solutions, whereas branding and designing helps in developing brand and communication strategies based on new ideas and designs (Rosen 2011). These help in providing solutions for the financial risks, creative and technological risks (Sloane 2011a). Product idea crowdsourcing has ben used and successfully integrated by several major global companies e.g., Fiat Mio, My Starbucks idea, Betavine, Ideas4Unilever, Tchibo ideas and others. Branding and Design crowdsourcing e.g., Spreadshirt Logo Design Contest, LEGO Cussoo, Peugeot and others (Abrahamson, Ryder and Unterberg 2013).

2.6.2.7. Peer production and P2P

This consists of all the initiatives and activities of the P2P crowdsourcing e.g., Linux, Wikipedia, Yahoo Answers, Funding Circle, and others.

2.6.2.8. Public crowdsourcing

Crowdsourcing has not been limited to the corporate world. Rather, it has extended to the general public and public institutions like the iBridge Network for university innovation, the German Catholic Church for open innovation; the Ideas campaign specific to the ideas in Ireland and many others.

Figure 9. Crowdsourcing landscape by examples

Source: Crowdsourcing Results (2011: crowdsourcing.org)

Some selected examples of various crowdsourcing concepts are elaborated below:

2.6.2.8.1. CafePress.com and CrowdSpirit.org

Internet services like CafePress.com and CrowdSpirit.org were one of the first platforms that used crowd creation principles for their product ideas and development. At CafePress.com, customers and talented users pool their creativity to develop new products and share a provisioning percentage once the product sells (Franke and Klausberger 2008). Similarly, CrowdSpirit.com engages with users to share their experience and vote for products or services. A product development and its launch are dependent on the number of positive and matching votes. Additional rounds of iterative optimization are stimulated by user opinions

(Franke and Klausberger 2008). Any monetary incentives are controlled and managed within the existing community (Hempel 2007). Burmann and Arnhold (2008: 66) stated that,

"*The companies often play smart and crowdsource the task that is not very important for them and consumes most of their time."*

A practical adaption can be found in the areas of advertising and promotion to challenge the best possible claim for a product or service or to qualify user-backed content through a semantic context crowd (Whitla 2009). Content development requires time and effort. Crowdsourcing these tasks allow companies utilize the time needed to complete them on another stage of a product's life cycle (Wu and Huberman 2009).

According to Krontiris and Freiling (2010), the stimuli for the crowd to provide for ideas and activities should be innovative and authentic. Some ideas depend on an emotional touch, such as products with a high personal anticipation, and others, require specialized skills, like industrial or mainly technical feasible products. Products can in effect be launched with a central marketing message promoting the unique propositions. One of the most frequent and early forms of crowdsourcing is idea-jamming; asking individuals to come up with a tagline or slogan for a specific product or service in exchange for monetary incentives (Nambisan and Nambisan 2008). This task is usually complemented with word-of-mouth advertising of a product or serviced by the participants. Crowdsourcing has been misused for simulating additional clicks on advertising banners or social media likes on websites like Facebook (Nambisan and Nambisan 2008). However, numerous media outlets and corporations have internal scoring systems and bias-control pools to deal with such practices. Another successful application for the use of crowdsourced worker pools is market research campaigning. In the

conventional model, respondents were asked to fill out survey forms. The process of selecting and reaching the appropriate target respondents and motivating the desired group to completely and correctly fill out the forms can prove challenging (Nambisan and Nambisan 2008).

At present, online survey forms are typically being designed and sent out to the target audience (customers) via E-Mail (Nambisan and Nambisan 2008). These assessment forms consist of both open-ended and closed-ended questions, with fixed word limitation for answers. Motivation for participation can be monetary or socially activated (unpaid). The most prominent inconvenience results in the difficulty to control the process of data collection because some of the respondents are not from the targeted population, but merely respond to earn pay or for entertainment. It is also very challenging to find people in the target population on the Internet.

2.6.2.8.2. Funding Circle (Peer Production and P2P)

This intermediary brings together potential investors with those who are seeking financing. This website lists the credit ratings of the projects posted in order to help investors analyse potential risks, as well as aid in diversification of their investments. Borrowers are also able to seek the most favourable interest rates. Investors can make greater returns, and borrowers can obtain loans at lower costs without the involvement of banks. The investors receive between six and nine percent of annual returns and two percent cash back. Peer-to-peer lending provides an interesting alternative for mezzanine financing in a SME environment. For seekers of credit the lending intermediaries allow a possible lower interest rate compared to a bank loan with low or no additional fees. Signing up for the service is free of charge and

supports the overall lending based community. In a European perspective peer-to-peer lending is developing rapidly. Especially the use of crowd-based ratings and scoring schemes that support traditional credit scoring providers this alternative form of financing prospers (Funding Circle.com, 2010).

2.6.3. Management of risks in crowdsourcing

Burger-Helmchen and Pénin (2010), elaborate on the theory of crowdsourcing of inventive activities, and highlight the differences with the crowdsourcing of regular work and the crowdsourcing of content. Identifying the possibilities of crowdsourcing inventive activities by applying two complementary theories for crowdsourcing, which are described as the transaction- and the evolutionary theory (Burger-Helmchen and Pénin 2010). These two theories describe limits of crowdsourcing inventive activities. Crowdsourcing may also come into view when knowledge is adequately used; however, the question of legal protection has arisen with theoretical predictions to be tested (Burger-Helmchem and Pénin 2010). Modern principles followed by enterprises do not hesitate to handle knowledge and technologies developed by other enterprises. Crowdsourcing represents a technique for an enterprise to contact outside knowledge. Nowadays, economic and management ideals have pushed the advantages of crowdsourcing rather than other options. Managers must determine whether to complete activities within their business enterprises or outsource them to single-service providers. It is not common to crowdsource inventive activities, as crowdsourcing represents only a fraction of the enterprise (Burger-Helmchen and Pénin 2010). The examples of complex crowdsourced tasks (i.e. Atizo, Crowdspirit, and InnoCentive) show us that these projects are frequently associated with consistent earning schemes. A suggestion that answers

to these sizeable and highly remunerative projects may be the result of hierarchical or autonomous groups (Wenger 1998).

Burger-Helmchen and Pénin (2010) conducted a study to discover the limits of Crowdsourcing Incentives Activities (CIA). The objective was to understand the aspects that affect the efficiency and incentives of the enterprise by using the CIA. There are two theories of the CIA: transaction cost theory and evolutionary theory. These theories of enterprise allow putting forward situations that have cost implications on CIA. This revealed that there was a gap in understanding the problems and costs connected with CIA in crowdsourcing. Previously, enterprises utilized crowdsourcing for solving problems and gaining ideas. The study shows that enterprises did not gain knowledge, but rather information, time, and computing capacity from the crowd. Individuals, irregular information, insecurity, and indication of the transactions make CIA very hard to manage. The evolutionary theory of an enterprise puts forward the ideas of learning and transfers the knowledge between two individuals. This process is significant, as it routinely builds knowledge-intensive communities (Cohendet and Simon 2006; Nonaka and Von Krogh 2009).

All the points mentioned above limit the presentation of the CIA and identify the internal solutions of an enterprise for co-development with established associates. By using these two theories, the enterprise recovers the issues of the CIA. The problems and crises can be crowdsourced only when the problems are clearly described and easy to guard. CIA allows the crowd to solve internally unsolved problems. In this case, the crowd offers its time, information, and knowledge to the enterprise. The problems of the enterprise do not get solved internally due to time and cost constraints. However, the crowd provides its optimum effort to

find any solutions. An enterprise describes a problem and offers a prize to search for the solutions to such problems. The inventors in the crowd try to solve the problems and win the rewards. The CIA represents only a marginal activity with respect to the global research activities of any enterprises. The CIA affects small transactions, especially with an opportunistic behaviour of the CIA involved in this. Each problem includes the background of the problems, a way of developing solutions, and deliverables. This research clearly shows the fixed nature of the problems and the solutions are there to help the CIA remain active and practicable. It should be very important to collect the data of different cases in the CIA. Data should explain the problems, attributes, and quality of an enterprise and the crowd. This practical work is hard to solve, but it improves and develops the knowledge of the CIA (Burger-Helmchen and Pénin, 2010).

Every crowdsourcing campaign has to be management and planned in a very conservative way to provide an effective alternative to traditional sources of innovation. Even various risks have been identified the adaption and rise of crowdsourcing in the marketplace has proven to be successful since its first breakthrough (Lebkowsky 2010). In cases of participation that result mostly out of social or intrinsic motivation the level of overall engagement and anticipation for the project occurs to be careless. Sometimes people post replies that do not relate to the problem, or replies that do not make sense. Money can be motivating, or it can be a constraint that hinders creativity (Herzberg et al. 1993). Some make rewards their goal instead of aiming for the solution to a specific question, service or product. In many cases a purely financial gain attained as a factor of motivation at the expense of quality. However,

corporations can maintain these risks with applicable alertness and utilize crowdsourcing as an innovative risk management tool.

The management and direction of tasks and performance becomes demanding in a crowdsourcing model. The manager's role in a company is to income-contingent fulltime employees working under his governance; however, when people are working autonomously in a heterogeneous group they may lose their direction (Lebkowsky 2010). Crowdsourcing harvests the promised results when appropriate incentives and risk management tools are used to encourage quality work from a mostly undefined group of people forming the crowd. In order to recognize possible uncertainties in the use of crowdsourcing it is imperative to differentiate between the crowd and the community in which it is preserved. In a joined endeavour, the crowd tries to engage for a common goal to solve a problem or contribute to a product or service and the motivation is limited by time. In communities time is irrelevant to the problem or a common goal. The motivation to stay and participate in a community is socially manifested. One problem is broadcasting an open call to the most appropriate talent pool or target crowd. It is therefore the task of an intermediary to provide for proper means and methods to manage, filter, recycle and pool all contributions that are received (Piller and Vossen 2011). Setting goals well in advance and monitoring the achievements on the way has been proven to be crucial for a successful outsourcing campaign. The open call joins mostly talented amateur volunteers and firms are eager to maintain an equilibrated balance between the job requirements and its specific results to be gained.

To validate the work posts by individual contributors, all submissions should be constantly crosschecked with possibly overlapping existing postings. Individual workers may be not as

loyal as internal fulltime employees and share their ideas also with other companies or on alternative intermediary platforms. According to Schenk and Guittard (2009: 17),

"*The problem-solving process requires time and skills of the people involved. Thus we can say that complex tasks of crowdsourcing require a significant investment on the part of individuals forming the crowd*".

For example, regarding open-innovation projects, Schenk and Guittard (2009: 18) further elaborate the motivating factors for participants:

"*Reputation and ego gratification mechanisms may be incentives for individual participation*."

Crowdsourcing can help handle multiple risk instances, such as critical reliance on a specific crowdsourcing platform and topics related to knowledge and know-how of a particular task. According to Schenk and Guittard (2009: 25),

"*The client firm is partly dependent on strategic decisions taken by the platform owner.*"

Furthermore, Schenk and Guittard (2009:25) state:

> *"For classic outsourcing, the firm that uses crowdsourcing faces risks of unlearning and brain drain. But crowdsourcing also generates a competitive risk to the client firm. As in the model of Open Innovation, the relationship between the client firm and the solution developer may be ill defined from an IPR point of view. The solution developer may reuse the idea or solution developed to address the needs of other client firms."*

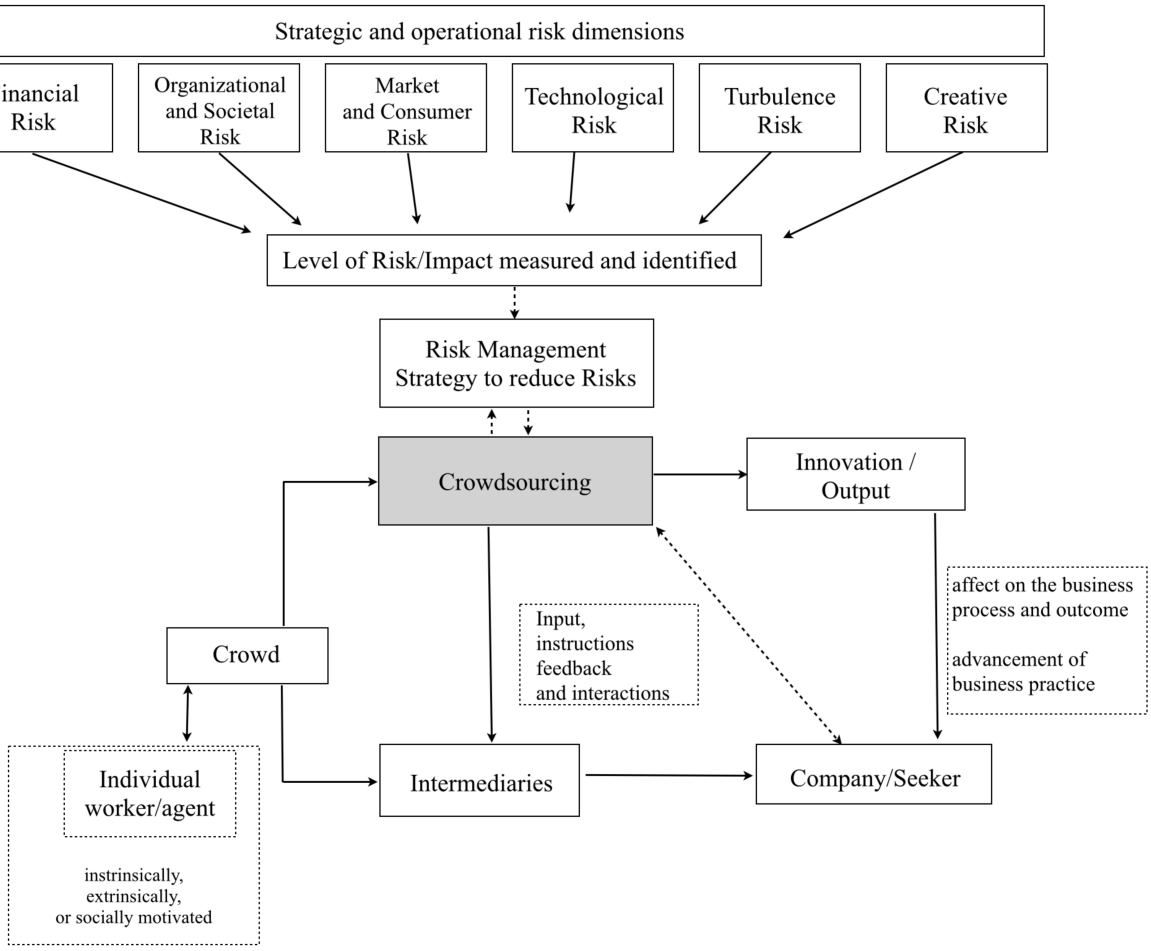
While more companies are benefiting from the value of crowdsourcing innovation, many are still uncertain how to control risks and what specific benefits they can gather from engaging with a global crowd.

2.7. Conceptual framework

This chapter analysed the different aspects of current practices of the commercial use of crowdsourcing, risk management for innovation and the risks involved in the practice of crowdsourcing. As exemplified by several authors it is apparent that the implication of crowdsourcing could be a source of multiple risks for companies (Keizer et al. 2002; Miller and Lessard 2008). Research has been undertaken, that crowdsourcing offers an effective platform for service seekers and providers, but also has various associated risks that are arising with the use of crowdsourcing in a business context. These Risks can exist at an individual, process/strategic, or company/operational level and may hinder crowdsourcing's overall innovative processes and may result in its failure. The conceptual framework for this study proposed in Figure 10 addresses the identified risks a company faces with the use of crowdsourcing innovation related to the crowdsourcing process, the crowd (providers/actors), the intermediaries and the seekers (companies). The conceptual framework covers the study's objective to determine the level of risk involved and identify possible strategic solutions to deal with those risks. When the risks identified are covered, innovation through crowdsourcing can be a more viable option for companies to drive innovation than, considering in-house teams, outsourcing or contracting selected outside partners. Companies have the option to communicate their open calls by using intermediaries or directly through their websites/infrastructure. Existing literature does not address a crowdsourcing risk level

analysis nor provide practical evidence on how companies control risk associated with crowdsourcing innovation. The framework therefore aims to identify the affect of crowdsourcing on business processes and possible advancement of business practices to address the central research aim on 'How to manage risks of crowdsourcing innovation in companies'. The proposed framework will set the basis in the development of research methodology and research design.

Figure 10. Conceptual framework



Source: Developed on the basis of reviewing and analysing existing literature

2.8. Summary and conclusion

Crowdsourcing is a term and method that has gained importance and practical adaption in various areas in a business context due to its practical approach and measurable outputs (De Sloane 2011b). There is evidence that crowdsourcing is integrated within the concepts of innovation and risk management (Alonso et al. 2008). Various factors differentiate crowdsourcing from an open sourcing environment; like the number of people involved, risk pattern, types of projects and many others (Hassan and Chairman 2008; Burger-Helmchen and Pénin 2010; Williams 2010).

The following key-insights have been aggregated:

- Low cost is the major advantage of crowdsourcing and gives more opportunity for amateurs to grow in comparison to highly skilled workers.
- Sources of motivation for different individuals can range from financial to non-financial incentives.
- Crowdsourcing is a good source of an additional income for individuals. (Schenk and Guittard 2009).
- The concept of crowdsourcing remains in its budding stages. Therefore, it is often used synonymously with other concepts; such as open innovation, user innovation and the open source initiative.
- The problem-solving process in risk management requires both the time and competence of the involved parties. (Schenk and Guittard 2009).

- Open innovation generally focuses on innovation processes and describes the interaction between the firms and the crowds.
- The user-innovation approach deals with the final product made by the users. The bulding of dynamic communities is essential in user innovation. (von Hippel 1998).
- Crowdsourcing acts as an application of the open source principles to other industries. (Howe 2008).
- Crowdsourcing can be a tool for dealing with the business risks related to the innovation.

In the evolution of crowdsourcing, it was evident that it initially offered people an opportunity to utilize their skills, share information, use a common interest communication platform, share views and ideas, and learn from the experiences of others (Howe 2006b; Whitla 2009). People helped each other to develop and grow. Gradually the concept gained momentum and paid incentives were offered (Boutin 2006). The reason people were willing to work for low incentives was the cost of information (Boutin 2006; Wu and Huberman 2009). If the cost of information is low, or the information is already commonly available, they would use that information on the crowdsourcing platform. It created risks for the companies because their employees might be sharing vital information with their competitors' employees (Tapscott and Williams 2008). Concurrently, a free flow of knowledge provided an opportunity for companies to get their work done at lower rates and in shorter periods of time. The involvement became questionable for the fun seekers and the non-serious service providers. This is evidence that crowdsourcing has certain risks as identified in section 2.4, but it also

offers an innovative platform with more potential gain than any in-house team or resources (Benkler 2006).

In the following chapter the deployed methodology is considered to investigate the research questions:

- What risks are involved with the use of crowdsourcing in a business context?
- How does the crowdsourcing concept advance business practices?
- How has risk management been incorporated with the use of crowdsourcing?
- What measures have been taken to keep track of any risks?
- How has the use of crowdsourcing affected the business processes and outcomes generally?

3. Research Design and Methodology

The identification and selection of appropriate methods and the design of this research are aiming to connect empirical data to the initial research questions and ultimately, lead to its conclusions and contribution to knowledge and practice in Chapter Five. Reflecting the extant literature discussed within Chapter Two a selection of methodology in relation to the adequate research philosophy can be drawn. In order to establish an appropriate methodology, aiming to achieve valid and reliable results, this chapter firstly clarifies the epistemological distinctions and their links to ontological positions underpinning the study. Thereafter, the central aims are revisited; to consider the appropriate methods and research design, namely a qualitative collective business survey in form of a prepared structured online questionnaire and one-to-one interviews. The chapter also details the approach used and conditions under

which the various stages of investigations were carried out and consequently used to collect the primary data. After explaining the analysis of the results process for the research methods deployed, issues of sampling, ethics and confidentiality are verified. In the final part of this chapter, the instrumentation, validity, reliability and process of generating data is analysed.

3.1. Research philosophy

The literature reviewed in the previous chapter examined crowdsourcing as a possible method for disruptive innovation and attainable risks applied. The research aims are to: (a) identify current practice of the commercial use of crowdsourcing innovation; (b) Determine the risks involved in the practice; and, (c) Identify possible strategic solutions for dealing with the risks. Funding and controlling innovation was long believed to be a major reason for the existence of the modern industrial corporation (Chandler 1977; Armour and Teece 1980; Freeman 1982). Until recently, only limited objections were raised to this dominant view (e.g., Allen 1983; Von Hippel 1988; Robertson and Langlois 1995). Two major perspectives on distributed innovation have influenced research and academia: open innovation (e.g., Chesbrough 2003a, 2006a) and user innovation (e.g., Von Hippel 1998, 2005). Inauen and Schenker-Wicki (2011) identified that the influence of open outside-in innovation for managers involved in the R&D domain has a significant positive impact on the different innovation performance measures. Research from a variety of perspectives as referred in Table 9 has argued that innovation no longer takes place within a single organization, but rather is distributed across multiple stakeholders in a value network (Bogers and West 2012). Ren and Levin (2010) more specifically describe crowdsourcing as a range of different approaches, including corporations acting as open innovation intermediaries, firms managing

their own crowds, communities that aggregate online content or coordinate peer production, or the open call organized as a contest. In recent research multiple examples of each of these approaches have been identified. (e.g., Dodgson et al. 2006; Huston and Sakkab 2006; Ogawa and Piller 2006; Jeppesen and Lakhani 2010; Archak 2010).

Table 9. Overview of research on integrated and distributed innovation perspectives

Attribute	Vertical integration	Open innovation	User innovation
Main research question	How do firms control end-to-end innovation process?	How can firms maximize innovation effectiveness?	How can users be supported to become innovators?
Key stakeholder	Firm	Firm	User
Other stakeholders	-	Other firms in value network	Producers
Level of analysis	Firm	Firm	Innovation
Key success measures	Profit	Profit	Quantity of (significant) innovations
Locus of innovation/knowledge	Within firm	Outside firm	Within users
Type of innovator	Organizational	Organizational	Individual†
Assumed motivations	Pecuniary	Pecuniary	Utility
Innovation mode	Internally controlled	Best of breed	Cumulative
Norms	Managerial hierarchy	Market exchange	Cooperation
Relationship with other innovators	None	Exchange	Cooperate
Spillovers	Blocked	Paid	Free
Representative works	Chandler (1977, 1990)	Chesbrough (2003a, 2006a)	von Hippel (1988, 2005)

Source: Bogers and West 2011

In contrast to date, the adoption of crowdsourcing in practice with the identification of involved risk has not been examined in depth. In terms of ontology, it is necessary to explore how decision makers view their world and their perception of reality when potential risk sources associated with crowdsourcing have been identified and appropriate risk prevention

methods have to be implemented. Ontology addresses what exists in a certain world; something that can be discussed. It is ideally an area in philosophy, which deals with articulating the structure and nature of the universe. The ontological query questions the nature and form of reality. Basically, it seeks to establish what thing exists that can be known concerning it. Ontology can be used to refer to terms and their definitions linked to a description of a world or a problem in question (Gruber 1995: 907-928). According to Cooper and Schindler (2008: 146) "*the area of investigation may be so new or so vague that a researcher needs to do an exploration just to learn something about the dilemma facing the manager. Important variables may not be known or thoroughly defined."*

Consequently, the positivism or interpretivism perspective of the researcher often influences and perhaps bias the research study. The acquisition of knowledge from a diversity of sources is often subjective and dependent on the abilities and attitudes of the person in question, managing crowdsourcing innovation. Therefore, this study embraces the concept of multiple realities, accepting that industry experts and customers of crowdsourcing intermediaries construct their own reality, according to how they interpret and perceive the world. The ontological position of this thesis recognises that the content of experience is conceptual (McDowell 1994) and is embedded in the thesis. In applying the methodological approach epistemology defines the kind of human understanding and knowledge that may be gained through various inquiries and alternative investigation methods and should direct to a consideration of the issues involved in the research question (Vasilachis de Gialdino 2011). The epistemological position seeks to determine the relationship that occurs between the knower or anticipated knower and the thing that can be known. Thus, the methodological

question seeks to establish the way the inquirer can go to find out what is believed to be explained after inquiry. The basis for the methodological selection applied for this research has directed the researcher to a consideration of the issues involved in the research question (Mason 2002). Based on this information a comprehensive and robust methodology is required, following an epistemological qualitative form.

3.2. Aim of the study

The purpose of the qualitative, collective study is to explore the practice of crowdsourcing as a tool of leading innovators and to identify possible risks involved by taking a mixed methods approach of one-to-one interviews and an online survey of customers of selected crowdsourcing platforms, that focus on a intermediate business context (Companies and Organizations using crowdsourcing concept). The qualitative research methodology, with its roots in the social sciences such as anthropology, history, and political sciences, researchers approach the research from the researcher as an observer perspective, with data collection and interpretation through contact with the field (Miles and Huberman 1994; Tayler and Bogdan 1998).

The focus will be on the particular behaviours affecting the levels of risk, as well as on the application of crowdsourcing in the decision-making process and its applicability based on any risk involved by tapping into a largely voluntary workforce as a means to solve problems and/or expedite innovation. These risks will be indicative or predictive of success or failure.

Corresponding with the thesis aims introduced in section 1.7 and in arriving at this purpose and in context with the research methods deployed, the research design seeks to establish:

1) The relationship between crowdsourcing innovations and innovation in a business setting together with the risks involved.

2) Whether innovations in crowdsourcing with higher risk levels have a greater chance of survival and the key factors that affect the risks involved in its application by policy makers in organizations.

3) The adaption of crowdsourcing by department and the extent to which risks are realized in organizations.

4) The risks and limitations associated with crowdsourcing, including the issue of trust and reliability.

5) The components that provided for risky situations and the management of such risks in the business context.

This chapter also presents how choosing a qualitative, collective survey approach was appropriate for the research, as well as the rationale for not choosing other methodologies of research. Additionally, included within the chapter are the descriptions of the population, the customers' identification process, attaining informed consent, and maintaining confidentiality. This chapter also incorporates an outline of the plan of data collection together with a detailed analysis plan discussing both validity and reliability. Such descriptions, as highlighted in this chapter, expound on the areas of concern that are thought to be of great value to the process of determining the application of crowdsourcing and the risks involved.

3.3. Research design

The qualitative methodology and data collection was applied in the form of a prepared online questionnaire template; one-to-one structured formal interviews have been conducted and where a live one-to-one interview was not possible, the link to the online survey was sent to study-participants. Using a survey approach can allow for the possibility of stronger interpretation and "*better theorizing*" (Stake 2000: 437) and is "*considered more compelling, and the overall study is therefore regarded as more robust*" (Yin 2003: 46). The online survey and one-to-one interviews were accompanied by open-ended questions and sometimes closed-ended questions with word limitations for the answers. The incentive for participation was not driven due to any monetary motivation and purely voluntary. Lui et al. (2009) argue that aggregated firm´s responses from a qualitative survey are influenced not only by their own current and past output but also by an indicator of aggregated response. These response sentiments have a common collective component and demonstrate that firms, when replying to qualitative surveys, react not just to the hard facts but also to the "herd" behaviour. This "herd" effect supports the concept of pattern-based iterative clustering to refine the collected data towards the distinctive questions that the research is aiming to find answers for (Kriegel et al. 2009). Alternative research methods have been explored – i.e. focus-group interviews are used extensively across a wide variety of disciplines. However due to the global nature of the adaption of crowdsourcing in a business context and the difficulty of utilizing synchronized interviewing providing for one of the main characteristic of focus groups – a simultaneous involvement of a number of respondents in a research process could not be provided. Alternatively case based research methods have also been evaluated. However

survey-based research methodology usually tends to address research problems within the interpretivist paradigms rather than the positivist paradigm (Carson et al. 2001). In reference to possible future theory-building research a survey-based approach within a defined subgroup of companies that had already adopted crowdsourcing would then be a more appropriate methodological fit.

3.3.1. Sampling method

The researcher collected primary data leveraging a sample frame out of a defined subgroup of firms that have already facilitated crowdsourcing in a business context through an intermediary platform. The selection of this systematic random sample, although not representative of all companies using crowdsourcing, was more appropriate than soliciting volunteers from general sites with unknown populations and provides for the purpose of generalizability of data.

However, theory (Peshkin 1988; Stake 1995: Yin 2003) suggests that it is ambitious to command the process of collecting the data properly as some of the respondents may not from the targeted population, but merely respond to earn pay or for entertainment. It is also very challenging to find people in the target population on the Internet (Fricker and Schonlau 2002; Birnbaum 2004). Thus, data was collected using systematic random sampling throughout industry experts and a cross-section of customers of crowdsourcing intermediary companies. The selected sampling technique with the purpose of assessing specific primary data has been selected because of its convenient accessibility to this subgroup of population and proximity to the researcher to this specific subset of companies.

The chosen method required also conducting face-to face opportunistic interviews between the interviewer and crowdsourcing experts (respondents), utilising and adapting a structured questionnaire, whereby the respondent is asked a series of pre-established open-ended questions and sometimes closed-ended questions with word limitations that resonate to the questions being conducted for the online survey (Roberts et al. 2006; Levy and Lemeshow 2013). Wright (2005) and Dipboye et al. (2012) identify that this method yields a high response rate, at an excessive cost, with control over the interview situation. Merriam (1998: 116) points out that one of the goals of qualitative research is to "*reflect the participant's perspective*".

Therefore conducting a qualitative survey was identified as the best apposite to the study, as qualitative methodology engages exploring and achieving an understanding (Creswell et al. 2003). A collective survey approach is fitting when the effort is made to discover more about a phenomenon that is well comprehended (Forza 2002), achieving a deeper perceptive of the phenomenon of professed factors that influenced the crowdsourcing and risk-management relationship and the longevity or success of the application of crowdsourcing.

The problem is the absence of information on crowdsourcing and risk-management relationships in the business context and the longevity or success of crowdsourcing. Qualitative research involves the need to listen, as well as the need to develop meaning from customers of the intermediary crowdsourcing platform (Creswell et al. 2003; Corbin and Strauss 2008). Gratitude is given to the customers as experts on their own experiences by conducting face-to-face opportunistic interviews. Even knowing the possible disadvantages of higher cost, interviewer bias or less anonymity the advantages of flexibility in sequencing the

questions, details and explanation, improved ability to contact hard-to-reach populations, higher response rates and increased confidence that data collection instructions are followed strengthen the choice of one-to-one interviews to support the online survey data.

Intermediary mediated crowdsourcing projects can be seen as continuous processes that typically require longitudinal observations (Pettigrew 1990). In response to find answers the central research aim on 'How to manage risks of crowdsourcing innovation in companies' a sampling technique through systematic random samples occurred to identify customers in the study. The sampling method of choice identified customers from whom to collect the data related to the research question from a specific sub-group of a general population – customers of existing crowdsourcing intermediary platforms and selected industry experts.

The consideration of possible predictable behaviour of the survey respondents due to the nature of the defined sub-groups of companies that already used crowdsourcing through an intermediary may lead to limited generalization of the findings to other organizations or contexts (Heiner 1983). Likewise, different inductive biases can be captured by assuming different prior distributions over hypotheses. The approach makes no a priori commitment to any class of representations or inductive biases, but provides a framework for evaluating different proposals (Griffiths et al. 2010).

3.4. Appropriateness of design

Qualitative research, as described by Corbin and Strauss (2008), enables the unearthing of customers' knowledge of the intermediary crowdsourcing platforms within their traditions, cultures, or settings. The basis of a naturalistic investigation or epistemological perspective of

a qualitative research design is the hypothesis that unravelling the perceptions and ideas of the customers of the intermediary crowdsourcing platforms from their context is not feasible. The methodology that makes an attempt to comprehend experiences and offer meaning and explanation should be complex and contextual (Corbin and Strauss 2008). The questions of research as established in Section Five of this chapter were driving the plan in order to appreciate the perceptions of the customers of crowdsourcing intermediary platforms. The collective survey design facilitated achieving a deeper perceptive of the phenomenon of professed factors that influenced the crowdsourcing and risk-management relationship and the longevity or success of the application of crowdsourcing (Baxter and Jack 2008).

3.4.1. Consideration of research methods

A quantitative technique in which a survey methodology would be utilized was first reviewed. The questionnaire would have requested the customers of the intermediary crowdsourcing platforms to rank factors gleaned from the literature as being those affecting the application and effectiveness of crowdsourcing in the business context and the longevity or success of the crowdsourcing concept. A quantitative approach is more appropriate to comparisons between persons or groups. Miles and Huberman (1994) and Creswell et al. (2003) asserted that quantitative methods have evolved to accentuate the gathering of information in order to evaluate and offer a number or a score. Other researchers argue for the use of qualitative research methods in order to create enhanced understanding of phenomena (Strauss and Corbin 1990). The setting of each customer of the crowdsourcing intermediary platform is imperative and essential to how he or she frames the individual response, and grading the information in the context would have been tricky. Even though the study could have taken

the form of a quantitative research design, the questions of research themselves, understanding the viewpoints of the factors the customers of the intermediary crowdsourcing platforms believed predisposed their decision, determined the methodology.

Yin (2003) noted that the greatest concern is over the lack of strictness in collective survey inquiries. To reduce the risk of such a problem, the collective survey incorporated the organized collection of information using online questionnaires. The online questionnaire interview format eradicates one of the facets of bias by eliminating the ability of the customers or researchers to formulate assumptions based upon body language or voice tone (Seymour 2001). All data gathered was reported without censorship (except for information redacted to maintain privacy and confidentiality).

A concern found in investigating collective surveys is the difficulty in generalizing in the findings for other uses (Yin 2003). The purpose is not to generalize the information collected. The collective survey methodology is a plan that permits greater comprehension of the fundamental phenomenon studied. The results of a collective survey which relies on the context of the observable fact, and therefore cannot be generalized to other contexts, has led some experts to determine the generalization of collective survey results a hypothetical proposition rather than related to a population (Yin 2003). The theory of making decisions is the principal theoretical intention for the research study. The ability of connecting abstract theory with a multifaceted practice is an added benefit of a collective survey using a subgroup defined sampling technique of a systematic random sample. The use of the collective design of the survey strengthened the research, which has multiple cases comparable to replicating the survey. A collective survey amplifies the ability to simplify results (Yin 2003).

3.5. Research questions

3.5.1. Operationalization of survey questions

Operationalization of the survey questions from the literature reviewed in chapter 2 defined the terms on how the key concepts for the study on crowdsourcing and the management of its risks were going to be measured. The key concepts from the literature were crowdsourcing as a driver for innovation, risks associated with crowdsourcing, and risk management (Baruch and Holtom 2008). Operational definitions underline the conceptualization of relevant survey questions and their measurement of output.

Those questions of research are the basis of the survey instrument that give direction and purpose to the study (Creswell et al. 2003). The review of existing literature included an examination of the application of crowdsourcing in the world of business and technology, where the practice of crowdsourcing has become an increasingly important tool in product development and troubleshooting. This thesis seeks to demonstrate its use as a tool of leading innovations, as well as its risks. How policymakers in business organizations perceived crowdsourcing was a major theme driving the research and a variable to be measured. The research questions that guided the design of the collective survey instrument are stated as follows:

1. What risks are involved with the use of the crowdsourcing tool in the business context?
2. How it is believed the crowdsourcing concept has advanced business practices?

3. How has risk management been incorporated in crowdsourcing in the business context?
4. What measures have been taken to keep track of any risks realized with the crowdsourcing concept?
5. How has the crowdsourcing concept affected the business processes and outcomes generally?

The analysis of existing literature defined the wording of the survey questions and the scale on which the responses where measured. At the conceptual phase the formulation of questions was aimed to be consistent with the respondent´s level of understanding in order to eliminate possible unreliable responses. The basic research question design for this study has its foundation in studies such as the Gartner Research (Erickson and Gratton 2007), which stated that over half of all Fortune 1,000 companies have made some attempt to integrate crowdsourcing into their marketing approaches by 2010, with predictions that most of these efforts will be susceptible to poor management and the results will be of no use to anyone. Therefore, for a business to successfully integrate crowdsourcing into any aspect of its business, whether research and development or marketing, it is important that it first lays the required groundwork by understanding both - risks and opportunities alike. The rewards for using crowdsourcing can be realized if businesses take an active role in overseeing and managing the process. This is what these research questions seek to address using a collective survey methodology. Demographic factors taking into account gender, age, category of business and crowdsourcing experience were all examined in connection with the concepts of crowdsourcing concept roles and the degree of satisfaction, but were optional in the

formulated questionnaire instrument as they were not primarily of interest in the study. Therefore, not much interest is directed to them but instead, the study focused on the response of the customers of the intermediary crowdsourcing platforms on the list of the items provided. The questions where formulated to assess the effect of the roles of crowdsourcing concepts on various fields of practice and business contexts in which each respondent works. Even though the business structure of organization initially depended on hierarchical authority, emerging evidence confirmed the crowdsourcing concept was in application at all levels in various business departments and outlets. The instrument of questionnaire (Appendix B) in this case was made to get a measurement of the degree to which the use of crowdsourcing in an organization is perceived or not viewed by policy makers and crucial organs in the said organizations. The study of the research went further to investigate the use of crowdsourcing to emerging organizations, which were reached through the Internet.

Further, the research questions helped in examining the capability of crowdsourcing to transform all facets of business practice with good management procedures embedded. Other factors looked into the crowdsourcing concept as a liaison between management and frontline personnel under well-controlled circumstances. Research studies into the relationship between customers' behaviours, and an organization's commitment to react to them, have shown that a phenomenon called crowdsourcing can have a dramatic impact on a company's bottom line, if managed properly. It is a model capable of aggregating talent and leveraging ingenuity while reducing the cost and time formerly required for solving problems. Crowdsourcing is enabled only through the technology of the web, which is a creative mode of user interactivity, not merely a medium linking messages to people (Rossiter 2006). Satisfaction with

crowdsourcing and organizational commitment to the process are directly related. This is why some organizations are bound to fail when such a balance is not realized, as illustrated by these previous studies. The current study went further in examining the relationship between the use of crowdsourcing and the risks involved. The policy makers in various business departments were asked about their risk perceptions and the level of satisfaction they attained from their jobs.

Moreover, the research questions were used to evaluate the concept of crowdsourcing on matters of risks when used to change the conventional manner of assessing and monitoring business performance, without managing the process. As an important tool in the business context, the crowdsourcing concept and the effect of its general application needed to be analysed in various settings. With specific implications for the crowdsourcing concept on specific departments, a deeper evaluation of the process was closely related to effectiveness. The researchers are of the opinion that those instantaneous responses to change in the status of the business, which make a department effectual, may be more favourable to practices of leadership than the crowdsourcing concept. Crowdsourcing might be more beneficial when effectiveness involves the practice of innovation. In addition, researchers in the past note that many factors contributing to effectiveness in business departments are beyond the scope of crowdsourcing. This might therefore be much required for the process other than the people and the messages they put forward.

The impact of a well-managed crowdsourcing project on quality and safety outcomes for business operations and/or customer populations was also addressed in the design of research instrument. As discussed and reviewed in chapter 2, the roots of crowdsourcing can be traced

back to mutual efforts as realized with the development of the Internet together with the open source movement. The provided examples stressed the collaborative nature of crowdsourcing and its tendency as well as promoted the public good over profits. It is imperative to note, however, that crowdsourcing has already been applied to various commercial settings.

3.6. Population

The population from which the customers of the intermediary crowdsourcing platforms were drawn included the Internet, where crowdsourcing is thought to have taken its roots, and mainly from proven market leaders (i.e. Crowdflower), which offer crowdsourced business solutions. Within the customer base of these existing intermediary platforms systematic random samples have been drawn from a population of all existing customers.

3.7. Sampling frame

Customers of the intermediary crowdsourcing platform were selected out of systematic random sampling using an informal network of businesses and organizations making use of crowdsourcing tools and their application, as well as from crowdsourcing associations (i.e. crowdsourcing.org) and crowdsourcing intermediary companies. A network of current businesses and organizations using crowdsourcing, based on personal knowledge and previous relationships, was used to assist in identifying potential customers. The study of customers would have had to contemplate crowdsourcing for participation eligibility and have made a decision to become involved in crowdsourcing within the context of its business and/or organization. The customers made the first contact with the study through existing industry networks. Several keynote talks and presentations in front of industry professionals and

insiders where given to introduce to the study´s research questions and goals (Crowd-Convention 2011 and 2012, Crowd-Expo 2011, Crowd/Innovation Conference 2011-Appendix B). The researcher then offered an introductory invitation letter accompanied by the informed consent form (Appendix A). Once the signed informed consent form was established, the customers of the intermediary crowdsourcing platforms received the interview questions. Those who participated were not in a database, nor were the traits recognized in their workforce records. The sample size was established by the end of the study, as is habitually true in qualitative investigations; nonetheless, it was prearranged there would be a minimum of 30 customers of the intermediary crowdsourcing platforms for each setting. A systematic random sample allows for typicality, variety, accessibility, and the opportunity to study the case. Creswell et al. (2003) noted the sufficiency or completeness of the information collected, or the understanding gained, and settled on a naturalistic sample size. Sufficiency was obtained when data infiltration was attained. Data saturation and infiltration happens when information obtained from customers of the intermediary crowdsourcing platforms is repetitive and no new insights have been attained. Neuman (2006) contended, that if the goal is to scrutinize a general trend, the number of participating individuals need not be large. The study concerned the exploration of crowdsourcing and the risks involved within the business context, as well as the longevity or success of the process. The phenomenon of factors perceived to pressure the decision is the shared knowledge within the proposed case study.

