Crowdsourcing: Using Open Modes of Collaboration for Product-Service System Innovation

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Abstract: Due to the current global challenges such as resource depletion and the economic crisis, and international societal mega-trends such as multi-internationalisation, society is in transition from conventional methods of production to relatively novel methods that strive to be competitive, satisfy customer needs and have a lower environmental impact. Product-Service System (PSS) is deemed a solid alternative towards this vision. To do that, we are in need of novel approaches to re-envision the current system. Therefore, innovation methods are the backbone of PSS. Since PSS highly emphasizes the customers' needs and co-creation with them, user-innovation methods are required in order to boost PSS Innovation. Among user-innovation methods, crowdsourcing seems a valid option that would enable us to attract a large, undefined network of people to the innovation process. In this research, a success model for crowdsourcing practice is proposed and validated by literature and expert interviews. As a follow-up, based on the success model, a strategic guideline for innovation using open modes of collaboration is proposed. Moreover, we discuss the implication of PSS and sustainability and how these concepts can be empowered by crowdsourcing.

Keywords: Product-Service System, Sustainability, Innovation, User Innovation, Crowdsourcing, Wisdom of Crowd
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Executive Summary

Introduction

Today society faces international mega-trends. The world’s population is exponentially increasing and we face one of the biggest challenges of our times which is providing resources for our near future. In regards to these highly concerning issues, product-service systems (PSS) can be considered as a possible alternative (Tukker and Tischner 2006). PSS mainly revolves around four pillars: value offering, sustainability, systems thinking, and innovation.

PSS can be considered a very good alternative in terms of future competitiveness since PSS have the potential to sustain the value in future through unique offering, novel strategies and combinations of products and services. As de-linking profit from physical artefact is one of the objectives of PSS, designers tend to deliver the same perceived value through smart offers that are the integration between products and services. This cannot be possible without understanding the true needs of customers, and realization of needs cannot happen without close interaction with customers. A designer cannot thrive on PSS design without understanding the essence of the problem and true needs of customers. This cannot be possible without using methods that involve users in the process of innovation. Therefore, innovation plays a very important role along this path. Innovation should be studied further to identify useful methods for designing PSS.

In this research, we are eager to study crowdsourcing, which has strong potential of attracting a large network of people to the innovation process relative to the other user-innovation methods. More so, we want to study how crowdsourcing can empower designers and developers to address properly the issues in the way of PSS design.

Research Methods

Based on Design Research Methodology (DRM) (Blessing and Chakrabarti 2009), Type 2, Comprehensive Study of the Existing Situation was chosen for this research. The main motive was because this area of knowledge is populated by buzz words, false statements and questionable assumptions.
Hereby regard to research limitations, to make the best contribution to the field, this research goal is to carefully identify the main factors related to success and failure of crowdsourcing practice. To do that, an exploratory research was chosen to clarify the topic. Doing an exploratory study on Xinmade, a crowdsourcing platform that is being developed by Xuefeng Bai, helped the research to reach to its research question, its hypothesis (initial success model) and scope. To answer the research question, in-depth literature review, a series of semi-structured interviews, and a survey were conducted.

Results

The results of this research are a success model for crowdsourcing practice. All influential elements that were found in the literature review, interviews, and survey are included in this model. The success model is the improved version of the initial model (Figure 10), is composed of 12 elements and the relation between them, and is described (Figure 11) in the results section.

Purpose of the practice
Crowdsourcing can be used for different purposes (Roth 2012). Depending on the purpose of practice, a certain group of people would be attracted to the cause (Shriky 2008). The outcomes of crowdsourcing can vary as the purpose changes.

Mode of Collaboration
Mode of collaboration is defined as set of modes for user participation which can vary in terms of governance and extent of participation. Each of them demands different dynamics and strategies. The expected outcomes of each are different from each other. These modes are used to define the boundaries of collaboration and extent of users’ participation.

User Engagement
Engagement of users is defined as regularity in users' participation in the practice, i.e. engagement of users occurs when users regularly contribute to the process since the matter of practice becomes important to them. User engagement is about developing strategies for engaging users in online project to “harvest” the contribution of participants by thriving on challenges.
**Strong Internal Department**
The role of the internal department in the crowdsourcing process is interpreting crowdsourced ideas and giving meaning to them. As Poetz (2012) describes, “The role of internal designers and developers is to take the final crowdsourced ideas to the next level and develop them.” Also, Schreier points out to the fact that “A good balance between internal and external resources depends on the product category.”

**Organic Design of the Platform**
An organic design would provide an environment that ideas are generated, boiled, and developed Roth (2012). It does not necessarily resonate with providing a variety of tools and options.

**Diversity of Users**
Diversity is defined as contextual differences in terms of background. Brabahm (2008) describes the diversity of identity and skills and political investment, which are the consequences of having a diverse crowd, and lead to a successful crowdsourcing practice.

**Informing Role of the Rules**
Each crowdsourcing platform acquires a set of rules and regulations to sustain the process and to thrive on the goal of practice. These rules are related to the dynamic of the platform and include elements such as the characteristics and degree of user participation.

**Transparency of Communication**
Transparency of communication can be defined as the transparency of and clarity in the communication between firm, platform, and participants. It is an important factor that can affect the outcome of the practice.

**Richness of Tasks**
Richness of tasks is defined as the engine of creativity. Some argue that creativity only occurs when the individual is compelled by the task (Amabile 1988; Ryan and Deci 2000). As a result, richness of tasks is very important design factor (Yoth 2012). It is important that the platform offers different tasks that would suit to different type of users.

**Clarity of Reputation System**
Reputation system is defined as a systemized structure within the crowdsourcing platform to build online representation for crowdsourcing
users. This would be done by recognizing the effort of users and the value that they bring into the practice. This recognition can be translated into stars, medals, scores, titles, etc. that can motivate users more effectively than other approaches such as monetary incentives.

**Reward System**
A reward system is one of the winning cards of crowdsourcing relative to other online collaboration methods. A reward system is defined as a systemized structure to reward the effort of users by offering monetary incentives. Since monetary incentives have more tangibility compared to intrinsic motivations such as recognition and reputation, they are often a more effective approach when it comes to certain types of crowdsourcing such as contest-based crowdsourcing where competition and winning are highly important to the users.

**Discussion**
In the discussion chapter, we discuss the implication of crowdsourcing for PSS design and sustainability. Then we discuss the pitfalls of relying solely on crowdsourcing. Next, we separately discuss the matter of user engagement to highlight the importance of it. After that, we discuss the elements of the success model more elaborately through proposing a strategic guideline for innovation using open modes of collaboration. The strategic guideline contains these steps:

- Step 1: Purpose of Crowdsourcing (Purpose)
- Step 2: Problem Definition (Define)
- Step 3: Selection of the Mode of Collaboration (Strategy)
- Step 4: How to Design an Engaging Crowdsourcing Practice (Design)
- Step 5: Strong Internal Department (Balance)
- Step 6: Measuring the Quality of the Outcome (Measure)

Consider that, this guideline is not a linear process, and to reach the desired outcome, one should consider a non-linear approach and they should go and back the process constantly. At the end, we discuss the limitation and strength of research.
Glossary

**Blueprinting**: A blueprint is usually a type of paper-based reproduction of a technical drawing, documenting an architecture or an engineering design (WIKIPEDIA 2012).

**Business to Business (B2B)**: These products and services are definite within the business settings and are usually traded between firms and companies. They are usually more sophisticated and technical than consumer products.

**Business to Consumer (B2C)**: It contains businesses that deliver products and services to consumers. The outcomes usually are related to everyday life of consumers.

**Cognitive Evaluation Theory (CET)**: It is a theory in Psychology that is aimed to describe the effects of external factors on internal motivation.

**Crowd-out effect**: It happens when extrinsic motivations undermine the intrinsic motivation which leads to disengagement and dissatisfaction with the practice.

**Customer Satisfaction**: It is the quality of and the value behind products and service VS customer expectation and how well customers’ expectation can be satisfied.

**Dematerialization**: Dematerialization is to delink economic growth from quantity of physical goods. In this way, we can maintain and offer the same value with reduction on physical quantity.

**Design-Thinking**: It is a style of thinking and is aimed to apply the design process and its reasoning process to ill-defined problems that might be within or outside the design arena.

**Ethnography**: It is a qualitative research method aimed to understand the cultural and societal issues within a certain regional boundary.

**Functional Result/Result oriented PSS**: It is a specific type of PSS which is the major output of the system revolves around the result, function that is
delivered through the product. One of the examples of this system is printing. One just wants the paper printed and does not care about photocopier or required ink.

**Gross Domestic Product (GDP):** It is defined as the total market value of all the register final products and services within a national boundary.

**Human-Centred Design:** It is a design philosophy. Here, the main concern is to put humans in the middle of all the design activities in order to incorporate human needs, wants, and characteristics into design.

**Innovation:** 1: the introduction of something new  
2: a new idea, method, or device: novelty (Merriam-Webster 2012)

**Life Cycle Cost Assessment (LCCA):** LCCA is a method aimed for assessing the total cost of products and involved processes and activities.

**Life Cycle Assessment (LCA):** LCA is a method aimed to understand environmental impacts of products and involved processes and activities through rigorous analysis of the system and all the actors within.

**Linux:** It is an open-source computer operating system.

**Manufacturing economy:** It is defined the economy that is based on producing physical products and the supporting infrastructure to pursues this goal.

**Mass customization:** It is the use of enough and demanded infrastructure to produce and develop customized outputs that can satisfy different preferences and desires.

**Mass production:** It is defined as the product of standardized products in large and unlimited quantity.

**Minimax dilemma:** This dilemma argues that “users try to do the least possible of the task for most possible of the reward” (Kruglanski et al. 1977; 141-148).
**New Product Development (NPD):** It is a term describing the full process of developing products from initial idea to introducing products to the market. The process contains of these phases:

- Idea Generation
- Idea Screening
- Concept Development and Testing
- Business Analysis
- Beta Testing and Market Testing
- Technical Implementation
- Commercialization
- New Product Pricing

**Open Innovation:** It is a concept that organizations should open up organizational boundaries in order to be exposed to outside ideas.

**Product-intense system:** It is a system that the majority of the output consists of tangible value which is delivered through different products to customers.

**Product Oriented PSS:** It is a specific type of PSS and the major output of the system revolves around the physical product.

**Product-Service Systems (PSS):** ‘A product service-system is a system of products, services, networks of “players” and supporting infrastructure that continuously strives to be competitive, satisfy customer needs and have a lower environmental impact than traditional business models’ (Goedkoop et al. 1999).

**Self-Determination Theory (SDT):** It is a theory of motivation. It is concerned with supporting our natural or intrinsic tendencies to behave in effective and healthy ways (Self-determination Theory 2012)

**Service Economy:** It is an economy in which different services play an important role. Currently, services dominate 70% of Gross Domestic Product (GDP) while manufacturing covers 20% of GDP (The service Economy 2000, 1).

**Service-intense system:** It is a system that the majority of the output consists of intangible value which is delivered through different services to customers.
**Sticky Innovation** Users usually describe the need through suggesting a solution. They do not only want their needs to be satisfied but also they want to participate in the process of developing the solution von Hippel (1994, 2005).