3.8. Informed consent

Voluntary and informed consent is essential to any research involving any person, such as the customers of the intermediary crowdsourcing platforms (Maylor and Blackmon 2005).

Voluntariness is the model in which consent is given freely, without compulsion, dishonest means, or pressure, and consent may be withdrawn at any moment (Cassell and Symon 2004; Maylor and Blackmon 2005). To meet the necessities of informed consent, each individual offered a statement explaining the purpose of the study, the researcher identification and contact information, the kind of study to be conducted, the expectations from the customers of the intermediary crowdsourcing platforms and an explanation of the procedures for research (Appendix A). Each survey participant belongs to subgroup of customers of a intermediary crowdsourcing platform and was after systematic random sampling initially approached by their leader and asked about their willingness to participate. After pointing out the would-be customers of the intermediary crowdsourcing platforms, the leader in the informal network provided contact information to the customers for the study. After customers made contact with the researcher, a letter of introduction requesting participation as well as describing the nature, rationale and study risks was provided to the customers of the intermediate platforms. Each individual customer of the platforms was additionally provided with an informed consent form (Appendix A). The customers of the intermediary crowdsourcing platforms were expected to read, sign, and return the informed consent form before participating in the study (Neuman 2006).

3.9. Confidentiality

Privacy is a basic value, and thus maintaining confidentiality of the private information obtained from customers of the selected intermediate crowdsourcing platform is supreme. Protection of privacy as well as confidentiality of the customers of the intermediary crowdsourcing platforms is provided by the Research Ethics Board (Neuman 2006). All

customers of the intermediary crowdsourcing platforms reactions were coded with names and any identification information was removed. No names or other identification information were used in the final dissertation. Guarantees regarding confidentiality were incorporated in the informed consent form. The online questionnaire interview responses have been printed and the original e-mail gathered in a detached file and archived on a portable memory stick. The printed copies of the interviews have been protected in a locked filing cabinet in a home office for a period of three years. After three years, the printed copies of the interview responses will be shredded and disposed and the portable memory stick will be destroyed. If a customer opts to pull out from the study, the personal information including any interview material will be deleted and disposed.

3.10. Data collection

Data was gathered from the customers of the intermediary crowdsourcing platforms through online questionnaire interviews. The online questionnaires assist in conquering distance and issues of geography in terms of accessing the respondent. The online questionnaires again permit data gathering from a geographically isolated group, provide fast access and an enormous text database and enhance ease for follow-up together with clarification (Creswell et al. 2003). Collecting data through an online approach is resourceful, lucrative and expedient while collecting the information in a short frame of time (Creswell et al. 2003; Neuman 2006). The online questionnaire also provides the customers of the intermediary crowdsourcing platforms time to make a reflection on the questions before giving an answer, thus promoting a more thoughtful response. Online questionnaires are devoid of nonverbal prompts such as

facial expressions as well as body language, but can display communicate cues by using bold or using emoticons or capital letters (Rezabek and Cochenour 1998).

An additional advantage of online questionnaires is the eliminating the need for record, which may amount to a decrease in the efforts of transcription and data integrity loss (James and Busher 2009). All the same, a shortcoming of online questionnaires is the incapability of confirming the customers' identity (Stanton 1998; Dillman 2000). Likelihood exists where an individual could pretend as a customer of the intermediary crowdsourcing platforms. The kind of answers to the online questionnaire may offer clues if the person responding has misrepresented the researcher. Confirmation of personality is an additional technique for lowering the risk of potential data deception. The method of online questionnaires has a higher rate of attrition than synchronous Internet messaging or face-to-face interviewing. A customer may make a decision to no longer participate in the study at four possible times: after the initial contact has been made, after obtaining consent, after a partial reply to the questions, or by failing to respond to any e-mail asking for clarification. To alleviate these issues one follow-up e-mail was sent, if needed, requesting clarification, before contact can be deemed complete. Limiting extra contact to this one follow-up e-mail will recognize and respect the privacy of all customers (Fowler 1995).

The online questionnaire will be semi-structured to make sure particular questions are addressed. Use of an online questionnaire provides the opportunity to go back to the customers of the intermediary crowdsourcing platforms to clarify indistinguishable passages or ask for development of ideas. Using online questionnaires permits numerous interviews to take place at the same time, thus decreasing the time needed for data collection. A lead study

using the proposed collective survey methodology allows for refinement of the data collection plan (Yin 2003). The location of the pilot study will be selected for its geographic expediency, as was the appropriateness of the customers of the intermediary crowdsourcing platforms. The customers and industry experts will be systematic randomly sampled for their fit within the frame of sampling, but also for their concern in the study and willingness to provide feedback. The collective survey methodology guaranteed consistency between the specific subgroup of customers of the intermediary crowdsourcing platforms. The questions of the online questionnaire were the same for each participant, and the e-mail interview eliminated any potential prejudice the researcher might have added if conducting a face-to-face interview. All communication through online questionnaires with each customer was entered into a logbook of the collective survey. Each probable customer's responses have been analysed separately (Weller and Romney 1988). Initially, the research followed a three-step approach as stipulated below:

1. Verification with experts in the field of crowdsourcing.
2. Interviews with intermediates and crowdsourcing providers.
3. Interviews with the customers of crowdsourcing platforms and industry experts.

This approach supports Yin´s (2003) and Riege´s (2003) view, suggesting the need for construct validity, internal and external validity, and reliability to improve the quality of the collective survey evidence using a systematic random sample as reliable technique.

3.11. Instrumentation

The main aim of the qualitative study was to establish the level of perceptions of crowdsourcing and the risks involved in its implementation in the business context, and how the concept amounts to success in the process and the outcomes of the process amongst the organizations and companies employing its use. The questionnaire tool (Appendix C) was aligned to determine both functions of the crowdsourcing concept in business organizations in addition to the process and outcomes of the implementation. The questionnaire instrument was also designed in a manner to make use of the application's open-ended questions and other question's partly closed ended with a word-limit response. The research study is likely to discover and collect qualitative data and information on the views of the crowdsourcing concept in a professional business environment and the level to which the policy makers were satisfied (Creswell et al. 2003; Leedy and Ormrod 2005). The analysis of the results was to be based on themes drawn from the various responses of the customers of the intermediary crowdsourcing platforms in the study who were also required while the interpretation of the findings was undertaken. The researcher utilised grounded theory and domain analysis to identify the conceptual complexities in the data and semantic relationships that exist within and between the data across the case studies. Grounded theory represents an inductive, iterative process whereby the aim is to investigate an area of study and allow the themes to emerge (Strauss and Corbin 1990). Following the concept of iterative clustering, cluster analysis was utilised to complement and extend the initial data analysis by distinguishing the semantic nature and meaning of the relationships between the variables, thus supplying

enhanced insight into the phenomena of crowdsourcing and related risk and contributing to answer the research aims and objectives.

The design of such research instruments has found a vast amount of application to deal with the absence of scholarly studies as well as instruments of measurements pertinent to such matters like the study on a crowdsourcing concept. As a new tool to be used in modern business organizations and companies such research would require the need to measure behaviours, views or perceptions of individuals. Even though various empirical studies based on matters of business organization and performance have been carried out in the recent past, there has been minimal attention to developing further instruments of measurement of the efficacy of important tools used in the business world (Cooper and Schindler 2003). The literature review pointed out minimal research on the subject of crowdsourcing and involved risk. Therefore it is imperative to place more emphasis on this subject. Various questionnaires have been used previously to determine the perceptions regarding the performance appraisal process, but were later rejected for the same reason (Yin 2003). Owing to this fact, there was a need to develop another instrument which best suited the current project. Moreover, such questionnaires were limited to the research in which they were used and were not fully applicable in assessing the area of crowdsourcing based on the number of constructs, which could be studied and examined.

The validity of a construct, according to Stake (1995), was not indeed an established or recommended tool in addressing the questionnaire limitations. The instrument designed for worker assessment in a particular organization was not really appropriate for this current study since it did not make a provision for a general assessment of crowdsourcing in an organization

setting. Other instruments developed previously also did not suffice in measuring the impact of an innovation model like crowdsourcing and its risks from the perspective of organization. There was therefore the need to develop another questionnaire instrument, which could be used in determining the effectiveness of crowdsourcing in an organizational environment.

An initial study was employed when coming up with this new questionnaire instrument to clearly identify the functions and risks of crowdsourcing. To test this instrument, 10 fellow student and conference participants from various departments of business economics, who had completed a doctoral qualification were asked to identify and present their perceptions of the concept of crowdsourcing and its possible risks from a theoretical perspective as well as from their limited experience with crowdsourcing. Past studies have made use of several works of research in coming up with constructs of their instruments (Johnson and Onwuegbuzie 2004; Marschall and Rossman 2010). In this case, two consecutive questionnaires were utilized to agree on and authenticate a final list of the important or crucial functions and risks involved in implementing the crowdsourcing concept. The group was thought to clearly differentiate theory and practice. Based on the constructs of the group, 21 items were developed to characterize the instrument (Appendix C).

In developing this instrument, several previous instruments were assessed on the grounds of their minimum characteristics of construct validity and reliability. This depended entirely on the results of the specific studies for which the instruments were used. Later on, they were investigated for their content validity as well as responsiveness. This approach highlighted six studies concerning instruments applied to heterogeneous populations (Simsek and Veiga 2001; Dennis 2003; Newby et al. 2003; Cycytota and Harrison 2006; Baruch and Holtom

2008; Ball 2010) and another eight studies concerning particular job populations found in the sector of business and economics (Bosco and Bianco 2005; Tyers et al. 2006; Wang and Chao 2008; Hansen 2009; Rhys et al. 2011; Tyers and Golley 2011; Leonard and Clementson 2012; Wiesmeth 2012).

The themes of analysis together with the questionnaires employed in the studies were the foundations on which the present instrument was constructed. Fifty-six questions, which were most relevant to the intents of this research, were adapted and translated to the cultural context suitable for application in various regions and business settings. The questions were arranged in a particular order that gathered the anticipated information while making sure that the prospective customers of the intermediary crowdsourcing platforms were not. Therefore open-ended questions, some with specific word limits, were used owing to their nature of presenting a wider view. Other factors were added to the questions to improve the volume and quality of information presented in the responses. The assistance was to focus entirely on the subject wanted in the question in order to enhance the customer's willingness; to promote objectivity together with ease of responding, without being compelled by the interviewer's tone or body language; and to perform an analysis of qualitative nature based on themes drawn from the responses (Creswell et al. 2003).

As discussed by Stake (1995), a degree of caution was exercised in phrasing the questions for the purposes of coming up with a clear and complete succinct instrument with the ability to attain high rates of response as well as eliminate biases and errors during processing and completion (Stake 1995). To enhance the confidence that the questionnaire instrument incorporated the appropriate theoretical framework, or included a significant part of it, the

selection of the items to be included in the questionnaire instrument was guided by Herzberg's and Maslow's theories, which deal with the hierarchy of needs. As a final result, 21 items were included in the instrument. This questionnaire instrument provided a way to gather data that could be generalized by drawing themes from the responses of the customers of the intermediary crowdsourcing platforms on such matters like crowdsourcing functions and perceptions held concerning the risks associated with its implementation. The number of items to be tested has varied from one research study to another. For instance, while this instrument had only 21 items, instruments in the past have used more than 50 items (Baxter and Jack 2008); in fact, some recording items totalled 80 (Yin 2003). However, there is always a need to do away with lower items to help in testing correlations.

This kind of elimination should maintain the same reliability, as well as adherence to, the basic constructs as done in the instrument that was constructed specifically for this study. The basis for the reduction of test items is to increase the ease of administration to the customers of the intermediary crowdsourcing platforms by way of shortening the amount of time needed to complete the instrument. Anticipation has been a valid as well as reliable instrument to determine the measurement of data of such variables as the concept of crowdsourcing in these organizations, thereby increasing the study topic in general. Incorporating items concerning the satisfaction of policy makers in particular organizations regarding the crowdsourcing concept widen the scope of the area of interest in the study (Creswell et al. 2003). According to Stake (1995), a significant response on the instrument of questionnaire indicates a greater extent of satisfaction with the research subject. Selecting an instrument for a questionnaire of this nature as the tool to gather data for this study was suitable since the instrument was

prepared to establish phenomena of this kind; to determine the degree of crowdsourcing and its impact integrated with the risks involved in the business world in organizations that worked well from the initial testing process. In addition, the instrument was useful in measuring the perceptions of the policy makers in these organizations regarding the process and the outcomes as well as dependent variables (Podsakoff and Dalton 1987). The tool made a provision for the maximum number of methods available for answers as well as testing the hypotheses. The validity and reliability of the questionnaire instrument made a contribution to thorough research that offered meaningful data and information, which resulted in a strong analysis and conclusion.

3.12. Validity and reliability

Validity and reliability are linked mainly with quantitative research, although they are also used to determine the strength, trustworthiness and credibility of the research (Corbin and Strauss 2008). The capacity to reproduce and validate findings from a comprehensible and detailed portrayal of the analysis and the ability to relate the findings in various contexts increases the credibility of the qualitative research study. Leedy and Ormrod (2005) assert that the ability to generalize results from the sample of the study to the broad population from which the sample was obtained is defined as external validity. Validation of the qualitative outcomes is a sign of vigour in a qualitative study (Creswell et al. 2003) and justification assists in determining if the results are precise from the point of view of the researcher or the users of intermediary crowdsourcing platforms. Yin (2003) explained four tests pertinent to determining soundness for survey based studies: construct validity, internal validity, external validity, and reliability. Internal validity of the data collection method was addressed by

experts in the field, whereas the content can be determined through statistical measures and construct validity. The use of the questionnaire as an instrument removed the outward influences pertinent to biases of the researcher. Creswell et al. (2003: 45-48) argue that

"*On various occasions, contended an advantage of self-administered forms of questionnaire as the anonymous sourcing of customers of the intermediary crowdsourcing platforms, without the interference of the researcher*".

The pressures to validity, which are most likely to be realized with an instrument of data collection, include the possibility of untruthful and erroneous reactions, as well as the nonexistence of the ability of looking for clarifications at a time when the customers of the intermediary crowdsourcing platform will be stuck in the process, and may be the absence of flexibility in the questions they will be responding to (Creswell et al. 2003). Twelve experts where identified throughout the high-recommended top contributors of the crowdsourcing.org industry website using a purposive nonprobability approach. Therefore, to minimize the effects of possible pressures posed on internal validity a sample was utilized throughout these experts (Cooper and Schindler 2008).

External validity defines the ability of generalizing the data from the researched content in their times and settings (Yin 1994; Riege 2003). It is therefore applicable in the generalization of the results of the research from all customers to the entire reachable population when the customers of the intermediary crowdsourcing platforms are selected using sampling. Since the design of the study included the choice of specific sample customers of the specified subgroup of intermediary crowdsourcing platforms, the results were generalized at different levels to capture all information pertinent to various customers making use of themes, which could help

in defining their responses. However, for the purpose of making references beyond the reachable population to the prospective target population, the sample population should have the same features as the entire population (Creswell et al. 2003). The online questionnaire incorporated characteristics of demography to expand inferences to populations of the same kind and make provisions for further analysis of the study results.

Therefore, the validity of the study can be vulnerable in the event that causality claims emerge. The questionnaire instrument was utilized to determine the degree in which crowdsourcing was applied by organizations in business contexts and eventually, with the risks involved, to establish if any relationships existed as well as the satisfaction that came about with its use. The availability of crowdsourcing in the business context correlated good performance positively with the correct style of management. In addition to the concept of crowdsourcing, several factors can impact the outcomes of the engagement in business. Reflecting the light of the business context in which each respondent works that include process of crowdsourcing risks, acuity of organization members, insufficient resources, the absence of perceived colleague support, status of business, factors of the environment and technology use (Section 2.4).

Enhancing the validity of the interview contents, four specialists in Human Resources Management (HRM) and psychometrics vigilantly reviewed the first draft of the study questions. They were requested to come up with individual judgments of the appropriateness, wholeness and clarity of the questions as well as with the entire content in its totality for form, question sequence and finish time (Raimond 1993). The process was again repeated with experts with crowdsourcing experience from the selected panel. The end result of both these

interviews of the experts was what led to the identification of the questions overlying in construct; some questions that were vague, ambiguous, or redundant; and others that were apparently not relevant to the intents and purposes of the study. This process was very imperative in making sure that the unnecessary questions were removed; the result was a robust research instrument questionnaire (Carson et al. 2001). Reliability can be influenced by the absence of standardized procedures (Creswell et al. 2003; Tashakkori and Teddlie 2010). According to Creswell et al. (2003), the moment procedures vary, bias is incorporated into the research study and the data cannot fundamentally be comparable for general analysis. To reduce such bias, the gathering of data took place by making use of standardized procedures. The analysis process and interpretation were carefully reviewed to make sure that each and every step of the research study was well articulated and clearly documented. The process of validation supports the replication of the study where the same conclusions are duly expected. Thus validity in general terms determined the level to which the instrument of questionnaire could actually measure the things it was designed for. Furthermore, reliability is required to establish the accuracy and precision of the procedure of measurement to ensure the production of the same outcomes. Validity therefore is not an end but a goal. Validity is connected to the correlation that exists between the findings of a study and its reality. Creswell et al. (2003) defines validity as the possibility of coming up with justifiable and meaningful inferences arising from perceptions concerning a particular sample or a given population. All these characteristics are representative of a reference frame for making an evaluation of the quality of research designs. Choosing a reliable and valid instrument is imperative for an accurate and correct analysis, as well as to interpret the findings of the study. According to Stake (1995), the questionnaire should meet all the necessary reliability and validity requirements. The

initial testing of the online questionnaire instrument was proven to have an appropriate level of reliability. The instrument met the criteria of similar instruments used in the past (Yin, 2003). Reliability measurements using intraclass correlation (ICC) testing for the questionnaire produced a quantified correlation coefficient of 0.97 initially, suggesting its performance and internal consistency was appropriate (Shrout and Fleiss 1979).

3.13. Data analysis

Analysis is the procedure of investigating something to find out its operation, and therefore data analysis is the practice of taking the whole and breaking it into smaller details to determine meaning (Corbin and Strauss 2008). Meaning or interpretation of the data demonstrates that the researcher recognizes what the customers of the intermediary crowdsourcing platforms have tried to communicate. Analysis of the content is the explanation of the substance in the text through a methodical process of coding and identifying ideas. Data analysis in a qualitative study includes coding the data, which, according to Corbin and Strauss (2008), takes into account asking questions about the collected data and making comparisons within it to expand concepts from it.

In research, it is imperative for the researcher that the respondents understand the concepts and key terms of the study that are included in the questions in order to provide answers that are relevant and reliable to a study (Carson 2001). The author helped those respondents who did not understand the concepts and key terms by further defining terms that required meaning and context to provide a common sense of knowledge. Support was provided through E-Mail and live-Chat. The researcher ensured that every respondent understood the key terms and questions before they started answering the questions. Some of the key terms that were

explained were crowdsourcing, risk, and innovation models. The researcher also explained to the respondents the terms open innovation, community building, collective creativity, civic engagement, collective knowledge, cloud labour, and crowdfunding (Cooper and Schindler 2008). The respondents were given an opportunity to seek clarification where they did not understand a question or concept (Cassell and Symon 2004).

3.13.1 Data Analysis Framework and Process

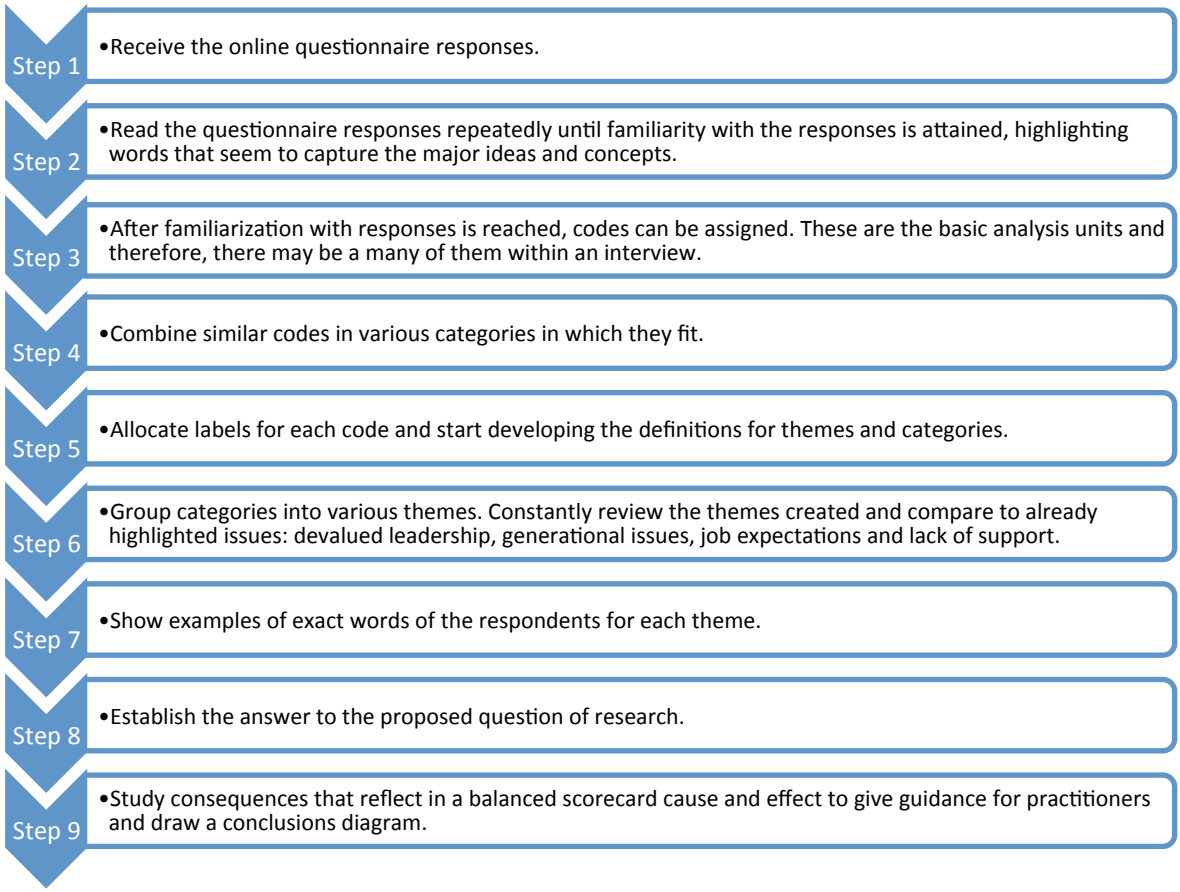
Yin (2003) noted a universal approach for analysing the collected data is essential before beginning the study. In this research, the approach for the analysis of data was in the following array: collect data inductively discover codes from the data, arrange the codes into themes, sort the data into the categories or themes by identifying patterns or phrases, scrutinize the sorted data to segregate patterns, and reflect on the patterns to make available a set of generalizations. The analysis first requires familiarization with the data. Memorandum writing is therefore the first stage of analysis. Memorandums encourage the use of theories rather than unrefined data, offer a storage area for thoughts, and should be put to use after each particular analytic session (Corbin and Strauss 2008). Memorandums offer a chance to detail preliminary thoughts concerning the analysis and can be evaluated later and updated when more information is made available.

Identifying all the key issues, concepts, and themes by which the data can be examined and referenced carried out a thematic framework. Drawing on a priori issues and questions derived from the aims and objectives of the study as well as issues raised by the respondents themselves and views or experiences that recur in the data. Indexing all the data in textual form by annotating the transcripts with numerical codes from the index. Themes and the

process of iterative clustering were guided by the central research aims and objective. Analysis of data based on themes drawn from the responses followed Cooper and Schindler's (2008) four categorization rules: suitable to the research problem, comprehensive, equally exclusive, and one-dimensional. A logbook of all codes was therefore kept. The coding and categorizing helped tabulate the occurrence of specific themes or patterns in reference to the business context in which each respondent works which include process of crowdsourcing risks, acuity of organization members, insufficient resources, the absence of perceived colleague support, status of business, factors of the environment and technology use (Section 2.4). Most human behaviour is logical and predictable (Heiner 1983); therefore, generalizations can be gathered from similarities in the group of customers of the intermediary crowdsourcing platforms. Data analysis is expected to commence the moment the first responses arrive.

The customers of the intermediary crowdsourcing platforms received a copy of their comments with the inductive themes, which required them to authenticate and approve the interpretation of errors, thus reducing probable bias. This kind of review on the interpretation by the customers of the intermediary crowdsourcing platforms is a member check, and is a type of internal validity or in other words, verification. Verification on the data by member check is an approach that adds strength to the research study (Creswell et al. 2003; Corbin and Strauss 2008). The complete nine-step process for analysing the data is being drawn in Figure 11.

Figure 11. Data analysis process



3.14. Summary and conclusion

This chapter outlined a detailed methodological description regarding the chosen method and its data collection strategies. To provide a thorough description of the methodology together with the rationale for choosing a qualitative research design over a quantitative design the deployed research process was illuminated in detail. The chapter also included a review of confidentiality, ensuring voluntary participation, identifying customers of the intermediary crowdsourcing platforms and providing consent. This Chapter concludes with a description of the sampling frame and population as well as a detailed description of the data analysis. The

next chapter contains the results of the analysis of the data collected as outlined. The following chapter will present and analyse the results of the primary research.

4. Analysis of findings

4.1. Introduction

This chapter will present the analysis of the data obtained from the respondents according to the research questions of the study. The structural logic and flow relates to the principal objective of the thesis to identify crowdsourced innovation models and examine the usage in a business context in order to evaluate and establish methods of managing crowdsourcing innovation risks in organizations. In the first section the researcher will give a description of the sample considering the demographic variables that the respondents represent. The description of the current practices on commercial use of crowdsourcing of the sample will then follow using descriptive statistics along with the areas of crowdsourcing experiences. The themes that have emerged from the thematic analysis of the data will then be presented to establish answers to the proposed questions of research. In order to determine the risks involved in the practice of crowdsourcing, quantitative analysis using descriptive statistics will be exercised to validate the risks identified. The final section of this chapter will be guided by the research aims and objective to identify possible mitigating plans to address the identified. The selection of quotes and key statements from the collective survey based qualitative research were randomly selected within the aggregated themes to undermine the propositions made and to promote the components that provided for risky situations and the management of such risks in the business context.

4.2. Demographics

The methodology applied in identifying the survey respondents was designed to ensure that the sample population derived from industries and companies actively involved in crowdsourcing, and whose job descriptions are as much as possible affiliated with their firms' crowdsourcing endeavours. It was expected that the findings of the survey would be representative of not just the respondents' sentiments and experiences, but will also be an indicator of more subtle dynamics of crowdsourcing such as the demographics, here refer to gender and age as the most relevant indicators.

4.2.1. Gender

With this in mind, the first notable demographic indicator worth analysing was gender, where it was found that 20.5% of respondents were female, while 79.5% were male.

Gender	Count	Percent	Total Responses: 151
Male	120	79.5%	
Female	31	20.5%	

In the course of the literature review, no existing research was found relating to the issue of crowdsourcing with regards to gender. However with such a wide disparity in representation of the two genders in the survey population, important questions may be raised in this regard. Tentative propositions can be made, suggesting that crowdsourcing activities are predominant in male-dominated fields or departments within organizations, particularly IT (Cohoon and

Aspray 2006). Second, it may be that males are more likely to share their views and participate as participants in a crowd as respondents than females. Third, it may be speculated that females in general are less receptive to the concept of crowdsourcing compared to males (Cohoon and Aspray 2006). However to provide proof for this claim, the statistical significance of the research is too marginal and none of these possibilities can however be ascertained without empirical research. It is therefore necessary to conduct said future research, to establish the dynamics between gender and crowdsourcing, and how the same relates to other crowdsourcing dynamics.

4.2.2. Age

The sample population had 22.7% of respondents being under the age of 30. This can be considered relatively high for an age group that is new to the work environment, having recently graduated or otherwise received some form of qualification. It is anticipated that as crowdsourcing becomes more mainstream in an increasing number of industries and applications, this percentage will grow as new entrants joining the workforce will be inducted into a crowdsourcing culture and will use the concept as established tool. The proportion of the respondents aged between 30 and 39 years was 39.3%, and was the highest proportion. This indicates a higher level of adaptability to new business models compared to older demographics. This is an age group, which has been exposed to both traditional forms of innovation and business processes and to new ones such as crowdsourcing. This proportion may be expected to rise as the increasing numbers of crowdsourcing adopters less than 30 years grow into this age group over time. The proportion of respondents aged between 40 and 49 years was 22.0%, which is only slightly lower than the proportion for under 30 year olds,

but a extensive 17.3% lower than 30 to 39 year olds. This may be a reflection of slower uptake of crowdsourcing in this age group, which has been familiar with more traditional forms of innovation for longer periods over the duration of their careers, and might therefore be more resistant to change compared to younger age groups.

The last age group of respondents was the over 50 year olds, who represented 16% of the total population surveyed. This indicates a lower uptake of crowdsourcing strategies, considering that the working population over 50 years covers all working respondents over that age. However driving innovation through crowdsourcing may be considered a "younger" approach, with the effect of a higher adaption rate in a combined age range between 30 and 49 years. It may also be concluded that this age group is also slightly more resistant to change, in a manner similar to the 40 to 49 year olds, albeit to a greater extent.

Combining the group of respondents of 40 years and up represent 38.0%. This percentage is expected to be rising in the years to come, as to the higher adaption of crowdsourcing within business innovation (Libert and Spector 2007).

4.2.3. Crowdsourcing experience

The experience levels of the respondents reflected the novelty of the crowdsourcing concept. Of the 147 respondents, only 31.3% had crowdsourcing experience exceeding 20 months, which correlates with the age group of 30-39 years and their overall work experience. Analysing the results, 29.3% had less than 5 months' experience, while 39.5% had between 5 and 20 months' experience. This is an indicator of the fact that crowdsourcing is still very much in its infancy, experiencing exponential growth in numbers of adopters over time. This

metric may have an impact on acceptability of crowdsourcing, due to limited understanding of its costs, benefits and risks. As experience grows however, it is anticipated that acceptance will grow, as individuals and organizations become more familiar with the concept, its risks and its potential rewards.

4.3. Analysis of data related to the research aims and objectives

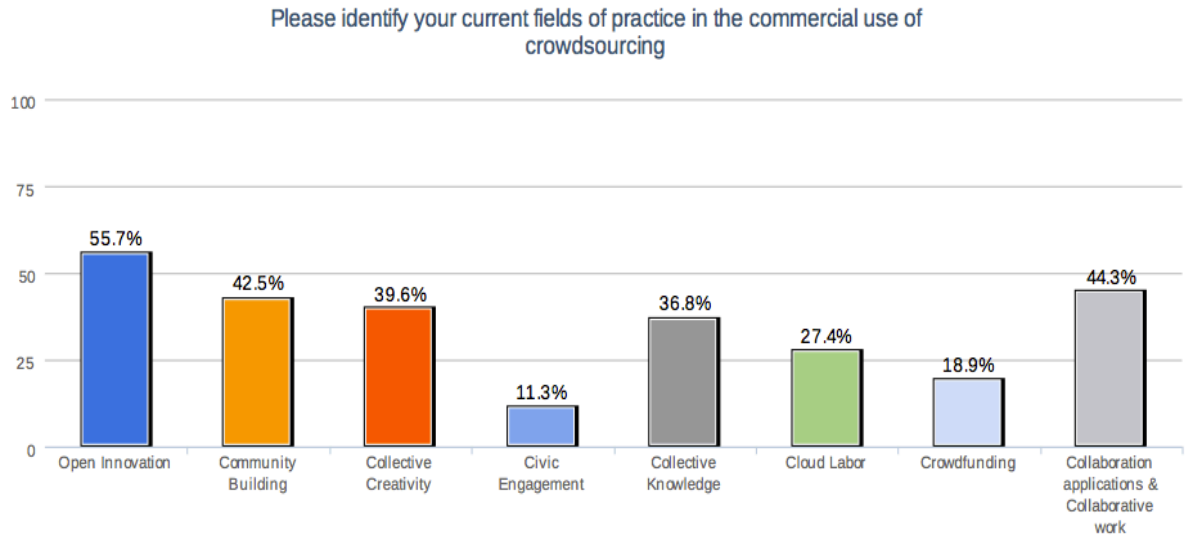
4.3.1. Identify current practice of the commercial use of crowdsourcing

From the results of the survey question on the respondents' fields of practice in the commercial use of crowdsourcing, the most notable phenomenon was the overlap in application of crowdsourcing strategies within the same firms. Most respondents selected more than one field of practice, suggesting that the fields involved in crowdsourcing are interconnected and participants generally engage in more than one field. The field with the highest representation was open innovation with 55.7% of the respondents reporting that they practice the search for innovation via crowdsourcing. This may be attributable to the fact that most models of crowdsourcing are a form of open innovation and naturally either overlap or are indistinguishable. The second most prevalent field in crowdsourcing is in collaboration applications and collaborative work, which had 44.3% of respondents stating that they applied it commercially. This high incidence is attributable to the fact that, similar to open innovation, most forms of collaboration applications and work involve a crowd, be it within the same firm, with partner firms, or with the general public.

The third most represented field was community building with 42.5% of the respondents commercially practicing this, which is an interesting field because of its ambiguity in terms of

commercial applicability; while community building includes aspects of commerce such as social enterprise, its principal aim is not commercial but social. For this reason, it forecasts different risks, costs and potential rewards when compared with other forms of crowdsourcing. Almost 40% of respondents practice in the collective creativity field, with 36.9% practicing in the collective knowledge field. Cloud labour had 27.4% of respondents under it, while crowdfunding had 18.9% of respondents. The least frequent field was civic engagement, which had 11.3% of respondents. This is a very low percentage, given the fact that civic issues are among the most heavily debated in any society. The percentage distribution of the crowdsourcing practice in these fields is summarized in Figure 12.

Figure 12. Commercial use of Crowdsourcing



4.3.2. Adaption and relevance of Crowdsourcing to different departments

Respondents were asked to state whether they thought crowdsourcing models recommended suitable approaches to a number of departments. Overwhelmingly, the R&D department was the most cited, with 79.4% of responses. Marketing and sales followed almost 10 points behind at 69.6%, while information technology was a distant third at 54.9%. HR and operations were third and fourth, at 39.2% and 33.3% respectively, while administration, logistics and procurement had 25.5%, 22.5% and 18.6% respectively. Accounting had the least responses, with 15.7%. The findings reflect the general conviction that crowdsourcing is largely relevant to innovation, seeing as R&D was the overwhelming favourite. However they also indicate that the use of crowdsourcing is a disruptive element for every department within an organization. Innovation most effectively occurs on a random basis, with the ideas emanating from a crowd, being intrinsically or extrinsically motived. The need for innovation is increasing over time, necessitated by the constantly changing business environment, which in turn changes stakeholder and consumer expectations. Explicitly in R&D, each discipline usually involve a large amount of data, crowdsourcing could be an optimal tool to collect and analyse this information, which traditionally requires long periods of time for a few researchers to complete. Marketing and sales, seen by the respondents as the second most relevant department in which crowdsourcing is practiced, is also widely acknowledged as a field that heavily leverages crowds. The most prominent reason for this is the fact that any organization needs to have a consumer-focus if it is to remain relevant in the market (Cooper and Edgett 2008). If it loses customers due to dissatisfaction, its existence is threatened. The second reason, which is intricately tied in with the first, is that marketing owes its

effectiveness to innovation; once user preferences are established, the organization has to come up with the products and services the market requires. Many organizations realize that the most effective way to achieve these marketing and innovation aims is to apply the user innovation model of crowdsourcing.

Crowdsourcing and information technology

The third most prominent department with regard to crowdsourcing was IT, at 54.9%. The confluence between IT and crowdsourcing is two-fold. First is that crowdsourcing stimulates development of IT through such voluntary endeavours as open source software and commercial endeavours such as SAP's 'SAPiens' environment, as discussed earlier. The other way in which IT and crowdsourcing merge is in IT's central role in most crowdsourcing models in use today; while crowdsourcing is not entirely dependent on IT, it has nonetheless become synonymous with it. The information age has ushered in an era of mobility in the labour market, particularly for knowledge workers that enables borderless rendering of services through very flexible terms. This has been facilitated by rapid developments in the information and communication fields that allow collaboration on projects to an extent unimaginable just two decades ago (Friedman 2005). This helps crowdsourcing (and open innovation in general) by allowing organizations to source for external parties with whom to engage in outside-in, inside-out or coupled processes. Crowdsourcing has caught on the Internet - without which its application would be severely limited or not of existence.

Crowdsourcing in Human Resources

Any crowdsourcing model has at least two of three elements, according to Schenk and Guittard (2009). The first is the benefitting entity, which puts out the project to the crowd. The second is the intermediary, which acts as a mediator between the beneficiary and the last element – the providers. More widely known as the crowd, providers essentially act as the HR to any crowdsourcing project. The relevance of crowdsourcing to HR comes in the form of bridging gaps in in-house skills, replacing existing personnel with crowds, using crowds as a quality assurance team, among other applications. Google uses its internal crowd to test new products and services; they encourage internal staff to stress-test the technologies, expose bugs and alert the engineering team to correct the same (Nocera 2006). The technologies are further subjected to stress tests (known as beta testing) to a controlled crowd composed of the general public, which reports bugs or proposes improvements. In this way, Google leverages both internal and external crowds as HR for its quality assurance department (Goldman 2010). Similarly, the Oxford Galaxy Zoo project and NASA's joint program with Microsoft are examples of how crowds can become part of an organization's core human resource.

Crowdsourcing in Procurement and Logistics

'Operations' covers a wide range of organizational activities that include production and procurement as the major ones. The results demonstrate that 33.3% of respondents thought crowdsourcing is relevant to operations. Crowdsourcing in procurement could be said to have been in existence for centuries, in the form of tender invitations. By putting out notices inviting people and organizations to tender, an entity is effectively tapping into a crowd to secure a supplier.

Production through crowdsourcing applies mostly to software and design work, which are easily transferable via the Internet.

4.4. Determination of risks involved in the practice in crowdsourcing

To assess the level of risks involved in the current practice of crowdsourcing among various businesses, the thematic analysis of the responses was used to form the categories of risks and perception of risk level by the participants. The following subsections present the analysed predominant key themes that emerged from the segmented responses.

4.4.1. Risk level determination and risk awareness

One of the salient themes that have been recorded from the data was the belief that crowdsourcing involves minimal to no risk. A number of responses have been grouped to the category of "perception of minimal risk level". These responses are indicative of the complacency of the participants of how beneficial crowdsourcing is, that they neglect to see any risks involved. Some examples of responses that capture this sentiment include

> *We don't really see "risk" from the use of crowd sourcing methods.*
> (Question 13, Respondent 246)

> *Low risk in general, but difficult.* (Question 13, Respondent 286)

> *No risks, only benefits, for my particular crowdsourcing model.*
> (Question 13, Respondent 164)

> *No Risks, the results we provide are excellent.* (Question 15, Respondent 168)

The overall risk is minimal... (Question 15, Respondent 147)

These responses demonstrate that crowdsourcing risks could be subjective and dependent on the field of business that utilizes crowdsourcing practice. Most of the respondents agree that R&D, sales and marketing are the departments that they think would most benefit from crowdsourcing, thus, an implication of this result suggest that some areas of business might incur losses and face difficult risks when they utilize crowdsourcing practices. Alternatively, other fields are more suitable to practice this because of the minimal risks involved.

Strong opportunity for outsourced R&D. (Question 16, Respondent 204)

The acceptance of crowdsourcing is for some an emotional issue. In the R&D group there is less resistance to incorporating this form of a model. A traditional department such as accounting or legal see this as a very risky endeavour. So the way in which the discipline operates will dictate the risk level. (Question 13, Respondent 277)

A crowd sourced innovation model is well suited to the current R&D environment and will help organizations to stay ahead of the learning curve. The same cannot be said for the traditional business setting. This is the reason why traditional business models are considered more risky than crowdsourcing today. (Question 18, Respondent 182)

It can be difficult to infuse a crowdsourcing innovation model at the higher levels of business management, as the decisions are generally not ones that many people have the capability to decide upon. Also, self-confidence of the C- level executives can sometimes become a problem. (Question 20, Respondent 241)

Another implication of this finding is that the practice is relatively new to most people, that some of them have not foreseen the risks involved in the practice. Several of the respondents are limited to their own experiences of participating in crowdsourcing activities or businesses that they neglect to see the risks for other parties involved.