**Supporting Infrastructures:** Supporting infrastructures are those such as manufacturing and transportation that enable us to deliver final product and service.

**Sustainability:** 1: capable of being sustained
2
a : of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged <sustainable techniques> <sustainable agriculture>
b : of or relating to a lifestyle involving the use of sustainable methods <sustainable society> (Merriam-Webster 2012 )

**System:** It is a collection of elements including their relations.

**System Innovation:** This term corresponds with systems thinking. The rationale behind it is that applying systems thinking would lead to identify potential spots for innovation.

**Systems thinking:** it is the term that emphasizes considering all the actors and their relations to each other instead of focusing on individual factor.

**System Mapping:** It is a set of tools and methods to map the system and all the actors within and the relation of actors to each other.

**Use Oriented PSS:** It is a specific type of PSS and the major output of the system revolves around the usage of the product. One of the examples of this system is leasing products.

**User Innovation:** It means focusing on consumers and users for innovation purposes instead of professionals. The main reason is that it is the users and consumers that live with the products and not professionals.

**Uses and Gratifications theory (U&G):** It is a theory to explain that how individuals’ needs can influence how they interact with a medium.
**Value Offering:** It is a value that delivered to customers through products and services. The value is conceived by customers.

**Voice of Customer:** It is a term used in business environment and is one of the methods to interact with customers to hear their thoughts and expectation and their experiences with products and services.

**Web 2.0:** It is a new version of the World Wide Web which leads to change the internet users’ experience radically. Web 2.0, which is set as a network as platform, is designed for mass participation and involvement of online users (O’Reilly 2007).
# Table of Contents

Acknowledgements ........................................................................................................ iii  
**Executive Summary** ........................................................................................................ iv  
Glossary .......................................................................................................................... viii  
**Table of Contents** ........................................................................................................ xiii  
List of Figure and Tables .................................................................................................... xv  
1 **Introduction** ................................................................................................................. 1  
1.1 Product-Service System (PSS) ..................................................................................... 2  
1.1.1 PSS Structure ........................................................................................................... 4  
1.1.2 PSS and Value Offering ............................................................................................ 6  
1.1.3 PSS and Sustainability .............................................................................................. 6  
1.1.4 PSS and Innovation .................................................................................................... 7  
1.1.5 How to Design PSS ................................................................................................... 8  
1.2 Design Challenge .......................................................................................................... 9  
1.3 Crowdsourcing ............................................................................................................. 12  
1.4 Common ground between PSS and crowdsourcing ...................................................... 16  
1.5 The Potential of User Innovation .................................................................................. 17  
1.5.1 Crowdsourcing VS Open Source ............................................................................. 19  
1.6 Research Question ....................................................................................................... 20  
2 **Research Methods** ...................................................................................................... 21  
2.1 Type of Design Research .............................................................................................. 22  
2.2 Exploratory Research .................................................................................................... 22  
2.3 Exploratory Study: XinMade ......................................................................................... 22  
2.4 Hypothesis (Initial Model) .......................................................................................... 24  
2.5 In-Depth Literature Review ......................................................................................... 25  
2.6 Interviews .................................................................................................................... 26  
2.7 Survey .......................................................................................................................... 26  
2.8 Synthesis of data ......................................................................................................... 27  
3 **Results** ......................................................................................................................... 28  
3.1 Success Model .............................................................................................................. 28  
3.2 Purpose of the practice ............................................................................................... 28  
3.3 Mode of Collaboration ................................................................................................. 29  
3.4 User engagement .......................................................................................................... 30  
3.5 Strong Internal Department ......................................................................................... 31  
3.6 Organic Design of the Platform ................................................................................... 32  
3.7 Diversity of Users ........................................................................................................ 32
3.8 Informing Role of the Rules .......................................................... 33
3.9 Transparency of Communication ................................................. 33
3.10 Richness of Tasks ...................................................................... 34
3.11 Clarity of Reputation System ...................................................... 35
3.12 Reward System .......................................................................... 35

4 Discussion ....................................................................................... 37
4.1 Implication of PSS ....................................................................... 37
4.2 Implication of Sustainability .......................................................... 37
4.3 Considering the Pitfalls of relying solely on crowdsourcing ....... 38
4.4 User engagement .......................................................................... 39
4.5 Strategic Guideline for Innovation using open modes of collaboration .......................................................... 41
  4.5.1 Step 1: Purpose of Crowdsourcing (Purpose) ................. 42
  Step 2: Problem Definition (Define) ............................................. 43
  4.5.2 Step 3: Selection of the Mode of Collaboration (Strategy) 44
  4.5.3 Step 4: How to Design an Engaging Crowdsourcing Practice (Design) ......................................................... 46
  4.5.4 Step 5: Strong Internal Department (Balance) .............. 55
  4.5.5 Step 6: Measuring the Quality of the Outcome (Measure) 56

4.6 Strengths of Research .................................................................. 56
4.7 Limitation of Research ................................................................. 57

5 Conclusion ........................................................................................ 58

References .......................................................................................... 60

6 Appendices ....................................................................................... 70
6.1 The Definition of Crowd, And Their Motivation ......................... 70
6.2 Summary of Interview Results ...................................................... 72
6.3 Interview Results (complete) ....................................................... 78
  6.3.1 Interview Poster ................................................................... 78
  6.3.2 Interview with Kara Maki .................................................... 79
  6.3.3 Interview with Bernardo A. Huberman .............................. 79
  6.3.4 Interview with Yannin Roth ............................................... 80
  6.3.5 Interview with Daren Brabahm ......................................... 82
  6.3.6 Interview with Dan Dixon .................................................. 84
  6.3.7 Interview with Alexander Vossen ..................................... 85
  6.3.8 Interview with Martin Schreier ......................................... 86
  6.3.9 Interview with Frank Piller ............................................... 88
  6.3.10 Interview with Marion Poets .......................................... 89

6.4 Survey ............................................................................................ 92
## List of Figure and Tables

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>PSS structure</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>Subcategories of PSS</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>The evolution of Product and Service Systems</td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>Systematic approaches to face consumption challenge</td>
<td>7</td>
</tr>
<tr>
<td>5.</td>
<td>What is crowdsourcing?</td>
<td>13</td>
</tr>
<tr>
<td>6.</td>
<td>Types of Crowdsourcing</td>
<td>14</td>
</tr>
<tr>
<td>7.</td>
<td>The percentage of online users</td>
<td>18</td>
</tr>
<tr>
<td>8.</td>
<td>Research Methods</td>
<td>21</td>
</tr>
<tr>
<td>9.</td>
<td>XinMade.com Main Process</td>
<td>23</td>
</tr>
<tr>
<td>10.</td>
<td>Initial Hypothesis (model)</td>
<td>25</td>
</tr>
<tr>
<td>11.</td>
<td>The success model</td>
<td>28</td>
</tr>
<tr>
<td>12.</td>
<td>Modes of Collaboration</td>
<td>30</td>
</tr>
<tr>
<td>13.</td>
<td>Tasks for each different types of users in terms of motivation</td>
<td>35</td>
</tr>
<tr>
<td>14.</td>
<td>Synthesis of the success model with the guideline</td>
<td>42</td>
</tr>
<tr>
<td>15.</td>
<td>Different Purposes for Crowdsourcing</td>
<td>42</td>
</tr>
<tr>
<td>16.</td>
<td>Füller's Proposed Impact of Personal Characteristics on Consumers' Motives</td>
<td>48</td>
</tr>
<tr>
<td>17.</td>
<td>Social media environment</td>
<td>49</td>
</tr>
<tr>
<td>18.</td>
<td>Applicability to Stage of New Product Development Process</td>
<td>50</td>
</tr>
<tr>
<td>19.</td>
<td>Managing the crowd</td>
<td>51</td>
</tr>
</tbody>
</table>
1 Introduction

The 21st century's businesses are different from 20th century's businesses. One could claim that we are in a transition phase to shift from hyper consumption to collaborative consumption (Rachel Botsman 2010), from a product-based economy to a service-based economy which values function, and customer’s enlightenment as the final end of an economic process. There are mainly four reasons put as the causes of this transition: sustainability issues such as climate change and resource depletion, economic crisis and changing the ownership model, population and urban density and Technology (Gansky 2010).

The service elements of the economy of developed countries expanded rapidly in past few years. Based on The Service Economy report in 2002, services contain a large portion of the western economy. Services dominate 70% of Gross Domestic Product (GDP) while manufacturing covers 20% of GDP (The service Economy 2000, 1). One can say that change has been happening in conventional methods of production. We are observing a shift from a manufacturing economy to a service economy, from mass production to mass customization (Cook, Bhamra, Lemon 2006; Cooper and Evans 200; Mont 1999).

However this shift did not happen out of nowhere. Today’s world faces international societal mega-trends, such as multi-specialisation and multi-internationalisation, smaller and double-income families (Tukker and Tischner 2006). Doubling the world's population in the next 40-50 years and rising in the level of consumption by the wealthy people would require an increase in food production, increase in energy use and growth in income (Mont 2001). As a result, sustainable consumption and production is on the global agenda (Mont 2001; Tukker and Tischner 2006; Weizsacker and Lovins 1997). Weizsacker and Lovins (1997) argue that dematerialization, de-linking economic growth from environmental pressure, should be put forward on the global agenda.

Regarding these highly concerning issues related to sustainability and current condition of world economy, product-service systems (PSS) can be deemed as the solution to current challenges (Tukker and Tischner 2006). Goedkoop et al. gave the first formal definition of the product-service systems. They defined it as “A product service-system is the system of products, services, networks of “players” and supporting infrastructure that
continuously strives to be competitive, satisfy customer needs and have a lower environmental impact than traditional business models’ (Goedkoop et al. 1999). This would shift the focus from merely producing to fulfilling customer needs. In another words, dematerialization would shift the production mindset from physical products to product’s functionality and the value behind products.

However this mindset towards production requires innovative approaches for rethinking and revaluing our current system of product development and consequently shifting from conventional approaches to more novel approaches such as PSS. As a result, one can claim that innovation is the backbone of product-service systems. As a result, in this thesis, we are curious to study a specific type of user innovation, crowdsourcing, and how it influences the outcome of product-service systems.

1.1 Product-Service System (PSS)

There are many definitions proposed for this concept by different scholars (Goedkoop et al. 1999; Center for Sustainable Design 2001; Mont 2001; Manzini and Vezolli 2003; Brandsotter 2003; Wong 2004; Elima 2005). Each definition emphasizes on different aspect of PSS and brings different issues to the light: some focus on business benefits and competitiveness, some highlight the sustainability potential of PSS, and some focus on customer satisfaction and value offering.

However, one thing in common is that PSS have the potential to lead the businesses to the sustainability path while maintaining competitiveness. It is still to be argued whether PSS can be the ultimate solution to sustainability but none denies the fact that it can be a good start towards this goal (Tukker and Tischner 2006).
As it is shown in figure 1, PSS mainly revolve around four pillars: value offering, sustainability, systems thinking, and innovation. PSS are designed to move towards sustainability. This would not happen without analysing the whole system and identifying threats and opportunities. Since de-linking profit from physical artefact is one of the objectives of PSS, designers tend to deliver the same perceived value through smart offers that are the integration between products and services. Therefore, innovation plays a very important role along this path. Innovation should be studied further to identify useful methods for designing PSS.