> *At this early stage of adaption the acceptance is high and risk not a main factor.*
> (Question 13, Respondent 206)

> *For Russia it's the new way for managing innovation. However it is 'innovative' and 'prestigious' way and has become popular. Many companies now are afraid of new technologies, but the idea of using new technology in investigating something new looks quiet attractive for them.*
> (Question 16, Respondent 296)

> *Crowdsourcing is taking people to a new unfamiliar way in how to see things and develop things.* (Question 22, Respondent 312)

> *The results based on crowdsourcing are enlightening and optimistic. The findings explore the vast potential of this new concept.*
> (Question 15, Respondent 182)

> *Companies are afraid of the unknown. The risk of crowdsourcing itself is very low…*
> (Question 16, Respondent 223)

> *Still in an early stage of development and a long way until all stakeholders are involved.*
> (Question 13, Respondent 158)

The unfamiliarity of some respondents with the risks involved in crowdsourcing demonstrates that there is a need to create awareness of all the areas involved in the practice. Several practitioners are unaware of the risks that they are subjected to, whether they are part of the crowd or the business owners that employ crowdsourcing. The findings determine the extent to which risks are realized in organizations. The observations is critical and underline Purdy et al. (2002) finding´s as the increased number of participants and diversity within the crowd can increase the probability of risk in managing relationships within the crowd.

4.4.2. Opportunistic risk awareness – benefits over risks

Although some respondents are not yet aware of the risks involved in crowdsourcing, more respondents have demonstrated that they recognize the negative side of crowdsourcing and the risks of practising this in business; however, they feel that the benefits very much outweigh the risks, thus, they fully accept crowdsourcing as a profitable and dependable model for their businesses. Thus, this theme has been formulated from the more salient opinions of the respondents. Some of the responses that describe this sense of acceptance include the following:

> *That's the way the world is going, there are lots more benefits than risks.*
> (Question 13, Respondent 151)

> *People tend not to really look at the risks when making the decision to crowdsource or not. Not really know (the risks). They just go for it, with the benefits in mind.* (Question 13, Respondent 220)

> *Benefits of crowdsourcing are far more compared to the negative impact. Obviously there are risks involved in the same but they can be easily taken care of by proper alignment of all stakeholders in the crowdsourcing process.* (Question 13, Respondent 313)

4.4.2.1. Growth benefits

Growth is probably the one benefit which crowdsourcing presents the largest potential for. Growth takes various forms and can be evidence by; increases in revenues and profitability (financial growth), escalation in number of users or consumers, expansion in staff numbers and scope, growth in the number and nature of an organization's value propositions and others. Examples of organizations that have leveraged crowdsourcing strategies for exponential growth include Apple, with its "Apple App Store", or IBM's collaboration with the open source community has seen its platform become the dominant one running servers. These firms have generated large amounts in revenue as a direct result of their application of crowdsourcing strategies. Some of the respondents recognize this potential of crowdsourcing stating that since more people are involved in the innovation process, then more people would support their own creation, thus increasing the number of consumers and product supporters. Individuals are more motivated to be part of something if they are involved in its creation, or are at least given the option to contribute to the development of something, because they feel like a part of the creation. The findings resonate with Antikainen and Väätäjä´s findings (2010) as social motives like care for community attachment to a group, recognition and reputation as well as friendship, relationships, social support are main drivers for motivation and essential for successful crowdsourcing projects (Table 10, p 213).

They pay loyalty to that creation, and are bound to be more active contributors and consumers of the creation once it is made. The following quotes are representative:

> *Growth is sure with any risks involved.* (Question 16, Respondent 255)

> *Well at least more people created it, so you are pretty sure that they will support the fruit of their work and creativity.* (Question 21, Respondent 137)

4.4.2.2. Cost benefits

Some of the other benefits recorded from the data include the low cost of crowdsourcing compared to the traditional business practices. This subcategory has been formed from the responses that indicate an increased acceptance of the model due to its lower cost, which was quite popular among the responses.

> *It is a fantastic way to cut cost and reduce risk - without fixed cost and on demand service.*
> (Question 13, Respondent 313)

> *Crowdsourcing would not only help to reduce costs but also make the process of managing company innovations more efficient.* (Question 17, Respondent 266)

> *Innovations are of higher quality for less cost. The process is risky, but can be handled.*
> (Question 15, Respondent 282)

Cost savings and scalability are related as far as crowdsourcing is concerned. One component of cost savings is crowdsourcing's ability to heavily cut down HR costs by 'outsourcing' many functions to crowds.

> *We have lost 35% of our staff due to the recession, but now every resident and visitor can be our eyes and ears and we get real-time multimedia reports with location and time. Many times, visitors cannot even pronounce the street signs around them. This is no longer an issue.*
>
> (Question 17, Respondent 272)

In many applications, crowds, eliminating or reducing those costs as well, can do quality assurance. Crowdsourcing also reduces costs owing to the principal of economies of scale, where marginal costs reduce with every subsequent unit produced (Mankiw and Swagel 2006).

4.4.2.3. Scale and diversity benefits

The reach, scale and diversity of the crowd are another positive benefit of crowdsourcing that has emerged from the categories of the data responses. The respondents expressed how the quantity of the crowd has influenced the acceptance of the crowdsourcing model among businesses. Most people acknowledge this particular benefit, along with the decreased cost of operation using crowdsourcing compared to traditional business processes as more important than the perceived risks of the model. From this group of participants, a number of high quality solutions that offer different perspectives are harnessed and either applied individually or by harmonizing more than one good solution to business problems. This is a strong

incentive for adopting crowdsourcing strategies. Its approaches are inevitably superior to traditional innovation models used by the R&D department, and are fed often by the same pool of loyal customers, for all its innovation activities as indicated below:

> *Crowdsourcing gives diverse opinions with a healthy spread.* (Question 18, Respondent 179)

> *The opportunity for a greater and more diverse crowd with crowdsourced innovation compared to a business setting.* (Question 18, Respondent 223)

> *Potential diversity in crowdsourced people and distance communication alters completely the innovation model.* (Question 18, Respondent 311)

> *The wider the range of participants the more diverse the solutions, but the solutions must be tested against business goals.* (Question 19, Respondent 169)

> *If you continue to come at the same problem in the same way, it will become more difficult to innovate. Involving the crowd and looking at the same problem from different experiences and knowledge bases will improve performance/innovation.* (Question 17, Respondent 289)

> *Without crowdsourcing, we would have to use our limited staff to do the inspection and documentation of each sign.* (Question 24, Respondent 272)

With the widespread diversity of the people sourced for this model, the creativity and quantity of the ideas needed for innovation were also recognized as benefits of the practice that lessen the fear of businesses of the risks of crowdsourcing.

> *Crowdsourcing is very important to broaden the horizon, get new ideas, creativity and new, cheaper production processes.* (Question 24, Respondent 326)

> *Great potential because it enables companies to scale up businesses more quickly, gain access to new creativity and one-off demand.* (Question 17, Respondent 109)

> *More flexibility, lower priced productions, on going creativity and optimization.* (Question 17, Respondent 326)

The speed and accuracy of the outputs of crowdsourcing models has also been seen as an additional benefit of the practice that makes the positive effects outweigh the risks perceived by businesses.

> *From a consumer point of view it is very effective - speed and flexibility.* (Question 15, Respondent 269)

> *...crowdsourced innovation can deliver speed and accuracy advances 100x better than the "gold standard" existing algorithm. Therefore the ability to process through crowd based tools allows humanity to ask bigger questions.* (Question 17, Respondent 243)

These statements resonate with the fact that there are tasks organizations need to have done which computer algorithms simply cannot perform – tasks that only humans can perform. Such tasks largely involve qualitative and subjective analyses that cannot be measured to precision using hard metrics. Auditing accounts, for example, is a subjective issue that requires knowledge of tax laws, accounting principles and some experience, that cannot realistically be conducted using an algorithm to satisfaction. Traditionally, individuals would perform such tasks in-house based on prior knowledge and experience, personal sentiments

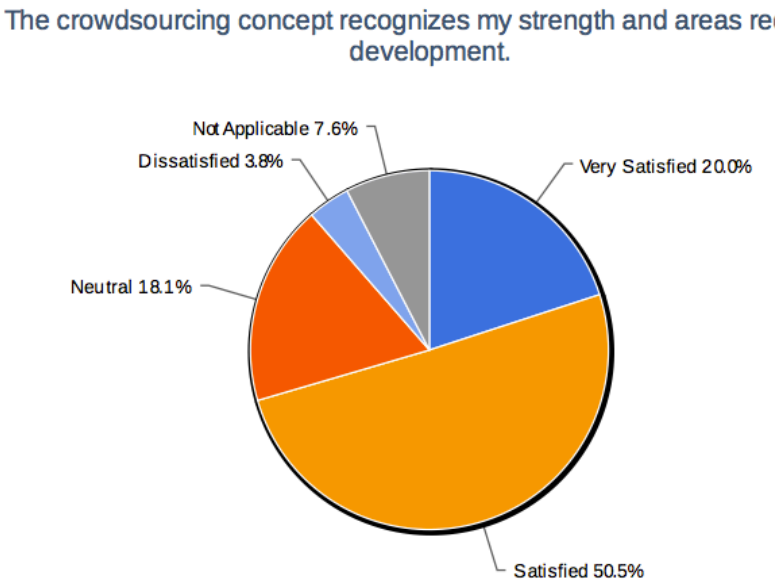
and feelings, etc. Crowdsourcing allows such tasks to be done with greater efficiency and enhanced objectivity.

An additional source of speed and accuracy lies in the fact that tasks that need humans to perform – the example of financial audit has been given – can be speedily conducted when such jobs are fragmented into small tasks that can be done by many people working simultaneously on a fragment each, thus taking a small fraction of the time it would take one individual to complete the entire job. Massive efficiency gains can be made in this way. Yet another way efficiency is enhanced through crowdsourcing draws from the fact that in many organizational settings, highly qualified individuals have to contend with tasks involving repetitive tasks and low intellectual engagement to enable them to do their roles effectively.

4.4.2.4. Benefit of personal development

Respondents were asked whether the concept of crowdsourcing recognized their strengths and weaknesses. The purpose of this was to establish the effectiveness of crowdsourcing in leveraging the personal strengths of employees while making up for their weaknesses. Twenty percent of respondents stated that they were ‘very satisfied’ with crowdsourcing’s recognition of their strengths and weaknesses, while 50% were ‘very satisfied’. Eighteen percent were neutral, with 3.8% expressing dissatisfaction. The distribution of the responses is illustrated in Figure 13.

Figure 13. Personal development as benefit of Crowdsourcing



It can be seen in the illustration that the majority of the respondents are satisfied with the level of personal development that they receive while working with the crowdsourcing concept. This is evident from the mean score of 4.03 (SD = 0.8), meaning that on a scale of 1 through 5, the participants have rated personal development as a benefit of crowdsourcing as relatively high. This particular benefit of crowdsourcing did not come up from the thematic analysis; however, it provides support to the finding that there are numerous benefits to crowdsourcing that the risks of the practice are often outweighed.

4.4.2.5. Application benefits for policy makers

Of the respondents to the question as to how often crowdsourcing does benefit policy makers in helping them make their decisions, 4.8% stated that crowdsourcing was ‘very often’ instrumental in policy making at their organizations. It is expected that this sentiment came from respondents working in environments where crowdsourcing is not just a useful addition

to the business process, but rather is a fundamental part of it, in most cases the whole business being built upon a particular crowdsourcing model. This is possible in such industries as crowdsourcing intermediaries. According to Schenk and Guittard (2009), intermediaries are firms that mediate the crowdsourcing project between the benefitting organization and the providers (participants in the crowd). As such, intermediary companies are bound to apply crowdsourcing to policy making 'very often'. Similarly, organizations operating in open source or one form or the other of competitive crowdsourcing (Carpenter 2010) by default apply crowdsourcing to policy-making 'very often'.

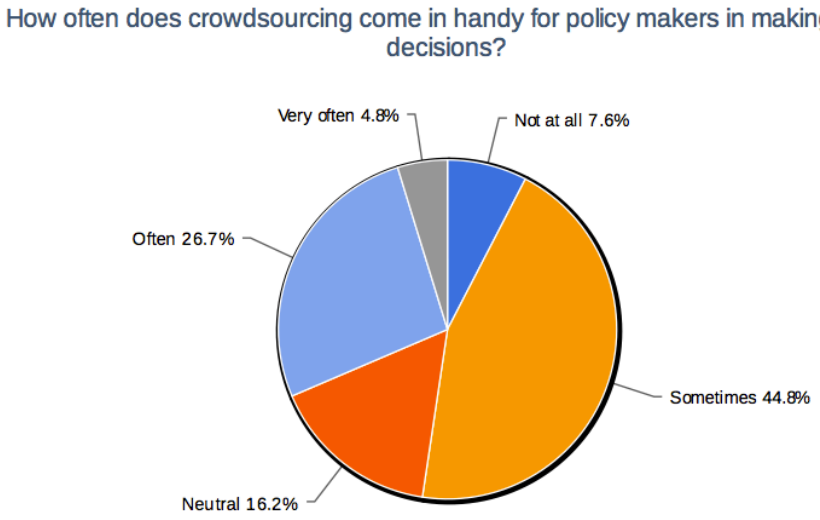
Almost 27% of respondents responded with 'often'. This implies that their working environments are not entirely dependent upon or built around crowdsourcing models, but nonetheless crowdsourcing has become an integral part of operations. These are likely to be companies that were founded and have run without crowdsourcing for long periods of time, but have recently discovered the benefits of crowdsourcing and have embraced them enthusiastically. This category is expected to grow as more traditional firms modify their operations to leverage the possibilities presented by crowdsourcing.

Almost 45% of respondents to this question stated that their firms used crowdsourcing for policy decisions 'sometimes'. Being the response with the highest representation, this is a reflection of general sentiments toward crowdsourcing – caution. Most respondents' firms, it seems, are still sceptical about the risks involved in crowdsourcing and the benefits to be accrued. According to Roth (2009), acceptance of crowdsourcing strategies is inhibited largely by the limited understanding of risks, costs and potential benefits. Risk sources typically at the top of management's mind include fear over leakage of confidential information,

compromising IP, and lack of a developed market for innovations, financial risk, and risk of turbulence as a disruption to business processes. More than 16% of responses were 'neutral' regarding how often crowdsourcing was of value in decision-making for policy makers. It is noteworthy that this group is different from the 7.6% of respondents to whom crowdsourcing does not apply, and who answered 'not at all' to this question. For a firm involved in crowdsourcing to some extent, at the very least it does influence decision-making. The 'neutral' response is therefore curious, especially given the significant percentage of 16.2%. It therefore calls for closer examination. A possible explanation is that the respondents are unaware of the influence of crowdsourcing on their superiors' decisions, because they are not privy to those decisions and are not part of the decision making process.

Overall, the benefit of crowdsourcing in the policy-making area was rated as 2.73 (SD = 1.09). The high standard deviation is a reflection of how diverse the opinions of the participants were, this means that there is minimal consensus among the sample, and that the benefit of crowdsourcing is highly variable. This suggests that although the average score of this crowdsourcing benefit is relatively lower, it is still reliant on the type of company that uses the crowdsourcing method. This is reflected in the less defined distribution of responses featured in Figure 14.

Figure 14. Support for policy maker´s decisions



Crowdsourcing and Performance Improvement

The responses to as to whether crowdsourcing improves the performance of the staff were revealing in several ways. The most notable was that the hitherto unchanging 7.6% of respondents whose firms had no affiliation with crowdsourcing finally changed to 5.8%. This means that 1.8% of respondents whose work environments have no affiliation with any crowdsourcing strategies nonetheless have experienced some form of performance improvement from crowdsourcing in spite of that feedback. This is possible given the fact that many crowdsourcing tools are available to everyone with an Internet connection, regardless of their work environment, whether or not they realize it. For example, Howe (2009) and Lane (2010) outline the different forms of collective intelligence, which include problem solving and crowd casting as well as idea jamming. In both forms, a problem or topic of discussion is posted onto a specific forum on the Internet where the online community contributes solutions or adds to knowledge in one way or another. An example of such a platform is Yahoo

Answers, which is available to everyone with an Internet connection, and where users post questions for the online community to answer. With such a platform, people working in environments where crowdsourcing is not institutionalized can still leverage its capacities and thereby improve their performance.

4.4.2.6. Effect on staff performance and work environments

Approximately 10% of respondents stated that application of crowdsourcing concepts improves the performance of staff at their work environments 'very often'. This is exactly double the percentage of respondents who state that crowdsourcing influences policy makers at their organizations 'very often'. This goes further to prove the point made in the afore-going paragraph that individuals tend to appreciate the power of crowdsourcing in improving performance faster than their organizations do. This is an encouraging observation because it implies that crowdsourcing concepts will continue to be adopted in spite of resistance to change by senior management. It has been discussed that cultural differences, social aspects and morality, among other factors may present risk to organizations. Skeels (2009) conducted a study analysing of the use of social networking sites by professionals. They found that their use – especially Facebook and LinkedIn – had increased dramatically among professionals, and that instead of boosting productivity, their use had the potential to severely compromise it. Professionals could spend hours on these sites, and over time some get addicted to them (Karaiskos et al. 2010).

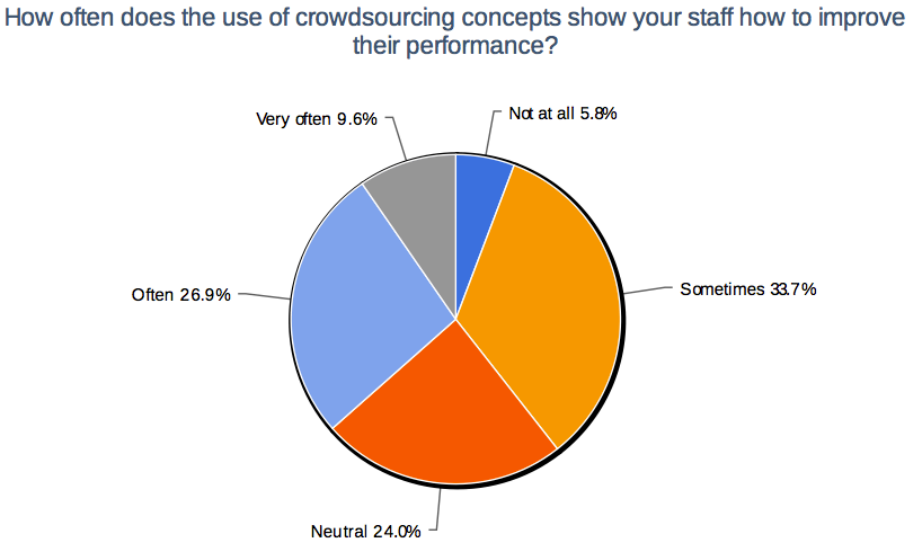
Instances of such disruption to productivity have led many organizations to ban the use of social networking at the workplace (Karaiskos et al. 2010). There are many cultural, social and moral questions raised on either side of the divide. These questions add to the list of risk

sources presented by Corsello and Averbook (2009). For these reasons, managers and policy makers must deliberate extensively before they adopt any new strategies. Individuals however are less encumbered by these considerations, and are therefore more likely to seek solutions through the crowdsourcing tools available to them, as and when they need to. Almost 27% of respondents stated that crowdsourcing enhanced employee performance 'often', while 33.7% responded with 'sometimes'. This brings the total percentage of respondents who have experienced improved performance as a result of crowdsourcing to 70.2%. This resonates almost perfectly with the findings from question 6, where 70.5% of respondents stated that they found crowdsourcing personally useful to them in terms of enhancing their strengths and bridging their weaknesses. In total 24% of respondents answered 'neutral', which is a higher percentage than the 18.1% who responded with 'neutral' to the question, which asked whether crowdsourcing recognizes their strengths and weaknesses. Since between the two questions the number of satisfied respondents held steady at 70.2% and 70.5%, the larger number of neutral responses in question 8 was drawn from the pool of 'very dissatisfied' and 'not applicable' respondents in question 6, which registered a combined 11.4%. This is confirmed by research responses, which demonstrate that in question 8, only 5.8% stated that crowdsourcing did 'not at all' show the staff at their workplaces how to improve performance. The implication of this finding is that there was a pool of respondents – about 5.6% of them, who did not find crowdsourcing personally useful, but had nonetheless seen it work for other staff members as far as performance improvement was concerned.

While reasons for the afore-going phenomenon are at present purely speculative, one possible explanation is that this 5.6% are what can be termed as 'late majority' and 'laggards',

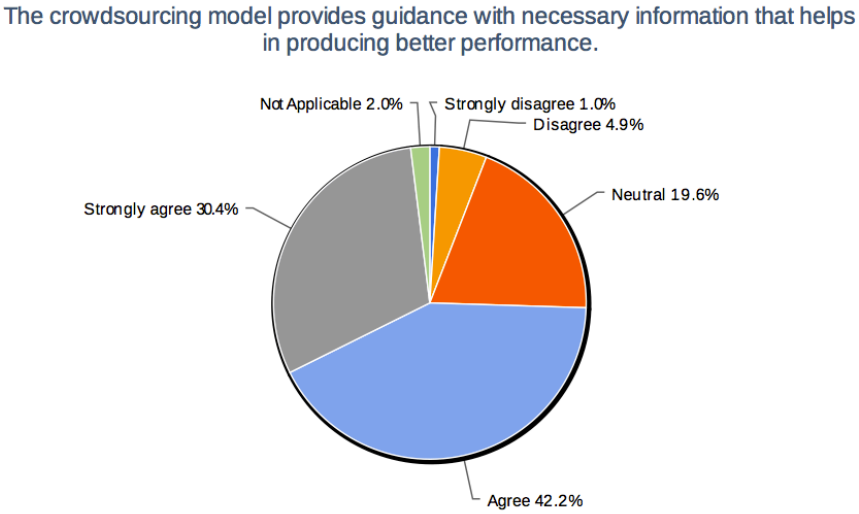
according to the Innovation Diffusion Theory (Pedersen 2005). According to this theory, innovations are not universally adopted the moment they come out, but rather a pattern can be expected on how the diffusion of that technology will take place. At first, a small number of 'early adopters' is drawn to the new innovation out of excitement, need or simple curiosity. The 'early majority', who see the benefits of the new innovation and take it up, follows them. The uptake reaches the tipping point when the largest number – the 'late majority', join in and make the innovation mainstream. Finally, the 'laggards' are the conservative types who only adopt the innovation either because everyone else is using it, or because they are compelled to adapt to remain effective. More than 5% of respondents did not find crowdsourcing strategies as enhancing performance, most likely because of limited encounter or a failure to recognize them as such. On average, the respondents have rated the performance improvement benefit of crowdsourcing as neutral, as evidenced by the 2.98 (SD = 1.08) mean score. This also indicates that there is also a diverse opinion of the respondents about the particular benefit of crowdsourcing to the performance of the in-house staff, as illustrated in Figure 15.

Figure 15 Effect on staff performance improvement



Alternatively, there seems to be a stronger consensus among the participants on whether crowdsourcing provided guidance with necessary information that helped in producing enhanced performance relating to the organization. An overwhelming 72.5% either strongly agreed or agreed. 19.6% were neutral, while 5.9% either disagreed or strongly disagreed. The strong opinion about how crowdsourcing improves the organization's performance, either through customer feedback, improved research and development methods, or innovative ideas from the crowd, is evident from the high mean rating by the respondents of 4.03 (SD = 0.84). The distribution of the responses is shown in Figure 16.

Figure 16 Effect on work environment and performance



The participants are more definite about their answers and most of them do agree that the crowdsourcing model is highly beneficial to the performance of the company by providing guiding information. This further supports the finding of the qualitative analysis that suggested that the benefits of crowdsourcing often outweigh its risks. However, despite the benefit of improving individual and company performance through crowdsourcing, the risk of producing low quality output through crowdsourcing is still a relevant issue among the respondents. This suggests that although crowdsourcing could enhance the competency of the staff, it still is not enough to provide excellent output. Several other factors could still affect the performance of the individuals among the crowd, which includes incentives, motivation, goal setting, and working environment amongst others.

4.4.3. Analysed and allocated risk themes

4.4.3.1. Risks on Intellectual Property Ownership

The most overwhelmingly popular response about risks involved in crowdsourcing models is the issue of IP, which includes a number of aspects. First, to leverage crowdsourcing strategies, firms of necessity need to release some pertinent information as raw material for the crowd to work with. In many cases, especially those involving innovation, such information includes fragments of patented works which the benefiting firms spent fortunes to acquire. Releasing them to the crowds – even when the crowd is a controlled one – is a major risk which most firms are averse to. This risk to the businesses was reflected in the responses of the respondents involving the risk of open sourcing and the transparency of the whole process. The following comments are illustrative:

> *It is hard to predict all the consequences of crowdsourced projects.* (Question 16, Respondent 331)

> *Clients are always concerned with the open source environment.* (Question 16, Respondent 187)

> *The risk of crowdsourcing innovation is … the long-term management of IPR.* (Question 18, Respondent 176)

> *The crowdsourced innovation model is much more transparent, and this can create problems in companies where decisions are kept secret.* (Question 18, Respondent 241)

> *It's about IPR & copyright leakage. That's all for me. As we do cannot sign NDAs with all. Even if we can, it is difficult to implement.* (Question 22, Respondent 179)

> *The key risks we see are rising confidential data to the crowd and a reputational risk that the company worries about possible media implications on giving private data to the crowd.* (Question 13, Respondent 317)

> *Over-disclosure could hinder patent acquisition and inform competition.* (Question 15, Respondent 223)

Therefore, it is evident that business owners are apprehensive about releasing their products and IP to the crowd in order to practice open innovation. One risk is that of piracy, especially considering software, which has pervaded most commercial software markets. This has the potential to compromise the user experience and therefore negatively impact the brand's promise of quality. Revenues are also lost in the process, because these open sourced software, which are pirated are usually downloaded free of charge in an illegal market, but are readily available to potential customers. Another risk involving the release of IP even to a controlled crowd is the threat of leakage to competitors, thus, posing a danger to the brand's innovation and image. A further problematic issue arising from crowdsourcing strategies is the risk of exposing confidential customer information to the crowd, which then exposes the benefitting firm to the possibility of lawsuits and negative publicity. This was a concern explicitly expressed in some of the segmented data. The risk originates from the fact that with many applications of crowdsourcing strategies, the tasks to be processed involve volumes of data containing confidential information belonging to clients, who may be individuals or organizations. From the responses received, there are two aspects to this; first is the question

of who is legally liable for content found on a crowdsourcing platform if such content either infringes upon copyrights and patents, or breaches privacy. The second aspect is whether the owners of a crowdsourcing platform have leeway to use information gathered through their platform as they will, for their own benefit or to share it with third parties, for example the government.

> *The main risks being seen so far are data protection (if customer data or strategy information is involved) and the general risk of unforeseen customer reactions due to more transparency.* (Question 13, Respondent 329)

> *Internet or the cloud and the security and privacy issues emerging out of it is the main concern.* (Question 23, Respondent 182)

> *The components for me are, one, concept leakage and, two, customer information leakage.* (Question 23, Respondent 179)

A further aspect to the user information divulgence risk relates to the freedom intermediaries should have with the information they have gathered using their platforms. This places all types of intermediaries in a difficult situation, as they have to comply with national and regional laws, but have to contend with cynical users who, upon finding out that their information can be shared freely with authorities, choose to reduce their usage of the intermediary services or cease their use altogether. Moreover another aspect of the IP issue is the protection of the ideas of the individual crowd members. The participants of crowdsourcing usually divulge their own ideas, labour and opinion, that could help further the development of businesses towards increased performance or enhanced products. However,

most of these original ideas go unaccredited and uncompensated due to the transparent nature of the whole process. This poses a risk for the crowd since their ideas could be claimed by the company that they are helping or even by other people who have access to their information.

> *My idea has to be shared with unknown people, which have IPR leakage risks.* (Question 13, Respondent 179)
>
> *The only risk factor is with IP ownership.* (Question 14, Respondent 251)
>
> *It's risky only if someone is stealing ideas.* (Question 18, Respondent 151)

Because of this possible risk to the crowd, some people are reluctant to provide their honest opinions and their intellectual ideas to the companies or brands that do not have strong policies that would safeguard them against the risks of IP leakage. This would in turn, affect the efficacy of crowdsourcing in terms of the quality of output and results of crowdsourcing practices, and even the quantity of participants. Whether it is the crowd or the business' IP that is threatened by crowdsourcing, the larger companies would still ultimately carry the risks and consequences of idea ownership leakage, thus, the risk of IP loss posed by crowdsourcing practices is quite high for businesses that require confidentiality of information about their products and innovations. This risk is highly recognized by businesses as reflected by their concerns voiced out in their responses. The question that determines whether crowdsourcing is adopted, when IP loss is the most significant issue under consideration, then becomes whether the anticipated benefits of crowdsourcing outweigh the potential risks.

4.4.3.2. Risks on motivation of the crowd

Motivation is critical to quality processes and output because desirable quality can only result when one gives their best. While people can be compelled to perform through some form of coercion, they can only give their best when they are motivated to do so. It is therefore important to understand the sources of motivation and how they can be leveraged.

> *Transparency is key to developing trust; let every stakeholder see (what is being aimed at and what is being done to achieve that aim).* (Question 19, Respondent 286)

> *Bad crowd participants without motivation (referring to risks of crowdsourcing).* (Question 23, Respondent 296)

> *A lack of understanding on how to motivate the crowd to participate, as well as what the crowd is interested in participating in (referring to risks of crowdsourcing).* (Question 20, Respondent 158)

Disclosure of information can promote general agreement and increase the perceived truth-value of that given information. These statements allude to the need for the managers of a crowdsourcing process to have a motivated crowd to work with. Transparency is one way to motivate a crowd to support your cause, because it allows them to see the larger goal and how their efforts are being called upon to contribute to a said goal. According to Nohria et al. (2008), people have an inherent need to find a purpose in what they do, what they call the 'comprehension drive'. It states that people are driven to 'understand the world and how it works'; how the individual small contribution goes toward the advancement of society. The theory states that to fulfil this drive, individuals look around their environment after they have

gained an idea of how things work, and then use the resources around them to create meaning out of their lives. Besides transparency, another key motivator is a sense of belonging. Wabba and Bridwell´s (1976) revisited hierarchy of needs puts, as the third need on the hierarchy the requirement for association, which refers to people's inherent desire to belong to a group and find a sense of identity. Individuals in a crowd can get motivation from the simple fact that they are part of that crowd. It is incumbent upon the crowdsourcing project manager to create an atmosphere of teamwork in the crowd, through such techniques as naming the group and giving a unique reference/identity to participants in the crowd. The analysis of the themed responses have identified the following main crowd motive clusters for participation: Care for community attachment to a group, sense of efficacy, altruism and ideology, monetary rewards, need for improvement, knowledge exchange, friendship and social relationships and personal training. These main user motives correspond and develop from the intrinsic, extrinsic and social motive-groups researched by Antikainen and Väätäjä (2010).

4.4.3.3 Risks on financial loss

Since the cost of using the crowd instead of the traditional setting has been widely perceived as more cost effective, the financial risks that are associated with crowdsourcing has not been seen as threatening as the other risk factors proposed by the respondents. Considering this input, a few responses also reflect the apprehension of some businesses to finance a crowdsourcing model due to the possible financial losses that an unsuccessful crowdsourcing practice might cause.

> *Yes, it is a risky process if it does not manage well. It can have a financial risk for the company who like to give reward to the crowd and risk of not attracting the crowd for future project if it fails in motivating them at first.* (Question 15, Respondent 310)

> *Quality is generally good. Only risk is of wasting money.* (Question 15, Respondent 254)

> *The biggest risk I see is to waste time and resources and not generate reasonable results.* (Question 15, Respondent 286)

The more obvious financial risk that companies might incur involves those firms that use the paid crowdsourcing approach, since these companies have to invest money in order to receive the service that they require from the crowd. The fear of financial loss becomes a reality if the crowd does not deliver on the quality of the work needed, or if the crowd falls short of the expectations. This would mean that the financial incentive paid to the crowd in exchange for a low quality service would be shouldered by the company or the clients, creating more apprehension for clients to consider crowdsourcing as an option for their business or research, which would in turn heighten the fear of financial loss among the companies relying on paid crowdsourcing as indicated by the following representative quotes:

> *The quality variable is mainly dependent on the time preinvested to concept the crowdsourcing process and the money that calculated for crowdbased contributions.* (Question 15, Respondent 158)

> *Lack of immediate financial gains may prevent the employers and organizations alike in adopting this new method (of crowdsourcing).* (Question 23, Respondent 182)

> *very good concept, however the financial risk is significantly higher, related to the quality risk and the risk of resources and management.* (Question 16, Respondent 158)

For most crowdsourcing practices that use the unpaid approach, the financial risk, as perceived by the respondents, would result from the possible decreased profitability of the project if the implementation of the practice was not properly undertaken. This financial risk is seen when crowdsourcing practices are compared to the more rigorous efforts that actual company employees would do in order to reach a target profit. Company employees are aware of their tasks and their roles in order to achieve an explicit quantitative goal for the company. Alternatively, the crowd does not have the sense of responsibility nor awareness of such financial goals of the company. Thus, they are more lax in terms of the effort they put into their tasks. This could be linked to the risk of motivation as discussed earlier. Traditional employees have a stronger sense of responsibility to hold on to their jobs, and have shared values with the entire company to reach the collective objectives. The crowd, however, have a shorter sight in terms of goal-setting that they only focus on the current task given to them.

4.4.3.4. Risk on the quality of results

When the respondents were asked to comment on the quality of output experienced at their organizations from the crowdsourcing processes they applied, in light of risk, under half of the respondents were positive about the quality of results realized, rating it at different levels between “great” and “fine”. Some of the positive remarks include:

> *Great quality and strong applicability. Not really risky when implemented properly.* (Question 15, Respondent 253)

> *Good results, not risky as long as the crowd has access to information to gain a clear perception of required quality.* (Question 19, Respondent 187)

> *The quality of the results is directly linked with the amount of people that the project is exposed, the more the better.* (Question 19, Respondent 313)

A further response pointed to crowdsourcing's ability to attract multiple perspectives on the same issue, problem or topic, which helps eliminate blind spots by flushing out potential risks and highlighting hidden potential benefits. Some responses were of the position that quality was dependent upon the number of participants, explaining that including more participants for a given task would increase the quality of the work. Alternatively the majority of the respondents were either ambivalent, non-committal, neutral or negative about the quality of output due to the lack of expertise and quality ideas drawn from the crowd.

> *Yes it can be risky as there is not a lot of expertise in this area that can be relied upon at this time.* (Question 19, Respondent 171)

> *Yes. It is easy to not have your goals be fulfilled, if you do not steer properly. Sometimes companies aim for quality results and receive a great amount of quantity, without 'anything good' in it. Sometimes companies aim for quantity, but not receive any ideas or input from the crowd at all.* (Question 15, Respondent 220)

One neutral response stated that in their experience, it was possible to gain quality output, but that this involved laboriously sifting through results. A further neutral respondent emphasized the need for the crowd to understand the goal. This response resonates with one negative

response that had experienced "*bad results mainly due to bad briefing and inexperienced participants*" (Question 15, Respondent 109).

A neutral respondent stated that quality "*depends on the context and structure, temperament and generational make-up of the crowd*" (Question 23, Respondent 277).

Another response added to the social angle of this by stating the importance of understanding the mechanism of motivation that drives individuals and communities. This suggests that cultural differences, social aspects, morality and other factors could be potential barriers to quality of output. From the responses, it is apparent that crowdsourcing strategies can be both beneficial and detrimental to an organization that employs them. However, the majority of the respondents did not fail to see the benefits of crowdsourcing to the business' performance as a whole. One positive response stated that crowdsourcing had the potential to "*yield a more agile and nimble organization if properly used*" (Question 17, Respondent 277). Five other positive responses in different words also pointed to the importance of "*doing properly*". "*Cost savings and improves scalability significantly*" was another response. Faster turnaround time was another benefit cited. One response stated that in any setting, stakeholder engagement always improves business performance, whatever the mode of engagement. Instant access to diversity and knowledge (diversity in perspectives), risk reduction, positive disruption of processes, flexibility and perpetual creativity, speed and accuracy as well as excellent replacement for HR were all variously cited by the respondents as benefits of crowdsourcing. "*Resonance with users and consumers*" (Question 17, Respondent 137) was also cited as a benefit. More responses pointed to crowdsourcing's potential to stimulate growth.

4.4.3.5. Risk on transparency and lack of control

Some businesses find it challenging to control the crowd to the vastness of its reach and the magnitude of the participants. Business managers consider lack of crowd control as a potential risk of practicing crowdsourcing as the following illustrates:

> *Lack of control is the main component and the missing management of the crowd. It is not a trial and error process.* (Question 23, Respondent 176)

> *They are difficult to predict and difficult to control. In fact crowdsourcing could be a useful resource and a huge problem either. The continuous monitoring of the crowd is the only way to prevent crowdsourcing to become anarchy.* (Question 24, Respondent 187)

> *The primary risk is loss of control so the project loses its original intent.* (Question 24, Respondent 246)

> *The market risks: People involved in crowdsourcing processes start having more influence on brands, other than customers and the media.* (Question 15, Respondent 329)

Compared to more traditional business methods wherein the stakeholders and managers have more focused and defined control over the employees, crowdsourcing methods have drastically lowered this sense of control and have given the crowd more power to steer the business to a possible direction or even to influence the consumer market to go in a specific direction. As noted by a respondent, a continuous monitoring of the crowd is needed in order to prevent the crowd from taking over the company. How this could be done would require a lot of time and effort from the firms due to the overwhelming number of crowd participation.

> *Using controlled crowds is one way of doing this, rather than fully open crowds (referring to crowdsourcing strategy).* (Question 23, Respondent 187)

> *The main issue is the loss of know-how, followed by the control of the process. Innovation and project management need new methods.* (Question 23, Respondent 282)

Controlling what the crowd does would not be very feasible, but other responses have pointed out to the need to use a controlled crowd, wherein the members of the crowd would be chosen carefully based on certain qualifications and criteria rather than utilizing the services of everyone who wants to participate. Selecting this method, the quality of the services could be kept in check more efficiently due to the lesser number of crowd members and the probability that the output would be of high quality is also increased. However, doing so might not be very beneficial for some large scale companies, as controlling the crowd could be seen as alienating members of certain demographics, that would potentially impact the image of the company which could lead to the loss of the loyalty and support of potential customers.

4.4.3.6. Risk on ethical and political impact

As respondents noted, scepticism towards crowdsourcing results also from the ambiguity of the law with regard to taxes and labour issues. Crowdsourcing draws expertise from around the globe, bringing in complex dynamics regarding compliance with national and international law. Among the issues that need addressing are which minimum wages to apply if at all, which jurisdiction to submit taxes to and how much of such taxes to pay to which authority. If a crowdsourcing project involves income generation from sources in multiple jurisdictions, must each transaction be adjusted to meet the relevant jurisdictions requirements? The risk as

perceived by the respondents is prominently due to the novelty of the practice, that labour and tax laws have yet to be adapted and established by policy makers globally. The lack of distinct and clear laws that govern all crowd members all over the World and the companies involved make crowdsourcing a risky process for some companies.

> *The legal ones (referring to areas of risk), we see a lack in jurisdiction and legislation that has to be closed in the near future.* (Question 15, Respondent 326)

> *Our current experience is somewhat limited because we are still in the trial status. We are currently evaluating typical legal aspects like labour / tax law and data protection requirements.* (Question 14, Respondent 329)

> *At the moment the level of risk is still low, but especially in Europe labour and tax issues arise at the horizon.* (Question 23, Respondent 206)

> *Some areas are still to be defined, but will frame as soon as a legal body will apply. The main risk will remain, as global tax issues have to be settled.* (Question 14, Respondent 147)

> *The market awareness is rising, on the other hand labour and tax issues appear.* (Question 13, Respondent 204)

Another important area involves IP and copyright issues, which assumes an ethical bent. Compensation systems in crowdsourcing is potentially explosive because producers of IP that gets implemented are often paid a tiny fraction of the amount of money that the seeker eventually earns from use of the IP, in instances of crowdsourced designs and/or innovations. Another issue needs addressing is the fact that crowd- and open-sourcing is pushing many

professionals – photographers, writers, programmers – out of jobs, or forcing them to settle for much less than they are used to earn, an issue that is social, economic and political.

4.4.4. Quantitative risk level assessment

In order to verify or provide support to the result of the thematic analysis, the quantitative part of the questionnaire was used to evaluate the level of risks and benefits involved in crowdsourcing as perceived by the crowdsourcing practitioners.

4.4.4.1. Risk level determination and category analysis

Question 9 posed to respondents asked them whether they thought that crowdsourcing evaluates the progress of organizational processes using predetermined risk management mechanisms, which led to remedial action through collaboration of all staff. Overall 16.7% 'strongly agreed', meaning that they resonated with all three elements in the question – the ability of their particular crowdsourcing model to evaluate progress, its in-built predetermined risk management capabilities, and its ability to marshal collaboration among staff to take corrective measure.

Notably, this 16.7% response was 7.1% higher than the number of respondents to question 8 who stated that crowdsourcing showed staff how to improve performance 'very often'. This may imply that even relatively well designed crowdsourcing models that factor in risk, evaluation and collaboration may fall short in terms of how their output gives tangible benefit to individual staff members. If this is a given fact, then there is a need to add an element of reporting to most crowdsourcing models such that the output is relevant not just to senior management but to every relevant staff member. This element of communication has been

highlighted as critical by Küng et al. (2008) and Binder (2007), who stress the need for timely communication to all stakeholders with regard to progress and the findings of providers. People act based on their knowledge and expertise, and will improve based on new information as and when it arises. A lack of sufficient, relevant communication to all staff may explain the reason for the large disparity between those who think well of their crowdsourcing models' technical soundness versus those who think that it improves performance. In total, 31.4% of respondents 'agreed' with the proposition. This indicates that they concurred partly with the three elements in the question. It could be that they agree with two of the elements but disagree with one, or that they agree with all but only to a certain extent. This is understandable given the novelty of crowdsourcing models as organizational strategies. This is especially true of smaller entities, which lack the capacity or wherewithal to implement comprehensive checks and balances in their processes.

In total 28.4% of respondents were 'neutral' to this question, while 16.7% 'disagreed'. One percent 'strongly disagreed'. The neutrals may be accounted for by two possible factors; first, it could be that these respondents have no way of knowing whether their crowdsourcing model evaluates progress, has predetermined risk management processes, or leads to collaboration. This brings back the issue of communication, already explored in the preceding section. Second, it could also point out the fact, that the respondents are ambivalent about their crowdsourcing models' score on the three elements in question. They might have seen some positive and some negative outcomes that on average make their sentiments 'neutral', 16.7% 'disagreed', while 1% 'strongly disagreed'. These may similarly be attributable to mistakes made at their organizations with regard to one or more of the factors identified by Cooper and

Edgett (2008). Undoubtedly, some of the disagreements were also expressed because crowdsourcing was not practiced at the respondents' firms. Overall, the participants have judged the benefit of crowdsourcing on progress evaluation as slightly above average with a mean rating of 3.66 (SD = .96), this means that the people are still generally not fully convinced of how crowdsourcing could benefit their company through progress evaluation and collaboration efforts. This could possibly be due to the novelty of the practice; hence, most participants are still unaware of all the aspects of the model, and its potential benefits.

Risk level evaluation

To assess the level of the risks involved in crowdsourcing, the respondents were asked to rank the risk level posed by the crowdsourcing model on several aspects using a scale of 1 through 5. The lowest risk assignment would be one, the highest five. The result of the assessment is presented in Table 10, using descriptive statistics.

Table 10. Descriptive statistics on risk levels of Crowdsourcing

	N	mean	Std. dev.
Financial Risk	74	2.32	1.22
Organizational and Societal Risk	74	2.38	1.07
Market and Consumer Risk	74	2.22	1.15
Technological Risk	74	2.16	1.2

Turbulence Risk	74	2.43	1.09
Creative Risk	74	2.08	1.13

It can be seen that the participants have rated the risks on all aspects as being below the median which is three, indicating that the risks were perceived as relatively lower than the benefits, the mean ratings of which range from 2.73 to 4.03, way above than any of the mean scores of the risks assessed. This provides further support to the claim that the benefits of crowdsourcing outweigh the possible risks. It can also be seen that the standard deviation obtained from all aspects of the risks are relatively high, indicating that the opinions of the respondents are diverse and more widely spread throughout the range of the scale. This indicates that the risks of crowdsourcing are greatly varied across different fields of practice, and are dependent on several factors that differentiate the crowdsourcing process of one company to the other. It can also be speculated that the newness of the industry might account to the lack of strong consensus among the respondents, that is, since crowdsourcing is a new practice, most people are still unaware of all the risks posed by the model, thus, making them unsure of how the process affects the several aspects of the business.

Analysing table 9 (see page 136), it can be seen that although the risks were ranked relatively less serious, the turbulence risk was ranked as having the highest level of potential risk to crowdsourcing, this refers to the risks caused by unforeseen factors that usually affect large-scale businesses with set hierarchy- and power-schemes. The impact of crowdsourcing forces

to adapt change and refocus the attention to develop progressive and innovative strategies to overcome the risk of potential turbulence. Organizational and societal risks closely follow, and these provide support to the ethical and political risks identified from the thematic analysis of the study, further suggesting that the impact of lack of general laws that govern the rights of all parties involved in the crowdsourcing model poses a threat to the efficacy and implementation of the practice. The participants also recognized financial risk as a possible threat. Although this aspect did not get a very high rating, the fact that the score was above "2" means that some respondents perceive the slight risk in it.

Market and consumer risks, technological risks and creative risks were ranked last on the list of potential risks of the crowdsourcing model. Market and consumer risk was not seen as very threatening since crowdsourcing might actually pose as a positive development of companies in this aspect by engaging the general public. Through crowdsourcing, the ideas would come from the consumers and they would also decide which products or ideas are good for them, thus, increasing market approval of innovative products. Technological risk factors are also minimal in the crowdsourcing environment due to the fact that there are several other people with varying levels of technological expertise working on a particular task, thus, making crowdsourcing a possible solution to technological risks of traditional innovation. Creative problems of traditional innovation could also be solved by crowdsourcing, which might be the reason why the participants did not view creative risks as much of a threat to crowdsourcing. Due to the utilization of a diverse range of individuals or various backgrounds and expertise, the limitation to creative ideas available within a traditional innovation model could be

elevated by gaining insights from the contributions of the crowd, thus allowing for a multitude of creative options for the company.

4.4.4.2. Overall risk level assessment

Turbulence risks and IP risks were seen as the most prominent threat to crowdsourcing. However, there is a growing consensus that the benefits of crowdsourcing could potentially outweigh the level of risks if the practice is done properly. More businesses are focused on the positive impacts of crowdsourcing that they neglect the inherent risks of the practice. Although the perception of these risks is relatively low, they still pose a threat to any business if not mitigated. Managing the pace and polyvalent character of change, especially considering turbulence risks – and its impact on organizational structure, group culture, and personal management styles is one of the most fundamental and enduring aspects. Overall, the level of the risks involved in crowdsourcing is still highly subjective and dependent on several other factors, such as number of participants, area or field of practice, scale of the company, level of IP protection policies, amount of financial investment, standards and practices for quality verification, and level of crowd control, and crowd motivation practices. In order to optimize the services that the crowd could offer while minimizing the risks, several strategies found to be suitable for employment, as suggested from the responses of the participants. These strategies will be fully discussed in the succeeding section.

4.5. Risk control and possible strategic solutions scenarios

The companies and businesses could diminish the prominent risks identified from the previous section through various strategies being implemented.

4.5.1. Quality control

One potential problem that was identified by the respondents was the possibly poor quality of service provide by the crowd due to the lack of expertise, time, incentive, motivation, or goal. The participants have suggested various models on how to improve the quality of work for the seeking company.

> *The use of strong criteria of how the crowdsourcer can be positioned in your project could provide necessary condition for risk management. Otherwise however you could rely on your experience and methodology that provide necessary action to get the results.*
> (Question 14, Respondent 296)

> *Behavioural screening allows elevating quality response.* (Question 15, Respondent 275)

> *Very difficult to continuously control the quality of output. Have to sift through a lot of submissions to find valuable concepts.* (Question 15, Respondent 204)

> *With other options entering the field and some with better control over their own handpicked workforce produces much higher quality and lower risk.* (Question 23, Respondent 286)

One possible solution is increasing the standards when screening crowd participants. In specific, that would be, behavioural motivations, level of expertise and experiences should be considered when picking a possible workforce. This suggests that using a controlled crowd, rather than an open crowd would lessen the risks of low quality output. A downside of this practice is that the benefit of wide scope and massive participation crowdsourcing would be

greatly reduced, and the risk of alienating potential customers by turning down their offer to participate in the innovation process could also be a negative result of this particular strategy. However, this mitigation plan could work on smaller-scale businesses rather than global brands. The quality of the results depends on the understanding of the goals when starting the crowdsourcing initiative. A clear understanding of the desired outcome leads to high quality results.

> *Not risky as long as the crowd has access to information to gain a clear perception of required quality.* (Question 19, Respondent 187)

> *Bad results mainly are a result to bad briefing and inexperienced participants.* (Question 15, Respondent 109)

Some respondents attribute poor quality of output to the lack of information given to the crowd, thus, a possible mitigating solution could be the proper briefing of the crowd, giving them all the information they need, and providing transparency where it is necessary. The crowd should be made aware of the long term and short term goals of the company, in order to create a sense of shared values among the crowd in order to push them towards a common community goal. A possible risk of this model is the threat of information leakage. Giving too much information to the crowd might result to piracy, IP loss or competition information leak. The company should provide safeguards in order to protect their ideas and IP rights in order for this method to be fully effective.

> *One of the risks is customer dissatisfaction. We treat that with a 100 % money back guarantee. We have strict copyright and service agreements set up.* (Question 14, Respondent 266)

> *Pretests and demo groups mostly assure quality. Even then risks are limited through a rigorous quality management within the crowd and innovation process.* (Question 15, Respondent 268)

> *Risks can be limited due to a collective quality assurance.* (Question 15, Respondent 147)

> *Result quality is better than traditional methods. It is not a risky process, as with proper crowd management key decision makers vet all results.* (Question 15, Respondent 241)

> *Sometimes good. Yes it is because you use people outside the company for the solution. Of course there is a contract but you can sell the solution with small adjustment. in my opinion the best solution for a company is to believe in the internal people.* (Question 15, Respondent 300)

Other companies provide other solutions to poor quality by giving guarantees to the clients. In this way, any financial risk on the part of the client could be diminished. Another plan to increase the quality of work is to rely on the internal staff of the company that has the sufficient expertise to judge the quality of the output provided by the crowd. These employees could serve as the decision makers in order to ensure the quality of the work. In order for this plan to work, the internal staff should have enough knowledge of the business, should be

motivated, and work for the company's common goal. A downside of this model is the increased cost of labour expenses by employing field experts as quality assurance staff.

4.5.2. Enhancing motivation

Engaging the crowd and keeping them interested to work is one of the ways to increase the quality of the results produced by the crowd. In order to do this, the company could address the intrinsic motivation of the crowd by providing them a cooperative community where they could be a part of giving them a sense of belongingness that would keep them working towards a common goal.

> *Opening a particular task to an undefined group of people with an incentive that has to be well defined throughout the task. Acknowledgement and trust is key to success.* (Question 24, Respondent 266)

> *Providing the proper incentives for people to participate and minimizing the effect of ulterior motives that people have.* (Question 23, Respondent 289)

> *Second to find ways where the crowd can compete with each other and stay motivated to get involved. Crowdsourcing will mature over time and risk will flatten, the more you bother on the process the better the risks can be managed.* (Question 24, Respondent 317)

> *One can gather great insight when using the right crowd and asking the right question. Keeping people engaged is always a risk.* (Question 17, Respondent 331)

> *The whole organization is based on innovation led by all members of the community. The art then consists in having a core staff always here to maintain the excitement in the community, valuing innovation and internal individual or collective initiatives. Then it's also about always creating the new layers of motivation following the growing complexity of the community members productions and as a matter of fact, relationships.* (Question 14, Respondent 137)

Other forms of motivation are extrinsic, and include cash rewards. Cloud labour relies on compensation for work done. A related form of motivation is competition; some people are motivated by the thrill of winning, and will give their best when presented with an opportunity to compete. Innocentive's model is built around competitions, where a project is put out to crowds and the best one wins a cash prize. Related to this is another motivating factor, the desire for recognition. Many computer virus makers and hackers have been known to create havoc merely to gain recognition. Such energies can be harnessed into a constructive crowdsourcing process where excellent performance is rewarded with recognition. Many online forums apply this principal by assigning points or graduated titles depending on the quality and quantity of their participation. Correlating with Antikainen and Väätäjä (2010) and Carpenter (2011) findings, the following main motivations for participation have been identified and developed: Care for community attachment to a group, sense of efficacy, altruism and ideology, monetary rewards, need for improvement, knowledge exchange, friendship and social relationships and personal training.

4.5.3. IP protection and confidentiality

These risks have pushed most businesses to develop strategies to minimize the risks of IP, as reflected by the responses of the interviewees:

> *Intellectual property risk can be reduced when a proper process driven risk control system is established in an early stage of conceptualization.* (Question 14, Respondent 158)

> *The company has a NDA police agreement for some projects, which brings protection.* (Question 18, Respondent 255)

Although some of the respondents have ideas of how to deal with IP issues, the implementation of such are always difficult especially involving a large population of crowd members. Most responses are not quite sure how to resolve this issue or if it is even feasible.

Companies could protect their IP by setting up policies or binding their workforce in a contract that would make them liable for any information leakage or IP infringement. However, there are several grey areas in this matter that would make it difficult for the companies to protect their property from being stolen especially the case of open source innovation on software, or when utilizing an open crowd innovation. The members of the crowd are also at a disadvantage, since their ideas are publicized without being credited or compensated for them. The lack of legal laws that would secure the IP of individuals despite the growing online trends of communication makes it even more difficult for the SME crowd seekers to protect their IP. Thus, it is for the companies' benefit to provide solutions to these risks.

> *The lack of transparency of the process and access to information provide for risky situations. All stakeholders need to develop an "open-minded" approach. Those skilled individuals need very specific information from the project lead and in our world, that information is most effectively communicated.* (Question 23, Respondent 243)

> *It is all about transparency. Crowdsourcing suggests more people receiving and sharing information. Hiring secret information mitigates risk, and innovation opportunities.*
> (Question 23, Respondent 151)

> *Our risks are related to information security, because some can sell confidential information. But we will restrict access by type of login.* (Question 14, Respondent 171)

> *We understand that it is necessary to partly give up safety in order to establish transparent interaction with the cloud. To protect certain strategic information as good as possible, we usually work with a "private crowd", being people individually selected and known to us by name and person.* (Question 19, Respondent 329)

> *It all starts with information and becoming educated. Treating a crowdsource approach for innovation very seriously is a smart move, always. Asking in depth questions of your potential innovation platform partner allows you to gauge the maturity of their platform and their ability to handle complex matters.* (Question 19, Respondent 243)

Some of the respondents protect the information from the crowd by keeping them confidential and restricting access to them. Others suggested the need to divulge only the necessary

information and keep some of this information confidential even from the crowd. A possible risk of this is the decreased quality of the output. It has been established in the discussion about quality of output that most respondents believe that misinformation and improper briefing could account for the low motivation and unsatisfactory output, and it was suggested that full disclosure could help mitigate this risk. It is a matter of which is riskier for the company. That is why stakeholders and experts should always have the authority to decide the priorities of the company. As already discussed, working with a controlled crowd could also be a good solution, however, the downside of such method, should also be considered.

4.5.4. Financial risk mitigation

Methods of mitigating the financial risks of crowdsourcing have been unclear throughout the response set. None of the respondents have a direct solution on the financial risks involved. This could primarily be attributed to the fact that most respondents perceive crowdsourcing as a method to reduce the operation costs of business. The following quotes are representative:

> *A rigorous risk control system is often not in place. Mostly financial risk (money paid and effort with external crowds).* (Question 14, Respondent 158)

However, the financial risks that were identified by the respondents are the risks associated with poor output quality. This means that this is the only area of financial concern that is perceivable by the respondents.

> *The biggest risk I see is to waste time and resources and not generate reasonable results.* (Question 15, Respondent 286)

> *The quality variable is mainly dependent on the time invested to conceptualize the crowdsourcing process and the money that was calculated for crowd-based contributions.*
>
> (Question 15, Respondent 158)

This suggests that by focusing on quality assurance of the output, the financial risks could be greatly diminished. Quality of the results of crowdsourcing could be enhanced by implementing some of the strategies suggested in this chapter´s section about quality control.

4.5.5. Crowd control

An often-unforeseen problem of crowdsourcing is the growing influence or power of the crowd that they stray from the actual objectives of the company causing turmoil to several businesses, policy makers and even influence the consumer market.

> *Policy makers always face turbulences with people following certain opinion makers. That gives a feeling of not being in control and other people using the crowd.* (Question 22, Respondent 109)

A company that loses control of its crowd not only loses the benefits of crowdsourcing but also hurts the reputation and image of the brand that would in turn affect the company's profitability and consumer acceptance. In order to keep the crowd in line with the objectives of the crowdsourcing model, some of the respondents suggested the following:

> *Ensure that the company allows business leaders and controlling stakeholders to make the ultimate call regarding innovation pathways. All project participants need to be*

> *involved and trained to minimize risks rather than seeing opportunities.* (Question 14, Respondent 243)
>
> *The primary risk is loss of control so the project loses its original intent. The best way to deal with this is to start with a good project management team that can keep the crowd happy while still overseeing the project and keeping it in line.* (Question 24, Respondent 246)
>
> *The component that presents the most risk is of course the crowd themselves. In case the crowd turns against the situation, it is best to listen to their concerns and address them directly, rather than trying to control them.* (Question 23, Respondent 241)
>
> *It's all about: - how good you manage to visualize the interactions and productions of your community - how you make this easily available and improvable by the community itself.* (Question 24, Respondent 137)

Crowd training was one of the suggestions in order to minimize the risk of a (controlled) crowd. In order to do this, the company would have to invest on training materials and practices, and it would take more time to implement. It would also drastically lessen the number of crowd participants. This method could be used if the business does not require a huge quantity of crowd members, it is optimal for those businesses that utilize controlled crowdsourcing models, rather than for the large companies that involve open crowdsourcing. Proper management of the crowd is not dependable on the project size, and would prove to be also ideal for small-scale crowdsourcing projects. Since it would involve more personnel to personally guide the crowd towards the goal of the company. If the crowd involves more

participants, that crowd management department should also employ more staff, which means higher cost of operation. By listening to the crowd's concerns, instead of controlling it, the company could harness the trust of the crowd, making the whole process more effective. As one respondent stated:

> *Acknowledgement and trust is key to success.* (Question 24, Respondent 266)

A feasible strategy for the large-scale innovation models would be to foster an open and supportive communication channel.

4.6. Conclusion and summary

The main objectives of the study have been answered through the use of thematic analysis of the responses of the crowdsourcing representatives. The extent of which crowdsourcing innovation is practiced for commercial use has been explored. It was established that open innovation and collaborative work have been the most prominent commercial uses of crowdsourcing, suggesting that growing power of the consumer to not only have the option to buy which products they want, but also to have a hand at creating the products that are appealing to them. Companies now recognize the need to include the diverse opinions and ideas of people from varying backgrounds in order to effectively come up with innovative ways to create a product that addresses the needs and wants of a vast majority of the consumer population (Schenk and Guittard 2009). Companies also recognize the benefits of using crowdsourcing models to enhance the company's performance. Most companies are aware of the overwhelming benefits brought about by the technological advancements that allow people to communicate effectively their concerns, feedbacks and ideas using a wide scale channel at

lower cost. Despite the many benefits of crowdsourcing, several risks have been identified, although most respondents perceived the benefits to outweigh the risks.

The main barriers that may hinder the acceptance of crowdsourcing strategies have been comprehensively uncovered by the literature and the responses. Respondents to survey were asked to describe risk management approaches reflecting the risks they perceive as inherent in crowdsourcing. The respondents had many views on what these risks are, as well as various propositions on how said risks had been mitigated at their firms or could otherwise be mitigated. One respondent proposed "IP protection", which is a very broad proposal in any terms. Another response proposed diversification of sources of desired output, while two others recommended evaluation at each stage of the crowdsourcing project. Many of the risk mitigation measures in one way or another related to the placement of basic guidelines, rules and principles, as proposed by Cooper and Edgett (2008); one respondent's solution to IP-related risk advised that the "*key is not to over-disclose*". Another response was that the "*risks are predictable and controlled with proper risk-control guidelines and moderation*". Such guidance and moderation could include employing "*social algorithms and deep engagement*", as proposed by another respondent. SLAs and copyright agreements work well for another respondent's firm. They build in consequences for any breach of the agreements, such as money-back guarantees for customers and penalties for crowdsourced designers. One respondent's firm had a NDA signed with the police for some projects with the effect on minimizing the loss of know-how and IP. Methodical testing of crowdsourcing output, preferably using a team of known personnel was another mitigation measure proposed; another proposed similar methodical testing, but with a small sample group before scaling up,

in what the respondent refers to as the "*lean start-up approach*". One response proposed that the organization's leaders and major stakeholders should be allowed the final decision regarding the use of crowdsourcing outputs and application of strategy. Emphasis is placed on "*action planning*" by one respondent, with apparent reference to front-end loading. One potential measure a respondent proposed was data anonymization. For two reasons; first to protect confidential data, and second to make the data neutral to the crowd and thereby curtail any bias individuals in the crowd might have an negative affect on the outcome of the crowdsourcing project. In all these, basic security measures such as user login into restricted areas should not be overlooked, as proposed by yet another respondent.

4.6.1. Adopting basic principles, rules and guidelines

Tsai and Lan (2003) suggest that in a setting based on a complexity paradigm, there needs to be a context within which the chaos inherent in the model manifests. Otherwise, results will be wildly unpredictable, and may even be detrimental to the objectives of the relevant entities involved. They propose the use of principles and values to place constraints to all the activities being carried out in said setting to ensure their desirability. Specific rules can also be drawn for specific departments, operational processes or projects as and when it is necessary to do so. This resonates with Gibson et al. (2009), which proposes that in pursuing a strategy that is responsive to complexity theory and at the same time overcomes the challenges that come with it, there are a number of measures an organization will need to put in place. Among them is the creation of a context based on a vision using a core set of values, development cost and customer-centric organizational behaviour, development of self-organization mechanisms, a focus on relationships, and creation of mechanisms necessary to encourage and harness

functional conflicts. The process of creating a context within which the entropy inevitable in a fast-evolving sector can be confined starts with the creation of a vision (Tsai and Lan 2003). The organization may be a start-up looking for a strategy on which to build or may be an on-going concern looking for a change in strategic direction. For both of these cases, the starting point is the articulation of an approximate vision of the position the firm would like to attain within the industry in the medium-term, because it is vision that inspires effort and teamwork. This vision must then be communicated to the rest of the team and stakeholders effectively (Kotter 1995).

4.6.1.1. Values

A good example of a set of principles and values is Google's 10 things, which specify the things that the company holds dear, and which every employee must observe however much the operating environment might change. The values include "*focus on the user and all else will follow*", "*democracy on the web works*", and "*great just isn't good enough*" among others (Google.com 2012). Observing these values has ensured that even in an ever-shifting firm based on crowdsourced information, high quality and user-centric reign, even as ethics are upheld. Collins and Porras (1994) point out that visionary companies (the most successful and enduring) each have a set of common traits; that even as they stimulate their growth and progress over time, they preserve a set of core values that never changes, enduring constant change in the business environment. The authors state that to thrive through decades, a company must be willing to change everything about itself – its product lines, its processes, its markets, etc. – except its core values. This, the authors found, has been the principal success factor behind such visionary companies as IBM, Nordstrom and Sony, among others. This is a

pointer that even in a complex environment with the unpredictability of crowdsourcing, inducing stability through core values can mitigate risks.

4.6.1.2. Diversification of sources

A rule that could apply directly to crowdsourcing strategies is that of diversification; information, software, designs and other output from crowdsourcing projects can be complimented by input from other sources. Notably, responses in questions 13 and 14 mention the need to balance crowdsourcing output with expert opinion. This is because crowds, depending on their type, can be very random in terms of their qualifications and experience. There is the danger that a critical size of the crowd is unqualified, severely compromising the quality of output, if measures are not put in place to qualify the individuals within the crowd. An example of this dilemma is evident in Wikipedia. Wikipedia's strength lies in the fact that anyone can put up an article. This is however its greatest source of risk as well, because of its lacks of a proven mechanism for qualifying the authority of the articles' authors. The only (albeit potent) quality assurance mechanism is collective self-assurance, where writers check the accuracy of articles and propose or make changes (Ebner et al. 2009). Because of these inadequacies, academic institutions do not allow citation of Wikipedia articles as sources. For organizations to which credibility is important, a diversity of sources of output may be necessary. Besides experts, peer-reviewed journals and scientific surveys offer alternatives as credible sources of information, output or quality assurance; but still reflect a possible risky endeavour of trustworthy information.

4.6.1.3. Entry evaluation of crowd participants

Evaluation of individuals who make up the crowd is particularly important for some models of crowdsourcing, most notably cloud labour. In cloud labour, an intermediary is given a task assignment by the benefitting entity. It then puts the same out to a crowd of qualified individuals to pick up the task and execute it. Upon successful completion of the task, the individual who executed the project is paid for the task, again through the intermediary. With such a model, an intermediary would lose its credibility if the level of quality of output from individuals in its crowd were persistently sub-standard. Respondents to question 15 in the survey, which asked about the quality of output, stated that his/her organization had experienced "*bad results due to bad briefing and inexperienced participants*". It is therefore imperative for such an intermediary to build up its crowd from the ground up, meticulously evaluating each new participant for qualification and competence. It could ask them to submit samples of works done previously, present certificates or other proof of qualification, or take a test to gauge their competence. Doing this significantly reduces the risk of poor quality.

4.6.1.4. Setting Standards and reinforcing them

Without a benchmark and framework to work with, a crowd can run wild. As applied by one respondent's firm, standards include quality and quantity expectations, bound within a timeframe for delivery, with in-built penalties for breach of set standards. Collins and Porras (1994) state that visionary companies, after establishing their core values, go further to create a set of mutually reinforcing standards, processes and measures that guarantee that stated values are upheld.

4.6.1.4. Customer-focus/ User-focus

The survival of any organization is sustained by the consumers/customers; if those consumers no longer exist, then the organization ceases to be relevant. It is therefore incumbent upon any business or service organization to ensure that at all times, its processes and operations align with the interests of the consumers of its output (Amabile et al. 1996). It is noteworthy at this point that the consumer of the output is not always necessarily the organization's customer. This point becomes apparent when examining the business models of search engines and social networking sites, whose users/consumers are the general public but whose customers are advertisers.

5. Discussion and Conclusion

5.1. Introduction

In this chapter, the researcher endeavoured to give meaning to the results by tying them to past theory, research, policy, and practice in crowdsourcing. As well, the results are extrapolated to future theory, research, policy, and practice in the field. The interpretations are based on the results of the study as well as on prior literature. The conclusions will address the research questions, and the recommendations will reflect learning's from the research process. The purpose of the present dissertation was to explore practices in the commercial use of crowdsourcing and to determine the perceived risks involved with the use of crowdsourcing in a business context. In pursuance with this purpose the objectives of this thesis are summarized as follows: (a) Identify current practice of the commercial use of crowdsourcing; (b) Determine the risks involved in the practice; and, (c) Identify possible strategic solutions for dealing with the risks. The significance of the study lies in the observation that crowdsourcing is a relatively new phenomenon (Schenk and Guittard 2009), thus obtaining and synthesizing views of its risks, from people who have had experience with crowdsourcing, would provide insights on its perceived risks and ways to mitigate these.

To realize the first question, a thorough review of existing literature was conducted, in order to provide a more detailed overview of the history and use of crowdsourcing in a range of organizational contexts. The second objective, which is to determine the level and types of risk involved in crowdsourcing, was addressed through the literature review and conducting an online survey. The analysis of the results has provided a more detailed overview of risk

management and its application to crowdsourcing in a variety of organizational contexts. Identification of possible strategic solutions for dealing with the risks, the third and final objective of the thesis, was realized through analysis of the online survey as well. The findings of the research have carefully considered best practices identified. Participants in the online survey were crowdsourcing clients – in other words, the employers. The benefits and risks of crowdsourcing from the employers' or clients' point of view were thus the focus of the data collection. The benefits and risks to crowd workers, were not part of the research questions, and therefore are discussed only in light of the risks to clients. Quantitative- and qualitative-type questions were asked of participants. Mostly, questions were related to risks in crowdsourcing as well as mitigation measures used. Thus, this final chapter will provide practical strategies for mitigating risks in crowdsourcing, based on the experiences and suggestions of participants, who have had existing crowdsourcing experience as clients.

5.2. Crowdsourcing practices

Schenk and Guittard (2009: 2) best expressed the reason firms use crowdsourcing: "*Why should a firm outsource certain activities in countries where labour is inexpensive, when by using the Internet, firms are a mouse click away from an eclectic, university educated, population ready to invest in intellectually stimulating projects for little or no remuneration?*" Given Schenk's statement above, the Internet indeed is the primary vehicle and enabler for crowdsourcing. As Surowiecki (2004) observed, crowdsourcing would not be possible without the Internet and the rise of mobile computing (p. 92).

5.2.1. Open Innovation and User Innovation

The study's results demonstrated that open innovation is the most common commercial application of crowdsourcing, with 58.3% of participants (the highest percentage) indicating that they used crowdsourcing for open innovation. The essay responses of the participants corroborate the quantitative responses:

> *If you continue to come at the same problem in the same way, it will become more difficult to innovate. Involving the crowd and looking at the same problem from different experiences and knowledge bases will improve performance/innovation.* (Question 17, Respondent 289)

> *The crowdsourcing model can bring new insights for all areas. Looking at the business in different perspectives can impact positively in the future and it's a good way to prevent crises with new and innovative ideas.* (Question 17, Respondent 264)

> *People don't often ask the big questions, because they don't even know what to ask. At the same time crowdsource innovation can deliver speed and accuracy advances 100x better than "gold standard" existing algorithm. Therefore the ability to process through crowdbased tools allows humanity to ask bigger questions.* (Question 17, Respondent 243)

The departments which embraced crowdsourcing required constant innovation, such as the R&D department, with 79.4% of responses; followed by Marketing and Sales, at 69.6%, and by IT, at 54.9%. Other departments for which innovation was not that important lagged behind in adoption of crowdsourcing, where Human Resources and Operations were third and fourth,

at 39.2% and 33.3% respectively, while Administration, Logistics and Procurement had 25.5%, 22.5% and 18.6% respectively. Accounting had the least responses, with 15.7%.

According to Gassmann and Enkel (2004), open innovation is the inclusion of external entities in a business's innovation processes. Thus open innovation may be in the form of outsourcing or crowdsourcing, among other techniques. Chesbrough (2003) stated that the reasons for companies to adopt the open innovation approach were skilled workers' increasing mobility and external suppliers' increasing capability. The present study's results indicate that in crowdsourcing, Chesbrough's (2003) observation – in terms of workers' increasing mobility – hits the mark more perfectly than does outsourcing. As the participants indicated, they do not know the members of their crowd directly, but only through the intermediary companies. Thus, crowdsourcing has perhaps fast-tracked the movement towards increased worker mobility, and the Internet enables this to happen, as asserted by Surowiecki (2004).

User innovation as a concept was developed by von Hippel (1998), who defined it as a type of innovation where users who are forced by the market to bear part drive innovation or all of the costs associated with it. These costs are likely to be risk-related or occasionally, finance-related. In user innovation, a team of lead users invent the product to meet their own needs. Von Hippel gives the example of sky surfing, where users propose design changes as they use skis. They therefore take on the risk of injury, etc. in case the designs incorporated into the products have faults. A more contemporary example is open source software, where users of the software detect bugs and fix them or see potential improvements and implement them. This way, the end product is as customer-centric as can be and the advantages are perceived by the target customers and are understood as beneficial (Rogers 2003). Besides user

innovation, another popular application of crowdsourcing in marketing is in collective intelligence, specifically market prediction. With collective intelligence, the market is called upon to predict or refine. With market prediction, crowds are required to forecast future trends based on their knowledge and expertise. The relevant organization can then leverage these to innovate in a manner that positions it to take advantage of future potential. With this practice, a problem, proposed solution, or emerging issue is posed to the crowd, and commonly brainstormed upon it. Different perspectives will influence discussions, and in the end a balanced answer or solution will emerge out of the crowd's collective intelligence. This is an excellent solution for firms to gauge market sentiments and work on products or services, which address the needs and concerns of different consumers in a balanced manner.

Another form of crowdsourcing that marketing departments in large firms utilize involves a much more controlled crowd, and it is referred to as the controlled collaborative process. It deploys resources outside business boundaries in order to harness external innovations, and to market internal ones that it does not need immediately but which have market value. It involves three core processes, according to Gassman and Enkel (2004). The outside-in process, where innovations created outside the firm's boundaries are introduced to complement internal efforts and processes to produce marketable goods and services that give the firm a competitive edge. The example is given of BMW, which introduced the joystick technology developed in the video-gaming industry into its latest seven series range of vehicles (Lewis 2004). The second process is the inside-out process, which takes innovations created in-house but which either cannot be commercialized by the firm or fall outside its strategies, in order to license out said innovations to other firms that are willing and able to

commercialize them. The third process is the coupled process, where R&D is conducted in collaboration with external entities to develop innovations that are mutually beneficial to all parties involved. Partners, characteristically, include suppliers, clients, universities and independent industry researchers (including government agencies). One major characteristic of the controlled collaborative innovation paradigm is its insistence that the focus of knowledge need not be the same as the focus of innovation, and neither of these has to double up as the focus of commercialization, much as they are free to if it does make business sense. It places great emphasis on the need for an open, collaborative climate, built upon trust between the parties involved (Gassman and Enkel 2004). The findings of the study reflect the general conviction that crowdsourcing is highly relevant to innovation (Schenk and Guittard 2009), as shown by the result that research and development was the overwhelming favourite among the participants. In R&D, crowdsourcing could be an optimal tool to collect and analyse information, which traditionally requires long periods of time for a few researchers to complete by themselves. The results indicate that crowdsourcing clients see the urgency of innovation to create competitive advantage. As Peters (1997) observed, the pursuit of being competitive is innovation. Thus, the need to innovate is a compelling reason for crowdsourcing. Other leading business areas where crowdsourcing is utilized are Marketing & Sales and IT, both of which necessitate innovation. Marketing and sales, seen by the respondents as the second most relevant department in which crowdsourcing is practiced, is also widely acknowledged as a field that heavily leverages crowds. The most prominent reason for this is the fact that an organization needs to have a consumer-focus if it is to remain relevant in the market (Cooper and Edgett 2008). If it loses customers due to dissatisfaction, its existence is threatened. The second reason, which is intricately tied in with the first, is that

marketing owes its effectiveness to innovation; once user preferences are established, the organization has to come up with the products/services the market requires. Many organizations realize that the most effective way to achieve these marketing and innovation aims is to apply the user innovation model of crowdsourcing. As one participant observed:

> *For marketing researches and investigating human needs, crowdsourcing is the best way you should use. In other areas the risks (for me) are too high and you should rely on experts' opinion.* (Question 15, Respondent 296)

Such an observation by one of the participants partly explains the reason for the lack of crowdsourcing use in sensitive areas such as operations and accounting, where patented company processes and financial information are handled. The findings also reflect some shift in areas of relevance for crowdsourcing. For instance, some participants are from the public sector, and they utilize crowdsourcing to point out problems or areas needing improvement. Hence, although this study explored the commercial practices for crowdsourcing, it has shown that this phenomenon may have an innovative impact not only for businesses, but for government agencies as well. The findings of the study are consistent with other studies, which found that open innovation (with or without the use of crowds) helps businesses to create more products in a shorter period, as compared with closed innovation (Inauen and Schenker-Wicki 2012).

5.2.2. Free crowdsourcing

Results of the study reveal that free crowdsourcing can be used in short tasks; as one participant stated: "*we use crowdsourcing to help monitor our warning signs, and to alert us*

to any damaged trees or infrastructure in our parks" (Question 24, Respondent 272). Perhaps another motivation for participating in unpaid/free crowdsourcing is if the task ultimately redounds to some benefit for many people or a community. The results support Schroer and Hertel's (2009) theory that people would readily participate in a crowdsourcing endeavour if the tasks were personally important for them, among other intrinsic motivators (autonomy and newness of the challenge). Analysis of the results also supports Frei's (2009) observation that free crowdsourcing is a possible way to involve the crowd, but will only be successful if the task being outsourced is emotionally fulfilling, entertaining, or leads to recognition (Frei 2009). Frei further asserts that if the task characteristics fail to meet these criteria, they will simply not get done (Frei 2009). Free crowdsourcing may be implemented in software development and design, as well as in content creation and review, as demonstrated by successful exemplars as Linux and Wikipedia. In this way, open source can be viewed as a form of crowdsourcing, although the difference between the two is that, unlike open source, the products or ideas generated from free crowdsourcing need not necessarily result in something, which everyone can use (Goldman and Gabriel 2005; Perens 2009). Analysis of the results demonstrate that free crowdsourcing could help companies, and in this case, even government agencies, to monitor the condition of their assets and to prioritize tasks to work on. The task of monitoring assets and gathering data on their condition, and identifying defective and/or damaged assets, was demonstrated to have been crowdsourced with no remuneration. The results also demonstrate that free crowdsourcing could be done only if tasks are emotionally fulfilling, as Frei (2009) suggested.

5.2.3. Paid crowdsourcing

Paid crowdsourcing is a concept in which individuals are financially compensated for their work (Brabham 2008a). Paid crowdsourcing suppliers provide organizations with tools that ensure their work is completed on time, at equal or better quality than a full-time workforce (Frei 2009). In return, companies must provide monetary incentives along with other incentives, such as recognition, for the purpose of improving the likelihood of getting satisfactory results in a timely manner (Schenk and Guittard 2009). When tasks are complex, do not lead to recognition, and are not emotionally fulfilling, paid crowdsourcing is recommended (Frei 2009; Schenk and Guittard 2009). Frei (2009) observes that the majority of tasks which need to be done would not qualify as fun or emotionally fulfilling, and that therefore, paid crowdsourcing is the path to mainstream. Frei's (2009) observation is demonstrated in the results of the study, as most participants in the survey subscribed to paid crowdsourcing. The participants recognized the substantial benefits to their businesses. Schenk and Guittard's (2009) observe that, with crowdsourcing, the organization can externalize the risk of failure and only pay for products or services that meet its expectations (p. 5), is echoed by the responses of the participants, as follows:

> *It's not really a risk if you know what you are putting out to the crowd. You have the control to use what you want and what you don't.* (Question 14, Respondent 164)

> *The risk of both lower costs and higher management of quality controls, crowdsourcing is a great solution for some needs as compared to traditional outsourcing models.*
>
> (Question 18, Respondent 204)

As with most paid crowdsourcing practices, the participants in the study did not directly deal with the crowd, but instead, used intermediaries. This finding is consistent with Schenk and Guittard's (2009) general model for crowdsourcing, which involves three players: the individuals of the crowd, the client companies, and an intermediation platform, which is the link between the two (p. 8).

5.2.4. Competitive crowdsourcing

In crowdsourcing contests, clients call for submissions to solve problems or create designs (Kleemann et al. 2008). Crowd members then create and submit ideas or designs. The company then selects from the submissions, either through online voting by the community, or through evaluation by a panel of experts. When used by retailers, online voting is usually preferred, because voting by consumers usually translates to enhance sales. When used for research, however, a panel of expert evaluators are usually used, as in the case of Innocentive (Howe 2006b). Perhaps the main advantage of the competitive crowdsourcing format is that it enables the company to obtain not only the solution of a problem, but also to tap the ideas of a diverse collection of individuals who have different backgrounds, perspectives, and experiences (Burger-Helmchen and Pénin 2010). Competitive crowdsourcing is seen as a way to generate ideas in a short period of time:

> *The model of innovation using crowdsourcing can provide a shortcut for companies to see ahead, creating new products based on people´s needs and using different areas of expertise.*
>
> (Question 18, Respondent 264)

> *Crowdsourcing helps look at the same thing from a different perspective - which may or may not be the voice of the masses.* (Question 15, Respondent 135)

In addition, the client pays only for the ideas or products, they desire, or which adhere to its expectations (Kleemann et al. 2008). Kleemann et al. (2008) see crowdsourcing as a way to reduce the risk of failure, due to the absence of a dependence on a single company, as well as reducing the possibility of not getting the task done or not obtaining the desired solution.

5.2.5. Civic engagement

In this study, it was found that crowdsourcing could also be used in civic engagement. In what Kleemann et al. (2008) termed as *"community reporting,"* businesses develop a mechanism for the crowd to report on trends. However, whereas Kleemann et al. (2008) focused on the utilization of community reporting for obtaining marketing trends and news only, the study found that such a crowdsourcing approach for gathering important information such as a government agency's asset conditions. In this research, the community-reporting tool could be used for civic engagement, and agencies could crowdsource the reporting of government asset conditions, such as the conditions of traffic signs.