Tukker (2004) breaks down PSS into eight types. In the Figure 2 that is captured from Tukker’s work on 2004, you can see that PSS vary from product-intense system (tangible offer) to service-intense system (intangible offer). In this spectrum, there three main types of PSS: Product Oriented, Use Oriented, and Result oriented PSS.

Product oriented PSS are related to those offers that are relying on physical products such those that have after-purchase services. Use oriented PSS are regard to those systems that offer the use of the products. Customers have
no ownership of products and the only issue that concerns them is to use the product. The vivid examples would be car renting, leasing and sharing.

Figure 2. Subcategories of PSS

Result oriented PSS deal with those systems that offer the function that one can expect from associated products. A good example would be the companies that provide all the facilities (from providing the product to offering the maintenance) as the final offer instead of selling merely the printer.

1.1.1 PSS Structure

As it can be seen, figure 3 (Baines et al. 2007, 4) describes the evolution of product-service system concept.
Morelli (2006) describes the servitization of products and productization of services as the shift from traditional methods that product(s) is inseparable from service(s). It means service(s) is becoming the inseparable part of the product(s) as the final offer and product(s) is becoming the inseparable part of service(s) as the final offer. As Mont (2001) discusses that PSS give competitive advantages to providers since product oriented company can come up with a unique offer that is combined product and service. Also, service oriented company can differentiate themselves from competitors by adding a tangible part to their final offer.

As Baines et al captured from Goedkoop et al, the key elements of a PSS are:

Product: a tangible commodity manufactured to be sold. It is capable of ‘falling on your toes’ and of fulfilling a user’s needs.
Service: an activity (work) done for others with an economic value and often done on a commercial basis.
System: a collection of elements including their relations.

The system is contained of the supporting infrastructures that enable to deliver final product and service. The supporting infrastructures include all the actors in supply chain from suppliers to production line and maintenance services, etc. The reason that system explicitly is counted as part of the key elements is the importance of systems thinking and system design in this concept. PSS should provide infrastructure that enable
providers to deliver both the tangibility of products and the intangibility of services.

### 1.1.2 PSS and Value Offering

Although there are differences in PSS definition, all agree with the fact that PSS are designed to reach the novelty in value offering (Tukker 2004; Tukker and Tischner 2006 [b]). This cannot possible without understanding the true needs of customers, and the realization of needs cannot happen without close interaction with customers. As Tukker and Tischner put it well, ‘Product-service systems (PSS) are a specific type of value proposition that a business (network) offers to (or co-produces with) its clients’ (Tukker and Tischner 2006, 1).

PSS potentially lead to more customer interaction and loyalty, and PSS can contribute to customer satisfaction through a unique final offer. Baines et al. (2007, 5) describes it as “A PSS is a special case in servitization, which values asset performance or utilization rather than ownership, and achieves differentiation through the integration of product and services that provide value in use to the customer.”

Finally, PSS can be considered a very good alternative in terms of future competitiveness since PSS have the potential to sustain the value in future through unique offering, novel strategies and combination of products and services.

### 1.1.3 PSS and Sustainability

Some scholars such as Manzini et al. (2003) defined sustainability as the ultimate goal of PSS. However this claim might not be true in all the cases. Some scholars deny this argue and some of them such as Tukker and Tischner (2006, 2) claims that ‘PSS equals sustainability is just a myth.’ Among different types of PSS, Tukker (2004) discusses that functional result is the only type of PSS that has the actual environmental reduction impact and has the genuine sustainability characteristics. In this study, he states that Product leasing might have the worst environmental impacts. However, it is still a matter of discussion whether PSS is the solution towards sustainability or other methods should be considered for this matter.
Having said that, none of scholars deny the fact that PSS contributes to less environmental impacts of products and services since it aims for:

- Dematerialization, which is to break the link between value delivered to the customer/user and the amount of physical material needed to create that value (Baines et al. 2007, 4)
- Sale of use instead of sale of products
- Shifting all the maintenance cost to provider

And also,

- Closing the loop of material and energy flow through designing take-back model which enables recycling, upgrading and re-using the product

1.1.4 PSS and Innovation

PSS are genuinely designed for competitiveness and novelty (Goedkoop et al. 1999; Mont 2001; Manzini and Vezolli 2003). Therefore the matter of innovation plays an important role in PSS design. Also as it is already described, since PSS were initiated with regard to sustainable production and consumption, the main potential for innovation are the opportunities related to behavioural change and system-level innovation (Williams 2007). In terms of behavioural change, Kang and Wimmer (2008) break down systematic approaches to face consumption challenges.

![Figure 4. Systematic approaches to face consumption challenge](image)

These five opportunities that are shown in figure 4 can sum up the innovation potential regard to sustainable consumption. Because PSS genuinely are aimed to produce less quantity of products, the desire to
consume should be regularly compensated with customized solutions and high quality offers that are designed for emotional satisfaction. Moreover, alternative use scenarios can be conceived and designed in order to be able to offer customized solutions. Also, one of the important issues that comes with PSS innovation is the evidence of high-order learning among stakeholder (Williams 2007) that can lead to better interaction and communication of the actors within system. High interaction genuinely leads to a learning environment that both providers and users/customers can improve their actions and decisions.

In terms of system innovation, Authors such as Mont (2001), Tukker and Tischner (2006) and Williams (2008) stated the potential for system innovation is tied down in the whole value chain. One of the approaches to identify system-level potential for innovation is by applying a rigorous system mapping, life-cycle-assessment and life-cost assessment to identify the spots with high potential for innovation. As a consequence, innovative solutions for those high potential areas would lead to changes in infrastructure and institutional practice; changes in product design, manufacture and end-of-life management (Williams 2007).

Product-service systems are designed for high interaction with users. A designer cannot thrive on PSS design without understanding the essence of the problem and true needs of customers. This cannot be possible without employing methods that involve users in the process of innovation. Therefore, user-innovation methods are deemed as powerful, complementary methods for boosting PSS innovation.

1.1.5 How to Design PSS

There are several guidelines proposed for designing PSS (Tukker and Tischner 2006; Halen, Vezzoli and Wimmer 2005; Morelli 2006). All of them mention the fact that systems thinking should be incorporated into design process. Moreover, since one PSS goal is to address the specific need of customers, understanding customer requirements plays an important role in the process of PSS design. Considering customers’ needs into the design would lead to reduce the risk of developing wrong products for wrong targets of people that happens often in New Product Development (NPD) process (Goldenberg, Lehmann, and Mazursky 2001).

PSS design almost follows the NPD process, which starts from idea generation to commercialisation of the idea. However, during the process,
there are main difference between PSS development process and New Product Development process such as highly incorporating customers in understanding need and concept generation, Implementing Life Cycle Assessment and Life Cost Assessment, System Mapping, Envisioning PSS: Scenarios and Use Cases, Representing the structure of PSS using different techniques such as blueprinting. Also, PSS hires similar methods that are being used in service design for understanding the needs such as ethnography, social studies and also other design-oriented methods such as Human-Centred Design and Design-Thinking.

The significant difference between PSS design and product design using NPD is that a PSS designer cannot conceive the exact configuration of the final offer, which could be a combination of products and services, as a product designer can. This is mainly because PSS involve interacting with customers through different service offerings. The characteristics and form of any emotional value delivered by services cannot be conceived and prescribed fully unless it happens in reality. Therefore, PSS design is an on-going process that changes over time due to customer and infrastructural requirements.

1.2 Design Challenge

Innovation-wise, firms used to be firm-centric. Meaning that, they rely solely on their internal competencies (Chandler 1977). Role of the customers were passive and they were used if they were needed. Firms were used to employ approaches such as customer voice and focus groups for getting feedbacks. The directions of interactions in these very methods are often one way. It usually happened when Firms were curious to find a solution to a challenge so they asked customers in order to find out the answer. Also, the intensity of interaction between firms and customers were dependent on and defined based on the need. Firms were used to be interested in individual knowledge and averaging all the individual knowledge to reach to a general solution. All was done though direct interaction with current customers using methods such as voice of customer (Sawhney, Verona and Prandelli 2005). However, studies show that ‘newly launched products suffer from notoriously high failure rates, often reaching 50% or greater. The main culprit has been a faulty understanding of customer needs.’ (Ogawa and Piller 2006, 1) This means that new products fail not because of technical shortcomings but lack of proper methods for understanding the problem and customer needs. Therefore, these products
have no markets at all and they address the wrong problem. It has been discussed that the most important phase of new product development process is to understand the needs and product requirements in the best way possible (Ogawa and Piller 2006).

Due to these challenges, Scholars proposed different approaches. Two major streams of research concerning this fact are research of von Hippel (von Hippel 1976, 1988, 2005) that emphasized the role of user innovation and how valuable innovation can be delivered by users. The other stream of research is research of Chesbrough’s (Chesbrough 2003, 2006), which highlights the role of open innovation for companies. Open innovation is the effort to open up organization boundaries in order that an organization will be exposed to outside experiences and ideas (Bogers and West 2012). It is an effort to let the organization expose to outside ideas at the same time generate in-house ideas. The argument behind is that usually good ideas are not developed inside organization boundaries and exist outside where users and customers are actually exposed to the products and services (Chesbrough 2003).

Open innovation and user innovation methods have some advantages compared to the traditional perspective of customer engagement. In such methods, the story is completely different. That is, firms, which use these methods, have become more dependent on customer in terms of innovation and idea generation. The role of the customers becomes active and they consider themselves as an active member of the innovation process. Therefore, we can expect a two-way interaction between customers and firms that is continuous and on going. Firms become keener on social and experiential knowledge instead of individual knowledge (Sawhney, Verona and Prandelli 2005). Moreover, Kozinets (1999) argues that online environments improve the firm’s ability to dig into the social aspect of customer knowledge and experience by providing a virtual environment that allows interaction and communication with users. This notion has risen since meaning and need characteristics are relative and are defined based on social interaction and in dialogue with others.

The other advantage of these respected methods is that users and producers tend to perceive differently. As von Hippel (1994, 2005) argues that Product developers need two types of information in order to succeed at their work: need and context-of-use information (generated by users) and generic solution information (usually it is the job of the producers to
generate specialized solution that is technologically sound). He points out the term ‘sticky innovation’ (von Hippel 1994, 2005). He further argues that users usually describe the need through suggesting a solution. They do not only want their needs to be satisfied but also they want to participate in the process of developing the solution for the need.

Furthermore, von Hippel argues that why it should be considered mapping internet-base collaboration mechanisms into NPD process. Since in the NPD process, to develop new products, there is a need to identify real needs. Conventional methods based on several reasons already pointed out earlier, are unable to fully deliver the true needs of customers. Sawhney, Verona and Prandelli (2005) argue that ‘Internet-based collaboration mechanisms can be mapped to the NPD process.’ They discuss that based on two dimensions—the nature of customer involvement that is needed, and the stage of the NPD process at which the customer involvement is desired, that open and user innovation methods can be mapped into our NPD process.