5.2.6. Crowd labour

Perhaps the most controversial commercial use of crowdsourcing is crowd labour, because the compensation for individuals from the crowd is usually minimal compared to the value they create for the crowdsourcing client (Howe 2006; Kleemann et al. 2008; Yang et al. 2008). In this study, 28.3% of participants claimed that they practiced crowd labour. The responses related to the use of crowd labour indicated that successful crowd labour projects involved

breaking down projects into smaller tasks, which were in turn defined clearly to avoid problems. In crowd labour projects, most of the risks involved quality of output, thus task replication – wherein the very same task is handed out to at least two crowd workers – was often used to increase output quality. History tracking – where clients give experienced crowd workers ratings and such ratings accumulate and become part of the crowd worker's profile – was also often utilized to mitigate quality risks. In Brabham's (2012: 2) latest work, he criticized the exploitation of the crowd by businesses, particularly in the crowd labour model, stating that the amateur/hobbyist label of crowd workers is a myth which is perpetuated in order to mask the fact that

"*large amounts of real work and expert knowledge are exerted by crowds for relatively little reward and to serve the profit motives of companies*". (Question 18, Respondent 204)

Because the study did not obtain crowd workers' perspective, whether workers viewed crowd labour as exploitative or not was not observed.

5.2.7. Acceptance of crowdsourcing

The sample of crowdsourcing clients surveyed have reported mixed acceptance of crowdsourcing by their respective organizations. The study reveals that lack of acceptance of the crowdsourcing concept exists in some organizations and departments within organizations. Such lack of acceptance could perhaps be partly explained by the transaction cost theory. Using the transaction cost theory proposed by Williamson (1993), the decision to crowdsource is similar to a make-or-buy decision, wherein internal efforts to innovate are analogous to 'make', and the decision to crowdsource is similar to a 'buy' decision. According to

Williamson's (1993) analysis, crowdsourcing is advisable if the transaction is not too frequent, and when uncertainty and specificity are not too important. Thus, when the crowd becomes too uncontrollable to handle, that is, when the turbulence risks become too great, for instance, the transaction cost theory recommends that not to crowdsource is a more cost-effective strategy. This is perhaps the reason for the lack of acceptance of crowdsourcing by some businesses and even by some business departments, such as finance. Another possible explanation is that those organizations, which have not yet accepted crowdsourcing, are what can be termed as the 'late majority' and 'laggards', according to the Innovation Diffusion Theory (Pedersen and Ling 2003).

5.3. Risks and risk management measures

The main objectives of the study have been answered through the use of a thematic analysis of the responses of the crowdsourcing representatives. The extent to which crowdsourcing is practiced for commercial use has been explored. It was established that open innovation and collaborative work have been the most prominent commercial uses of crowdsourcing, suggesting that the growing power of the consumer to not only have the option to buy which products they want, but also to have a hand at creating the products that are appealing to them. Companies now recognize the need to include the diverse opinions and ideas of people from varying backgrounds in order to effectively come up with innovative ways to create a product that addresses the needs and wants of a vast majority of the consumer population (Schenk and Guittard 2009). Companies also recognize the benefits of using crowdsourcing models to enhance the company's performance. Most companies are aware of the overwhelming benefits brought about by the technological advancements that allow people to communicate

effectively their concerns, feedbacks and ideas using a wide scale channel at lower cost. Despite the many benefits of crowdsourcing, several risks have been identified, although most respondents perceived the benefits to outweigh the risks. It is apparent from the analysis of the results and from the literature that crowdsourcing leads to significant advantages for business clients. However, it has inherent risks, as revealed in the following discussion, which business managers need to manage seriously in order to harness the potential of the crowd.

Crowdsourcing could be a source of strategic risks such as risks of litigation or regulatory actions due to employment law, patent issues, and copyright ownership, and securities regulation of crowdfunding (Wolfson and Lease 2011), leakage of sensitive information, and risks to reputation (Keuschnigg and Ribi 2009). Other strategic risks include low quality of work (Swan 2012), increased supervision costs, and failure to motivate a crowd (Kleeman et al. 2008). Analysis of the data collected revealed the recognition by clients of crowdsourcing's risks to them. These risks include: turbulence risk, risk of leaking confidential information to the crowd; employment issues; IP and patent issues; quality issues; and participation risks. This dissertation considered the risks and limitations associated with crowdsourcing, including the issue of trust and reliability. Although there is a growing awareness amongst practitioners and academics alike regarding the relationship between these two areas, existing research has not caught up with current practices. Carefully managed, crowdsourcing can provide good solutions for companies (Howe 2006b). Though it is risky, the riskier approach is to not take risks. There will be no innovation if the business keeps doing the same thing over and over. There will be no changes without taking risks. This is one of the major reasons for crowdsourcing to be successful and accepted in the marketplace.

5.3.1. Turbulence risk

Turbulence risk was seen by the sample as the greatest risk of crowdsourcing, garnering 2.43 points out of the highest 5. The significance of turbulence risks pertains to the unpredictability and increasing complexity of the business environment (Floricel and Miller 2001). These risks are usually experienced by large-scale businesses due to unforeseen factors (European Commission 2010). They limit the validity of traditional planning approaches, because they render the consequences of strategic actions to be unpredictable (Floricel and Miller 2001). Turbulence risks usually result from several factors such as technological changes and innovations, competitor moves, political and economic volatility, and radical shifts in institutional frameworks, among others (Floricel and Miller 2001). Turbulence risks strongly indicate change and its need of being managed properly. The challenge to manage change has fundamentally transformed to the point where leaders face new conditions and situations and try to manage those with outmoded institutional practices and structures, designed for a much less complex and dynamic environment. A paradigm shift is taking place in the manner of Porter's value chain, where there is no mention of customers as value creators anywhere and is mainly focussed internally. The use of crowdsourcing in a corporate context is in general a new and mostly uncertain endeavour of doing business and clearly needs the commitment of the people in the company. Entering a world where the infrastructure is easily accessible to anyone who is interested is substantially different from the economic behaviour learned in how tasks in companies are performed. Being experienced in crowdsourcing, the participants in the study were quite aware of the unpredictable nature of the crowdsourcing approach.

Turbulence risks, which are due to uncertainty, could arise out of the following unpredictability of the crowd and lack of control of the crowd and may result in:

- Possible dilution or destruction of the brand or project.
- People involved in crowdsourcing processes start having more influence on brands or projects, other customers and the media.
- Having a disruptive impact on business both in a positive and negative way.

The participants were aware that the impact of an uncontrolled crowd on the brand is possibly adverse, as in the case of Gap, which tried to change its logo but stopped the effort due to several complaints by the 'crowd' in many social media sites (Tarnovskaya 2010). The participants' sentiments are consistent with Goldman and Gabriel's (2005: 174) observation about relinquishing control to the crowd:

"*Project leaders and other managers advance by taking responsibility for a tough project and then deliver. But to some this can appear hard to do when control is relinquished to others*".

Thus from the study it was learned that an often unforeseen problem of crowdsourcing is the growing influence or power of the crowd. The results are consistent with prior researchers' findings that there is danger of the crowd straying from the actual objectives of the company, causing turmoil to businesses, and even influence the consumer market (Howe 2009; Aitamurto et al. 2011). Crowdsourcing clients were concerned that losing control of the crowd not only loses the benefits of crowdsourcing but also hurts the reputation and image of the brand, which would in turn affect the company's profitability and consumer acceptance

(Aitamurto et al. 2011). Other issues are related with uncertainty such as issues with regard to IP ownership and confidentiality.

5.3.1.1. Managing turbulence risks

In order to keep the crowd in line with the objectives of the crowdsourcing model and turbulence risks in pace, several of the respondents suggested the following:

- Ensure that the company allows business leaders and controlling stakeholders to make the ultimate call regarding innovation pathways. All project participant(s) need to be involved and trained to minimize risks rather than seeing opportunities.
- Manage to visualize the interactions and productions of your community - make this easily available and improvable by the community itself.

These suggestions reflect the adaptive response of crowdsourcing clients to turbulence risks. According to Floricel and Miller (2001: 452), adapting is

"*changing something in the technical or organisational structure of the project to avoid or sustain the consequences of the event*".

One of the suggested adaptive risk management responses was crowd training, in order to minimize the risk of out of control crowd. In order to do this, the company would have to invest on training materials and practices, and it would take more time to implement. However, the suggestion reflects the advantage of building a community of crowd participants, which the company could readily utilise at any time (Torro 2007; Sweeney 2009); Libert and Spector (2007) and suggests creating processes to guide the crowd towards the

goals of the company, and to foster an open and supportive communication channel. Other insights by participants include:

- Acknowledgement and trust.
- Innovation as a sharing process.
- The need for governance and moderation.
- Good project management teams that can keep the crowd happy while still overseeing the project and keeping it in line.
- In case the crowd turns against the situation, it is best to listen to their concerns and address them directly, rather than trying to control them.

Traditional boundaries seem to vanish or at least give cause for renewed reflection. Companies are in need for transformation and suggestions by participants reflecting Mohr's (2010) assertion that, in order to be innovative, companies need to embed the innovative projects in major parts of the organization. The process needs to be tolerant of failure, because, due to turbulence risks, predicting the market is impossible (Floricel and Miller 2001). Factors to successful crowd moderation include an organizational structure that supports business growth; transparency towards business objectives and a business model that suits the organization's needs (Lindgardt et al. 2009). Major brands such as Apple, Siemens and Procter and Gamble have a venture or advisory board, which disseminates information and ideas from within the company; as well as from sources outside the company, through all departments (Lindgardt et al. 2009). Building a structure open to crowdsourcing includes listening to the crowd's concerns, instead of controlling it. This is consistent with Koulopoulos´s (2010) suggestion to focus on the process over the product. That is, the

organizational leaders need to be committed to cultivating innovation and new ideas (Koulopoulos 2010: 117). As the main leverage point for transformation, the mind-set is a key essential element that is needed. Without initially transforming their mind-sets, leaders and employees would ultimately continue to operate in their old ways which then in turn completely rules out the ability for the business to change into its new designs and execute its new strategies. They will have to alter their inner ego; do a complete turnaround in some situations; and re-enter the marketplace from a different direction, and possibly with a totally differentiated market mix.

5.3.2. Leakage of sensitive information

Security risks connected with crowdsourcing are primarily focused around the risk of leaking sensitive information to the public and even to competitors (Kogut and Zander 1992). This is a form of IPR, but specific to data security. To leverage crowdsourcing strategies, firms of necessity need to release some pertinent information as raw material for the crowd to work with. In many cases, especially those involving innovation, such information includes fragments of patented works which the benefiting firms spent fortunes to acquire. Releasing them to the crowds – even when the crowd is a controlled one – is a major risk which most firms are averse to. When businesses release sensitive information such as financial account details or even proprietary work to the crowd, they would have no control over its distribution to others. They inadvertently provide particular beneficial information for other organizations (Kogut and Zander 1992). Such a risk is a strategic one, because it could affect the company's continued success and existence, and may result in failure to achieve business objectives (Aron, Clemons and Reddi 2005). Potentially, the client organization's competitors could get

hold of the data and use the information against the company. It is thus understandable that the study participants felt strongly about data security risks. Their concerns are summarized as follows:

- Over-disclosure could hinder patent acquisition and inform competition.
- Contrary to crowdsource HR policy or cases where there is a need to disclose proprietary information.
- Providing confidential data to the crowd leads to reputational risk – possible media implications on giving private data to the crowd.

That some participants in the study have expressed caution over this risk, stating that it is one of the reasons for not using crowdsourcing extensively in their organizations, reflects the observation by Wu and Huberman (2009) and Frei (2009) that most companies are currently reluctant to post anything open to the public that could easily identify specifics about the company's business interests. For these participants, crowdsourcing is seen as a potential leakage of sensitive information to competitors and others (Aron et al. 2005).

5.3.2.1. Managing confidentiality risks

According to risk management theory on the different types of risks, one way to manage leakage risk is to avoid it (Alexander and Sheedy 2005). Following this guidance, crowdsourcing should not be used for tasks, which require the utilization of sensitive company data. The transaction cost theory – or whether to ‘make’ or ‘buy’ a solution, service, or idea (Burger-Helmchen and Pénin 2010), also explains the avoidance strategy, in that if the uncertainty due to possible leakage of proprietary information leads to great costs for the

company, then to 'make', or internally generating ideas and solutions for a problem or project, may in the long run be less costly than turning to crowdsourcing (considered as a 'buy' decision in transaction cost theory). Participants themselves have recognized the practicality of the avoidance strategy, cautioning future crowdsourcing clients to not trust the approach for core business processes, for developing HR policies, and for cases when there is a need to disclose proprietary information. Risk mitigation is another viable risk management strategy, which consists of activities designed to reduce risks (Alexander and Sheedy 2005). Some participants have shared creative risk mitigation measures to the quality risk, including:

- Restricting access by login type.
- Anonymizing the data so that it becomes more neutral when released to the crowd.
- Breaking down a big project into smaller elements.

Through these risk mitigation techniques, the risks of inadvertently leaking sensitive and private information to the crowd can be mitigated.

5.3.3. Quality risks

Participants in the study were very concerned about possible quality risks. Because the task could be allocated to people they do not know, the clients or requesters are exposed to serious problems regarding the quality of results (Schulze et al. 2011). Participant concerns included:

- Wasting time and not generating reasonable results.
- Getting unwanted results.
- Difficulty of controlling the quality.

- Need to sift through several submissions to find valuable input.
- Concerns about the quality of crowdsourcing participants.

These statements reflect the general agreement among the study participants that one of the most important risks in crowdsourcing is potential lack of quality output. As Erickson and Gratton (2007) predicted, even though over half of all Fortune 1,000 companies will have made some attempt to integrate crowdsourcing into their marketing approach by 2010, most of these efforts will be so poorly managed that the results will be of no use to anyone (quoted in Libert and Spector 2007 pp. 5-6). According to empirical studies, compared to permanent employees, external workers such as outsourcing suppliers, individual contractors, and crowd labourers, are less reliable and trustworthy, and yield poorer quality results (Ang and Slaughter 2001). In their study they compared supervisors' perception to the quality of work of external IT workers (contractors) and permanent IT professionals (employees). They found that fulltime employees were higher performers, and were more loyal, obedient, and trustworthy than their contractor counterparts. Lebkowsky (2010) theorizes that a possible cause of the lack of quality output is the crowd members' careless engagement. This mainly occurs when people participate for pleasure, wherein people post replies that do not relate to the problem, or replies that do not make sense (Lebkowsky 2010).

Another possible factor leading to low quality is lack of proper guidelines and directions on how the task is to be completed (Borst 2010), resulting in workers not understanding the requested task. The study participants also recognize this as a possible cause. Their statements supporting the need for proper guidelines for each task are as follows:

> *The quality of the results depends on the understanding of the goals… a clear understanding of the desired outcome leads to high quality results.* (Question 15, Respondent 289)
>
> *The quality variable is mainly dependent on the time pre-invested to concept the crowdsourcing process.* (Question 15, Respondent 158)
>
> *It is easy to not have your goals be fulfilled, if you do not steer properly.* (Question 15, Respondent 220)

These statements support Huang et al.'s (2010) conclusion that an effective risk mitigation measure is to choose an adequate task design. In addition, firms must first lay the groundwork in order for them to successfully integrate crowdsourcing into any aspect of their business, whether R&D or marketing (Libert and Spector 2007). As practitioners and theorists, Libert and Spector (2007: 5) observe,

"*if collaboration isn't done right, it had best not be done at all*".

The third cause of lack of quality, as proposed by Schulze et al. (2011) is the quality of crowd workers, particularly when such workers are too focused on the monetary reward, shirking responsibility for the output. As Schulze et al. (2011: 2) explain, some crowd workers submit work by submitting irrelevant text or providing random answers, "*hoping to be paid for simply completing a task*". Schulze et al. (2011) describe this low quality work as a spam problem, which may occur because some crowd workers engage in the task even though they were simply not qualified to solve it. Thus, money can act as a constraint, which actually hinders creativity. Because there are some people in the crowd who make monetary rewards their

main goals, instead of aiming for the solution to a particular problem. As Schulze et al. (2011: 2) observed, "*financial gain acts as a motivating factor at the expense of quality*".

5.3.3.1. Managing quality risks

Possible risk management measures suggested by the participants include:

- Defining quality levels and fixed compensation for these levels.
- Spending time to clearly define the task.
- Using a collaborative, rather than a competitive model.
- Entry evaluation of participants.
- Task replication.
- Ensuring greater participation.
- Behavioural screening (which could be done through pre-testing).
- Tracking crowd workers' performance (on-going quality control of work).
- Having people to facilitate the process.
- Automated quality control.
- Building your own community of subject area experts.

From these results, it is clear that one popular mitigation measure is to identify the appropriate crowd. While much of crowdsourcing is random and chaotic, it is worth noting that the most successful approaches rely on pre-existing communities. As Howe (2009: 28) points out,

"*crowdsourcing efforts generally attract people both with and without professional credential*s".

While both groups may be capable of providing meaningful input, there is no guarantee that they will find the project on their own. Thus, the use of tested crowdsourcing intermediaries such as Innocentive or Crowdspring, among others, ensures that the appropriate crowd gets informed about the project (Kleemann et al. 2008). The suggestion of tracking a crowd member's performance is consistent with the suggestion of Alonso et al. (2008) to incorporate a reputation system in the crowdsourcing platform, because if workers remain anonymous and minimal information is made known to crowdsourcing clients or the requesters, it is difficult to evaluate whether dishonest workers are involved (Alonso et al. 2008).

Ensuring greater participation by the crowd supports Burger-Helmchen and Penin's (2010: 4) theory that "*the heterogeneity of the crowd is an increasing function of its size*". This means that ensuring a greater number of participants to the crowdsourcing task also ensures a diversity of solutions, in that "*the bigger the crowd the more diverse it is, which means that the size of the crowd cannot be completely neglected*" (p.4).

Hubbard (2009) proposes that to reduce risk, setting clear instructions to providers and ensuring their understanding of what is necessary to meet the company's goals, and ensuring the crowdsourcing project managers abide by some guidelines is essential for success. Qui and Wu (2010) emphasizes the need to clarify these directions at the beginning of the project. Instructions and directions would focus around the areas identified by the responses to this thesis survey´s question 14 – review systems, diversification of information sources for decision-making, front-end loading, defining review levels (metrics accountability), effective portfolio management, and anonymization of confidential data, among others. The suggestion of entry evaluation of participants could be applicable to more complex tasks, wherein experts

are needed to address the problem. This supports Pisano and Verganti's (2008) suggestion to not use an open call, but instead to "direct their call toward a small number of experts previously identified". This approach, however, contrasts with the suggestion to ensure greater participation, because only experts in a certain field, as opposed to a more heterogeneous the crowd in terms of education, geographic location, or experience, are invited to participate. Burger-Helmchen and Pénin (2010) also argued for separating "*the seeds from the weeds*" in that great ideas have to be searched from mediocre ones. The participants suggested an automated quality system to do this task. One of the important requirements of crowdsourcing is keeping a system ready to filter the contents and to maintain the brevity. It is noteworthy that study participants did not recommend providing higher monetary incentives for crowdsourcing projects. The results are consistent with studies which found that paying a higher monetary incentive for a task does not lead to higher quality, but only to a shorter completion time (Alonso et al. 2008).

The use of collaborative models for crowdsourcing is an interesting insight from the participants. This early in crowdsourcing's trajectory, clients seem to become aware that competitive and selective crowdsourcing approaches may not necessarily provide quality results. This supports Tapscott and Williams' (2008) observation that when generating ideas or developing products, expected results may be more effectively obtained through collaboration. Recognizing the need for collaboration as an innovation approach, some crowdsourcing intermediaries, such as CrowdSpring , have collaboration tools where crowd workers could opt to work with other members of the community to collaborate on a project, with the aim of encouraging collaboration to improve the product (Perens 2009).

5.3.4. Financial risks

The results indicate that financial risks are tied with quality risks. Some responses reflect the apprehension of some businesses to finance a crowdsourcing model due to the possible financial losses that an unsuccessful crowdsourcing practice might cause:

> *Yes, it is a risky process if it does not manage well. It can have a financial risk for the company who like to give reward to the crowd and risk of not attracting the crowd for future project if it fails in motivating them at first.* (Question 15, Respondent 310)

> *Quality is generally good. Only risk is of wasting money.* (Question 15, Respondent 254)

> *The biggest risk I see is to waste time and resources and not generate reasonable results.* (Question 15, Respondent 286)

The more obvious financial risk that companies might incur involves those firms that use the paid crowdsourcing approach, since these companies have to invest money in order to receive the service that they require from the crowd. The fear of financial loss becomes a reality if the crowd does not deliver on the quality of the work needed, or if the crowd falls short of the expectations. This would mean that the financial incentive paid to the crowd in exchange for a low quality service would be shouldered by the company or the clients, creating more apprehension for said clients to consider crowdsourcing as an option for their business or research, which would in turn heighten the fear of financial loss among the companies relying on paid crowdsourcing.

5.3.4.1. Managing financial risks

Choice of a good model and platform, as well as understanding the process involved and its implications, were the mitigation measures used by the participants in the study. In addition, because the financial risks are related to quality risks, risk management measures suggested in the quality risks section are also applied to the financial risks, such as tracking a crowd member's performance, ensuring greater participation, use of collaborative models, and entry evaluation, among others.

5.3.5. Employment law risks

As crowdsourcing is a new model for generating ideas and work, laws such as those pertaining to employment, have yet to catch up with this trend (Felstiner 2010). There is concern among legal professionals regarding the protection of crowd workers, as well as the employment relationship between crowdsourcing clients and the crowd (Wolfson and Lease 2011). Since crowdsourcing enables clients to hand out tasks normally assigned to an employee now to a massive and worldwide pool of crowd workers, it essentially exposes these crowd workers to substandard compensation and working conditions. According to Schenk and Guittard (2009: 17),

"*The problem-solving process requires time and skills of the people involved. Thus we can say that complex tasks of crowdsourcing require a significant investment on the part of individuals forming the crowd*."

In addition, the crowd usually have no protection under the law, because the Internet is still unregulated. Some of the statements of participants regarding employment law issues include:

> *Our biggest risk is that a worker might claim to be an employee, not a freelancer, but we think we've protected ourselves from that.* (Question 14, Respondent 204)

> *We see a lack in jurisdiction and legislation that has to be closed in the near future. People involved in crowdsourcing processes start having more influence on brands, other customers and the media. There is no mitigation for such risks, because they are implicit to the concept of crowdsourcing.* (Question 15, Respondent 329)

5.3.5.1. Managing employment law risks

Voluntarily employing "best practices" in compensation would help to mitigate such risks.

> *As a Telco company, we are used to handle risks very carefully, because we are under close observation by all kind of authorities. In the past, we were usually more on the careful and risk-averse side when it came to new policies and risk assessments. We assume, this basic attitude will help avoiding risks that might occur here.* (Question 22, Respondent 329)

5.3.6. Intellectual property ownership risks

On of the most overwhelmingly popular response about risks involved in crowdsourcing models is the issue of IP, particularly IP ownership. Considering a shift from ownership to usership there is concern among the participants regarding the lack of legal clarity with regard to IP ownership, especially in cases where the competition or contest format is used. In this crowdsourcing format, once an idea is submitted to the client, the ownership of the idea becomes hazy. To whom do these ideas belong? Obtaining many ideas and solutions for a

problem, the client selects only one or a few ideas and pays only for these. What happens to the non-winning and therefore unpaid ideas is that they could potentially be used by the business in the future. Moreover even paid ideas would have murky IP ownership, because, after all, it is clear that they came from somebody else and not the client.

> *The challenge is to make all stakeholders work together. You can argue that companies only do real crowdsourced innovation when they create new IP. It is easy enough to decide who brings what to the table and how to compensate for this. The real challenge starts when you co-create new IP.* (Question 16, Respondent 243)

> *The only risk factor is with IP ownership. As long as it is sorted upfront, there are no risks.* (Question 14, Respondent 251)

> *I think the risk can be reduced if there's a planning involved.* (Question 15, Respondent 264)

The result supports Schenk and Guittard's (2009) assertion that solutions given by the client firm and the developer are ill defined from the point of view of IPR. Having relatively extensive experience in crowdsourcing, participants of the study were quite aware of this issue, and saw it as a major roadblock for utilizing crowdsourcing as a product development approach. The participants offered varied mitigating measures to manage this risk, including:

- Implementing strict copyright and service agreements.
- Having workers control their own intellectual property.
- Segment into small personal units per project.
- Seeking innovations that are not strategic.

5.3.7. Low participation

The study participants also considered crowdsourcing initiatives to be risky in terms of low participation. The participants deemed the low participation to be due to a number of factors such as:

- Lack of awareness of the crowdsourcing initiative.
- Lack of clear communication between the requester and the crowd.
- Lack of understanding of how to motivate the particular crowd.

Howe (2009) and Pénin et al. (2011) recognize that motivation is the key driver of keeping a crowd active. The motivating factors to get crowdsourcing to work are fame, fortune, fun, and fulfilment (Howe 2009; Schenk and Guittard 2009). All of these factors will call people to participate as volunteers for crowdsourcing. One of the important requirements of crowdsourcing is keeping a system ready to filter the contents and to maintain the brevity. In order to yield good results, one must find and combine all experts working for him or her. The process should be as simple as possible. It is important to maintain the interconnectivity between the contributors and the crowdsourcing service providers. Existing communities may work in much more effective coordination than new communities. However, progress has to be monitored during the process. Encouraging participation and offering feedback on ideas can greatly influence the process design. In this case, if participation involves any kind of transfer of legal property, a terms and conditions clause may be required. Finally, crowdsourcing requires effective and efficient communication channels in order to be successful (Pénin 2008).

An additional source of motivation for collective intelligence participation is “glory”, as suggested by Malone et al. (2010). This is the case when individuals respond to the opportunities to be recognized by peers in a community. Brabham (2008b) also discusses the role played by addiction that makes the participants to return to in this specific research the Threadless website. The author suggests that when using crowdsourcing, organizations should develop more deliberate means for the crowd to support problem-solving missions, to contribute to the public good and express their addiction to – or love for – the project, product, or activity.

5.3.7.1. Managing motivation risks

Suggestions from participants focus on community management – moderation of the crowd, and taking more time to structure a motivated and faithful community. Such a practical suggestion from the participants is supported by research, particularly by Garry (2010), who argued that while a crowd works together for a short duration and a common goal, a community is always together, whether there is a reason to work together or not.

Adapting Antikainen and Väätäjä (2010) and Carpenter (2011) findings, the following main motivations for participation have been identified (table 11).

Table 11. Motivation for participation in crowdsourcing

Altruism and Ideology	Sense of efficacy, influencing
Care for community attachment to a group	Monetary rewards
Recognition and reputation	Need for improvement
Friendship, relationships, social support	Recreation
Knowledge exchange	Personal training, Social capital

In crowdsourcing, researchers concluded that crowd members were found to share a fascination with matters related to their special interest and were intrinsically, extrinsically and socially motivated (Postigo 2003). For instance, within the IT community, the challenges of creating software appealed to them on an intellectual as well as a practical level. In addition, there was a sense of community that drove the project. The individuals involved shared a genuine desire to create the best possible system and they believed that this could best be achieved through the collaborative efforts of all involved (Postigo 2003).

For example, regarding open source software, Schenk and Guittard (2009) further elaborate the motivating factors for the participants:

"*Reputation and ego gratification mechanisms may be incentives for individual participation*."

Thus, although monetary rewards may be a great motivating factor for crowds (Schenk and Guittard 2009), other motivating factors may need to be considered.

Based on these conclusions the research recommends ways to more effectively manage risks, expecting that this will facilitate the development of a more thorough risk management protocol for crowdsourcing.

5.4. Conclusion

This paragraph summarizes all lessons learned, including a comparison of how identified dimensions of obstacles were perceived and managed by commercial crowdsourcing clients. Conclusions can then be drawn as to these risks encountered in commercial crowdsourcing and the effective management of such risks. From the prior discussion, all is set for the conclusion to be established in order to give an answer to the following research questions:

- What risks are involved with the use of crowdsourcing in a business context?
- How does the crowdsourcing concept advance business practices?
- How has risk management been incorporated with the use of crowdsourcing in a business context?
- What measures have been taken to keep track of any risks realized with the use of crowdsourcing?
- How has the use of crowdsourcing affected the business processes and outcomes generally?

Research Question 1:

What risks are involved with the use of the crowdsourcing in a business context?

Turbulence risk, which pertains to the uncertainty, unpredictability and increasing complexity of the business environment (Floricel and Miller 2001), was seen by the participants as the greatest risk of crowdsourcing. Because they are associated with unforeseen events, they could overlap with the other types of risks (European Commission 2010: 48). Results of the study reveal that for crowdsourcing clients, turbulence risks include the unpredictability of the crowd, brand destruction, risks to reputation, uncertainty of IP ownership, and leakage of proprietary information, otherwise known as confidentiality risks. Of these, IP risks were seen as the most prominent threat to crowdsourcing. However, the study results have also indicated that there is growing consensus that the benefits of crowdsourcing could potentially outweigh the level of risks if the practice is done properly. More businesses were focused on the positive impacts of crowdsourcing, reasoning that risks could be managed.

The "Summary of Risks Identified" table, presented below, summarizes the risks identified through the study. The risks were classified according to the framework used by Keizer et al. (2002), Miller and Lessard (2008), and the European Commission (2010) – through its research paper entitled 'Risk Management in the Procurement of Innovation', which identified the five types of risks associated with radical innovation as turbulence, organizational/societal, market, financial and technological.

Table 12. Summary of risks identified

Dimension	Risk Level	Identified Risks	Risk Management Measures
Turbulence	2.43	Unpredictability of the crowd Brand destruction Reputation risks IP ownership risks Confidentiality risks	Crowd moderation Avoid crowdsourcing for sensitive areas such as HR policy Copyright and service agreements Restricting access by type of log-in Anonymizing the data Break down a big project into very small bits
Organizational/ Societal	2.38	Employment law issues Resistance by employees Lack of acceptance by	Copyright and service agreements Building an “innovation mindset” within the organization

Dimension	Risk Level	Identified Risks	Risk Management Measures
		managers & departments Legal and regulatory changes	Voluntarily following the law
Financial	2.32	Related to quality risks	Defining quality levels and fixed compensation for these levels Entry evaluation of participants Task replication Ensuring greater participation Behavioural screening Tracking performance Have people to facilitate process
Market	2.22	Low participation risk	Intrinsic motivation: build a community Build communication lines

Dimension	Risk Level	Identified Risks	Risk Management Measures
			Use gamification concepts
Technological	2.16	Quality risks	Clearly define task Use collaborative rather than competitive model Automated quality control Build community of subject area experts

Organizational risks are those, which arise due to the client's organizational processes and resources, including lack of internal acceptance, compatibility of the innovation with organizational objectives, and absorptive capacity – or the capabilities of employees and the organizational structure to adapt to the innovation (European Commission 2010). Societal risks include lack of acceptance of the product by society or political and regulatory changes (European Commission 2010). It includes legal and regulatory changes, IP and patent issues, and employment law issues. Financial risks involve monetary issues, including cost overruns, and failure of an innovation, thus incurring costs without financial rewards (European Commission 2010). In crowdsourcing, these risks are often related to quality risks, such as failure of a crowdsourcing initiative due to lack of quality results and the need for duplicate

tasks in order to ensure that at least one worker had it done right, among others. Market risks are demand- and supply-related risks, such as lack of demand for the product and lack of interest by suppliers (European Commission 2010). In the present thesis, crowd members replace suppliers. Thus, market risks include failure of a crowdsourced product to be accepted in the market and lack of crowd participation in the open call. Technological risks include those related to the non-completion of projects and tasks, underperformance, or false performance. Such risks usually arise from the selection of obsolete or wrong technology, usually come from the service provider's side (European Commission 2010). In crowdsourcing, this could include quality risks, late delivery of a task or product, and high cost of maintenance. Overall, the level of the risks involved in crowdsourcing is still highly subjective and dependent on several other factors, such as number of participants, area or field of practice, scale of the company, level of intellectual property protection policies, amount of financial investment, standards and practices for quality verification, level of crowd control, and crowd motivation practices. In order to optimize the services that the crowd could offer while minimizing the risks, several strategies could be employed, as suggested from the responses of the participants. These strategies will be fully discussed in the succeeding section.

Research Question 2:

How does the crowdsourcing concept advance business practices?

Participants in the study generally viewed crowdsourcing as a highly beneficial and cost-effective innovation tool. They observed that the benefits of crowdsourcing are far more compared to the negative impact. Participants saw crowdsourcing as a way to externalize

risks, particularly in the selective crowdsourcing approach, because failure of an idea or solution resides with the crowd, as the firm only selects ideas or solutions, which meet their expectations. This confirms Schenk and Guittard's (2009) argument that in crowdsourcing, the risk of not obtaining input appears to be minimized, since a client firm issues an open call with financial incentives:

"*For the company the benefit is substantial; it can externalize the risk of failure and it only pays for products or services that meet its expectations."* (p. 5).

Crowdsourcing advanced business practices mostly by fuelling open innovation, which confirms Chesbrough's (2003) observation that today's businesses are compelled to make their innovation strategy more flexible, more responsive, and scalable. The crowdsourcing approach addresses these innovation needs.

Research Question 3:

How has risk management been incorporated with the use of crowdsourcing in the business context?

Based on the varied answers of participants on the risk management processes used, it could be gleaned that though there are risks involved in crowdsourcing, they can be easily taken care of by proper management of the process. Several risk management approaches by the participants were practical in nature, though some recommendations were very creative, such as anonymizing the data and gamifying the process, reflecting participants' relatively extensive experience with crowdsourcing. The following risk management avoidance matrix were culled from the research analysis:

Table 13. Risk management avoidance matrix

Crowd moderation and avoidance for sensitive areas that affect policy or patented work	Installation of copyright and service agreements	Anonymization of data	Drive change for corporate culture and mindset toan "innovation mindset" within the organization	Behavioural screening
Installing an intrinsic motivation framework for ensuring greater participation	Task replication and performance tracking	Clearly define task and install communication lines	Using a collaborative rather than competitive model	Install a community of subject area experts with automated quality control
Avoidance of crowdsourcing for sensitive areas such as	Restricting access by login type	Define quality levels and fixed compensation	Entry evaluation of participants	Using gamification concepts in

HR policy and patented work		for those levels		crowdsourcing

These risk management strategies are mostly in the area of risk mitigation, and only one – avoid crowdsourcing for sensitive areas such as HR policy and patented work – follows the risk avoidance measure. The variety and multiplicity of suggested risk management strategies demonstrate that despite the relative newness of crowdsourcing, practitioners who use it for commercial purposes have already found creative solutions to the challenges and risks of the practice. Moreover, the list shows that, carefully managed, crowdsourcing can provide good solutions for companies. This is one of the major reasons for crowdsourcing to be successful and accepted in the marketplace.

Research Question 4:

What measures have been taken to keep track of any risks realized with the use of crowdsourcing?

Participants did not keep track of any risks realized, although awareness of the risks brought about mixed reactions. A segment of the participants admitted lack of acceptance of crowdsourcing within their organizations, due to the risks they perceived crowdsourcing to have. This segment kept a "wait-and-see" attitude on how risks were handled by active crowdsourcing clients. Another segment was optimistic regarding the management of risks, and they generally believed that the benefits of the crowdsourcing approach far outweighed the risks. Their views are consistent with Schenk and Guittard's (2009) assertion that crowdsourcing is not risky for crowdsourcing clients, and in fact the risks of failure are

transferred to the crowd workers, who, despite exerting time and effort to complete tasks, may not receive any reward for doing so. Thus this segment generally viewed the risks as predictable and controllable with proper guidance and moderation of the crowd. Tracking risks were handled by their own or intermediaries' systems.

Research Question 5:

How has the use of crowdsourcing affected the business processes and outcomes generally?

Results of the study reveal that through crowdsourcing, companies have been able to more cost-effectively implement open innovation. Some have also tried cloud labour, and still others base their business models on crowdsourcing. Collaborative work through crowdsourcing is being tried, though not yet carried out in full. In addition, since crowdsourcing is still not widely accepted, even among organizations, which have implemented it, its effect on business processes and outcomes is far from its full potential. Thus far, based on the results, the positive impact has been felt more strongly, and the negative impacts that were felt were minimal. This was reflected in the results of the survey, that financial risks came as only third in importance. Organizations now recognize the need to include the diverse opinions and ideas of people from varying backgrounds in order to effectively come up with innovative ways to create a product that addresses the needs and wants of a vast majority of the consumer population (Schenk and Guittard 2009). They also recognize the benefits of using crowdsourcing models to enhance the company's performance. Most companies are aware of the overwhelming benefits brought about by the technological advancements that allow people to communicate effectively their concerns, feedbacks and

ideas using a wide scale channel at lower cost. Despite the many benefits of crowdsourcing, the main barrier affecting its acceptance is still the perception of risk, usually by members of the organization who have not yet encountered it first-hand. The findings are consistent with Roth's (2009) argument that acceptance of crowdsourcing strategies is inhibited largely by limited understanding of risks, costs and potential benefits.

Through this study therefore, it is hoped that risks would be more effectively understood.

5.5. Implications and Conclusions

The researcher has also endeavoured to identify the risk management strategies by gathering and summarizing the suggestions of crowdsourcing experienced industry experts who were participants in the study. Earlier in the thesis, the researcher stated that the study's relevance is hinged on the possibility of constructing a risk management protocol for developments and innovations that are conducted using crowdsourcing methods. The implications and conclusions of the study´s have been aggregated in table 14.

Table 14. Implications and conclusions

Research Question	Implications	Conclusions
What risks are involved with the use of crowdsourcing in a business context?	Identification of a risk-framework applicable for crowdsourcing. Summarization of specifically researched risk levels for each individual risk dimension: turbulence-, organizational/societal-, financial-, market- and technological- risk.	The risk dimension of turbulence-risk described as uncertainty, unpredictability and increasing complexity of the business environment has been identfied as most prominent. Correlating risk managemet measures have been analysed and applied for each risk dimension in realtion to an application of crowdsouring in a business context.
How does the crowdsourcing concept advance business practices?	The study results reflected crowdsourcing as a highly beneficial and cost-effective innovation tool to provide a	In response to the survey results, crowdsourcing can address the innovation needs of a corporation and advance

	competitive edge for more strategic flexibility, more responsiveness, and advanced scalability.	business practice, when managed properly and a considerable risk framework is applied.
How has risk management been incorporated with the use of crowdsourcing in a business context?	Analyses of the survey data uncovered various risk prevention methods applied by the firms– all with a shared objective: to conduct proper risk management schematics for the crowdsourcing process.	Current risk management strategies often vary by individual approach. Data analysis disclosed a common set of risk prevention tools and methods resulting in the creation of risk management avoidance matrix.
What measures have been taken to keep track of any risks realized with the use of crowdsourcing?	Data Analysis draws conclusions to a more opportunistic approach taken by the firms for tracking possible risks to crowdsourcing. No firm stated to keep track of any risks realized but to apply a	Possible Risks of failure are broadly transferred to the crowd workers or the intermediary platform providers. Firms resonated a optimistic approach to handle risks as predictable and controllable with proper

	"wait-and-see" approach on how risks were handled.	guidance and moderation of the crowd.
How has the use of crowdsourcing affected the business processes and outcomes generally?	Research results showed a positive impact on costs and potential benefits for firms using crowdsourcing. The survey unveiled also a possible enhancement of the company´s performance to communicate effectively innovation and ideas.	Individual departments are testing collaborative work through crowdsourcing, though not yet carried out in full. The effect on business processes and outcomes is far from its full potential. Therefore due to the novelty of the concept, limited understanding of risks, costs and potential benefits largely inhibits the acceptance of crowdsourcing.

5.5.1. Contribution to research

The thesis contributes to academic knowledge and practice by identifying relevant risks associated with the use of crowdsourcing in a business perspective and delivering potential strategic solutions to the risks illustrated (Table 15: 282). Exiting research (Howe 2006; Reichwald and Piller 2006; Brabham 2008a; Vukovic 2009; Whitla 2009; Antikainen and

Väätäjä 2010; Burger-Helmchen and Penin 2010; Ribiere and Tuggle 2010; Alonso and Lease 2011 ;Kazai 2011; Wexler 2011; Estellés-Arolas and González-Ladrón-de-Guevara 2012) has not yet focussed on risk and risk management been incorporated with the use of crowdsourcing nor pursued to provide answers on what measures have been taken to keep track of any risks realized with the use of crowdsourcing. The researcher believes that such goal has been achieved in part with the summarized risk identification table (Table 12: 267). The table additionally summarized the approaches to risk management and the relevant measures being executed to reduce and control possible risks and follow in the development of a risk avoidance matrix (Table 13:274). Another important implication of the thesis is the agreement between participants' answers regarding acceptance in the organization of the crowdsourcing concept. There was overwhelming support for getting buy-in from within the organization for the crowdsourcing process. This is because participants viewed management and employee support as important to the crowdsourcing approach. They recommended working towards a change of attitude, organizational culture and incentives to establish clear awareness and principles of crowdsourcing. From the results, employees seemed to be afraid of the possibility in the future that organizations will replace highly qualified and paid staff with less expensive external people composing the crowd workers. Highly associated with the identified and prominent turbulence risk (Table 12: 267) these fears need to be addressed and further researched in order for crowdsourcing to be accepted by employees in general.