Furthermore, in terms of user innovation, research has shown that most radical innovations that lead to novel products have been performed by users—both user firms and individual users (Baldwin 2006). It was realized that 80 percent of the most significant scientific instrument innovations were developed by users (von Hippel 1988). Shah (2000) discovered that most successful products with high commercialisation potential in four sporting fields were done by users. Studies in five types of industrial products showed that between 19% and 36% of users are used to develop or modify products for their own personal purposes (Urban and von Hippel 1988). Also, across industries, about a quarter of innovation opportunities tend to come from interactions with customers and new customer requirements (Terwiesch and Ulrich 2009).

In addition, there have been studies (Tseng and Piller 2003; Piller and Walcher 2006; Reichwald and Piller 2006) arguing that integrating customers in the value creation process, in which they could take part in both innovation value-creating activities and operational activities, can be an effective strategy.

As Maue (2004) puts it well “The old-fashioned notion of an individual with a dream of perfection is being replaced by distributed problem solving and team-based multi-disciplinary practice. The reality for advanced design
today is dominated by three ideas: distributed, plural, collaborative.” (Maue 2004, 17) What we observe is the shift in paradigm, from conventional ways of ideation and design practices to an open, distributed, connected and beyond organizational boundaries practices. Nowadays, a multi-disciplinary team that is culturally diverse and rich is the core base of each design team. User-centred design is the core value of each design.

Enough said, all implies the idea of outsourcing activities such as need-finding, idea generation and concept generation, that were used to be seen as the domain of the firm, to those who actually can deliver them in the best way possible e.g. customers and lead users. Hereby, the scope of the thesis is set to explore the opportunities that user-innovation methods can bring to the process of product-service system innovation. More specifically, we are eager to study crowdsourcing, which has the most potential of attracting a large network of people to the innovation process among all the other user-innovation methods. More so, we want to study how crowdsourcing can empower designers and developers to address properly the issues in the way of PSS design.

1.3 Crowdsourcing

Jeff Howe in Wired Magazine described the phenomenon of crowdsourcing and potential of the crowd as ‘everyday people using their spare cycles to create content, solve problems, and even do corporate R&D (on the web)’ (Howe 2006). Jeff Howe and Mark Robinson, who coined the term ‘Crowdsourcing,’ introduced the crowdsourcing as a web-based business model and they defined it:

*Simply defined, crowdsourcing represents the act of a company or it to an undefined (and generally large) network of people in the form of an open call. This can take the form of peer-production (when the 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. Howe (2006:5)*

It is good to point out that this definition might imply that crowdsourcing follows a top-down pattern in which a firm proposes a problem and the crowd seeks answers. However, crowdsourcing process can also follow a bottom-up pattern where crowd initiates a concept. Platforms such as
quirky.com, which is a social product development company, the product ideas come in, their community works on them, and then they sell it, are genuinely following a bottom-up process where users are the ones who submit ideas but platforms such as Innocentive.com, which they solve important problems proposed by firms, genuinely follow a top-down process where they are dependent to firms’ open calls. Hereby, this definition overlooks a range of platforms that are successful and they use crowdsourcing. In this thesis, we would like to rely on Yoth’s (2012) definition of crowdsourcing, which is:

_Crowdsourcing is a variation of top-down and bottom-up models. It is a blend of both top-down process and bottom-up process._

![Figure 5. What is crowdsourcing?](image)

Moreover, different firms that were early adaptors of this approach, such as Dell, Threadless, Starbucks, Adidas, BBC, BMW, Ducati, and Muji initiated crowdsourcing as one of the drivers of innovation or improvement. Some see crowdsourcing appealing to firms since it is an approach to potentially obtain a large number of novel and commercial ideas, at relatively low costs from such initiatives (Huang, Vir Singh, Srinivasan 2011). Threadless.com is a good example. Having more than 120,000 members has made Threadless a strong actor in its respected field, clothing. Threadless develops each week a few products that have a good market. All is possible because there is a large crowd who submit ideas, a large crowd who improve the idea and a large crowd who buy the final products. (Ogawa, Susum Piller, Frank T 2006)
According to Crowdsourcing.org, as it is shown in figure 6, there are 6 types of crowdsourcing: Crowdfunding (22% of sites), Crowd labour (8% of sites), Crowd innovation (10% of sites), Distributed knowledge (37% of sites), Crowd Creativity (14% of sites), Tools (9% of sites).

**Figure 6. Types of Crowdsourcing**

A good example for Crowdfunding would be Kickstarter.com. Crowdfunding means raising money from a large, undefined network of people instead of soliciting large amount of money from a small group of investors. (Belleflamme, Lambert, and Schwienbacher 2011) In this way there is no limitation in terms of payment. You can contribute any amount of money you wish. The owner of project should compensate your effort in a decent way whether with the product (if it is the outcome of the crowdfunded project) or with a sort of gratitude.

Crowd Labour is to use a large crowd on the internet for tasks and jobs that demand a massive collaboration. The famous example is Amazon Mechanical Turk (Mturk.com).

Crowd innovation is related to those projects that firms through an open call ask a crowd about an issue, challenge. This kind of platform endeavours to tap into a large crowd to get them to innovate. Innoecentive.com Leverages open innovation and crowdsourcing to help organization to solve their challenges.

Distributed knowledge platforms aim to distribute and aggregate knowledge through massive collaboration of users and pooling information. Wikipedia and Yahoo Answer are very good examples of this context.
Crowd creativity platforms aim to tap into crowd creativity and use their creativity for design and artistic goals. eYeka, 99designs.com and istockphoto.com are good examples.

In terms of tools, there are platforms that develop tools that run under the idea of crowdsourcing. Ushahidi, which is a crisis-mapping tool, is run by a crowd. This tool is essentially obsolete without the crowd. It is designed to map the crisis through collaboration among the crowd. Therefore, tools such as Ushahidi are highly dependent on large crowd of people.

Generally two kinds of strategy can be used for crowdsourcing practice: selective approach or integrative approach (Erkinheimo and Harjanne 2011, 3). In integrative approach, the strategy is to pool broad numbers of information and data from a large, undefined network of people. In selective crowdsourcing, the strategy is to tackle a specific issue that needs a defined group of people with specific skills. This might happen usually in the form of an idea contest or other types of open innovation.

Crowdsourcing is not suitable for every kind of task. Based on the interview with Yannin Roth (2012), Tasks can be generally categorized into three parts, simple tasks, complex tasks and creative tasks. Simple tasks are like the tasks that are asked in Amazon Mechanical Turk (Mturk.com) or sharing in Twitter. Complex tasks are those that are asked in platforms such as Innocentive.com that a group of scientists thrives on complex problems that are proposed by the third party. Creative tasks are those tasks that lead to a creative outcome such as designing T-shirt on Threadless or making video for an ad. Quirky.com and eYeka.com are good examples.

Crowdsourcing platforms are getting more attention from academia and firms simultaneously since they have changed the definition of work and formal tasks. By integrating fun and work, crowdsourcing platforms become a potential option for innovation. Brabham (2008) argues “Crowdsourcing communities are new hybrid hobby/work spaces where real money can be made. Friendship and other social networking features are secondary to individual fulfilment and profit in the crowdsourcing context”. Johann Füller puts it well: "Crowdsourcing novelty is about consumers are not only asked about their opinions, desires, and needs, but also are asked to contribute their creativity and problem-solving skills. Consumers take on the role of co-creators” (Johann Füller 2010, 98) Raymond (1999) claims that we are in the era of ‘gift culture’ in which
participant competition is for recognition, attention and prestige by devoting time, energy and creativity.

Apart from that crowdsourcing combines hobby and work and it makes challenging tasks fun and entertaining, the essence and quality of communication, intensity of interaction and the number of users are changed in the crowdsourcing medium which is not comparable to previous methods. As Sawhney, Verona and Prandelli (2005, 3) describes it perfectly, “The extended reach, enhanced interactivity, greater persistence, increased speed, and higher flexibility of virtual environments combine to produce three key benefits for collaborative innovation with customers: (a) the direction of communication; (b) the intensity and richness of the interaction; and (c) the size and scope of the audience”

1.4 Common ground between PSS and crowdsourcing

PSS is a business model that is designed for novelty, competitiveness and dematerialization. It endeavours to reduce the physical capital that is being used in a product and to substitute it by increasing the customer satisfaction through unique offering system that is the integration of products and services. To do that, PSS focuses on the approaches that connect providers to consumers. It focuses on the ways that interaction happens with consumers. In other words, it highlights the role of consumer in the development of products and services. PSS focuses more on the early stages of new product development process. The reason is that without identifying the real needs of consumers, reaching a unique set of offers in which products and services are jointly offered, is far optimistic. Therefore, a PSS designer looks for new tools and methods either inside or outside of NPD realm that can address the customer needs in the best way possible. As the result, a PSS designer looks for tools in design realm as well as innovation realm. They also consider issues related to social and psychological study.

One of the useful approaches for this purpose is the concept of user innovation. This concept aims to open-up organizational boundaries and to bring in users, either individuals or firms. This would help firms to get a broader set of insights into the problem, which helps to develop better products or services. Since PSS’s focus is on the early stages of innovation and production process, which is identifying users’ needs and problems,
user-innovation methods especially crowdsourcing seem to be a good match to PSS’s purposes. Crowdsourcing is a method that has the most potential to attract a large, undefined network of users to the development process among all other user-innovation methods. A PSS designer can reach a better design by using crowdsourcing. Crowdsourcing objective is to exploit the power of the online crowd for different purposes. Meaning that, if a company is weak in identifying user needs and their products cannot address the users’ needs properly, they can incorporate crowdsourcing into their design and innovation process.

1.5 The Potential of User Innovation

Not to mention that, user-innovation applications would not be conceived and considered as the important driver for innovation without the possibilities that internet and online applications open up for us. Based on InternetWorldStats till December 31, 2011, there are near 3 billion people using the internet while there are nearly 7 billion people living in the world, which means almost 32% of the world population using internet. Also, Statistics show that between 2000 and 2011, there was 528.1% growth in internet users. Based on The Harris Poll on December 23, 2009, American average users spend 13 hours a week online. This exponential growth of the usage of internet across the developed world has been mainly because of the development of web 2.0 technologies (Zhou 2010). The Internet removes the spatial and time barriers. People from most parts of the world could go online and participate in multiple activities. When distributed innovation discusses the idea of having diverse users that can participate in idea generation, it would not possible without using the internet, and web applications.
It would be interesting to know that when we talk about online users, we talk about almost 32% of world population (figure 7). Imagine that with providing proper online tools, what this large amount of people would be able to do. Online users are capable of performing in all the stages of the innovation process through sharing, collaboration and collective action.