Table 15. Contribution to research

Analysis of risk levels associated with crowdsourcing.	Reflection on strategic solutions for dealing with this risk.	Development of a risk avoidance matrix.
Analysis of the affects of crowdsourcing on business processes and outcomes.	Adapting and reflecting patterns of motivations for participation in crowdsourced projects.	Finding on measures been taken to keep track of the associated risks.

5.5.2. Contribution to practice

The thesis findings contribute to practice showing that crowdsourcing is particularly not only prevalent within Research and Development and Marketing and Sales, but also involved Human Resources, Logistics and Accounting among others. Even though the overall perception in favour for the opportunities to excel innovation was high, possible risks for adoption were identified. The importance of employment issues in relation to crowdsourcing is that the approach may serve to widen the gap between the higher and lower status segments of society, just as innovations have been found to widen this gap – creating the inequality effect (Rogers 2003). Although crowdsourcing has the potential to reduce the innovation costs to businesses, employees may be sacrificed in the process. Moreover, because crowdsourcing

has been found to pay crowd workers less than the minimum wage, even in developing nation standards, the issue regarding its ethical use needs to be studied further.

Methods to mitigate legal risks have turned out to be one of the foremost concerns of crowdsourcing clients. Concern over IP ownership, particularly, has prevented some organizations from fully adopting crowdsourcing as an innovation approach. Wolfson and Lease (2011) have suggested that being mindful of the law, and taking steps to protect the organization's legal interests, are the best risk mitigation measures which outsourcing clients could undertake. Their suggestion was supported by a participant's answer in response to legal risks, stating that voluntarily following the law is their primary risk mitigation measure for this type of risk. One of the biggest ethical issues with crowdsourcing is who benefits. Open source benefits those that do not have monetary resources – because the work of a few benefits many people – enabling them to use software freely. However, crowdsourcing, by practice, benefits the clients substantially, instead of the crowd workers. Crowd workers join a competition for the prize money or the fame. But the odds of winning the competition is similar to a lottery, there is only one winner in a competition joined by so many. Usually, this winner is the smartest. Thus, those workers who exerted effort will find that they do not benefit from the time and energy that they invested. This will impact on crowd motivation in the long run (Antikainen and Väätäjä 2010; Carpenter 2011). There is therefore a need to address this issue. The use of a collaborative approach, rather than a competitive one, was a very insightful suggestion from the participants. It indicates that, based on clients' experiences, not all competitive platforms yield great results. Thus it implies for crowdsourcing intermediaries that competitive approaches may need to be complemented by

collaborative tools, to make their platforms more responsive to the needs of crowdsourcing clients. Table 16 illustrates the major finding and contributions this thesis adds to practice.

Table 16. Contribution to practice

Identification of the adaptation level, departments have already incorporated crowdsourcing.	Validation of possible Risks associated and identification specific risk levels.	Identification of possible strategic solution scenarios to diminish the prominent risks identified.
Reflecting causes of motivation for crowdsourcing participation.	Analysis of the crowdsourcing concept as purpose to advance business practices.	

5.6. Limitations of the research

It is important to note that there are several possible limitations to the research that may bias the findings. This section analyses the potential impact to which different factors could limit the findings.

5.6.1. Choice of research instrument

The chosen research method by conducting online surveys itself poses several limitations to the study. The instrument used was a self-report as well as a face-to-face interview. It is possible that the participants' responses did not truly represent their thoughts and feelings. The researcher exerted resources to strengthen the content validity and wording of the questions, by submitting the questionnaire to four specialists in HR management and psychometrics for review. The specialists were requested to come up with individual judgments of the appropriateness, wholeness and clarity of the questions as well as with the entire content in its totality for form, question sequence and finish time. Despite this step, however, some of the questions seem to have been unclear to some of the participants. A pilot study to validate the questions and subsequently revise them was also used to ensure the clarity of the questions. The pilot study enabled the researcher to better identify possible confusing questions, because the evaluator would be a potential participant of the study.

5.6.2. Level of experience

Although the research was limited in terms of the number of participants (151), the findings provide insights that can be taken into account when developing crowdsourcing projects and initiates. However the level of experience of the respondents reflected the novelty of the crowdsourcing concept. Of the 151 respondents, only 31.3% had crowdsourcing experience exceeding 20 months. Some 29.3% had less than 5 months' experience, while 39.5% had between 5 and 20 months' experience. This is an indicator of the fact that crowdsourcing is still very much in its infancy, experiencing exponential growth in numbers of adopters over time. In addition, unlike the interview approach, wherein the interviewer could ask a follow-

up question to clarify a short or otherwise inadequate answer, in the online survey the researcher has no way of going back to the participants. Thus, when participants provide a very short or inadequate response, the researcher has to be content with the answer.

5.6.3. Points of view – relative perspectives

Even the researcher ensured to survey specifically business users of crowdsourcing acting as clients of intermediary platforms; the results do not reflect any insights by industry sector, size or geo-specific data. This in mind the perspectives of risks are viewed in a business context of the client's perspective, and are not entitled for generalization. Especially a critical examination of the risks to platform providers and workers has to be conducted and be put into relationship in future research.

5.7. Recommendations for future research

The use of crowdsourcing in a business context is emerging globally and disrupting the methods and tools of how innovation is fuelled. In this multidisciplinary field, there are multiple paths to take on future research. It is the researchers intention to widen the scope for future research and to recommend for conducting further research that follow this thesis are regarding the following themes in order to provide insights for both, practice and academia:

- Focus on a specific category of risks
- Focus on a specific industry sectors
- Perspective of crowd participants and crowdsourcing intermediaries
- Crowdsourcing in the public sector
- Accountability for the risks of crowdsourcing

5.7.1. Focus on a specific category of risks

The study explored the risks in crowdsourcing as well as the management of these risks. It was able to identify varying risks and their levels as perceived by experienced crowdsourcing practitioners. However, a broad scope may limit the degree to which in-depth and insightful risk management strategies, applicable to a specific type of risk, would be obtained. Thus, although through the study, several risks were identified and categorized, and risk management measures which were effective in practice were also obtained, it is believed that focusing on a specific type of risk, such as crowd motivation risks, could contribute more original and interesting risk management strategies for crowdsourcing.

5.7.2. Focus on a specific industry sectors

The study did not focus on any specific industry sector. However the importance and effectiveness of crowdsourcing for individual sectors should be discussed, as well as strategies explored for firms to adopt crowdsourcing methods. After analysing the differing economic roles of each sector, future research could explore their adaption of crowdsourcing as a tool for innovation to conclude how essential they are to the innovative progress of the economy, especially playing a highly significant roles at the early, fluid stages of development in new technological industries.

5.7.3. Obtain perspective of crowd participants and intermediaries

This thesis explored the possible risks of crowdsourcing, as well as the risks involved, from the perspective of crowdsourcing clients or employers. Thus, this thesis has provided only a single viewpoint – that of clients. However, there are three major players in crowdsourcing, as observed by Schenk and Guittard (2009): the clients – who want some tasks to be done, the crowd workers or participants – who perform the tasks, and the platform provider – who bring the clients and the crowd workers together. Obtaining the perspective of these two other players in crowdsourcing would provide a more complete perspective regarding the risks in this innovative approach. It also would contribute to the investigation to what extent workflow structures and supervisory functions could be assigned to crowd workers, and how diversified intermediary pricing structured could be optimized.

5.7.4. Crowdsourcing in the public sector

The study focused on commercial practices of crowdsourcing, but, as some participants revealed, the approach could be successfully utilized in the public sector as well. The ability of crowdsourcing to identify traffic violations, for instance, and motivations of the crowd for participating in such endeavours, could also be explored further in future studies. This type of collaborative work offers possibilities to solve unmet challenges, which mostly bureaucratic structured forms of public sector innovation cannot offer.

5.7.5. Accountability for the risks of crowdsourcing

Accountability within the firm for the risks of crowdsourcing has not been addressed in this thesis. Goldman and Gabriel (2005: 174) best expressed their recognition of lack of accountability in crowdsourcing by stating that

"*Project leaders and other managers advance by taking responsibility for a tough project and then deliver. But to some this can appear hard to do when control is relinquished to others*."

Therefore the question arises on how the resulting new relationships differ from traditional relationships and responsibilities. Thus, the researcher suggests that further research into this area be conducted.

5.7.5. Research agenda

The researchers personal agenda for future research is to explore the connecting intersections between different forms of crowdsourcing – seeking to answer some of the following questions: How could crowdfunding be a possible alternative to mezzanine financing tools for SMEs? Where do crowdinnovation origins within mobile and collaborative societies?
In search for talents within the generation Y – could crowdsourcing be an alternative to traditional work relationships?

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Appendices

Appendix A: collected definitions of crowdsourcing

Document /Author / Date	Page	Definition: Crowdsourcing is…
Alonso and Lease (2011)	1	... the outsourcing of tasks to a large group of people instead of assigning such tasks to an in-house employee or contractor.
Bederson and Quinn (2011)	1	.. people being paid to do web-based tasks posted by requestors.
Brabham (2008a)	75	... an online, distributed problem solving and production model already in use by for profit organizations such as Threadless, iStock...
Brabham (2008b)	79	... a strategic model to attract an interested, motivated crowd of individuals capable of providing solutions superior in quality and quantity to those that even traditional forms of business can.
Buecheler et al. (2010)	1	... a special case of such collective intelligence.

Burger-Helmchen and Penin (2010)	2	... one way for a firm to access external knowledge.
Chanel and Caron-Fasan (2008)	5	... the opening of the innovation process of a firm to integrate numerous an disseminated outside competencies through web facilities. These competences can be those of individuals (for example creative people, scientists, engineers...) or existing organized communities (for example OSS communities).
DiPalantino and Vojnovic (2009)	1	... [a set of] methods of soliciting solutions to tasks via open calls to large-scale communities.
Doan et al. (2011)	2	... a general-purpose problem-solving method.
Grier (2011)	1	... a way of using the Internet to employ large numbers of dispersed workers. ... an industry that's attempting to use human beings and machines in large production systems.

Heer and Bostok (2010)	1	... a relatively new phenomenon in which web workers complete one or more small tasks, often for micro-payments on the order of $0.01 to $0.10 per task.
Heymann and Garcia-Molina (2011)	1	...getting one or more remote Internet users to perform work via a marketplace.
Howe (2006b)		...a web based business pattern, which make best use of the individuals on the internet, through open call, and finally get innovative solutions.
Howe (2006a)		... the application of Open Source principles to fields outside of software. ... the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and general large) network of people in the form of an open call. This can take the form of peer-production (when the job is performed collaborative), but is also often undertaken by sole individual. The crucial prerequisite is the: use of an open call format, and the wide network of potential

		laborers. ... a business practice that means literally to outsource an activity to the crowd.
Howe (2008)		... the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call. ... just a rubric for a wide range of activities. ... the mechanism by which talent and knowledge is matched to those of need it.
Kazai (2011)		... an open call for contributions from members of the crowd to solve a problem or carry out human intelligence tasks, often in exchange for micro-payments, social recognition, or entertainment value.
Kleemann et al. (2008)	22	.. a form of the integration of users or consumers in internal processes of value creation. The essence of crowdsourcing is the intentional mobilization for commercial exploitation of creative ideas and other forms of work performed by consumer.

	5 6	... outsourcing of tasks to the general internet public. ... a profit oriented form outsources specifics tasks essential for the making or sale of its product to the general public (the crowd) in the form of an open call over the internet, with the intention of animating individuals to make a contribution to the firms production process for free or significantly less than that contribution is worth to the firm.
La Vecchia and Cisternino (2010)	435	... a tool for addressing problems in organizations and business.
Ling (2010) Liu and Porter (2010)	1 3	... a new innovation business model through internet. ... the outsourcing of a task or a job, such as a new approach to packaging that extends the life of a product, to a large group of potential innovators and inviting a solution. It is essentially open in nature and invites collaboration within a community.
Mazzola and Disefano (2010)	3	... an intentional mobilization, through web 2.0, of creative and innovative ideas or stimuli, to solve a problem, where voluntary users are included by a firm

		within the internal problem solving process, not necessarily aimed to increase profit or to create product or market innovations, but in generally, to solve a specific problem.
Oliveira et al. (2010)	413	... a way of outsourcing to the crowd tasks of intellectual assets creation, often collaboratively, with the aim of having easier access to a wide variety of skills and experience.
Poetz and Schreier (2009)	4	... outsource the phase of idea generation to a potentially large and unknown.
Porta et al. (2008)		...enlisting customers to directly help an enterprise in every aspect of the lifecycle of a product or service.
Reichwald and Piller (2006)	58	... interactive value creation: in terms of isolated activity of individual as directed
Ribiere and Tuggle (2010)		... consists of making an open online call for a creative idea, or problem solving, or evaluation or any other type of business issues, and to let anyone (in the crowd) submit solutions.

Sloane (2011a)		...one particular manifestation of open innovation. It is the act of outsourcing a task to a large group of people outside your organization, often by making a public call for response. It is based on the open source philosophy, which used a large ‘‘crowd’’ of developers to build the Linux operating system.
Vukovic (2009)	1	... new on-line distributed problem solving and production model in which networked people collaborate to complete a task.
Vukovic et al. (2009)	539	... a new online distributed production model in which people collaborate and may be awarded to complete task.
Wexler (2011)	11	... focal entity’s use of an enthusiastic crowd or loosely bound public to provide solutions to problems.
Whitla (2009)	15 16	... a process of outsourcing of activities by a firm to an online community or crowd in the form of an “open call”. ... a process of organising labour, where firms parcel

		out work to some form of (normally online) community, offering payment for anyone within the 'crowd' who completes the tasks the firm has set.
Yang et al. (2008)		... the use of an Internet-scale community to outsource a task.

Source: Estellés-Arolas and González-Ladrón-de-Guevara (2012)

Appendix B: cover letter and informed consent

August 12, 2011

Dear Chief Executive Officer,

The university of Glamorgan is carrying out a research on the applicability of crowdsourcing and the risks involved in the business context along with the longevity or success of the concept. We would need your assistance in establishing how the concept of crowdsourcing been applied within the context of your business and its permanence or extent of success and effectiveness based on the risks involved.

We kindly ask you to spare some of your time and complete the attached questionnaire and send it back to us. You will find that the attached form asks you to state your position in the organization and the views you have concerning the organization you work for.

Informed Consent and Confidentiality

Rest assured that all of these questionnaires will be kept confidential. The results will be given as a report after my dissertation has been completed.

Kindest Regards,

Michael Gebert

UNIVERSITY of GLAMORAGAN

SURVEY

GO

Steps to participate

1 Goal of the Survey

to explore the perception of the delegates on risks that might be associated with crowdsourcing.

2 Easy Online Participation

Please point your browser to the survey URL - you can hold and start the survey to your convenience

3 Thank you for your participation!

Your effort will be rewarded as you have a chance to WIN a innovative BumpSkin for your iPhone 4.

Crowdsourcing Innovation *and* Risk

Crowdsourcing is a great concept to source for effective solutions to difficult problems to the crowd to provide the knowledge, wisdom and creativity. First beeing brought to limelight by Jeff Howe and Mark Robinson Crowdsourcing Innovation has been adopted by various companies around the globe as an open innovation strategy. It has been proven invaluable in providing useful ideas for problems solving and decision making within the firm.

Even though crowdsourcing has proven priceless in the improvement of business practices, various risks have been witnessed in the use. This risks could bring about deleterious effects to a company if the proper measures are not adapted to address such risks.

SURVEY URL : BIT.LY/CROWDSOURCERISK

COMBINING THEORY WITH REAL-WORLD APPLICATION

The use of crowdsourcing has been presented as one of the strategies that companies can use in enhancing business performance. The understanding of the term in the corporate world however is still scanty. More so, the risks associated with crowdsourcing have not been effectively communicated.

As a result, managers have shied away from experimenting with this strategy. This research will shed light on this strategy so as to enhance better understanding of the concept. . It will highlight the application of crowdsourcing innovation as well as any risks that are likely to be faced when a company uses this strategy. Besides this, models of mitigating the risks will be studied. A combination of such knowledge will be invaluable in the management's decision making on whether to adopt crowdsourcing.

In order to satisfy the major goal, both primary and secondary information are beeing employed and analysed. Systematic sampling in form of a qualtative survey is used due to its ability to give a fair view of the overall population and the simplicity in implementation.

SURVEY URL: BIT.LY/CROWDSOURCERISK

The focus of the applied survey tool is on the particular behaviors affecting the levels of risk, as well as on the application of crowdsourcing in the decision-making process and its applicability based on any risk involved by tapping into a largely voluntary workforce as a means to solve problems.

Protecting your privacy as well as the confidentiality of your survey feedback is provided by the Research Ethics Board. Reactions are coded and any critical identification information will be removed. No names or other identification information were used in the ultimate dissertation.

Continued on page 2

Appendix C: survey toolset - crowdsourced innovation models and risk

Goal of Questionnaire: To explore the perception of crowdsourcing practitioners on the risks that might be associated with crowdsourced Innovation Models.

Directions: For each of the following questions, please provide a few words that best describe your answer.

Privacy: All information obtained in this questionnaire will remain private.

Demographic Information: *(Demographic questions are optional).

***Gender of Respondent**: _____Female _____ Male

***Age**: _____ <30 _____30-39 _____40-49 ____ >50

***Crowdsourcing Experience**: _____ <5 Months _____5-20 Months _____ >20 Months

SECTION A: CROWDSOURCING CONCEPT: ROLE FUNCTION

Please identify your current fields of practice in the commercial use of crowdsourcing?

[ ] Open Innovation

[ ] Community Building

[ ] Collective Creativity

[ ] Civic Engagement

[ ] Collective Knowledge

[ ] Cloud Labour

[ ] Crowdfunding

[ ] Collaboration applications, platforms and tools

2. The crowdsourcing Innovation Model recognizes my strength and areas requiring development.

[ ] Very Satisfied

[ ] Satisfied

[ ] Neutral

[ ] Dissatisfied

[ ] Very Dissatisfied

[ ] Not Applicable

How often does the crowdsourcing Innovation Model come in handy for the policy makers in making their decisions?

[ ] Not at all

[ ] Sometimes

[ ] Neutral

[ ] Often

[ ] Very often

How often does the crowdsourcing Innovation Model show your staff how to improve their performance?

[ ] Not at all

[ ] Sometimes

[ ] Neutral

[ ] Often

[ ] Very often

The crowdsourcing Innovation Model evaluates the progress of organizational practices with predetermined risk management processes and leads to the collaboration with all staff to make necessary adjustments.

[ ] Strongly disagree

[ ] Disagree

[ ] Neutral

[ ] Agree

[ ] Strongly agree

[ ] Not Applicable

The crowdsourcing Innovation Model provides guidance with necessary information that helps in producing better performance.

[ ] Strongly disagree

[ ] Disagree

[ ] Neutral

[ ] Agree

[ ] Strongly agree

[ ] Not Applicable

The crowdsourcing Innovation Model recommends suitable approaches to these departments.

[ ] Accounting

[ ] Human Resources (Personnel)

[ ] Marketing and Sales

[ ] Operations

[ ] Procurement

[ ] Research and Development

[ ] Information Technology

[ ] Administration

[ ] Logistics

SECTION B: CROWDSOURCING CONCEPT: PERSONAL PERCEPTION

Please rank the level of these potential risk sources associated with the crowdsourcing.

Financial Risk

Organizational and Societal Risk

Market and Consumer Risk

Technological Risk

Turbulence Risk

Creative Risk

How would you describe the acceptance of crowdsourcing based on the risks involved?

_____

_____

_____

_____

How would you describe your risk management approaches in dealing with any risk associated with crowdsourcing? Are the risks predictable? How well are they controlled?

_____

_____

How would you describe the quality of the results and findings based on the crowdsourcing Innovation Model? Is it a risky process? If yes, explain why.

Please rank the level of these risk sources associated with the crowdsourcing Innovation Model.

How would you describe the company's acceptance of crowdsourcing as a good concept in managing company innovations?

How would you describe the potential impact of the crowdsourcing Innovation Model on enhancing business performance?

_____

_____

_____

_____

How would you describe the relationship between a crowdsourced Innovation Model and innovation in a business setting together with the risks involved?

_____

_____

_____

_____

How would you describe working with and deploying a crowdsourced Innovation Model based on the safety of the process?

_____

_____

_____

_____

How would you describe infusing the crowdsourcing Innovation Model role at all levels of practice within the business context? Are the risk levels the same?

.

How do you evaluate whether innovations in crowdsourcing with higher risk levels have a greater chance of survival?

.

How would you describe the key factors that affect the risks involved in its application by policy makers in organizations? Can the process be trusted? Please explain your answer.

.

How would you describe the components that provide for risky situations and dangers with the use of crowdsourcing and the management of such risks in a business context.

_____

_____

Overall, how do you describe the concept of crowdsourcing? Touch on the risks and identify possible strategic solutions for dealing with these risks.

_____

_____

_____

_____

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE!

Appendix D: anonymous response coding system

13. How would you describe the acceptance of crowdsourcing based on the risks involved?

Response ID	Response
102	There is a need to carefully take the risks into consideration.
109	Mixed acceptance due to lack of knowledge and experience with results.
135	Its good to know how are the people thinking, but may not be always be the best option.
137	Our model being to start from being a NPO to a social business with a financial independence: we don't have the short-term shareholders constraints applied to us, but only the sustainability of community motivation and the organization of the service/product/innovation produced with the fast organic growth of the crowd community.
144	Currently has low acceptance.
147	Our customers love it.
151	That’s the way the world is going, there are lots more benefits than risks.

Response ID	Response
158	Very diverse across the organization. Still in an early stage of development and a long way until all stakeholders are involved.
164	No risks, only benefits, for my particular crowd-sourcing model.
169	The deeper the expertise, the more the resistance.
171	It's all new, we are starting with internal communication tools. We are trying to improve internal collaboration before going to open innovation and others.
176	At the moment many barrier. They’re of sceptics and frustration because of bad experience. in a major state people underestimate the formal process.
179	my idea has to be shared with unknown people, which has IPR leakage risks.
182	The success of crowdsourcing depends on the trust that can be able to established for secure usage.
186	Tentative.
187	Good acceptance.

Response ID	Response
203	People are concerned about protecting their ideas/IP.
204	CS is highly accepted and provides a good ground for pre-tests. The market awareness is rising, on the other hand labour and tax issues appear.
206	at this early stage of adaption the acceptance is high and risk not a main factor. however the moment crowdsourcing is disruptive to internal processes the risk factors rise.
213	Crowdsourcing requires precision in its nature of assessment. The outcomes measured should be precise.
220	People tend not to really look at the risks when making the decision to crowdsource or not. Not really know (the risks). They just go for it, with the benefits in mind.
223	Could risk securing patents on.
234	Overwhelmingly positive.
241	Forward thinking companies with the ability to understand breaking trends and current markets are excited to use it. More rigid structures are reluctant, and are more likely to have a negative crowdsourcing experience, because

Response ID	Response
	they are less capable of adapting to the crowd.
243	Risks can be leveraged by managing and communicating risks to all team members involved, internal risk controllers will more readily accept the role of placing guardrails for business, as opposed to being traffic cops.
246	My primary experience so far has been in the open source community. We don't really see "risk" from to crowd sourcing methods.
251	Acceptance is limited by low awareness of crowdsourcing benefits throughout the organization, not by the risks from the prior question.
253	Very high. With suitable crowd sourcing instruments at hand, risks can be strongly limited.
254	Our business operation combines traditional outsourcing with crowdsourcing (cloud labour). Crowdsourcing is a fundamental part of the operation, i.e., we could not run our business without it; therefore the risks must be acceptable.
255	It is acceptable if diversified and you make good investments.
264	Sometimes people are afraid to collaborate in a project using

Response ID	Response
	crowdsourcing because they have the feeling of being judged during the process. This kind of behaviour can make the risk grow, so it's important that the company shows that a door is open to collaboration.
266	Crowdsourcing is definitely growing and did not reach the tipping point but will be disruptive throughout different industries (creative design).
268	The acceptance in Europe is still in an early stage but evolving. Open questions rule out of sceptic and fear, but can be resolved over time.
269	I see 2 camps of people - the early adapters have not such a risk approach and the unconcealed competence people. I guess there is 90 in favour of the sceptics.
272	I work for a state agency, and use crowdsourcing to help monitor our warning signs, and alert us to any damaged trees/infrastructure in our parks. Concept Enthusiastically embraced by the public, but my field crew and managers feel as if their workload had increased drastically. (As if the iPhone caused that pot hole or cut that lock,). Now that we have data, they are afraid of being held liable. My approach is the opposite, if we are getting this many reports, we can now justify asking for additional resources.

Response ID	Response
275	Necessary and risk is minimal.
277	The acceptance of crowdsourcing is for some an emotional issue. In the R&D group there is less resistance to incorporating this for of model. Traditional dept. such as accounting or legal see this as a very risky endeavour. So the way in which the discipline operates will dictate the risk level.
282	Find the best balance between openness and know how protection.
285	Reluctant since quality of output is uncertain.
286	Low risk in general, but difficult.
289	When we first started a crowdsourcing community, people thought we were crazy. Now, people think it's crazy not to involve the crowd at some level.
296	For marketing researches and investigating human needs crowdsourcing is the best way you should use. In other areas the risks (for me) is to high and you should rely on experts' opinion.
300	You have to evaluate it.

Response ID	Response
310	Companies should focus more on motivating consumer in participating in a CS project. If it fails, another CS project will be hard for the company in attracting the crowd.
311	The acceptance is poor and that is exactly due to the risks involved.
312	Cautious acceptance, it is a unknown area of practice.
313	Benefits of crowdsourcing are far more compared to the negative impact. Obviously there are risks involved in the same but they can be easily taken care of by proper alignment of all stakeholders in the crowdsourcing process.
317	Small organizations seem to perceive the risk differently. Large organisations see higher risks involved. The key risks we see is rising confidential data to the crowd and a reputational risk that the company worries about possible media implications on giving private data to the crowd. Loosing control to the crowd.
326	The most companies don't accept crowdsourcing for their core business.
329	The main risks being seen so far are data protection (if customer data or

Response ID	Response
	strategy information is involved) and the general risk of unforeseen customer reactions due to more transparency.
331	I have developed a protocol to reduce these risks, so crowdsourcing is an accepted method.

14. How would you describe your risk management approaches in dealing with any risk associate with crowdsourcing? Are the risks predictable? How well are they controlled?

Response ID	Response
102	Due to the risks only being predictable to a certain extent the risk management approaches may be limited.
109	Defined quality levels and fixed compensation Entry evaluation of participants, on-going quality control of work Quality control of work briefings
135	We've got to test the hypothesis proposed by people on a small scale first and then, depending upon the results, take it forward. (Lean Start-up Approach)
137	The whole organization is based on innovation led by all members of the

	community. The art then consists in having a core staff always here to maintain the excitement in the community, valuing innovation and internal individual or collective initiatives. Then it's also about always creating the new layers of motivation following the growing complexity of the community member's productions (and as a matter of fact, relationships).
144	No task is assigned without definition of review levels. Most risks are predictable. Review and type of activities help to control risks.
147	Some areas are still to be defined, but will frame as soon as a legal body will apply. The main risk will remain as global tax issues have to be settled.
151	The majority of risk management initiatives has two flaws: focus on short-term denying long term vision (executives goals are set as year basis); hypocrisies (most risks are there and we don't look close to them).
158	A rigorous risk control system is often not in place. Mostly financial risk (money paid and effort with external crowds) and intellectual property risk can be reduced when a proper process driven risk control system is established in an early stage of conceptualization.
164	It's not really a risk if you know what you are putting out to the crowd. You have the control to use what you want and what you don't.

169	Risks are not predictable, they are not controllable, but the response to the risk is manageable.
171	Our risks are related to information security - but we will restrict access by type of login.
176	They can be predicted and controlled - in a similar approach that companies do it on outsourcing - with an adaption of methodology.
179	Well all I do is limit the explanation of details of the product.
182	Risks are paradoxical in nature. Risks can be predicted based on the learning from past technologies but crowdsourcing is a new concept and has its on inherent strengths and limitations. So we have to allow the past to guide us and still be able to learn fast and adapt to the risks associated with crowdsourcing.
186	Diversification.
187	Good control over risks - perhaps too great, limiting groups to known crowds to reduce risk but also limiting the advantage.
203	Require that only non-confidential information be submitted. The perception of risk is greater than the reality.

204	Our biggest risk is that a writer might claim s/he is an employee, not a freelancer, but we think we've protected ourselves from that.
206	The risks are considerable small and predictable. They can be controlled with an predefined role model and pre-test of the crowdsourcing campaign
213	Risks are not always predictable. The more the participation and the more granular the nature of the work the more there needs to be care taken about managing the crowdsourcing.
220	A very well approach. We have developed a crowdsourcing dashboard, with which risks are analysed and different scenarios are created, to predict and control the risks.
223	Key is not to over-disclose.
234	Social algorithms and deep engagement reduce risk.
241	Yes, the risks are predictable. Risk management is client specific, and is based around their specific market and the general mood of that market. As long as the crowd is listened to and respected, there are seldom any major problems.
243	Ensure that the company allows business leaders and controlling stakeholders to make the ultimate call regarding innovation pathways. All project participants

	need to be involved and trained to minimize risks rather than seeing opportunities.
246	There is always a group of "known" people controlling what finally gets put into the final product. There is also a well-defined testing method for everything. So the risk of bad or malicious code is very small.
251	The only risk factor is with IP ownership. As long as it is sorted upfront, there are no other risks.
253	Qualitative risk assessment is sufficient as risks are well predictable.
254	Most of our risks are related to the quality of the crowdsourced work performed. We've built automated quality control mechanisms (task replication & history tracking) to mitigate this problem.
255	The risks are known but difficult to control.
264	I think if everyone is in the same page, the risks are smaller than when ideas are so divergent that is necessary an intervention from the manager.
266	One of the risks is customer dissatisfaction. We treat that with a 100 % money back guarantee. We have strict copyright and service agreements set up. Designers control their own IP through an integrated reporting system.

268	Mostly crowdsourcing projects are based on small personal units per projects - therefore the risks are limited and results are discussed very open beforehand.
269	Disaggregation and multiplicity of the risk makes it predictable.
272	Very little risk to us. Not enough time to evaluate how well controlled.
275	Enough references are available to predict unwanted behaviour and screen for unwanted contributions.
277	Providing a transparent environment is key. Transparency in the actions and transparency in the way knowledge is used. Risks are not always predictable.
282	The main risks are predictable. Risk management should be stronger in case of crowdsourcing.
285	May not be predictable but can be controlled through further research and analysis to verify/assess crowdsourcing output.
286	Need for step-by-step implementation and each step evaluation.
289	The risks are predictable.
296	The use of strong criteria of how can be the crowdsourcer in your project could provide necessary condition for risk management. Otherwise however you could

	rely on your experience and methodology that provide necessary action to get the result.
300	There is no business without risk and risk can evolve in opportunity. In order to evaluate risk is useful BCG matrix. The risk is not bigger than OI.
310	Yes they are predictable if the CS project runs well.
311	Risk management is concerned about the risk associated and is trying to identify actions that will minimize the risk.
312	a lot of risks are controllable with the general concepts of risk - the settings for crowdsourcing seems to be harder to control.
313	Majority of the risks are predictable. Control over these risks is based on the action planning done once the risk is identified.
317	There is spectrum about standard consulting and crowdsourcing. We have a confidential dataset. We use also anonymizing the data set to bring a more neutral view to the crowd.
326	Not for core business, but as much test cases as possible.
329	Our current experience is somewhat limited because we are still in the trial status. We are currently evaluating typical legal aspects like labour / tax law and

	data protection requirements. Results open.
331	Through my protocol risks are anticipated and reduced.

15. How would you describe the quality of the results and findings based on the crowdsourcing concept? Is it a risky process? If yes, please explain why.

Response ID	**Response**
102	It will become more risky as the company moves further into the process.
109	Mixed results most mostly satisfying. Bad results mainly due to bad briefing and inexperienced participants.
135	Crowdsourcing helps look at the same thing from a different perspective - which may or may not be the voice of the masses.
137	It is not risky.
144	Results are fine, but approach is still conservative.
147	the overall risk is minimal, as the share of risk is leveraged by the crowd. mistakes are mainly produced because of the human interaction, but limited due to a collective quality assurance.

Response ID	Response
151	Sure is risky, its different. But nowadays the riskier approach is not taking risks. There is no innovation doing the same, there is no changes without taking risks.
158	the quality variable is mainly dependent on the time pre-invested to concept the crowdsourcing process and the money that calculated for crowdbased contributions.
168	No Risks, the results we provide are excellent.
169	it is risky, because if you use standard metrics, you will "kill" innovative ideas.
171	We are trying basic s first.
176	it is a risky process if you just count on statistics - many intermediates do that, but if you a controllable process the risk gets lower.
179	Quality is not bad.
182	The results based on crowdsourcing are enlightening and optimistic. The findings explore the vast potential of this new concept.

Response ID	Response
186	All venture capital is risky, but then, so is starting any small business. They should be viewed the same.
187	Results are good with no problems.
203	Very difficult to control the quality. Have to sift through a lot of submissions to find valuable concepts.
204	The risk for us is taken away because our customers have control over the quality of the work. Crowdsourcing improves the quality the customer gets.
206	the better the preparation and briefing the lower the risks.
213	The risks depend on the stakes. As such it need not be too risky. However if much is riding on the outcome then quite obviously extra care needs to be taken.
220	Yes. It is easy to not have your goals be fulfilled, if you do not steer properly. Sometimes companies aim for quality results and receive a great amount of quantity, without 'anything good' in it. Sometimes companies aim for quantity, but not receive any ideas/input from the

Response ID	Response
	crowd at all.
223	Over-disclosure could hinder patent acquisition and inform competition.
234	Excellent - absolutely not.
241	Result quality is better than traditional methods. It is not a risky process, as with proper crowd management key decision makers vet all results.
243	The overall quality is very good and can be adapted quite rapidly within the planned context. Typical risks evolve within the process and are nested mostly inside the corporation.
246	Linux and the surrounding software is a great example of crowdsourced development. It is one of the most stable OSes ever produced, and the risks seem to be very low. Most risks associated with it are falsely put forward by the more traditionally controlled competition.
251	It's all about community management (understanding the mechanism of motivation that bring a perpetual individual & collective innovation) and bringing the online and offline tools that will enable to well data visualize the productions of the community, based on the individuals contributions

Response ID	Response
	recognition.
253	Great quality and strong applicability. Not really risky when implemented properly.
254	In general we have been very happy with the overall quality, which is generally good. The only risk is of wasting money.
255	There are risks but diversification is key.
264	For me the results in a crowdsourcing project are based on 4 things: knowledge, comprehension, collaboration and evaluation. Knowledge: who’s going to collaborate, their know-hows, their backgrounds? Comprehension: people understood what's they need to delivery and what's the point of it? Collaboration: people are stimulated to collaborate? they feel free to give new insights? Evaluation: who will evaluate the answers? how is the model of evaluation? I think the risk can be reduced if there's a planning involved, considering this 4 variables.
266	The quality of the design is great and customers are very happy. Graphic design is very hard to communicate so for them crowdsourced services is the best out there.

Response ID	Response
268	Quality is mostly assured by pre-tests and demo groups. Even then risks are limited through a rigorous quality management within the crowd and innovation process.
269	From a consumer point of you it is very affective - speed and flexibility - there is definitely broader risk in integrating into businesses processes.
272	No risk at all. We are required by law to install and periodically monitor a large number of public hazard signs on our hiking trails. All we ask is a person has the free app on their smart phone (all os's), to simply take a photo of a sign and submit, So we get 20 reports per day that the same sign is there. WONDERFUL! As soon as someone reports that sign is missing we can replace it immediately.
275	Behavioural screening allows to elevate quality response.
277	It depends on the context and structure of the project. The emotional temperament and generational makeup will effect the perception of risk. Those who use social media seem less averse then those who do not.
282	Innovations are of higher quality for less cost. The process is risky, but can be handled.

Response ID	Response
285	It involves risk but it is NOT a risky process. Main issue is that people (the crowd) don't always do what say. The low-fat burger is a good example.
286	The biggest risk I see is to waste time and resources and not generate reasonable results.
289	The quality of the results depends on the understanding of the goals when starting the crowdsourcing initiative. A clear understanding of the desired outcome leads to high quality results.
296	The result of the crowdsourcing project depends on people, methodology and people who are facilitating the process. So when the plan and the whole organisation are based on right concept risks are low. As for my practice, the results of such projects were great (surprising and great).
300	Sometimes good. Yes it is because you use people outside the company for the solution. of course there is a contract but you can sell the solution with small adjustment. in my opinion the best solution for a company is to believe in the internal people.
310	Yes it is a risky process if it does not manage well. It can have a financial

Response ID	Response
	risk for the company who like to give reward to the crowd and risk of not attracting the crowd for future project if it fails in motivating them at first.
311	It is a risky process: the main risk is monitoring the crowd and how responsible the crowd feels.
312	The results are largely being very good, primarily the risk is that the crowd is shifting in a profound way and you can not detect the shift accordingly.
313	As a concept, crowdsourcing will take its time to start delivering quality outputs. The participants need to learn and evolve in this environment. It is risky process as the results / outputs may not be what are anticipated.
317	We set a benchmark of best practice with our customer and till today always beat the benchmark. The challenge we face is preparation the crowd and organizing the crowd and finalizing the results in the best manner.
326	Ideas and creative most with good results. Production low level. Need more/new processes for high level production.

Response ID	Response
329	For us, there are two areas of risks: 1. The legal ones (see above) - we see a lack in jurisdiction and legislation that has to be closed in the near future 2. The market risks: People involved in crowd sourcing processes start having more influence on brands, other customers and the media. There is no mitigation for such risks, because they are implicit to the concept of crowdsourcing.
331	Good quality, risks are reduced.

16. How would you describe the company's acceptance of crowdsourcing as a good concept in managing company innovations?

Response ID	Response
102	Since there is little use of crowdsourcing by the company there is limited acceptance of it as a good concept.
109	Great concept because the amount of output increases.
135	It should well be part of the R&D efforts.

Response ID	Response
137	Crowdsourcing is absolutely necessary to detect the complexity of detail of the market & consumers behaviour. Companies didn't get at all the wide range of positive implications that it can have on business innovation, business longevity, and stakeholder's happiness.
144	Most companies don't accepted it.
147	Internal company innovation teams are the key decision makers - this may be also an obstacle as productive scalability to operative success is difficult to fulfil.
151	Getting it.
158	Very good concept, however the financial risk is significantly higher, related to the quality risk and the risk of resources & management.
164	Excellent.
169	Everyone loves the concept, but they have trouble accepting new ideas in general.
171	We know that innovation comes when different people with different background see the same problem. And innovation means taking risks.

Response ID	Response
	That's we are investing in collaboration.
176	We are almost there - the risk is that the innovation is too open. And on the other side to not get the best from the crowd, because the real collaboration is not incentivised - a competition model is not best. A competition model is not a long term model, as participants get frustrated.
179	Well accepted.
182	Crowdsourcing would not only help to reduce costs but also make the process of managing company innovations more efficient.
186	Cautious.
187	Somewhat good, but clients are always concerned with the open source environment.
203	Cautiously optimistic.
204	Strong opportunity for outsourced R&D.
206	Acceptance for crowdsourcing is growing especially for the use of internal crowds to drive innovation.

Response ID	Response
213	It should be tried and fine-tuned.
220	It is accepted as a good concept in managing company innovations. However, companies tend to not crowdsource very easily, due to the unfamiliarity with the concept. Whenever they do crowdsource, they embrace it very well.
223	Companies are afraid of the unknown. The risk of crowdsourcing itself is very low.
234	Ideal.
241	Very good. Many decisions here are made with everyone providing input.
243	The challenge is to make all stakeholders work together. You can argue that companies only do real crowdsourced innovation when they create new IP. It is easy enough to decide who brings what to the table and how to compensate for this. The real challenge starts when you co-create new IP.
246	We actively use the model for software and research.