Moreover, with the advent of web 2.0, which is a new version of the World Wide Web, internet users’ experience has changed radically. Web 2.0, which is set as a network as platform, associated with all the web 2.0 applications (O’Reilly 2007). Web 2.0 harnesses cognitive intelligence of internet users and allows them to participate in the content generating process. It contributes to the liberation of the internet, which means enabling users to participate in what is happening. Web 2.0 allows for user-centred design and collaboration throughout the web (O’Reilly 2007). All is possible through “architecture for participation.” As Brabham (2008) describes it” The Internet — specifically given the recent Web 2.0 trend toward massive user-generated online content — is the vehicle for distributed, mass, pleasurable production.” Moreover, Afuha (2003) argues that the Internet is an open, cost-effective and ubiquitous network which companies can use that to tap into the network of consumers to create value for them. To sum it up, main features that are enabled by web 2.0 are information sharing through participation, user-centred design, and collaboration through whole network (O’Reilly 2007). To add to that, Clay Shirky (2006) in "Here Comes Everybody" discusses that online users in online groups that are empowered by web 2.0 and online applications, are mainly capable of sharing, collaborating and undertaking collective action.
The vivid examples for Web 2.0 would be social networks such as Facebook, sharing platform such as Twitter, collaborative platforms such as Wikipedia and collective action activities such as flash mobs. One of the most extreme and most frequently cited examples of user innovation is open-source software (Lerner and Tirole, 2002, 2005). Open source software is considered the application of the distributed processes and user innovation approaches (Bogers and West 2012). Interestingly, these applications are impossible to implement without using internet and Web 2.0 applications. They rely on the power of the online crowd. An obvious example of open source software is Linux. This is why that many both from academia and business have been trying to come up with an innovation toolkit for online users. Toolkits for the user innovation are another attempt to reduce the role of R&D departments and outsource those activities that are out of the knowledge of R&D and marketing research department. As Ebner, Leimeister, and Krcmar (2009, 2) puts it well “Toolkits for user innovation are an emerging alternative approach in which manufacturers reduce their attempts to understand user needs in favour of transferring need-related aspects of product and service development to users themselves.”

All in all it shows that online users are not just passive users. They share, collaborate and perform collective actions. This notion has been conceived to an extent that some prefer to use “Working Consumers” for online users rather than just consumers or users (Kleemann, Voß and Rieder 2008). Andresson (2004, 3) mentions ‘it blurs boundaries between consumption and production creating a new consumer type: the “working consumer” The proactive nature of “working consumers” and their direct involvement in the production and innovation processes give new meaning to the “long tail” effect.’

All in all, it shows the potential of crowd to be used for innovation purposes. This section was brought up to explain why crowdsourcing can attract a large network of people and how it can get them to participate in innovation process of product-service system innovation.

1.5.1 Crowdsourcing VS Open Source

Although both crowdsourcing and open-source practices use power of the crowd to pursue their goals, there is difference between them. Open source practice usually works for developing software or anything that does not demand any considerable overhead cost (Brabahm 2008). Also, open source
practice allows fully access to essential information of the design stage for the purpose of collaboratively improving which might not be appealing to businesses and acceptable in the business arena. Developers usually participate in an open source practice mainly because of self-interest while the monetary incentive is one of main part of the crowdsourcing model (Brabahm 2008). Contrary to open source, crowdsourcing users cannot benefit from their innovation right away (Johann Füller). As Brabahm (2008,82) puts it well “Crowdsourcing overcomes these limitations by providing a clear format for compensating contributors, a hybrid model that blends the transparent and democratizing elements of open source into a feasible model for doing profitable business, all facilitated through the web.” Crowdsourcing can attract a larger amount of people since it has a clear incentive model. Moreover, not everybody knows about coding and programming, that is why crowdsourcing by offering a variety of tasks and activities to users is more appealing to online crowd.

1.6 Research Question

Therefore, we would like to develop this research with this assumption that user-innovation methods especially crowdsourcing are genuinely effective to be used for developing product-service system. This assumption rose from literature review that some of them are already given and the rest will be given in its respected section. For example, Piller (2012) argues that under the right circumstances, crowdsourcing can be a powerful tool for innovation process. However, one cannot claim firmly that crowdsourcing can always lead to success since there are still need for research to improve the process and consequently the outcome of the crowdsourcing. Then we would like to focus more on crowdsourcing in details to identify the main elements that are involved in the success or failure of the practice.

Hereby, the research question of this thesis is:

*Considering Product-Service System (PSS) innovation as the outcome, what are the main elements that influence the outcome of crowdsourcing practice?*
2 Research Methods

Since the realm of user-innovation – especially crowdsourcing – is relatively new, it is often populated by buzzwords and false statements. Therefore, there is a need of carefully studying the existing situation in order to both identify the influential factors and to question the potentially incorrect statements. Then, the aim for this study is to carefully identify the main factors related to the success and failure of crowdsourcing practice. We would like to have a complete understanding of the current situation, existing model. As it is shown in the figure 8, the thesis follows these steps. Consequently, each step would be described respectively.

Figure 8. Research Methods
2.1 Type of Design Research

Accordingly, based on the Design Research Methodology (DRM) book (Blessing and Chakrabarti 2009), the type of design research project that is employed for this research is Type 2, Comprehensive Study of the Existing Situation. This type is chosen because of the comprehensive understanding of current situation is needed and it is very critical to this field of science.

<table>
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<th>Research Clarification</th>
<th>Descriptive Study 1</th>
<th>Prescriptive Study</th>
<th>Descriptive Study 2</th>
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<tr>
<td>2. Review-Based</td>
<td>Comprehensive</td>
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*Table 1. Type 2, Comprehensive Study of the Existing Situation*

In another words, this type of study is chosen mainly because of the lack of comprehensive study of the current situation.

2.2 Exploratory Research

Because the problem was not defined clearly for the author, an exploratory research was employed to choose the best research plan, methods, and the proper scope of study. To do that, every area and issue that is related to the subject went under study. We used social media and literature. Also we had brief discussions with experts and users to be able to define the problem. After this phase we were able to define the topic of the thesis, which is ‘Crowdsourcing: Using Open Modes of Collaboration for Product-Service Innovation.’

2.3 Exploratory Study: XinMade

Xinmade is a crowdsourcing platform that is being developed by the designer, Xuefeng Bai (snovo.bai@gmail.com), and his partners. This platform is aimed to use crowdsourcing in all the steps of the design process, from idea generation to concept finalization, and to use Crowdfunding to invest on the potential ideas. This was an opportunity to get in touch more closely to the current challenges in the way of designing a crowdsourcing practice. This exploratory study helped the author to observe and study different related issues. This gave a clear image to the author of where the problems are and how they should be addressed.
The author’s contribution to this project was related to the interaction design of the platform and the design of the rewarding and reputation system. Almost we spent 20 hours on improving different sections of the webpage. Sections such as homepage, idea development, product development, investment, and user profile page were the most discussed ones.

As it is shown in figure 11, the main process of Xinmade.com is drawn. How it works begins with an individual submitting an idea then if it turns out to be an idea with potential and after necessary improvement, it would go to funding phrase where the idea would be backed by other individuals which it is called the investing phase. Another way of backing an idea is to support a project by giving money via presale option which to buy products in advance that have value for you. After that, it goes for production and distribution. Also Xinmade.com allows shopping too. So if you are an outsider and if you are just interested in Xinmade products, you can just buy them via their webpage.

![Figure 9. XinMade.com Main Process](image_url)

In the way of reaching to the ideal design, we faced some main questions that we did not know any answer for:

- What kind of necessary information is needed to provide for users?
- How can we make a good reputation system to make it easier for successful entrepreneurs to trust the platform?
• What are the criteria for a good reputation system that could value the effort of the users in the best way possible?
• What is the best formula for the rewarding system?
• How can we address right people for the right task? How can we categorize them?
• How can we create the same language/tools to give fair recognition to different members?
• How diverse the range of proposed tasks should be?

These questions were the sparks for developing this thesis. Since they were the questions that arose from doing an actual exploratory study, they helped significantly to shape this thesis. Based on these questions and other minor challenges, we delved more deeply to find the answers and come up with a good design. This on-going interaction, finding a problem through developing XinMade and studying deeply to find the answer, contributed to finalize the final scope of our thesis and come up with the research question. Subsequently, the hypothesis that is matched to the research question was developed.

2.4 Hypothesis (Initial Model)

As it is already described, the initial hypothesis, which is shown in figure 10, was developed based on the exploratory research and the exploratory study. This rough model was an effort to find answers for the research question.

During the initial study, we found that one of the main important issues concerning every crowdsourcing design is how to engage users. User engagement itself deals with different issues. Therefore, we tried to find the relation between these different factors to each other and to the success of crowdsourcing practice. Some of these factors that are purposed in initial model are richness of the tasks, diversity of users and fairness of rewarding system.

This model and the factors were the speculation of the author of the main success factors of crowdsourcing practice. None of them were confirmed by any reliable source. Therefore, the next step was to perform an in-depth literature review.
2.5 In-Depth Literature Review

To gather the data to test our hypothesis, we did an in-depth literature review, which was more focused on the keywords such as crowdsourcing, user innovation, user motivation, online participation, and online interaction. To find the papers, we used Google scholar and the school’s online library. As it can be found in the reference section, many scientific papers were studied and analysed. The difference between this literature review and the one in exploratory research was the focus and scope of the reviews. The first one was more general and the second one was completely focused on crowdsourcing.

The findings of this phase are described in the results section. These findings helped us to validate the factors of the initial hypothesis. However, there were still uncertainties and ambiguity. This is mainly because this field is relatively new to academic environment and few experimental studies have done to clarify different issues. Then the author reached the conclusion that solely relying on the literature review cannot bring
scientific accurateness to this thesis. As a result, other methods were initiated and designed.

2.6 Interviews

Semi-structured interviews were chosen to discuss our hypothesis and related issues that were unclear with experts of the field. This set of interviews followed a semi-structured theme. Each interview lasted between 30 minutes to 60 minutes. A set of questions were already designed and provided (see Appendix 6.2 and 6.3). Questions were genuine and broad. The reason to choose general questions was to give enough space for discussion. However, in each interview, based on the expert background, more specific questions were designed in order to make the best out of the time and the expert’s knowledge. Moreover, since we realized that these interviews could help Xinmade platform and Xuefeng Bai’s thesis as well, they joined the author to participate in these conversations.

The hypothesis was improved by more interviews that were performed. Overall, 9 interviews were done. This set of the interviews was a stepping stone to validate the main factors and polish the hypothesis and improve it.

2.7 Survey

In order to give a fresh perspective about related issues to users’ engagement, we conducted a survey and we asked users about their motivation to participate in crowdsourcing practice. We were curious to understand why users participate and engage in an online activity. The survey is contained of three parts. First was an optional section in which users could introduce themselves. The second part was general questions related to how active the online users are on the web. In second part, we also asked questions about the reasons behind users’ participation in an online environment. In the third part, which completely focused on the matter of engagement in crowdsourcing practice, we asked about how users were satisfied with their activity. More so, we asked about the roles and tasks they usually take on in a crowdsourcing practice. Also we asked them about the fairness of a reward system and what would be the best ideal condition to reward their effort. The survey had both qualitative question and quantitative questions.
The main target of survey was three groups, users of crowdsourcing.org and users of Crowdsourcing & Crowdfunding for Entrepreneurs & Investors group on Linked-in and users who contribute to crowdsourcing and Crowdfunding HASHTAGS (#) in twitter. Likewise, few sub-groups that were users in Facebook and digg.com were targeted at the end.

At the end, demographic-wise, 75 people filled the survey of whom 65 filled it in completely. The participants were mostly from Europe, Asia and North America, 55% of them were male and 45% of them were female. 64% of participants' were less than 30 years old, 19% were between 30 to 39 years old, and 17% were more than 40 years old. It shows that the survey covers a very good range of people. Also, to make sure that the inputs are trustable, we asked for users' personal information. We took into account the data that gathered from this range of users.

2.8 Synthesis of data

The synthesis of data was combining the findings from in-depth literature review, interviews and survey and categorizing them based on the elements of the model. Synthesising data would contribute to realizing whether the results validate the initial elements and if not, how the success is affected. As a result, our success model was improved and developed through validating the initial elements with the findings from research methods. Therefore, the result section is presented as a description of each element and discussion of whether the findings from research methods validate that.
3 Results

3.1 Success Model

The success model is composed of 12 elements and the relation between them (Figure 11). This model is the improved version of the initial model (Figure 10). In the following sections, we go through each element and the related findings from literature review, interviews and survey.

![Success Model Diagram](image)

*Figure 11. The success model*

3.2 Purpose of the practice

Purpose of the practice was presented in the initial model and it was validated by both, the findings from the literature review (Shirky 2008) and interviews (Huberman 2012, Roth 2012, Dixon 2012, Brabahm 2012, Schreier 2012, Poetz 2012, Piller 2012).

Crowdsourcing can be used for different purposes (Roth 2012). Depending on the purpose of practice, a certain group of people would be attracted to the cause (Shriky 2008). Outcome of crowdsourcing can vary as the
purpose changes. The purpose of the practice can heavily affect users’ engagement and participation. Therefore, one of the important factors for user engagement is the value of the practice to the user (Huberman 2012). Accordingly, selecting and clearly expressing the purpose of the practice is essential for engaging group of online users that can give meaningful inputs according to the desired outcome.

### 3.3 Mode of Collaboration

Mode of Collaboration is an element that was not presented in the initial model. Basically, it was a finding from interview with Martin Schreier (2012) and Marion Poetz (2012). Different strategies for collaboration were discussed and recommended by Marion Poetz (2012).

Mode of collaboration is defined as set of modes for user participation which can vary in terms of governance and extent of participation. Each of them demands different dynamics and strategies. The expected outcomes of each are different from each other. These modes are used to define the boundaries of collaboration and extent of users’ participation. As shown in the figure 12, Pissano and Verganti (2008) state that there are four different modes of collaboration through crowdsourcing: Innovation Mall, Innovation Community, Elite Circle, and Consortium. All these four modes have two factors in common: participation and governance. In terms of participation, a crowdsourcing practice can be open or closed. In terms of governance, there are two types: hierarchical and flat modes. Based on the purpose of the practice and the desired outcome, the mode of collaboration should be selected carefully (Pissano and Verganti 2008; Poetz 2012). Each mode addresses different strategies for engagement and collaboration.
3.4 User engagement

Despite the different purposes and collaboration modes, crowdsourcing platforms have one thing in common, which is how to engage users (Roth 2012). This element was initially presented and it was validated and confirmed by the literature (Füller 2010; Bayus 2010; Brabahm 2008; Shirky 2008; Adamic and Ackerman 2008; Rawsthorne and Elliot 1999) and by interviews (Huberman 2012; Roth 2012; Piller 2012) as well.

Crowdsourcing platforms are small societies and they are as complex as every other society (Dixon 2012) where human factor is in the backbone of each project that demands vast participation of different individuals. Engagement of users is defined as regularity of users' participation in the practice. Meaning that, engagement of users occurs when users regularly contribute to the process since the matter of practice becomes important to them. User engagement is about developing strategies for engaging users to
online project to “harvest” the contribution of participants by thriving on challenges.

There are different challenges in the way of user engagement in crowdsourcing platforms which each of them can heavily affect the outcome of the practice. The underlying dilemma of crowdsourcing is the tragedy of the commons (Shirky 2008; Huberman, Romero, Wu; Yang, Adamic and Ackerman 2008). Consequently, the number of contribution follows a power law distribution. (Shirky 2008; Huberman, Romero, Wu) Yang, Adamic and Ackerman (2008) found that a very small core of users contributes to almost 20% of the winning solutions. Another main challenge is that crowdsourcing platforms should find creative ways to stimulate users' creativity, in order to motivate them (Roth 2012). Users either do not engage in the process or they will not keep engaged with the process for long. This highlights the issue of designing the process. Rawsthorne and Elliot (1999) stated that users after completing a task in reaching the goal of crowdsourcing practice would not have any motivation to stay engaged and participate.

3.5 Strong Internal Department

Strong internal department was presented in the initial success model. It is both validated and confirmed by the findings from literature (Sawhney, Verona and Prandelli 2005; Ulrich and Eppinger 2008; Kristensson et al. 2004) and interviews (Schreier 2012; Poetz 2012).

The role of the internal department in the crowdsourcing process is the interpretation of crowdsourced ideas and gives meaning to them. As Poetz (2012) describes ‘The role of internal designers and developers is to take the final crowdsourced ideas to the next level and develop them.’ Also, Schreier points out to the fact that ‘A good balance between internal and external resources depends on the product category. If you design the T-shirt, theoretically everything can be done by community.’ Finally, one can say that one of the main challenges in the way of the practice is that what the best balance of combining internal department with external resources is (Sawhney, Verona and Prandelli 2005). Therefore, having a strong internal department that is in a good balance with external resources is an important element in the way of the success of the practice.
3.6 Organic Design of the Platform

In the initial success model, the richness of multimedia tools was presented as one of the key factors that independently can affect the success of crowdsourcing (Sawhney, Verona and Prandelli 2005). However, after more literature review and interviews, it was found out the whole design of the platform is more important than the richness of multimedia tools.

An organic design would provide an environment that ideas are generated, boiled and developed Roth (2012). It does not necessarily resonate with providing a variety of tools and options. As Kara Maki (2012) described it: ‘In terms of richness of multimedia tools, a crowdsourcing platform can be still successful if it is still not as rich as platforms such as Google doc but it needs to have essential tools to let users to express their opinion and ideas.’

Furthermore, Dixon (2012) confirms that the design should provide an organic flow for ideation process and they elaborate on that “The approach to design the system should be an ecological approach. Designers should consider the whole socio-technical approach. The design is not merely about technical stuff but also about societal aspects.” At the end, as (Füller 2010) argues that a crowdsourcing platform should facilitate interaction in the best way possible in order to empower sense of exploration and exploitation among users along with giving sense of autonomy and self determination.

3.7 Diversity of Users

Diversity of users is an element that was presented in the initial model. It was heavily validated by the findings from literature review (Brabahm 2008; Surowiecki 2004; Shane 2000; Collins 2012; Bayus 2010; Erkinheimo and Harjanne 2011; Simonton 1997; Huber 2000; Archak and Sundararajan 2009) and interviews (Poetz 2012; Piller 2012; Maki 2012; Brabahm 2012; Vossen 2012).

Diversity is defined as contextual differences in terms of background. Brabahm (2008) describes the diversity of identity and skills and political investment, which are the consequences of having a diverse crowd, would lead to a successful crowdsourcing practice. Further on, he discusses that diversity and independence are of great importance. As well, Surowiecki (2004) puts a stamp on the fact we need a diverse group.
As Poetz (2012) describes it ‘Diversity is the factor that drives novelty. The more diverse your crowd is, the more likely that you have knowledge that is not functionally fixed by the target market, kind of existence solutions.’ Moreover, Brabahm (2012) argues that diversity is generally a positive factor for the success of crowdsourcing. Therefore, it is considered an effective, positive strategy to aim for a diverse group of people and to engage them in the practice.

### 3.8 Informing Role of the Rules

This element was presented in the initial model and it was also validated by literature (Osterloh and Frey 2000) and interviews (Maki 2012; Roth 2012; Brabahm 2012).

Each crowdsourcing platform acquires a set of rules and regulations to sustain the process and to thrive on the goal of practice. These rules are related to the dynamic of the platform and include elements such as the characteristics and degree of user participation (e.g. a crowdsourcing platform that allows just scientists to join). Crowdsourcing rules have two aspects: ‘controlling’ and ‘informing’. Osterloh and Frey (2000) argue that users should not feel that they are being controlled by the system. This perceived external intervention shrinks the feeling of self-determination and intrinsic motivation. But if users perceive the role of the system as just informing, then it probably contributes to increasing the feeling of competence and intrinsic motivation which leads to more creativity and generating novel ideas (Osterloh and Frey 2000). Therefore, it is very important that rules and regulations are set in an informing way in order to empower users’ feeling of self-determination and their intrinsic motivation (See Appendix 6.1).

### 3.9 Transparency of Communication

Transparency of communication is the element that was presented in the initial model and was validated and confirmed by the findings from the literature (Huang, Singh and Srinivasan 2011) and interviews (Maki 2012; Roth 2012; Schreier 2012).

Transparency of communication can be defined as the transparency of and clarity in the communication between firm, platform and participants. It is
an important factor that can affect the outcome of the practice. Maki (2012) argues that crowdsourcing platforms should act as mediators between firms and users. Their role can highly affect the quality of solution and quality of interaction in the platform. Also, Roth (2012) argues that ‘If you do not give feedback, you do not allow people to improve, you do not allow them to be visible, etc.’ Moreover, Huang, Singh and Srinivasan (2011) stated that number of ideas is reduced gradually and the rates of the ideas that are implemented by the firm are very low. This would be because of limited knowledge of users’ about the firm’s technological capability and the firm’s cost structure. This happens often in practices that firms are conservative about their data or they do not want share enough information about the problem (for various reasons), which could create an unclear communication between firm, medium, and users. As a result, the crowdsourced ideas cannot effectively address the whole problem and they would not be considered as solid solutions.

3.10 Richness of Tasks

Richness of tasks was the element that presented initially and was validated by the literature (Amabile 1988; Ryan and Deci 2000; Füller 2010) and interviews (Kara Maki 2012; Alexander Vossen 2012; Yannin Roth 2012) as well. Also through survey, we asked participants’ opinion on their willingness of taking on different tasks. The options were submitting new ideas, improving others' ideas, investing on good ideas, doing little tasks, and marketing products. We found out large range of participants are willing to do different tasks (see Appendix 6.4).

Richness of tasks is defined as the engine of creativity. Some argue that creativity only occurs when the individual is compelled by the task (Amabile 1988; Ryan and Deci 2000). As a result, richness of tasks is very important design factor (Yoth 2012). It is important that the platform offers different tasks that would suit to different type of users. As it is shown in the figure 13, Füller (2010) breaks down the variety of tasks that can be offered through crowdsourcing medium based on users’ characteristics. A variety of tasks should be provided since crowdsourcing attracts diverse types of users and they are motivated by different things. Therefore, when designing a platform, one should consider having diversity of tasks that are associated with different motivational aspects.
3.11 Clarity of Reputation System

Clarity of reputation is the element that was presented initially. It is further validated by the literature (Lampe, Wash, and Velasquez 2010) and interviews (Dixon 2012; Huberman 2012; Piller 2012).

Reputation system is defined a systemized structure within crowdsourcing platform to build up online representation for crowdsourcing users. This would be done by recognizing the effort of users that they put in and the value that they bring in to the practice. This recognition can be translated into stars, medals, scores, titles, etc., which can motivate users more effectively than any other approaches such as monetary incentives.