Response ID	Response
251	Crowdsourcing is just one tool for innovation. It is accepted as such.
253	Still hesitating and reductive some times. Getting better.
254	We don't do innovation crowdsourcing (focusing purely on cloud labour).
255	Growth is sure for any risks involved.
264	I think the acceptance will grow. The tendency is that companies will need insights from several fields of knowledge to grow. Innovation needs to be a sharing process and cases from big companies will be an important part to show how it's work and how it's good to use crowdsourcing for new insights.
266	Innocentive is one of the examples for a good managing and i think it is a perfect way for managing company innovations.
268	Large firms drive the innovation process using crowdsourcing at the moment. That has a positive affect as good PR is helping to promote the concept of crowd-innovation also to the medium sized enterprises.
269	It is very valuable and impactable - they would be fools not to explore this

Response ID	Response
	method of innovation and aggregation.
272	Upper management still very sceptical. Institutional Inertia.
275	Limited and only helpful if guided via concrete stimuli.
277	With a structured knowledge framework, the acceptance is higher. As trust and transparency, cooperation are built, the acceptance again goes up. This strategy is best to supplement not replace workers.
282	Crowdsourcing starts inside and needs a change in company culture.
285	There is generally lack of understanding of the WHAT and HOW of crowdsourcing. Most companies underestimated the benefits and overestimated the risks.
286	Acceptance will come through right communication and results presentation.
289	Acceptance is very high.
296	For Russia it's the new way for managing innovation. However it is 'innovative' and 'prestigious' way and become popular. Many companies

Response ID	Response
	now are afraid of new technologies, but the idea of using new technology in investigating something new looks quiet attractive for them.
300	Very high because cheaper than built a internal group with high competence. With the credit crunch, managers pay attention to the short time non-to the strategy in the long. I think company will pay this approach.
310	It is a very good and practical approach for creating innovation in a company.
311	It is not used for the moment.
312	It is a better concept of how it is being used at the moment - people are going through the motions at the moment to drive innovations.
313	It will take time for this concept to become the mainstay of managing company innovations.
317	Overall we deal with fairly innovative clients that reach out to us. The acceptance seems to be lower when it comes to data privacy.
326	They use it to get more ideas or creativity - without knowing

Response ID	Response
	crowdsourcing ;) the classic innovation funnel is not optimized for crowdsourcing models.
329	In principle the concept is widely accepted in our company, although we learned, that it needs governance and moderation. If those two are not provided, it is quite difficult to funnel ideas and expectations. This can result in a real backfire of frustrated contributors.
331	It is hard to predict all the consequences of crowdsourced projects.

17. How would you describe the potential impact of the crowdsourcing model on enhancing business performance?

Response ID	Response
102	If the process is successful the crowdsourcing innovation model could be seen to enhance business performance.
109	Great potential because it enables companies to scale up businesses more quickly, gain access to new creativity and one-off demand.

Response ID	Response
135	It could have a great impact, depending upon the outcomes.
137	Huge: it's like being in perpetual resonance with your target users or consumers.
144	We move to that direction. Time will come when few people will have regular job positions. One/few employee companies will take place of market.
147	There is a potential impact in new ways of interpretation of existing ideas and processes.
151	First the company needs to know what are their challenges, and then understand if/as crowdsourcing is a good way. Crowdsourcing or any other new-innovative management techniques are just tools, a mean to an end.
158	The potential impact is extremely strong and will get even stronger over time.
164	Excellent.
169	Could be good, but requires a culture to support disruptive, innovative

Response ID	Response
	ideas
171	We are focusing to eliminate rework and wrong objectives. All company has to go in the same direction.
176	the potential is huge, because the opportunity is to get instant access to think- and work pools.
179	Nothing.
182	The crowdsourcing model will enable businesses to enhance performance by reducing installation, downtime and maintenance costs.
186	Modest.
187	Excellent potential.
203	Requires patience. Not immediate results.
204	It helps our writers a lot.
206	There is a high impact to enhance the performance.
213	It can be beneficial. It depends considerably on how the questions are

Response ID	Response
	framed.
220	The potential impact on enhancing business performance is huge. When making use of the crowdsourcing model on a very effective way, companies can gain sustainable competitive advantage, an increase in their service expertise (how well do they do what they do) and many other benefits (such as an increase in loyalty, word to mouth, recognizing direct and latent needs, etc.).
223	Large.
234	Game changer - never before could you access the diversity and wealth of knowledge so instantly.
241	Excellent. There are many ways that the crowdsourcing model can enhance performance and productivity. In time, it will not be possible to run a business without some of these models in place.
243	People don’t often ask the big questions, because they don’t even know what to ask. In the same time crowdsource Innovation can deliver speed and accuracy advances 100x better than “gold standard” existing algorithm. Therefore the ability to process through crowd based tools

Response ID	Response
	allows humanity to ask bigger questions.
246	Contrary to what some of the big patent holders claim, most innovation seems to have come from cooperation of the experts in a field. So, crowdsourcing has the potential to greatly enhance performance of most things.
251	Crowdsourcing has a great impact on enhancing business performance by providing new ideas as well as understanding what the crowd thinks about your business.
253	Great potential.
254	Crowdsourcing provides substantial cost savings & improves scalability significantly.
255	Huge.
264	The crowdsourcing model can bring new insights for all areas. Looking the business in different perspectives can impact positively in the future and it's a good way to prevent crises with new and innovative ideas.
266	It is a fantastic way to cut cost and reduce risk - without fixed cost and on

Response ID	Response
	demand service.
268	There is a major potential to enhance and to benchmark performance. Not only is it very efficient but also ambitious to promote internal excellence.
269	It has a big impact and high potential to do so and enhance performance.
272	Possibilities are endless. We have lost 35% of our staff due to the recession, but now every resident and visitor can be our eyes and ears and we get real-time multimedia reports with location and time. Many times, visitors cannot even pronounce the street signs around them. This is no longer an issue.
275	No direct - translation of responses is what makes it applicable. Design with responses happen at the back-end and the front-end
277	Again if used properly, it can yield a more agile and nimble organization.
282	Tremendous.
285	Huge once companies see the potential value crowdsourcing brings AND at the same time know how to control risks involved.

Response ID	Response
286	Stakeholder's engagement should theoretically always-enhancing business performance.
289	If you continue to come at the same problem in the same way, it will become more difficult to innovate. Involving the crowd and looking at the same problem from different experiences and knowledge bases will improve performance/innovation.
296	30 % better through crowdsourcing process a lot of simple (and a few difficult) decisions for a problem turns up.
300	May be very high in a perfect business world. But this world is not perfect.
310	If it runs well it has very positive impact on the performance of the company because it will create a authentic relationship between the market and the company.
311	Shift to more open innovation trajectories.
312	It has the potential of a very profound impact. Business can focus on things where they have the best impact and skill set. We are now in crowdsourcing where the software industry was roughly in the 1970th.

Response ID	Response
313	It can have a disruptive impact on business both in a positive and negative way. The idea is to be carefully navigating the path and avoid any pitfalls.
317	It is revolutionary and disruptive on all levels of organization.
326	More flexibility, lower priced productions, on going creativity and optimization.
329	We are just about to learn in this area - our expectation is, that crowdsourcing provides several levers for operational improvements.
331	One can gather great insight when using the right crowd and asking the right question. Keeping people engaged is always a risk.

18. How would you describe the relationship between a crowdsourced innovation model and innovation in a business setting together with the risks involved?

Response ID	Response
102	If a crowdsourced innovation model is adopted taking into account the

Response ID	Response
	risks involved there is a need for full integration of its use into the innovation process.
109	Internal more control over quality but less output and more costs involved. Crowdsourcing more quality risk but better price/output relationship.
135	If the entire hypothesis, outcomes of R&D/Crowd-sourcing, are tested on a small scale first, the risks could be well managed.
137	It's essentially a matter of budget and sustainability perception. Internal innovation often implies important budgets to reach the innovation objectives in time, and marketing/advertising it after using a push approach. The advantage is time (you can go faster in theory), the risk is a rejection of your innovation by the users or consumers. Crowdsource based model implies to take more time structuring a motivated and faithful community that will bring in exchange a huge feedback and detect tremendously more the complexity of detail of the end user or consumer market (which product/service they want), and this with a much better societal impact. The advantage is the quality and durability of the innovation and the cost (much cheaper), but the time to market or reach a wide market impact is slower.

Response ID	Response
144	They will complete each other.
147	CS Innovation is often misinterpreted as convergence killer. CS is a new interpretation of existing innovation processes.
151	It´s risky only if someone is stealing ideas.
158	There is more potential from the crowd as from "traditional innovation" setups. the main differentiator is that crowd based innovation has now limits and is designed open ended in its core.
164	N/A
169	Accepting crowdsourced solutions need cultural support, and the risk metrics need to be adjusted to include new ideas and ways of generating new ideas.
171	We think the risk is too high to enter now. We will wait more time.
176	The main and new risk in the traditional model is to not innovate enough. The risk of crowdsourcing innovation is member satisfaction and the long term management of IPR.

Response ID	Response
179	The crowd sourcing gives diverse opinions with a healthy spread.
182	A crowdsourced innovation model is well suited to the current R&D environment and will help organizations to stay ahead of the learning curve. The same cannot be said for the traditional business setting. This is the reason why traditional business models are considered more risky than crowdsourcing today.
186	The same.
187	Both operate together.
203	Crowdsourcing is a step in the innovation process. Not a beginning or endpoint.
204	The risk of both lower costs and higher management of quality controls, crowdsourcing is a great solution for some needs as compared to traditional outsourcing models.
206	Both are different by definition - so no real relation is of existence.
213	Crowdsourced innovations need to be tried a lot more. Perhaps they will succeed in many situations where the typical business would not because

Response ID	Response
	of the granular nature of the task.
220	There is a strong relationship, in which the five phases of the Innovation Funnel in both situations (traditional and crowdsourcing) are met. The differences are that with crowdsourcing, much more value is created (such as unique bounds between a company and its customers, and unique products that meet the customer needs much better).
223	The opportunity for a greater and more diverse crowd with crowdsourced innovation compared to a business setting.
234	Crowdsourcing maps into business processes already established.
241	The business setting has a lower risk, as there is less transparency with the process. The crowdsourced innovation model is much more transparent, and this can create problems in companies where decisions are kept secret.
243	The crowdsourcing model is a fascinating exemplar of how to rethink the basic principles of management - away from old notions of hierarchy, bureaucracy, and extrinsic rewards, and towards newer concepts like crowdsourcing, self-organization, and intrinsic forms of motivation.

Response ID	Response
246	A good example of this was the race to complete the human genome. The publicly funded labs worked together and cooperatively split it up to increase efficiency, while the private ones kept everything secret. In the end, both sides got access to the complete genome, but it was far more expensive for the private sector as they had to duplicate work already done by someone else.
251	Both are essential parts of doing business
253	N/A
254	Not dealing with innovation crowdsourcing at all.
255	The company has a NDA police agreement for some projects, which brings protection.
264	The model of innovation using crowdsourcing can provide a shortcut for companies to see ahead, creating new products based on people needs and using different areas of expertise. The risk will depend on how the company deal with it and how is the plan, from beginning to end, starting with the shared idea until the prototyping, ending in the final product.

Response ID	Response
266	The traditional model is mostly build around a status quo - so innovation is strictly limited. I.e. Getty images would never have been able to invent istockphoto. Same thing with etrade that could have never been created by charles schwab,
268	Traditional models have better direct control mechanism, but crowdsourcing models tend to be more open and variable.
269	You can use CS for an particular initiative or an continuous process - the more you make open innovation a process the more you have to limit the group of people that participate.
272	N/A
275	Honestly, I am having a hard time understanding how risk factors into crowdsourcing. Innovation in my mind is the result of collecting relevant responses and combining them with existing expertise / knowledge. If you speaking of invention, that is a more discrete challenge. Innovation is the combination of things.
277	It's a cultural issue really. The culture of collaboration must be present. Also a culture that appreciates diversity in discipline and information

Response ID	Response
	processing style (a big picture person, a detail oriented person etc.). All this helps to Lowe the feeling of risk.
282	Business model innovation is a high level of crowdsourced innovation.
285	They compliment each other and one helps reduce the associated risks of the other. Hence, having both can increase chance of successful innovation (reduce risk of failure).
286	Don't understand the question. Sorry.
289	Both are viable methods. Everyone has ideas; some people find it easy to bring those ideas to the surface by involving the crowd, some people work better alone. Much like students having different learning styles from one another.
296	The crowdsourced model is more costly but gives greater and more surprising results. But in areas which needs a lot of expert's knowledge in my opinion you should use now experts opinion and the knowledge of your own super specialist.
300	The first is a solution of short time with short time risk the second one is a

Response ID	Response
	strategic solution with long time risk.
310	Combining these two in one innovation project is not very easy and I think it is better to manage separately
311	Potential diversity in crowdsourced people and distance communication alters completely the innovation model.
312	It is very similar but what it is doing is broadening the market for ideas and skills. And in the same time rising the uncertainties how to manage it at the moment.
313	They can go hand in hand and have some overlap.
317	The difference is, that you get input from a larger and heterogeneous group of people. Also adding gamification can drive innovation quite.
326	Stakeholder - special the controlling - don't trust crowdsourcing for core business processes.
329	As mentioned above, curation and moderation is key to any interaction with the crowd. Doing so, an integral approach of internal and external innovation will be doable. Our experience so far supports this assumption.

Response ID	Response
331	Crowdsourcing is faster and incorporates market's need: needs assessment is no longer needed.

19. How would you describe working with and deploying a crowdsourced model for innovation based on the safety of the process and acceptency?

Response ID	Response
102	There is a need to fully understand the process involved and its implications.
109	Needs a lot of A/B testing at the beginning. Understand your crowd, then what your customers need and finally how you translate that manageable work. A lot happens due to misunderstandings.
135	This is a challenge and there is no simple answer to it.
137	It’s a mater of community management and IT/offline tools involved.
144	At this time is experimental. Technology will make this a more robust and

Response ID	Response
	less risk scenario in the future.
147	The "human" factor is the main risk factor.
151	First understand the S-curve. Is your process, product, service, management, and market... tending to bend down? If yes, innovate more and harder. If you still think you have lots to improve on current way, then innovate less and try continual improvement and sustain.
158	There are certain challenges on the way. Adjustments on the way are crucial to drive overall safety and acceptance.
164	N/A
169	The wider the range of participants the meow diverse the solutions, but the solutions must be tested against business goals.
171	Yes it can be risky as there is not a lot of expertise in this area that can be relied upon at this time.
176	There is a organizational barrier, because crowdsourcing became a cross department and is reflecting more than one traditional department. The risk to have not the right decision maker at the right level is high. Also there is

Response ID	Response
	a risk how to implement the crowdsourcing concept, if the process is not synchronized with the existing shareholders.
179	N/A
182	Working with crowdsourcing for innovation would be an immensely enriching experience with a huge potential to work on cutting edge technology.
186	Cumbersome.
187	Good results, not risky as long as the crowd has access to information to gain a clear perception of required quality.
203	There are good models and platforms.
204	Doesn't really apply for writers.
206	Mostly internal barriers due to competence, but also budget restraints.
213	Such features are useful and provide reassurance.
220	In companies where there is not a complete 'open minded' culture, employees tend to give friction, sometimes even sabotaging crowdsourcing

Response ID	Response
	projects. (since they consider it to be a threat to their daily activities and vision). Other risks are also present, like not processing ideas and other input right, not communicating well internally and externally and many more like meeting the expectations.
223	If its not a patent centric industry like Software it could work well.
234	Strategic framing is key.
241	Deploying a crowdsourced model can be difficult, as the community must match needs. The process and acceptance are generally very safe once the community has been deployed, as disinterested members often simply ignore it rather than actively attacking it.
243	It all starts with information and becoming educated. Treating a crowdsource approach for innovation very seriously is a smart move, always. Asking in depth questions of your potential innovation platform partner allows you to gauge the maturity of their platform and their ability to handle complex matters.
246	The model is already accepted and expected in the open source community and is considered safe.

Response ID	Response
251	It is safe, but still not fully accepted.
253	needs a well thought through upfront and supportive communication.
254	N/A
255	I don't understand the question. Are you asking is it safe enough? If it is done right it is safe enough.
264	I think every model can be a chance to look at the entire process and improve steps.
266	First you have to have buy in - mostly there is internal resistance - job fear or pure neglecting.
268	There can be fear of competence since crowdsourcing may be disruptive and a massive change will be promoted.
269	CS requires a different governance and management strategy. You have to think new processes around the CS project.
272	Crowdsourcing app is freely available on all smart phone OS's. People, who know about it, want to put it on their smart phones immediately.

Response ID	Response
275	Guided and deliberate.
277	It is context specific.
282	Confidence and acceptance result in safety.
285	Could be challenging and time-consuming as it is necessary to educate relevant stakeholders and get their buy-in beforehand.
286	Transparency is key to developing trust; let every stakeholder see (what is being aimed at and what is done to achieve that aim.
289	If you are involving people outside of the people within your organization, it is more work than you'd anticipate.
296	Quiet right.
300	A legal problem.
310	No comment.
311	It is a good experience.

Response ID	Response
312	a lot of strategic management integration , the resistance must be overcome quite sensible. Resistance can be managed by existing tools.
313	The quality of the results is directly linked with the amount of people that the project is exposed, the more the better.
317	From a safety point of view it presents challenges to a conventional model. However you can limit the challenges. It term of acceptance there is a wide range of attitudes, but as time goes the acceptance is rising.
326	There is a need for professional tools/environment. Work with the crowd is a good experience.
329	We understand that it is necessary to partly give up safety in order to establish transparent interaction with the cloud. To protect certain strategic information as good as possible, we usually work with a "private crowd", being people individually selected and known to us by name and person.
331	Easy to use because of protocol.

20. How would you describe infusing a crowdsourcing innovation model role at all levels of practice within the business context? Are the risk levels the same?

Response ID	Response
102	There is a need to be careful when implementing the model at all levels of practice due to it being more appropriate for certain types of practice.
109	The more complex the work becomes the less it is capable of crowdsourcing. The second axis would be how crucial the task is for the business' core competence. Both levels define how eager and capable a company will be to crowdsource.
135	The risk levels vary, as does the exposure of the firm to the crowd.
137	N/A
144	No, risk depends on type of activity being crowdsourced.
147	The role model stays the same, as long as the crowd is contributing to one collective and existing operative problem.
151	This makes me think about culture. Don’t know the answer.

Response ID	Response
158	There are different risk levels - i.e. the frontline staff is more likely to disrupt the process due to a threat to competence. Senior level risks are around obstructing the process due to lack of understanding the risk.
164	N/A
169	no, the higher the level within the company the more resistance you encounter.
171	N/A
176	If there is a cross department for crowdsourcing responsibility on a high level, the risk are definably lower.
179	N/A
182	The risks levels would differ at different levels based on the teething problems and hurdles encountered during the implementation.
186	Yes
187	Practically yes. It takes some convincing to show people that it is

Response ID	Response
203	The level of acceptance and scepticism increases as the strategic value increases.
204	Question is not clear.
206	The lower the level of power within an organizational context the higher the risk of complication and un-acceptance.
213	No, the risks will certainly vary depending on the granularity of the work. Some tasks cannot be broken into discrete granular units.
220	It would work well, but many new risks would arise.
223	If its not a patent centric industry like Software it could work well.
234	Align strategic objectives with challenge.
241	It can be difficult to infuse a crowdsourcing innovation model at the higher levels of business management, as the decisions are generally not ones that many people have the capability to decide upon. Also, self-confidence of the C-level executives can sometimes become a problem.
243	This is why crowdsourced Innovation isn't about "the masses". The key is

Response ID	Response
	to know you are accessing the right community and working only with a mature global innovation platform that can handle your needs. But then turn your focus away from the “crowd” and back where it belongs. Your enterprise, your division, your team, your deliverables, your value add. Then risks will be eliminated or controllable.
246	I can't comment on this as I really only deal with research and development and everything we make is open.
251	Yes, and the risk levels are minimal, the challenge is convincing everyone about it.
253	Yes.
254	N/A
255	It isn't relevant for all levels.
264	First I think it's good to have a meet to put all persons in touch with the innovation and crowdsourcing model. With all expectations aligned, starts the research to find the better crowdsourcing platform for the objective established in the meeting. Then, is time to plan how.

Response ID	Response
266	There is a limited defined by the complexity of the task. I.e. you cannot crowdsource your HR policy or cases where you have to disclose a lot of propriety information.
268	The higher the level the more risk can reflect the output.
269	The more the integration of the group is provided in terms of knowledge and joint practice the better the success rate.
272	Not all risks are the same. There are many things that we monitor that would not be appropriate for crowdsourcing (i.e. monitoring populations of rare species, monitoring the condition of hazardous situations.
275	Would not recommend that.
277	Again it's a cultural issue. The more democratic the system (a system that allows outside influences) the less rick. The more command and control the grater the risk.
282	Depends on the specific situation.
285	May not be cost-efficient (since all playing the role need to have sufficient knowledge/expertise about crowdsourcing) and it could do more harm than

Response ID	Response
	good (if people don't have the necessary expertise).
286	N/A
289	No, crowdsourcing works better in some areas over others. To gather direct feedback, to innovate and to market effectively, crowdsourcing is great. However, there is a lack of accountability for tasks to be completed with crowdsourcing.
296	No, for different levels risks are different (highest for the top managed strategies).
300	No, bigger. It means that the company probably is a "cash cow".
310	I do not think it is practical to practice them in all level.
311	Improved business results and shareholder value.
312	The risk levels are not the same. You have to have a very clear model of what you are facing and what you are betting against. As with all adaption you have to lay the groundwork and where to force and step back and let the organization heal itself. How much does the group preserved risk and has this risk being abandoned.

Response ID	Response
313	N/A
317	It is important to see the support of top level and the involving level. Typical one person is your advocate (mostly lower level) - but they need the overall support from the top of the organization.
326	You must manage the crowd and set rules.
329	We are not yet at that level. The impact would be hard to assess.
331	It is possible to use crowdsourcing at all levels, even for HRM -innovation, where employees form the crowd. In this case consumer risks are negligible.

21. How do you evaluate whether innovations in crowdsourcing with higher risk levels have a greater chance of survival?

Response ID	Response
102	Careful monitoring of the situation will be required.

Response ID	Response
109	Yes, higher chances of survival since many opinions are involved early on and will cover more good markets.
135	Starting small on the project would help test the feasibility.
137	Well at least more people created it, so you are pretty sure that they will support the fruit of their work and creativity.
144	Compensation models must be developed for making this fly.
147	A higher risk can lead to higher acceptance and success rates - mostly the higher the risk the better the output.
151	They don’t. Look, innovation initiatives have non-guarantee of survival, or results. That’s why it creates all these uncomfortable feelings on established organizations.
158	In my opinion there is no correlation - it might change when the concept of crowdsourcing is widely adapted and developed.
164	Time will tell.
169	Look at solutions, not process or source.

Response ID	Response
171	N/A
176	There is a specific correlation, but the more the innovation is managed with all relevant parties the lower the risk gets.
179	Do not understand the point of survival here.
182	The evaluation can be done by using test cases and simulation..
186	Time, results.
187	On a case by case basis.
203	N/A
204	N/A
206	There is no direct correlation due to my experience.
213	Precision in the outcome, discreteness in the task, diversity in the crowd and considerable degree of independence.
220	No, I see no direct correlation. In my opinion the greater chance of survival

Response ID	Response
	depends on how well you manage / steer a project.
223	If its not a patent centric industry like Software it could work well.
234	Diversity and access make this a winning combination.
241	The crowd evaluates them. They are vetted multiple times by the crowd, and by individual experts. Once all of those gates have been crossed, the market becomes the final crowd to decide.
243	There is no direct correlation but i believe understanding how to access, manage and ultimately bring assets to market that create value for your business through non-traditional means – including utilizing global innovation platforms – will be a key asset for entrepreneurial leaders in the 21st Century.
246	Don't know.
251	Disagree with this statement. It depends on the innovation, sometimes the simpler ones win. I evaluate based on consumer appeal and the business model.
253	Not

Response ID	Response
254	N/A
255	You don't evaluate you just do it.
264	Doing research with consumers and prototyping.
266	There is a strong correlation to the positive.
268	I cannot the support this thesis, as it depends on the individual risk management method that has been chosen prior the process.
269	If people associate transparency with risk, then yes. I think any organization should increase risk just for the success.
272	N/A
275	To be proven - don't know.
277	It depends on why the risks exist. Higher risk doesn't mean it is a viable project. Survival depends on many variables.
282	In a decision analysis at a gate in the innovation process.

Response ID	Response
285	Greater chance of coming up with disruptive innovations, but not necessarily greater chance of survival.
286	By testing.
289	I'm not sure I understand the question.
296	They have to chance only to good management and planning.
300	In the BCG matrix should be a star. But in my opinion you've to consider that innovation is not a "son" of the company. Is the same thing to ask to develop the strategy to consultant. I can ask for some ideas but in my opinion it is very dangerous if the know all the real strategy and the company context.
310	No it is not relevant.
311	The fact is that companies have the creative people ready to engage. However, management needs to create a culture that unearths those people, through education, tools and the ability to take action.
312	Crowdsourcing has a disruptive effect, because it forces to look at thing in a different way. Crowdsourcing is new and old - it using old models with

Response ID	Response
	new terms.
313	N/A
317	Higher risks will become more acceptances over time. Lower risks seem to have a higher survival chance.
326	Test and learn. Each step with higher risk. Realize the expected level of quality and production time.
329	We have no formal evaluation in place yet.
331	Through our protocol.

22. How would you describe the key factors that affect the risks involved in its application by policy makers in organizations? Can the process be trusted? Please explain your answer.

Response ID	Response
102	Key factors affecting the risks involved will include teleological measures in terms of risks being set against the achievement of goals which will

Response ID	Response
	influence trust.
109	Policy makers always face turbulences with people following certain opinions makers. That gives a feeling of not being in control and other people using the crowd.
135	Biased personalities could influence the application and could be a major risk to the innovation initiative by the organization.
137	The KPIs are new and different: and more human-based.
144	At this point no, but we will move to trustable process.
147	Key Factor 1: is legal (work & tax issues) as well as security Key Factor 2: the official policy makers have to set the groundwork Key Factor 3: a detailed preparation and conception will benefit the output.
151	Is this about Innovation or about Risk? If you believe the highest risk is not innovating then share this all over your organization and reward errors made. If not, don't take risks; keep doing the same thing the same way. See you in the future Kodak.
158	Company culture and the dimensions of openness to change are the key

Response ID	Response
	factors. This is critical, as it reflects the support of crowdsourcing initiatives. If crowdsourcing is not defined in a very early stage of the process, there is a risk immanent.
164	N/A
169	The process does not really matter, not the source of ideas. the only thing tat matters is the quietly of the result - those who oppose crowdsourcing typically attack the process not the result.
171	N/A
176	The key factor is a good sourcing strategy. The better the source and crowd is predefined the lower the risks are involved within a organization.
179	It’s about IPR & copyright leakage. That's all for me. As we do cannot sign NDAs with all. Even if we can, it is difficult to implement.
182	The key factors would be: 1) The ease with which the transition to crowdsourcing can be made. 2) The cost involved to make the transition 3) Would the advantage gained by crowdsourcing be worth the risks? The crowdsourcing process enhances and adds to the current working

Response ID	Response
	environment rather than disrupting it. So the process can be trusted.
186	Yes, as much as any venture capital start-up
187	Making sure secrets are safe are one of the key watch outs.
203	Is the problem is well stated.
204	We trust our writers.
206	Every crowd process is very individual, so there is no real common sense of trust. the key factor is preparation of the project and the internal clarification of the impact.
213	Yes, it can be trusted.
220	Motivation, IP, organizational risks, friction, processing of input, external partners, execution, opening the company, managing / steering of the person responsible, platforms (IT), setting goals, the form of crowdsourcing, the knowledge of crowdsourcing in the person responsible.
223	It can be trusted.
234	Technology is now accessible to the masses no longer rely on early

Response ID	Response
	adopters
241	The process can be trusted so long as it is transparent. Transparency is the hardest thing to achieve with any approach, and if it is not present, the outcome will often not be useful.
243	Key factors are the lack of training and setting up a nimble technology culture that allows individuals to shepherd in technologies that can benefit the enterprise. Set the stage to foster this and empower the individuals within to lead the way.
246	The primary risk is loss of control, and I suppose it depends on what they want to control.
251	Don't understand this question.
253	Acceptances, understanding, trust, gain, and clear advantage What process?
254	N/A
255	Of course the process can be trusted.

Response ID	Response
264	All ideas need to be tested. The policy makers can be an allied if they are in all parts of the process, from the evaluation of the idea to market research, ending in the release of the product.
266	There is always a potential for sabotage or bad PR. The process has to be supervised very carefully so the risks can be limited. Reputational issues are the most addressed
268	The whole process has to be transparent and pretested to minimize the risk and make the process trustworthy. Policy makers have to be integrated in the process from the very beginning.
269	Use of a private crowd vs. a public crowd it is important depended of the nature of CS you need to know who the crowd is deploying a model that automated the process that should include to define rapidly the workflow and the likelihood of performance of the crowd.
272	Process can be trusted if we receive a large number of complaints on the same thing. Also, having a photo or movie to document the report is immensely helpful.
275	Treated as "research" of the crowd via concept provocations should not be

Response ID	Response
	an issue.
277	Cultural; discipline or professional domain; clear structure for the use of crowdsourced innovation; transparency; strong knowledge management capacity.
282	Working with a knowledge map that includes the core know how.
285	Whether policy makers have clear understanding of the roles of crowdsourcing, particularly its limitations - knowledge/expertise of the person/team who implement crowdsourcing initiatives - whether there is an assessment/verification system to cross check potential and feasibility of crowdsourcing output.
286	Depends how well managed.
289	A lack of understanding on how to motivate 'the crowd" to participate, as well as what 'the crowd" is interested in participating in.
296	The value of result expected cost of the project results of such projects through the filed of business project team belief in open innovation method.

Response ID	Response
300	I believe if you are able to motivate people and build team spirit.
310	It can be trusted but should be run well.
311	Can't describe.
312	No human process can be trusted. What happens here are 2 things. The application of the process has not being developed completely - crowd source is taking people to a new unfamiliar way in how to see things and develop things.
313	N/A
317	The key factors for policy makers are loosing control of IP and others do not understand their own business processes as good as them. it is all about coaching all parties involved.
326	Availability, quality, production time, professionalism.
329	As a Telco company, we are used to handle risks very carefully, because we are under close observation by all kind of authorities. In the past, we were usually more on the careful and risk-averse side when it came to new policies and risk assessments. We assume, this basic attitude will help

Response ID	Response
	avoiding risks that might occur here.
331	N/A

23. How would you describe the components that provide for risky situations and dangers with the use of crowdsourcing and the management of such risks in a business context.

Response ID	Response
102	Components that provide for risky situations and dangers with the use of crowdsourcing include the various degrees of uncertainty.
109	You need a support function that is available for the crowd and actively supervises the crowd (Wikipedia is good example). Furthermore, you need clear and transparent quality definitions of outputs to guide your crowd.
135	I'm sorry, couldn’t understand the question too well.
137	Lack of strategic information provided to the community (more people to inform, all the time).

Response ID	Response
144	N/A
147	Focussing of knowledge to just one entity.
151	It's all about transparency. Crowdsourcing suggests more people receiving and sharing information. Hiring secret information mitigates risk, and innovation opportunities.
158	The organization of staff members and role definition as well as code of conduct and responsibility. A high rate of subjectiveness on the project, missing quality control, legal and intellectual property risk
164	N/A
169	Proprietary information and IP needs to be carefully managed if you are sin gout side contributors.
171	N/A
176	Lack of control is the main component and the missing management of the crowd (it is not a trial and error process).
179	The components for me are: 1. Concept leakage 2. Customer information

Response ID	Response
	leakage.
182	Internet or the cloud and the security and privacy issues emerging out of it is the main concern. Lack of immediate financial gains may prevent the employers and organizations alike in adopting this new method.
186	I don't know.
187	Using controlled crowds is one way of doing this, rather than fully open crowds. I.e. using intelli-ideas rather than an innocentive group.
203	Management of IP.
204	This seems like a rewording of the other questions that are also not clear.
206	at the moment the level of risk is still low, but especially in Europe labour and tax issues arise at the horizon.
213	Unable to provide an answer here.
220	I use a seven-step model that really works to reduce risks. In short the steps are: 1) know what crowdsourcing is 2) set the right goals 3) choose the right form 4) Motivate well (who will you motivate and how, meaning

Response ID	Response
	which intrinsic and extrinsic motivations do you offer?) 5) Choose the right kind of platform (online1.0, online 2.0, offline) and built it yourself or outsource your platform (make this decision, based on the earlier set goals). 6) Consider several management choices that will make or break your project. These choices are for example: quantity/quality, open or closed platform, interaction or not, heterogeneous crowd or homogeneous crowd.
223	If its not a patent centric industry like Software it could work well.
234	N/A
241	The component that presents the most risk is of course the crowd themselves. In case the crowd turns against the situation, it is best to listen to their concerns and address them directly, rather than trying to control them.
243	The lack of transparency of the process and access to information provide for risky situations. All stakeholders need to develop an "open-minded" approach. Those skilled individuals need very specific information from the project lead and in our world, that information is most effectively communicated.

Response ID	Response
246	The risk and bad outcome that I have seen results from a major disagreement in the group. Then projects have split into two different ones. Over time one usually dies out leaving those who chose to use the wrong one having to change over. Any time you have to make a major switch (particularly quickly) there are costs involved.
251	Lack of awareness.
253	Lack of diversity, high pressure, lack of free thought, lack of interest.
254	In cloud labour the two (partial) unknowns are work quality and worker availability. The first is dealt with task replication & automated verification (as well as tracking historical performance), the latter we handle by using traditional outsourcing (=contracts) in addition to cloud labour.
255	When money is involved there are risks.
264	A guide aligns with the company directions and regular meetings to follow the risks very closer.
266	Company wide integration not letting the company sabotage.

Response ID	Response
268	Internal fear and lack of knowledge can lead to risky situations, but can be managed with open communication.
269	One of the risks is the fluidity of the workforce since it changes a lot. Another risk is the limited ability to go after damage (who do you sue). A lot of process changes and reintegration work has to be conducted.
272	I don't deal with financial risk; I deal with risks to human health and the environment.
275	Clear ramifications and design of the process when conducting crowd-sourced activities should mitigate this. Am I missing something here?
277	Depends on the context and structure, temperament and generational make-up oft he crowd.
282	The main issue is the loss of know-how, followed by the control of the process. Innovation and project management need new methods.
285	They can vary a lot by projects but in general it is often necessary to have end-users to assess/evaluate/optimize the crowdsourcing output.

Response ID	Response
286	With other options entering the field and some with better control over their own handpicked workforce produces much higher quality and lower risk.
289	Providing the proper incentives for people to participate and minimizing the effect of ulterior motives that people have.
296	1) 'Bad' crowdsourcers without motivation - you should work with their motivation (planning the motivation system), you should select crowdsourcers 2) facilitation of the process - good planning and execution of the plan 3) should work on the expectations of the customer.
300	You absolutely can not control at all.
310	No comment.
311	Can't describe.
312	The fundamental risk is coming from dealing aggregated labour. Do we understand the collaboration of the research instrument and the crowd? It is not clear are robust against crowd fail sure.

Response ID	Response
313	N/A
317	When the task that has been crowdsourced has not been fully thought thru and what to do with the output. You have to have a clear problem in mind the parameters set.
326	Keep business critical processes in-house, good crowd relation management (new definition for CRM ;) qualify different crowd levels.
329	1. Risk: exposure of strategic information to crowd / mitigation: closed crowd, high cultural tolerance to transparency 2. Risk: exposure of customer data / mitigation: closed systems; strong tracking mechanisms 3. Risk: inappropriate response to crowd proposals (shitstorm) / mitigation: closed crowds; transparent communication; scenario planning upfront 4. Risk: unforeseen labour tax payments / mitigation: unclear.
331	N/A

24. Overall, how do you describe the concept of crowdsourcing? Touch on the risks and identify possible strategic solutions for dealing with this risks.

Response ID	Response
102	The concept of crowdsourcing will be useful as long as it is implemented taking into account the risks involved against the benefits that can be accrued by the organisation.
109	In my opinion, Wikipedia and its followers is THE real innovation of the internet that enables a huge productivity potential that was previously filled with idle time and bad TV programmes.
135	Its a great concept which helps not only to get new ideas from people but also engage and build relationships with customers, society, etc.
137	It's all about: - how good you manage to visualize the interactions and productions of your community - how you make this easily available and improvable by the community itself.
144	Crowdsourcing creates relationships, which can be tested along time, different from the current usual relationships where you need to have a definite engagement (at least for a while). I believe formality in crowdsourcing will increase and this will help to reduce risks.
147	Crowdsourcing is a global approach for a joint work & knowledge pool.

Response ID	Response
151	More then One. Anywhere, anytime, diverse and different, synch and a-synch, personal and virtual, digital and physical... "If you have a problem you can't solve alone, EVOKE".
158	I define crowdsourcing as "tapping in the minds of many". Risks are context specific to the type of crowdsourcing and organization itself. To solve obvious risk a set of underlying definitions have to be established and a corporate governance framework for crowdsourcing layout.
164	N/A
169	Love the process and ideas generated but the focus needs to be on the results not the process or contributors. Often, those who don't know what they are doing come up with the most elegant solutions.
171	N/A
176	Crowdsourcing is a new and different sourcing strategy for companies - sourcing now from the largest workforce reflecting the power of the internet lack of control and monitoring the crowdsourcing process. It has to be management as an enterprise initiative and solution and must be part of the overall strategy of the company.

Response ID	Response
179	I have tried crowd sourcing for innovation & creative only. My experience is mixed. That is all what I can say,
182	Crowdsourcing is a concept where tasks traditionally performed by specific individuals are given to a group of people (crowd) who are most fit to contribute by leveraging the mass collaboration. The risks are the cost and time involved in bringing a project to fruition and the uncertainty involved.
186	Innovative, and the way of the future.
187	They are difficult to predict and difficult to control. In fact crowdsourcing could be a useful resource and a huge problem either. The continuous monitoring of the crowd is the only way to prevent crowdsourcing to become anarchy.
203	How the problem is stated will determine the risks and value of the outcome.
204	We describe it as many people working on a single task, with some competition among the crowd to produce the best results.

Response ID	Response
206	Crowdsourcing is a method to diversify a greater task to a heterogeneous group of people for a common goal.
213	The concept requires considerable diligence in understanding both the nature of the task and the nature of the crowd. If both conditions approach an ideal point then CS is a good possibility. As indicated above the task must be granular and the crowd must have certain conditions.
220	Using the desire of (large) groups of people, other than the designated employers, to participate in business activities, in a way that value is purposively created for the initiator. To reduce the risks, really steer well (with our seven steps), try to think about every kind of risk that is possible and come up with different scenarios (called scenario planning) to prepare for them.
223	If its not a patent centric industry like Software it could work well.
234	Its the future.
241	Crowdsourcing is a very complex concept, involving the use of new technologies and communication theories that are not yet complete. Risks include technological complexities, crowd slapping, unknown bias,

Response ID	Response
	information leakage, system gaming, and crowd interest.
243	I would define crowdsourcing as a unique combination of intense competitiveness and critical thinking skills matched with a strong desire to solve, engage, help and teach others. Crowdsourcing is typically not looking for a one-off solution, but rather a transformative way to increase productivity and bolster innovation.
246	Crowdsourcing is the use of the "crowd" to do something. It could be developing a project, brainstorming ideas, funding development etc. The primary risk is loss of control so the project looses its original intent. The best way to deal with this is to start with a good project management team that can keep the crowd happy while still overseeing the project and keeping it in line.
251	The concept of crowdsourcing is a must have. It is already happening organically with consumer reviews and social media. The challenge is in bringing it into the corporate world as it required change in thinking.
253	Using the collective intelligence of an organization to bring forward strong opinions as well as weak signals. Risks are extremely low if carefully implemented and results provide excellent quality.

Response ID	Response
254	For us, crowdsourcing is the ability to use a mass of unsupervised, untrained, anonymous workers who provide their own physical infrastructure (work space, terminal devices, internet connection).
255	Crowdsourcing takes the knowledge of the many while cancelling out the errors of the many.
264	Crowdsourcing is a contribution of ideas, concepts and solutions that has its origin in the exchange of knowledge and collaboration. The big risk appears when you don't give a guide to the collaborators, don't plan all the steps and don't pay attention to the results.
266	Opening a particular task to a undefined group of people with an incentive that has to be well defined throughout the task. Acknowledgement and trust is key to success.
268	For me crowdsourcing is outsourcing tasks to an undefined group of people risky situations can be carefully managed by predefining project groups that commit to a common goal.
269	Crowdsourcing is an online distributed problem solving and production model number 1: Obfuscation number 2: be very careful when you choose

Response ID	Response
	a private or a public crowd number 3: clear communication concept on how to deploy and manage the model - it requires a very different governance model.
272	"The outsourcing of a task to an undefined group of people who willingly provide a service to help with the task; in this case, we have used crowdsourcing to monitor and document the condition of our warning signs as per court order. Without crowdsourcing, we would have to use our limited staff to do the inspection and documentation of each sign.
275	Crowdsourcing proved to be a mess in the early days of the internet. To be fruitful, it would be wise to use a directed approach, using the right stimuli to solicit responses that are meaningful. Respond with design and repeat ... take openIDEO as a prime example.
277	Crowdsourcing has its place. It is not an employment strategy per say but may provide a way to expand the organizational boundaries to include external ideas. It is a strategy that requires commitment and internal staffing who have program management and knowledge management skills. One must have strong facilitators to interface with crowd, and one must be willing to provide compensation that is substantial enough to

Response ID	Response
	attract the right crowd.
282	Crowdsourcing will be one of the main levers of the future. The risks of a specific company situation in a certain environment must be analysed carefully and be included in a strong risk management.
285	Crowdsourcing cuts both ways - it brings huge opportunity but at the same time the level of risks associated is far from little. Companies cannot afford to omit the great value of crowdsourcing in this innovation-driven economy but traditional functions like R&D and market research still have their roles (though they may need to be modified to compliment crowdsourcing).
286	N/A
289	The application of open source principles to areas outside of software.
296	Planning, managing, enthusiasm - are the way to hold good crowdsourcing project be careful on selecting the crowdsourcers, and developing tasks for them (methodology should be excellent!).
300	It is like the senatus for latins or "poietica" for greeks... you put a question and "optimates" find a solution. But is that the best solution for company

Response ID	Response
	or for who? And can I provide the best solution to a problem if I don't know the contest?
310	it is a very practical approach to the business context but should manage carefully because if not, it can a double edge sword for the company.
311	It enables companies to have near infinite problem solving capacity, and they pay for solutions, not failures. And most importantly, it enables companies to solve problems faster.
312	Definition is: using spots or tasks markets to use collective labour The use of traditional tools help us on the risks, but we always should ask is it that close enough to the new model of crowdsourcing. How will the crowd uniformly behave in terms of group dynamics and group behaviour.
313	N/A
317	Harnessing the world best wherever they are and expertise and getting them to work at the problem that they would never had a chance to look at. Second to find ways where the crowd can compete to each other and stay motivated to get involved. Crowdsourcing will mature over time and risk will flatten, the more you bother on the process the better the risks can be

Response ID	Response
	managed.
326	Crowdsourcing is very important to broaden the horizon, get new ideas, creativity and new, cheaper production processes. a crowdsourcing model need management, rules and professional tools to become a relevant and trustworthy business model.
329	Crowdsourcing includes all kinds of (voluntary or incentivised) contributions of non-employees or contractual partners to an organizations value creation. Risks and mitigations see above.
331	Again, because of my protocol, we identify risks in advance and are able to deuce them.

Appendix E: publications I-III

This thesis has supported the following original publications, which are referred to in the text as I-III. The publications are reproduced with kind permissions from the publishers.

I Gebert, M. 2011. How the remote working landscape will shape the future of work. *Conference proceedings of the Crowdconvention Conference*. Berlin, June 15,2011.

II Gebert, M. 2012. Innovation from the use of new media for sharing ideas and business. *Conference proceedings of the Crowdsourcing Summit*. Cologne, April 27,2012.

III Gebert, M., Peisl, T. 2013. How crowdsourced innovation models evolutionize idea creation. *Gabler publications business+innovation*, No. 01/2013, pp. 28-34.

The author has made a substantial contribution for each publication in three aspects of authoring (Perry et al., 2003), listed below in Table 1.

Table 1. The author´s roles in each publication (Modified from Perry et al., 2003).

	Conception and design or analysis and interpretation of data	Drafting paper or revising it critically for important intellectual content	Final approval of the version to be published
Publication I	Conception and design	Drafting paper and revising it critically for important intellectual content	Paper approval for proceedings or publishing
Publication II	Conception and design	Drafting paper and revising it critically for important intellectual content	Paper approval for proceedings or publishing
Publication III	Conception and design or analysis and interpretation of data	Drafting paper and revising it critically for important intellectual content	Paper approval for proceedings or publishing

Publication I

"How the remote working landscape will shape the future of work"

Conference proceedings of the Crowdconvention Conference. Berlin, June 15,2011.

HOW THE REMOTE WORKING LANDSCAPE WILL SHAPE THE FUTURE OF WORK

Introduction

The world of work is actually changing quite rapidly and the office is really undergoing a radical redesign in order to accommodate the 21st century work practices. The future of work will greatly depend on motivation of the workers since it is actually more than money. Evidently, businesses of all categories and with different capacities have continuously sought to increase efficiency while attracting the best skills and talents as well. New workforces will require fresh deals. In this regard, due to development in technology, organizations have acquired the tools that have significantly boosted output and aided the cutting of costs in which case employees have been given liberty with concern to how they work, contributing to even a greener economy(Alice, 2012, 16). However, it is clear that many companies have not realized that a remote working landscape will impact on the future of the work. Basically, a remote landscape is one that consists of social, technological, ethical, ecological, and economical political as well as legal factors that affect the capacity of companies in making decisions in which case the firms however do not have any control over. They have to follow the dictates of these factors if they are to remain in place and operate without any difficulties which may negatively affect their well being as artificial entities. The remote landscape has substantially significant impacts in the future of work since owing to its uncertainty; it is true

that there can be no proper prediction regarding how the future of work is likely to change. As such political and economic as well as legal issues and the others as well have to be adhered to since they impact on work significantly. In this regard, we are going to address inherent issues that have a likelihood of impacting on the future of work in organization and how organizations should proactively develop contingency plans to respond effectively to these factors as they are bound to occur.

Part 1

Innovation is a key aspect that should be encouraged at the work set up since it is in itself a motivator that will see employees work competently to achieve various goals and objects as they have been set with the organization. It is of paramount significance to understand that innovativeness in the working set up is very significant if firms are to maintain working environments that suit their operations best. Positivity should be sought in all ways when it comes to work in which case every work should be presented with the ideals and requirements that the various remote factors require. Workers should be given the freedom to be responsible and accountable for their own actions. Essentially, trusting people in managing their own work lives individually or as teams will greatly pay off. Research evidence shows that companies which measure and reward people based on results rather than the hourly rates will normally benefit from higher and increased productivity, more motivated workers, improved consumer service as well as lower costs (Ron, 2009, 13). Motivated workers will give their full commitment to finding the most positive ways to apply so as to enhance the profitability and efficiency of the organization. The future of the work depends on the foundation of leadership that is laid by the current leaders who should be the models to the future leaders

since future work is anticipated to be based on excellence through exceptional performance at work. Leadership today should seek to address future work concerns through giving basic training to future organizational leaders so that they fully understand what it takes to achieve excellence in a highly complex work place and environment in future. Organizations that motivate their workers and reward them favourably will gain higher reputation in this regard and even attract more competent workforce that is talented and skilled in different aspects and this will ensure that there is continued innovation which will lead to developing new ways of managing costs, improving product features and quality and subsequently the profitability of the organizations. The workers in an organization, which fully understands and appreciates the remote environment factors, have a high likelihood of experiencing good results owing to different strategies that will be developed in addressing various issues of common and general interest in the organization by the different people skilled and talented in different areas of the operations of the organization. Instituting forward thinking ways of working in an organization will basically emanate from the creativity and the capacity of innovativeness of the people in charge of organizations. Economical issues should always be factored and considered whenever paramount decisions are being made. This has the implication that strategies should be integrated appropriately as deemed right by the authorities responsible in the workplace so that they work to the best interest of the organization and ensure that all the workers are well considered and appreciated at the workplace.

Managers should thus help virtual teams, for instance, if they at all exist in the organization to collaborate effectively so that they compound their efforts and work in the best interest of organizations and achieve desirable results based on the set goals and objectives. If

effectiveness and efficiency are to be achieved with due concern of a remote working landscape, the managers should understand that gender should be accounted for effectively at the workplace and work environment since men and women are talented in their individual and special ways which should not be the basis for segregation at the work place. Ideally, they will be differently innovative in their own unique ways and this will impact quite significantly on how the workplace should be viewed in which case, rather than favouring some gender on the basis of myths that have existed since antiquity regarding the greatness of men should no longer exist. Changes should be instituted in the working landscape in which case they should maintain their coherence with the remote factors of the workplace for the changes to be valid. Essentially, various aspects of management that encourage innovativeness among employees or workers like for instance employee motivation, trust and responsibility and accountability should permeate the working landscape with due concern for objectives and goals in place which should be achieved as appropriate. Management should seek to implement change processes in the most efficient and effective manner so that it benefits the organizations as desirable.

Part 2

In the remote landscape concerns, current worldwide trends display common as well as varying issues that are prevalent in this regard. Evidently revolutions occurring in working place are actually portraying undesirable trend since much is to be done if the future of work is a factor of concern in the current organizational trends.. Notably, organizations are quite slow to make changes that are necessary in order for them to be adequately competent in the business arena. Technology has changed greatly and quite rapidly. Many companies in most

places across the world are still lagging and using olden technologies which will not give them enough capacity to compete effectively in the global business arena (Khallash and Kruse, 2012, 3). Politics have taken different directions and are influencing every day aspects of organizational progress. Regulations and rules contained in the legal aspects of the remote landscape have taken different turns in which case organizations ought to respond promptly so that they can counter the possible effects of these changes. Economic times have grown sour and organizations are thriving in difficult economic environments. Similarly, the society and ecological set ups in which organizations operate have changed drastically and the changes are still in place. Organizations seem to have taken quite a deal of time in responding to current changes that impact in some way on the future of work. This has the implication that organizations are sauntering in accommodating these changes, which are actually of paramount significance and impact significantly on organizations. The image of working practices appear a bit vague as there is actually unclear understanding of how the future is likely to be for organizations in their different levels of growth and development. The society has many aspects including for instance culture that affects the working landscape in organizations. Employees hold different values in their ethical concerns, which need to be addressed appropriately to enhance further development and upholding of changes that are taking place in the global business arena.

Various aspects of organizational culture have resulted to different outcomes for organizations in as far as productivity and profitability are concerned. Work replacement for instance has impacted on organizations in the way they have responded to remote working landscape. Innovation is high with the current organizations all over the globe in which case they are

working their best to be competitive in the global economic arena (Rossdawnson.com, n.d., 1). However, unless they develop economic strategies that address issues that will enhance competence, effectiveness and efficiency like for instance proper management of costs, and good utilization of all their available resources they are most likely not to comply effectively with the expectations of onlookers who are keenly monitoring the moves of the organizations. Advisedly, all factors of production including labour and capital as well as technology as it is in the organizations today ought to be utilized properly in order to ensure that the companies achieve efficiency and effectiveness in their various routine activities which lead to their high productivity and profitability eventually.

Market forces are impacting significantly on the remote working landscape in which case forces that apply in the market set up will determine how organizations make decision. They will have to rely on the prevalent conditions in order to make viable decisions that will not compromise their legality. Various obstacles are causing the trends that are prevalent in the current global trend with regard to working landscape. Resources are highly valuable and they have a value too high for organizations to acquire promptly to address the prevalent situations. Availability of the most significant inputs in production like capital which is somewhat scarce has impacted this affects the decision making of the firms in as far as the working. The competence of management of the economical resources is another obstacle that has impacted on the current trends (Ron, 2009, 14). The skills and technological knowhow of many workers is wanting and is a leading obstacle that has contributed to the current worldwide trends in the working landscape. Reaping business benefits will be achieved through efficient utilization of the accessible and available threats in which case maximum value obtainable from them

should be extracted business strategies with regard to pricing and marketing as well as how well the workforce is dealt with through motivation and rewarding will as well impact in significant ways in reaping business benefits for organizations.

Part 3

It is paramount that organizations re-organize and re-engineer their business practices and the working landscape aspects. Essentially, it is important that management in organizations should focus on economic processes that address the working conditions so that their future may be clearer. The setting for the future of work is in the current workplace conditions and affairs. In this regard, the future of work can be well addressed in a framework that looks into different issues of importance in organizations and their economical affairs. Based on this, connectivity is paramount and organizations should make reforms that encourage connectivity so that relevant information is readily made available. Access to information that addresses how the future of the working landscape should be. Work mobility is very important so that workers can shift from one job to another as they have different capabilities and knowhow in as far as these jobs are concerned. Their rate of innovativeness varies significantly as well and they may bring about different positive results, which will help shape, the future of work in organizations.

Remote work should be enhanced in all ways in order to ensure telepresence at the workplace for instance whereby collaboration and sharing of ideas will be greatly promoted. The virtual worlds should be well interconnected through technology which is actually in the current times shaping the future of work (Malone, 2004, 16). This has the implication that the future of work should be enhanced by ensuring that technology and its aspects are well integrated at

work which should work in conjunction with other components that occur at work in order to ensure that they are highly effective and that they have a promising future in place for organizations in as far as economic realms are concerned. Economy of individuals should be upheld in which case entrepreneurship should be encouraged. Independence should be encouraged as well with the basic aim being proactive handling of remote working landscape factors in order to create an environment that greatly harbours positive working condition in all aspects of work and its future (Maitland and Thompson, 2011, 20). This will promote sound economic aspects, which will be geared towards achieving economic competence for organizations in as far as resources handling, and the human aspects of work are concerned. The underlying drivers like legal aspects, economical improvement, satisfactory technology and others should permeate the organizational practices since they have some effect of the future of the organization.

The economic structure should be modelled so that it fully caters for all the adjustments that are necessary in addressing the remote working landscape and its future implications. Innovation should be open and enhanced mechanisms and should be put in place which is economically developed models for ensuring that the organization is able to succeed in all its routine activities and enhance its competence in the global business arena (Kikoski, 2004, 12). Productivity should be a major focus whereby factors should be shifted appropriately and the impact that technology has when combined with the other factors will have, capital efficiency should be highly considered in order to ensure that the remote work environment requirements are closely adhered to in order to enhance the possibility of an improving future of the work.

Industry divergence should be thoroughly considered and appropriated in order to give findings that will impact significantly on the future of work.

There should be value polarization whereby expertise should be coupled with innovation in order to achieve high efficiency and effectiveness in building a solid platform for future of work as determined by remote working landscape which influences the operations and the decision making of organizations. Education is very vital for the work force if it is to be well updated and in compliance with the requirements of instituting changes which will make the organizations fast in accommodating the changes that are taking place in the global business arena and be competitive as desirable (Fluid network, n.d., 2). Work polarization is an essential part of the realms that are needed in developing a valid framework that will enable companies to decide about their processes effectively. Social expectation should be well considered since the work force emanates from the societal constituents and they keep a close observation of how organizations operate in as far as addressing the future of the work is concerned. Legal issues should be considered in every aspect of decision-making by the organizations in order to ensure that the decisions are well valid.

Conclusion

In conclusion, remote working landscape will impact on the future of work quite significantly. In this regard, the current work set up should be used as the base and setting of the future of work. It is therefore important that considerations be made appropriately in addressing the remote factors and responding to them. The remote working landscape today is deterministic of the future of work and therefore necessary attempts should be made by organizations in shaping the future of work. Effective response to these factors will be dependent on the

competence of the personnel that will be bestowed with the responsibility of handling the matters regarding political, economical, legal, as well as social factors among several others that form the remote working landscape (Burda, 2012, 1). Basically it has been noted that these will impact substantially on the future of the work. Organizations should seek to institute changes which are responsive to the changes that are taking place globally. Most important should be the focus on technology and its usefulness in impacting on the operations of the organization so that they run smoothly. Productivity should be enhanced and promoted so that the organizations can achieve their long term as well as short-term goals. Basically, the motivation of workers is paramount as they contribute to the achievement of common goals and objectives of organizations. Trusting people to manage their own work lives will be of paramount significance to an organization since they eventually pay off appropriately (Alice, 2012, 17). Organizations should no longer cling to rigid models of fixed working time and presence which is actually better suited to industrial age than the digital age which is highly sufficient in technology. As such, future work has actually set out quite compelling business case for shift in organizational cultures as well as working practices. Leadership styles have a future implication that they ought to be altered as appropriate. Efficiency should be worked toward by organizations with proper creation of value out of every single resource that is used in production so that the common goals and objectives are achieved objectively. Future work should be embraced today and now since it will actually not wait for the organizations that will fail to grasp the available opportunity in it now and they will thus lag behind in developing in all aspects of remote working landscape.

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Publication II
"Innovation from the use of new media for sharing ideas and business."
Conference proceedings of the Crowdsourcing Summit. Cologne, April 27,2012.

Innovation from the use of New Media for Sharing Ideas and Business

Abstract

This paper examines the concept that; innovation grows from networks that are gained from the use of new media for sharing ideas in addition to sharing of business. It also discusses the theoretical framework of the latest research and outlines the power derived from combining of open innovation and social media to innovate innovation. The paper presents some examples so as to emphasize the impact and trends that have emerged in innovation due to the use of new media.

1 Introduction

The innovation in social networking media has transformed the planet in the 21st century as it has been established that social networking sites, for instance LinkedIn, Orkut and Facebook, are increasingly being utilized in influencing consumers to increase their inclination towards viral marketing [1]. Not only has viral online marketing been achieved, but innovations have been seen in various sector e.g. education, health and finance, all emanating from the use of social networking. Swan & Robertson [2] cite innovation as a major reason for the surfacing of network structures. However, the extensive study of network structures has overshadowed the fact that there have been emergent diverse roles instigated by networking processes in various innovations. Indeed, network has led to innovation and processes of knowledge transformation.

1.1.Overview

The term 'innovation' can be defined as "the development and implementation of new ideas by people who over time engage in transactions with others in institutional context" [2]. Navi Radjou[1] estimates that seventy five percent of CEOs spread across industries find external collaborations as indispensable to innovation [7]. Networking is identified as playing the core role in innovation, based on its platform of social network. OECD [3] views networking as a structure of 'socio cooperation and collaboration' among various individuals and organizations, and has become popular during the last few years. It is true that physical networks have existed for some time, in physical proximity, but the advent of new communication technologies and a drastic decrease in communication costs has contributed to the establishment of a wider network, spread across a much larger scope.

Research on networks has established that networks can take a wide array of different structures, and that little consensus is arrived at in ascertaining its proper definition. It is safe, however, to state that within a network structure, several independent actors set up relatively slack relationships with each other so as to pursue an objective that is common to them all. Shavinina [2] attributes the main reason of developing network forms of organization as to encourage innovation. Little research has focused overtly on the relationship between innovation and networks. In addition, researches that have been undertaken to examine the link between innovations and networks have tended to be inclined towards the examination of

[1] Navi Radjou is a principal analyst and vice president at Forrester Research [7].

impacts of network structures, resigning the area of social processes of networking to limited spotlight.

2. Introduction

2.1.Open innovation and social media

Since its inception by Henry Chesbrough in 2003, the concept of open innovation[2] has gained outstanding momentum with 2.0 enabled web media [4]. The central idea behind the concept is that organizations should not rely exclusively on their research, but should instead seek to purchase license processes or inventions like patents from other organizations. Also, internal inventions that are not being used inside the organization should be shared with other organizations, which bring the use of social media into focus.

Pahnila, Väyrynen & Pokka [5] views the role of social media for companies as changing by the day. More and more companies are waking up to the fact that the social media presents immense potential as a source for research and development service innovations. The rapid growth of social media users has created a transformation into trends

[2] Open innovation is defined by Chesbrough as "a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology" [5]

that now offer companies new distinct opportunities to use the information and knowledge resources of social media.

Research models on open innovation and social media have indicated that social media enhance information and knowledge sharing and are the platform upon which community-based research and development service innovation are orchestrated.

Without the rich information provided by the social media users, virtual communities will possess only limited value and hence, the success of virtual communities in innovation is hinged on the communities' abilities to exploit the members' participation activities and invest in the creation of fresh knowledge [5]. Integration of social media enhances organizations' efforts of aggregation and identification of sense out of the partitioned global knowledge and expertise base so as to be more supple and adaptive.

Social media technologies enable companies to be more aware of the customer anxieties, needs and trends pertaining innovations and can provide guides and directions for further improvements and innovations [10]. In fact, research carried out by Economist Intelligence Unit 2009 showed that the addition of social media to the open innovation processes could outperform the likelihood to thrive innovation and help in shortening the channel followed in getting market-ready by almost twenty percent.

3. Mckinsey's LEAD approach

Social commerce solutions are increasingly being made available and are characterized by their fast evolving nature that makes venturing into social commerce a challenging feat [6]. To effectively

undertake innovation in the commerce world while utilizing the social media, it is imperative for one to make use of Mckinsey's LEAD approach that is outlined below.

Listen. Monitoring of social commerce behaviour in category that one is interested in, as well as in parallel categories should be the starting point to great ideas. Evaluation of the market and tools and optimal solutions that are required will give impetus to the conceiving of an idea that will be advanced towards looking for a solution. Use of the social media in tracking solutions that are currently being devised gives one an idea of how to go a step further. Learning about what is available by logging onto social sites and portals and keeping tabs on blogs and forums dedicated to providing the solutions will keep one abreast with the events.

Experiment. Here, one should consider his choice of action; what does he want to accomplish? For instance, one may undertake a business model innovation and using it as a platform, devise a few small-scale trials that are designed to deliver against his aims [6]. This gives one a preview of expected results and dissuades one against plunging head-on into risky undertakings.

Apply. From the small-scale trials, one should select results that are most favourable and build on. By integrating social media strategies, one should be able to come up with an innovation that delivers value for the time and capital resources invested. Choice of techniques and toolsets should be appropriate, and based on whether one wants to improve a product or process [6]. It is essential for one to capture feedback during this process.

Develop. Due to the evolving nature of social media and e-commerce, development of the innovation should be an on-going process; the innovator should always seek ways of

improving his product by continuously integrating new insights, technologies and tools. Listening and responding to feedback from the social media will help in constant improvement of innovation, as well as injection of fresh ideas and concepts.

4. Application of open innovation and social media to innovate innovation

4.1. Open Innovation in the Chemical Industry: DuPont

DuPont, a research based company, is credited with discovering and innovating various chemical fibres and new materials [8]. To solve mega-issues like those concerned with fossil fuels dependency, it is crucial for collaboration, openness and partnerships linking organizations, governments and other non-governmental organizations. The Polymer Science Park (PSP) was opened on 5th March 2012 in Zwolle, the Netherlands and it is an open innovation centre that is founded by DSM, Wavin, higher learning institutions and government in the quest of making it the knowledge and innovation body in the polymer and coating sector. DuPont established central research laboratories that were construed to identify and commercialize an astonishing variety of synthetic fibres like Kevlar, Lycra and Nylon, using open innovation [9]. Use of external research and development in open innovation creates significant value, as evident by the company's success in its innovations. Internal research and design is also needed to work in tandem with external research and design, hence DuPont's collaboration with other players in the sector.

In contrast to other companies that only undertake funding of research and development, DuPont involves itself in generating innovations and commercializing them, in addition to funding. Together with other powerhouses like AT&T (with Bell Labs) and GE, DuPont is constantly looking to innovate through various research and development initiatives

and the companies are considered as having cast the mould for a large number of research and development organizations [9].

Weigand uses the term '*collaboratory*' to describe openness and collaboration *i.e.* a laboratory devoid of physical walls and lacking borders [3]. No single organization or nation has the capability of single-handedly solving issues concerning food, energy and protection. Apart from making innovations, DuPont has invested heavily in sustainability. For instance, in the year 2011 alone, it launched in excess of 1,700 new products and invested twenty two percent of its $1.7 billion R&D budget on new chemistry and resources towards reducing reliance on fossil fuels. DuPont's 2011 patents filings directly reflected on its research and development investment in its innovative innovations. Underlying factors that contributed to the success were the collaborative efforts of scientists, marketing teams and expert patent team.

DuPont and PSP have undertaken to collaborate in innovation with external stakeholders so as to attain solutions in the most viable manner [10]. Its use of open innovation is hinged upon the notion that without sharing, it is impossible to multiply. The company believes that for better, quicker and cheaper multiplication, it is imperative for companies to open up more and engage in collaborations in research and development. The social media has opened up this avenue to them, just by the sheer numbers of users who frequent social sites.

4.2.Unilever's Open Innovation Model

Unilever introduced a new online platform that allows experts to assist the company in finding solutions to technical problems with the view of moving towards its objective of doubling its business size, while at the same time, recording a decline in its environmental

[3] Mr. Weigand oversees sustainability initiatives at Dupont [10]

impact [11]. The company has a long history of engaging in collaboration with its partners in development of products, but this was its debut in publicly sharing of research projects in open forums. Based on its efforts aimed at reducing the impacts of its operations on the environment, Unilever presents a list of challenges that experts should help it in addressing. For instance, the company requires technologies that can achieve its aim of bringing safe water to the poor sections of the world's population at less than one cent per liter [11]. The company also requires new active ingredients for their cleaning products that inactivate viruses. This should be done without the dependence on bleaches alcohols or strong acids. Unilever also lists technology that allows further reduction of the amount of sodium in food as one of its wants. Though, the reduction of sodium should not affect the products of the company's that taste 'great.'

Unilever boasts of strong research and development teams that are spread throughout the globe which consistently make innovation breakthroughs to help Unilever maintain its place at the head of the pack in product development and design. Since the company appreciates the brilliance of the minds of people who may not be part of their research and development teams, the company is always in the search for new ways to tap into those knowledge potentials by working with them. These people, as the company acknowledges, have fresh and serious approach to coming up with productive and new technology. In collaborating with other partners in open innovation, both parties are granted the freedom to perform business transactions in new and revitalizing ways; creating significant value in the process. It integrates the expertise and experience of the company in sustainable innovation with the fresh thinking and creativity of partners, helping to create new business models with potentials for furthering innovation ideas [11]. The successful open innovation model

envisioned by the company is viewed as being essential to achieving its ambition of doubling its business size, while at the same time, reducing the impact of its activities on the environment.

Social media as an accelerator for open innovation. The company also integrates the use of social media as an accelerator to help its open innovation process to be quick, better and cost effective in keeping it ahead in product development and design and, subsequently, double its business [11]. Unilever's *Wants* are opened up to a wider, global audience by the social media, which also helps it in faster gathering of ideas through tapping into niches and specialisms of partners and exchange and consolidation of ideas. The use of social media makes it cheaper since company is able to iteratively validate the process itself as well as shortening the marketing channel since collaborators will act as propagators for the co-created solutions.

Engagement. Long term engagement by Unilever in keeping people interested in its *Wants* is vital to the model's success in the long run [11]. It is also crucial in maintaining the platform's visibility and its existence, so as to be able to attract the required people to collaborate with.

Attract and seek. The social media offers a method for attracting the suitable people to their suitable challenges, due to its transparency. Another way is by ensuring the right people are actively sought and ensuring they are found. This has the implication of benefiting Unilever and its open innovation platform through outside-in attention and promotion, as well as inside-out discovery of partners to collaborate with.

Conclusion

Investment in open innovations through internal and external research and development is increasingly being used to draw the line between successful companies and those that are not. [9]. Companies that intensify open innovation activities are bound to be ahead of their

competitors in terms of product design and development and, subsequently, in market share and brand reputation. Integration of open innovation models with social media has led to rapid transformations in the world of research and development, particularly in the rate of innovations and patent filings. Innovation continues to become difficult by the day [8]. This requires organizations to consider being innovative in the area of innovation *i.e.* innovate *innovation*. But, in the quest to substantive innovation, social and environmental issues are altered, and thus, the need for processes that are sustainable to these aspects as in the cases of DuPont and Unilever, above. Companies are continuously seeking to improve their products' designs, as well as develop new ones and open innovation enables them to do so by tapping into and building on ideas and concepts presented by partners. The increased use of social media and the evolving technologies in the area has also made the process quicker, better and cheaper, and this helps companies in achieving their business goals. Integration of open innovation and social media could possibly contribute substantially to innovate *innovation*.

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How Crowdsourced Innovation Models Evolutionize Idea Creation

Introduction

The key challenge faced by organizations in the creation of sustainable competitive advantage is innovation of a business model. Findings from an IBM study in 2006 showed that around sixty percent of chief executive officers said that they would have to make adjustments in their businesses within a span of two years. When IBM carried out the same study in 2010, CEOs were still busy grappling with ways in which this could be well realized. This evolution was described as: "Previously, CEOs recognized the need for innovation of business models, but today they are working hard to find the right creative leadership to produce such an innovation. In the past, they said they needed to be closer to customers; today they need to go further and bring customers in their companies" (IBM, 2010).

The value of an organization is increasingly derived from its intellectual assets in the knowledge-based economy. Innovation is a paramount challenge of creating value through engagement of stakeholders in design activities in sustainable business models. Therefore the main question facing an organization's management is: **How to create business**

opportunities and value from knowledge that resides within individuals and organizations?

Another critical element of innovating a business model is it´s execution, i.e. the implementation and management of the new design. The execution of a business model involves the undivided attention and participation of a wide variety of stakeholders in implementing the plan and motivating all stakeholders.

In this paper the authors will look at how crowdsourced innovation models can evolutionize idea creation. This will be accomplished by defining crowdsourcing as a business term, a comparison between crowdsourcing and a traditional business model, and a holistic view on the crowdsourcing process.

Crowdsourcing in a business context

Crowdsourcing can be understood as the act of a company taking specific functions once performed by its employees and outsourcing it to an undefined (large) network of individuals in the form of an open call. The important prerequisite is the use of the open call format and the wide network of potential contributors (Howe, 2006). This idea has been actively discussed in the communication information technology sector as investigated by various scholars. Levy (1997) stated that the basis of crowdsourcing is usually the framework of collective intelligence. This is from the idea that knowledge is the most accurate when it contains contributions from a wide population. Surowiecki (2004) says that the concept of collective intelligence has been popularized as the wisdom of the crowds, and therefore defines crowdsourcing as an instrument for gathering collective intelligence for specific tasks.

Crowdsourcing is related to other ideas such as co-creation (Prahalad and Ramaswamy, 2000), user innovation (Von Hippel, 2002), and open innovation (Chesbrough, 2003). It involves the use of a large number of people in the information and technology sector to work as a unit in order to achieve a desired objective (Aitamurto, Leiponen & Tee, 2011).

Outsourcing is one of the forms of participatory social media. Other forms of participatory social media are open-source production, blogging, and sites sharing video and photos. Outsourcing is unique in the sense that it employs an organization participant relationship; where the company is involved in a top-down management process to seek a bottom-up, open contribution by users in an online community. "Crowdsourcing can be classified into four types namely peer vetted creative production, broadcast search, discovery of knowledge and management, and distributed human intelligence tasking as per Capitalizing on Complexity" (Global Chief Executive Study, 2010).

Crowdsourcing and Business Models

"A business model is the sum of how a company selects its customers, defines and differentiates its offerings (or feedback), defines the tasks it will execute itself and those to be out sourced, outlines its resources, goes to the market, creates utility for business customers and captures profits. It is a complete system for delivering utility to customers and earning a profit from that given activity" (Slywotzky, 1995).

The concept of a business model has become of great importance in the current competitive business environment. The preferred approach in the management of successful companies to cope with the dynamic business environment is the introduction of new business ideas and

concepts. The concept of business model can also be used as unit of strategic analysis focused on the current business environment that is relevant (Porter, 1980).

Therefore, a business model is a coherent framework for value creation to convert potential inputs trough customers and markets into economic output (Slywotzky, 1995). All business organizations are shaped by a specific business model whether explicitly considered or implicitly embodied in the act of innovation. Chesbrough (2002 pp.529-555) argues that firms need to understand the cognitive role of a business model, in order to commercialize technology in ways that will allow to capture value: “The two most important functions of a business model are creation of value and value capture”. Slywotzky (1995) argues that a business model stands for a conceptual tool that contains a set of elements and their relationships in form of a business design on “how a company selects customers, defines and differentiates its offerings, defines the tasks it will perform itself and those it will outsource, configures its resources, goes to market, creates utility for customers, and captures profit”. Firms use the term to describe a wide range of their formal and informal aspects, including its strategies, purposes, offerings, organizational structures, infrastructure, trading practices, processes and policies of operation (Mintzberg, Stragic Planning, 1990, Thompson, 2010).

A company’s success will always depend on an exceptional business model more than excellent operation, or products and services. Some of the most prominent and often cited objectives for investigation on business models include the following:

- ✓ to understand the key elements and mechanisms in a specific business domain, as well as their relationships (Osterwalder & Pigneur, 2002),

- ✓ to communicate and share the understanding of a business model among business or technology stakeholders (Gordijn & Akkermans, 2001b),
- ✓ to design the information and communication systems supporting the business model (Eriksson & Penker, 2000),
- ✓ to experiment with innovative business concepts in order to determine if current business models can easily adapt to them (Eriksson & Penker, 2000) and assess the viability of new business initiatives (Weill & Vitale, 2001),
- ✓ to change and improve the current business model (Eriksson & Penker, 2000; Osterwalder & Pigneur, 2002).

Across industries certain organizations have been consistent in producing sterling performance due to their superior business models. Examples of such organizations include Dell computers, Wal-Mart Stores, Google, South West Airlines, and Nucor Steel Company. As a prerequirement for a good business model the following will be put into consideration (Linder JC & Cantell, 2000; Magretta J, 2002):

- ✓ Identify what is needed in the market
- ✓ Consider the value of the proposed product
- ✓ Narrowing specific customer group to target group
- ✓ Structure of the cost
- ✓ Capture of value it creates in the chain
- ✓ Position and activities in the value chain
- ✓ Revenue generation
- ✓ Profit margins targeted

- ✓ Identifying a network of effects that can be utilized to deliver more value to customer
- ✓ Competitive strategy, which should include identification of competitors and complementors.

A reliable business model incorporates many principles including those of finance, economics, operations, entrepreneurship, marketing and strategy (Chesbrough, 2007).

Crowdsourcing and innovative modelling

Traditional R&D has been about getting a small number of brilliant people together developing a new product or solving a problem (Roussel, 1991). In crowdsourcing many people are used to conduct research to develop a new product or solve a problem. In the traditional method innovation was concerned with the prediction of future needs of the customers or market but in crowd sourcing organizations use the customers themselves to identify their needs and predict future markets. The crowdsourcing model is better compared to the traditional method since as the world is increasing in complexity and connectivity it is also proving harder to predict customer needs and market (Sydow, 2000, Ahlberg, 2010). The tests and preference of consumers change faster than before. In addition, new technologies occur at a faster rate causing much of the traditional R&D obsolete (Christensen, 1997/1999.) New organizational designs have emerged due to the growth of Internet and social media. These have allowed cooperation and communication between growing large groups of persons. The result of it all is that we have been brought closer to the idea of hive mind, which the traditional structures cannot match.

Traditional models offer a set of valuable concepts: customers and competitors (industry), the

offering (generic strategy), activities and organisation (the value chain), the resource-base (resources) and the source of resources and production inputs (factor markets and sourcing), as well as the process by which a business model evolves (in longitudinal processes affected by cognitive limitations and norms and values) (Mosakowski & McKelvey, 1997; Chatterjee, 1998). However complexity and technological development speed sets limitations for the organzational process to filter, select and respond accordingly.

The new crowdsourced innovation model

There are a number of new ideas in open innovation models. The first difference is that in traditional innovation external knowledge played a supplementary role. Innovation was focused within the organization Chesbrough (2002). In this closed innovation szenario, a company generates, develops and commercializes its own ideas. This philosophy of self-reliance dominated the R&D operations of many leading industrial corporations for most of the 20th century (West III & Meyer, 1997).

In the model of open innovation, firms commercialize external (as well as internal) ideas by deploying outside (as well as in-house) pathways to the market. Specifically, companies can commercialize internal ideas through channels outside of their current businesses in order to generate value for the organization (Sawhney, Prandelli & Verona, 2003; Wolpert, 2002).

Those who started the idea of including external knowledge were Bell Laboratories followed by several R&D laboratories that imitated the organization of Bell (Chesbrough, 2003). The question of the balance between external and internal innovation sources has not been fully addressed, even by the later theories of absorptive capacity. In open innovation, external

information is equally as important as internal knowledge, the main concern of the traditional method of innovation and R&D (Tidd, 2009).

Secondly, in open innovation paradigm there is centrality of the business model. In the traditional method little or no attention was given to the business model in planning for innovation. Instead the focus was on securing the best and most intelligent resources. This was done in the believe that this high class talent would be able to come up with the best innovation that could easily penetrate the market as long as funding for research was provided. In open innovation, organizations seek for bright people both within and outside to provide leadership in business modelling (Chesbrough, 2003). In turn crowdsourcing suggests that inventive output from within the organization is not bound to the current business model, but instead have a chance to go to the market through a number of channels.

Thirdly, open innovation differs from traditional innovation in a sense that the former assumed that there were no errors of measurements in the analysis of the research and design projects (Chesbrough, 2004). Analysis and evaluation is done in-line with the business model of the company. Once a R&D project was cancelled, it was final, and there was no any reason to lead to the notion that there was a systematic error that led to the abortion of the idea. Management of the innovation processes was mainly done to minimize the chances finding false positive errors (Cooper, 1992). The possibility of false negative error occurring was not in any way a concern. This means that firms lacked processes for managing false or negative R&D ideas. The business is treated as a cognitive device in open innovation. This cognitive device will always focus on analysis and evaluation of R&D projects inside the organization (Chesbrough & Rosenbloom, 2002). As cognitive tool, the business model will favour those

projects that fit in the business model only. This kind of method uses mostly subjective measures instead of relying on pure objectives and therefore permits biases. As firms struggle to cut down the probabilities of false positive occurring, the alert companies must also include additional techniques to manage false negatives. This enables them to extract the right value from them and identify new business models and markets from them.

The fourth difference is that traditional models gave little recognition to external shopping for knowledge and technology. A firm would only go out to seek for external knowledge in order to benefit internal R&D, manufacturing and sales. In open technology, allowing technologies to flow outward permits firms to let internal technologies that lack clear path to market seek such path outside the firm. In doing so, the internal businesses of the organization will then compete with these external paths to the market for new technologies. These external channels to market include ventures, licensing, and spin-offs that can create value. According to Bower (1970) these channels have to be managed as real options as opposed to the traditional approach of allocating budgets to projects using the net present value.

The fifth difference lies in the assumptions of the underlying knowledge of the environment. Traditional model did not acknowledge the importance of abundant knowledge. In the traditional model of innovation, critical knowledge is scarce and difficult to get, and dangerous to rely upon. Useful knowledge is widely distributed and of high quality in open innovation method. These external sources of knowledge are critical even to the most capable and sophisticated R&D firms. Merck (2000) annual report explains that although the organization is highly respected for it superb internal research: “Merck accounts for 1% of the biomedical research globally. To tap into the remaining 99%, we must actively reach out to

institutions of higher learning, research institutions, and companies globally to bring the best technology and potential products into Merck. The cascade of knowledge flowing from biotechnology and the unraveling of human genome-to name only two recent developments-is far too complex for any company to handle single handedly" (Merck 2000, Page 8). It is important to note that these external sources extent beyond institutions of higher learning and national laboratories to specialized small firms, retired technical staff, graduate students, startup companies, and individual inventors.

The new and proactive role for management of intellectual property (IP) right in the open innovation model is also an area of contrast. Though certain industrial firms find practice of IP to be hardly new, traditional models treated IP as a by-product of innovation and therefore the use of IP was defensive. This allowed firms to practice their internal technologies without being disturbed by the external IP. In open innovation IP becomes an important element of innovation, since there is regular flow of IP in- and outside the firm (Chesbrough, 2003). This can facilitate the use of markets to exchange valuable knowledge and to generate additional value to qualified stakeholders.

Lastly the most controversial area of contrast is the emergence of intermediaries in innovation markets. Initially intermediaries have dominated areas to do with technology but currently they play a direct role in innovation as a whole. The last distinguishing point in this discussion is that in open innovation there have been developments of new and varying metrics for assessing the performance of the innovation process in a firm (Lewrick, Peisl, Raeside, Omar, 2007).

While open innovation borrows greatly from the traditional model, it differs in distinctive areas and interpretations of the traditional model. In this judgment it is sufficient to warrant consideration as a new way of understanding innovation.

Conclusion

Close observation of current research show that the majority of business models are inward focused (Huizingh, 2010), and vertically integrated as discussed by Chandler (1990). Yet there is a clear understanding that organizations have to adapt to a new and yet not well-understood business model based on tapping on the mind of many. While the contours of open innovation are obscure it is clear that any in-depth understanding will need a new perspective that is focused externally. This will require involving actions of all stakeholders in a widely distributed innovation environment. Such a new model will require a close study of innovation activities in all dimensions (Peisl, Schmied 2009) of the organization from different levels. It is likely to follow an evolutionary path in existing organizations, but will also provide the basis for disruptive innovation in established or start-up organizations, the crowdsourced innovation business model.

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