The idea behind it is to establish a system is to give intrinsic awards (Dixon 2012). A good reputation system propagates trust in the whole platform. One can say that the outcome of the reputation system should result in distributing trust in the platform (Huberman 2012). Reputation can be defined in two ways as attention and recognition that users get by being active in the platform (Lampe, Wash, and Velasquez 2010). They further argue that as the size of group grows, individual contributions would be having less impact since they would be less seen by the others. Moreover, a well-designed reputation system can contribute to a smarter rewarding system where eligible users can be rewarded based on their efforts and effectiveness towards the goal of practice.

3.12 Reward System

Reward system is considered as one of the main elements of the model. It was initially presented. It was validated by literature (Füller 2010; Kruglanski et al. 1977; Lakhani et al. 2007; Archak and Sundararajan
Reward system is one of the winning cards of crowdsourcing compared to any other online collaboration methods. Reward system is defined as systemized structure to reward the effort of users by offering monetary incentives. Since monetary incentives have more tangibility compared to intrinsic motivations such as recognition and reputation, it would be a more effective approach when it comes to certain types of crowdsourcing such as contest-based crowdsourcing where competition and winning are highly important to the users.

Füller (2010) states that the matter of rewarding activities during New Product Development Process (NPD), which leads to innovation and creative ideas, plays an important role. The range of rewards can vary between intangibles (e.g. social amenities or friendship) to tangibles rewards (e.g. goods or money) (Füller 2010). Moreover, not all people can be rewarded the same. Some are motivated by intrinsic oriented motivations and some are motivated by extrinsic oriented motivations.
4 Discussion

In this section, we would discuss the findings in terms of the implication of PSS and sustainability. We point out the pitfalls of relying solely on crowdsourcing for product-service system innovation. Then, we discuss the matter of user engagement as a separate section to highlight its importance. Also, we elaborate on the result section’s findings and the success model through proposing a strategic guideline that discusses the characteristics of the elements of success model and puts them into the practice. Finally, we would talk about strengths and limitation of research.

4.1 Implication of PSS

PSS are the system of products and services. Product aspect of PSS can vary from consumer products to complex products. Consequently the market would vary from Business to Consumer (B2C) to Business to Business (B2B) market. The likelihood of the success of crowdsourcing for products that deal with daily life of consumers is more than technician and complex problems. In terms of technical problems, there are different aspects need to be considered in order to get desired outcome. However, service aspects of PSS demand constant interaction with consumers and users. It can vary from high-interaction services (e.g. functional result) to low interaction services (e.g. after-purchase service). Since PSS concepts are designed to offer different services and service it is essentially something that is co-created with consumers/users, crowdsourcing applications have genuinely high potential for PSS innovation.

4.2 Implication of Sustainability

Sustainability is essentially a term that weaves society, economy, technology, and environment together (Vezzoli and Manzini 2008). These areas are highly interconnected areas and a change in one would lead to change to others. Meaning that ‘desiring a sustainable future, that using primary local, conservative, regenerative (i.e. locally sustainable) resources become pervasive and decentralized system networks for the extraction, production and use of resources would be established, is not possible without convergence between key environmental and socio-ethical
strategies that is inherent in re-globalisation models characterised by
diffused participation, where locally based networked communities and
“network enterprises” (consisting not only of entrepreneurs, but also of
users, NGOs, association, institutions etc.) assume particular value’
(Tukker et al. 2008, 174). Therefore, conceiving sustainability without
considering any mentioned aspect is not possible (Vezzoli and Manzini
2008).

The focus of research is using open modes of collaboration for product-
service system innovation. As it is discussed earlier, PSS is a solid step
towards sustainable development. Using open modes of collaboration,
which is highly related to socio-technical aspect of sustainability, for this
purpose would lead to engaging a large network of people into innovation
process of products and services. This would consequently lead us to reach
a better decision-making process with considering all the concerning
aspects around the existing problem and would boost innovativeness of
sustainable development process. One can say that crowdsourcing, is a
powerful tool to empower product-service system innovation.

To give few examples of how crowdsourcing can be used for sustainable
causes, author would refer to platforms such as Kickstarter.com and
quirky.com empower people and social movements to innovate and
discover opportunities for social goods. Ushahidi, which is a crisis mapping
tool that uses a crowdsourcing concept, has saved lives of many people
(Okolloh 2008). Also, there are many sustainability-driven initiatives by
firms that have used crowdsourcing as their main approach such as
IdeasBrewery by Heineken, Nike and Best Buy's Green XChange, Desso's
Circle of Architects, Sony's two online campaigns, Open Planet Ideas and
FutureScapes, Tetra Pak and WWF to reach UK schoolchildren (Drew
2012).

**4.3 Considering the Pitfalls of relying solely on crowdsourcing**

There are discussions related to the novelty of ideas and the potential for
innovation of the ideas that are generated by the users. Some are in favour
and some are against the idea of novelty of crowdsourced ideas. Those who
are against the idea argue that users might be too accustomed to their
situation that they cannot bring outside-of-the-box ideas. They argue that
users mainly can contribute to the niche ideas which are related to their
specific problems (Brabahm 2008). A second group argues that crowds are often unaware of the cost structure of the firm, which leads to generating ideas that are not feasible. Also, they underestimate the capability of the firm of implementing ideas. This would lead to proposing ideas that might be good but impossible to implement (Schulze and Hoegl 2008). Based on this argument, a third group discusses that investing considerable amount of capital to monitor all the ideas that most of which are low potential and infeasible are not worthwhile. Instead, firms can invest on their R&D to develop new methods for generating innovative ideas (Brabahm 2008). Sullivan (2010) argues that firms only implemented a small proportion of crowdsourced ideas and he put a question mark on whether one should consider crowdsourcing as a viable approach or not.

These are some of the possible pitfalls of relying solely on crowdsourcing. To the author, crowdsourcing involves with high risks and initiate a venture blindly by relying on crowdsourcing would not be considered as the wise move.

4.4 User engagement

A separate section from strategic guideline is devoted to the matter of user engagement to highlight its importance. Here, the matter of user engagement is briefly reviewed and discussed. We also apply this knowledge to developing the guideline. In addition, Appendix 6.1 discusses the definition of online crowd and what their characteristics are. It is recommended to review the Appendix in order to fully understand the discussion around user engagement.

Studies on open source software suggest that people participation is mostly because that they think about it as a hobby. Ghosh uses the term Hobbyist (Ghosh, 1998a, 1998b; 2005). Also other studies on open source software suggest that people participate because of common good (Bonaccorsi and Rossi, 2003, 2004; Lancashire, 2001). Meaning that, at the same time they are contributing, they are getting a product. Founder of Linux discusses that people engage in an open-source project cause because they think it is fun. As he puts it well, “most of the good programmers do programming not because they expect to get paid or get adulation by the public, but because it is fun to program.” Linus Torvalds. Moreover, while open source software emphasizes the common good (Bonaccorsi and Rossi, 2003, 2004; Lancashire, 2001), hobbyist (Ghosh, 1998a, 1998b; 2005), crowdsourcing
models offers more than fun and entertainment by providing different bounties and explicit encouragement of the learning of new skills. The bounty can sometimes consist of cash and prizes but it also includes cultural and societal capital. Crowdsourcing platforms provide an environment that online users can acquire new skills and develop their portfolios for future work and entrepreneurship (Mack, 2006). In another words, the desire for engagement in crowdsourcing practice is mostly because of having fun, developing skills, taking on a challenge, solving problems and getting recognition and reputation among users with the same skills and interests. (Lakhani, et al. 2007; Brabham 2008)

Interestingly, Ryan and Deci (2000) argue the matter of intrinsic motivation (See Appendix 6.1) is the reason for participation and engagement. They refute the idea of extrinsic motivation such as monetary reward as the main engine for engagement. They suggest that inherent enjoyment and satisfaction rather than external pressures or rewards are the main engine of participation. Bayus (2010) discusses that if extrinsic motivations undermine intrinsic motivations, named as the ‘crowd-out effect’. This would lead to users gradually not to participate and the level of participation reduces over time. Deci et al. (1999) Takes it further and pose this idea that “virtually every type of expected tangible reward contingent on task performance undermines intrinsic motivation.” To add to that, according to the Cognitive Evaluation Theory (CET), one of the intrinsic motivations is the psychological need for competence and having this satisfied would lead to increase the intrinsic motivation. However, the intrinsic motivations will not increase without a sense of autonomy in accomplishing the task. Therefore, intrinsic motivation for performing a task will not be achieved unless a sense of autonomy is realized. This sense of autonomy leads to this belief that user behaviour is self-determined and is not forced by some outside intervention (extrinsic motivation) (See Appendix 6.1) (Deci and Ryan 1985; Ryan and Deci 2000). Moreover, Ambalie (1988, 142-143) argues that intrinsically motivated people will be more likely to generate novel ideas than extrinsically motivated people. Although, studies indicate that intrinsic motivations have more effect on the outcome, Frank Piller (2012) argues that the term ‘crowding out’ cannot apply to any crowdsourcing practice. This is very much dependent on the context. ‘Crowding out’ effect is more applicable to social goods when a society is behind. For profit-oriented practices, monetary incentives play an important role. For example, Threadless.com users participate because of
the reputation. In this context reputation, this is to get recognized among other designers, equals money.

4.5 Strategic Guideline for Innovation using open modes of collaboration

This guideline is developed to offer instruction for using the success model for profit-oriented crowdsourcing purposes. As it shows in figure 14, different elements of the success model that is covered by each step of the guideline. The guideline starts with recognizing the fact that the purpose of the practice should be clarified and the desired problem to solve should be defined. This would not possible without having clear understanding of the current situation of the system. Whether it is an established firm, organization or a start-up, they should identify the main characteristics of their existing situation, their weaknesses and strengths, and their threads and opportunities around their business. The next step is to choose a strategy, what kind of open mode of collaboration is suitable to the problem. The fourth step is to design the process. In this step, elaborately, we describe the main element in the way of the design of the practice. We develop this step based on the discussion around user engagement that is already given. The fifth step would be to establish a good balance between external and internal resources, between professionals and users. Last but foremost, the outcome of each design process should be measured. We propose a formula to measure the outcome of crowdsourcing practice in order to make sure that the desired goal is achieved. The last step is not an element of the success model but it is discussed in the literature. Therefore, this step is not described in the result section but it is elaborated in the guideline as the last step.

These steps should be considered as an on-going process and the results should be measured in order to make sure that the desired purpose is achievable.
4.5.1 Step 1: Purpose of Crowdsourcing (Purpose)

Crowdsourcing can be used for different purposes varying from global purposes to social purposes and business purposes. Based on the purpose, a certain group of people would attract to the cause. The outcome of crowdsourcing can vary as the purpose changes. The purpose of the practice can heavily affect user engagement and participation.

Platforms such as Wikipedia will not be threatened by the lack of participation phenomenon since they have a global, humanitarian purpose that is exciting and meaningful enough for each individual. Also, platforms that are developed around social purposes can eventually find their target group since their purposes are related to social goods and welfare. The real
challenge faces business-oriented platforms that are developed neither for
global nor social purposes.

In terms of profit-oriented platforms, crowdsourcing can be used for idea
generation, problem-solving, product innovation. Moreover, generally, it
can be used for three broad innovation purposes: Business-model
innovation, process innovation and product innovation (Erkinheimo and
Harjanne 2011). Mainly business-oriented companies that are pursuing
innovation ideas using crowdsourcing have two streams of product. The
first stream is consumer products and deal with daily life of consumers. The
second stream is complex and technical products that are for business to
business market. Certain requirements are demanded for each stream. For
example, in product category that are related to children, the problem is
strongly tied to need-based information. It is the consumption problem.
Here the consumers are the advantage since they live in usage environment.
They have enough exposure to the problem. If the problem at hand, however,
is not so much tied to the usage problem, maybe because the
problem is more tied to technology and materials, in this kind of situation
probably the affect is the reverse. Here the designers are more useful
because designers have the skills, knowledge and experience regarding any
technological matters (Schreier 2012). Having a technical and complex
problem at hand does not mean that the likelihood of the success of
innovation outcome would be reduced since the success of platforms such
InnoCentive.com, which is a place to solve complex problems, proves it
wrong. However, it is very important to consider for what purposes
crowdsourcing method is going to be used for.

**Step 2: Problem Definition (Define)**

The matter of defining the problem is a crucial issue. As Poetz (2012)
argues that if firms know the problem and the problem can be specified in
such way that can be used in crowdsourcing platform, the crowdsourcing
practice would be successful. Also in the interview with Yannin Roth
(2012), they stated that if you ask users exactly the question that company
would initially ask themselves when facing a challenge, the practice would
definitely fail.

However, it has been argued that the matter of need-finding and problem
definition is one of the main challenges of the firms (Poetz 2012).
Therefore before starting a crowdsourcing initiative, it is very important
that a firm make sure how well they define the problem. Good problems for crowdsourcing initiatives are those that are defined in a general way or those that are asking for specific issues (Poetz 2012). Again, firms should make sure that the nature of the problem is clear for them before jump into a crowdsourcing initiative.

4.5.2 Step 3: Selection of the Mode of Collaboration (Strategy)

Innovation process is an on-going process that changes constantly as the dynamic and characteristics of the ecosystem evolves due to the changes in different factors that are affective such as competitors, market saturation, advent of new technology, resource depletion, regulations and etc. Therefore, relying solely on one strategy would not guarantee the success.

The notion that crowdsourcing can be applicable to every type of endeavour is completely flawed. Each enterprise should employ a set of strategies in committing to a form of open and collaborative innovation methods (Pisano and Verganti 2008). An enterprise should consider their capabilities, organizational structure and the reason that they look for creating value through open modes of innovation. For example, some companies are looking for a large set of ideas to get inspired for future innovation. In this order, a crowdsourcing practice that could address a large, undefined network of crowd would be the best recipe.

There are different modes of collaboration (Figure 12) that can be hired based on the existing condition and challenges. Expected results are different from each of them and they demand different dynamic and resources. For example, using open participation and flat governance would genuinely attract a large group of people to innovation process. This would be a good strategy for challenges that are difficult to define and to develop without having a pool of ideas. Moreover, closed participation and hierarchical governance is suitable for the situation that companies have a clear understanding of what the problem is and they have the capability to identify the best solution among the pool of solutions. Finally, as the strategy evolves, the plan should be changed to meet the new requirements.

As shown in the figure 12, Pissano and Verganti (2008) state four different modes of collaboration through crowdsourcing. All these four modes have participation and governance factors in common. To have a good
understanding how to use these different modes, we would like to elaborate those regards to participation and governance factors.

In terms of participation, a crowdsourcing practice can be open or closed. Meaning that, in the open mode, there is no limit to participation and everyone can engage in the practice. The advantage of this is that so many ideas come from different, unexpected sources and parties. As Pissano and Verganti (2008) put it well ‘interesting innovative solutions can come from people or organizations you might never have imagined had something to contribute.’ The diversity of ideas and participators are the key advantage here.

In the closed mode, the strategy is to have more control over the process. Closed mode is used when a certain group of the crowd is already defined for participation. Moreover, you already study and have enough knowledge of why you look for a certain group of people. Also, the closed mode is good for situations where defining the problem is the priority to gather pool of solutions for a general challenge. Conversely, you often use open mode for big problems that are broken into pieces and those small pieces are offered separately to the mass of people.

The other difference between close or open mode is that the latter is not good at attracting the best players. That is mostly because when you address a large, undefined network of people, it is less likely that all the ideas would be considered and selected. Therefore, best players get disengaged since they think their ideas might not be considered. As Pissano and Verganti (2008) put it well ‘ Open modes work best when the spread between the ideal solution and the average solution is not big and the consequences of missing out on a much better solution from an elite player are small.’

In terms of governance, there are two types: hierarchical and flat modes. The main difference between them is who gets to define the problem and choose the final solution. In the hierarchical form, it is the enterprise that is to decide what type of problem should be proposed and what type of value is desired and should be captured from the endeavour. Conversely, the flat mode is the type of governance where all the parties share the costs, risk, technical challenges and they have the same interest on the overall purpose. Moreover, the process of decision-making is decentralized. Pissano and Verganti (2008) further elaborates that ‘Hierarchical governance is
desirable when your organization has the capabilities and knowledge needed to define the problem and evaluate proposed solutions. Conversely, flat modes work well when no single organization has the necessary breadth of perspective or capabilities.’

At the end, it should be crucial to consider ‘as the strategy evolves, the right mode of collaboration might change.’ (Pissano and Verganti 2008) Even a hybrid form can be employed and at the same time few modes can be used to go towards the success. Again, in choosing each mode, enterprises should look at their strategy, their vision of success, their capabilities and technological limitation. Not every type of crowdsourcing can meet every purpose.

4.5.3 Step 4: How to Design an Engaging Crowdsourcing Practice (Design)

There are mainly four key challenges in the way of launching a crowdsourcing practice, which are: How to recruit contributors, what they can do, how to combine their contributions, and how to manage abuse (Doan, Ramakrishnan, Halevy). Each of them demands different strategies for engagement and openness and each of them demands that different factors be taken into consideration.

4.5.3.1 Organic Design of the Platform

The matter of designing the crowdsourcing process is of great importance. Ren et al. (2007) realized that different decisions in designing of the process led to different consequences in terms of dynamic of users’ engagement. Also, because crowdsourcing deals with different and complex issues such as psychology of the crowd, it is difficult to address these issues into the design of the practice. Another challenge towards the design the process is how to scale the project. Scaling up is the most important question in the design process (Dixon 2012).

The approach to design the system should be an ecological approach. Designers should consider the whole socio-technical environment (Dixon 2012). The design is not merely about technical stuff but also about societal aspects as well. Crowdsourcing platforms are social systems. People know that they are other people existing and interacting with each other. Creating societal capital is a must in a good design for users (Dixon 2012). An ideal crowdsourcing platform should resonate with a meaningful purpose that has

46
value for the crowd. Also it gives a sense of independence in exploring and experimenting to users. Moreover, the crowd should feel challenged by the tasks and should get motivated by accomplishing it. This challenge should be designed in a way that users feel gaining mastery over the demanded skill to solve the challenge. The platform should be designed in a way to empower users. Empowering users is a very crucial factor especially since most of the work is supposed to be done by users. The platform should be designed in a way that gives autonomy, mastery, freedom, and a sense of play (Mowgli 2012). These factors are very important when it comes to a crowdsourcing platform since the whole crowdsourcing concepts revolves around the crowd. Therefore if the crowd of people were unwilling to participate, the practice would face failure.

An interaction in a crowdsourcing platform can be observed along three different ways: the content, the process and among users. The content is what users desire to exchange with others. The process is how the system is designed to provide ways for users to interact. And also, direct interaction among users is the third type of interaction in a crowdsourcing platform (Füller 2010). A crowdsourcing platform should facilitate interaction in the best way possible in order to empower sense of exploration and exploitation among users along with autonomy and self-determination. A crowdsourcing platform should effectively manage the crowd in order to keep them motivated to come up with new ideas and also attract new ideators to the system especially in the core group. As it is shown in figure 15, Based on this, Füller (2010) discusses that there are four types of consumer: reward oriented, intrinsically interested, curiosity driven and need-driven participant and he proposes a relation between consumer’s type to their innovation capability. Intrinsically interested users have high web-exploration tendency and high innovation capacity while need-oriented people have low innovation capability and a low tendency to explore the web. Furthermore, reward-oriented users are goal oriented and practical. They have high innovation capability but not necessary have tendency to explore. They seek for a challenge to solve.
In terms of exploration-exploitation, one can argue that extrinsic motivated people tend to be more goal-oriented. Füller (2010) further elaborates that ‘intrinsically motivated consumers tend to prefer experiential-oriented behaviours, while extrinsically driven consumers tend to favour goal-oriented behaviours’. For contest-oriented challenges, extrinsically motivated users are the key target and for the practices that demand collaboration, team working, and exploration, intrinsic motivated users are the key target group. A good design would consider different types of users who have different behaviours and preferences in interacting with the platform.

*Scale it up: Social Media Approach*

One of the main challenges against the design is how to scale up the project. The first thing that each design needs to guarantee is to make sure that the practice would scale up. In order to scale up the crowdsourcing practice, reaching to critical mass through tapping into social media is strategic move. A crowdsourcing practice is successful when it reaches to social media environment, when it exists in social media (Dixon 2012). Meaning that, in the design of the practice, a concrete plan of how to connect the platform to social media environment should be envisioned.
Therefore, understanding how social media works and how the practice can be connected is essential.

In terms of designing the platform, the mindset of designing the homepage first should be substituted with the mindset of where the first place that users would be led to the platform from social media.

**Richness of Multimedia tools**
As it is shown in figure 18, Sawhney, Verona and Prandelli (2005) breaks down different online tools that can be used for different stages of new product development process based on two factors: nature of collaboration and applicability of each tool to a stage of New Product Development Process (NPD).
Captured from (Sawhney, Verona and Prandelli 2005)
Figure 18. Applicability to Stage of New Product Development Process

This mapping is just an example of a possible set of online tools to provide for the practice. It is important to consider that richness of multimedia tools does not necessarily guarantee the success if they are not designed regard to the outcome of the process. For example, if one merely looks for a pool of new ideas to get inspired, providing tools for virtual prototyping seems to be irrelevant. Each tool offers facilitate certain option to users. Craigslist is a good example of the simple platform with a simple set of tools that reached huge success. A platform with the right tools for the right tasks is the key to success. Having enough sets of tools that are along with the purpose of the practice is important.

4.5.3.2 Diversity of Users

Any good model of open Web contests needs to capture heterogeneity of “skills” or “expertise” across the pool of potential contestants (Archak and Sundararajan). Having a diverse group of people for innovation using crowdsourcing is a must. Diversity of skills, ethnicity, and culture would lead to gather a pool of diverse ideas around one issue. This would lead to give a broad perspective on the issue. The odds to get a desirable solution out of this pool of diverse ideas are very high.
Also a good crowdsourcing platform would facilitate an environment that a solid core group can gather together. Some scholars discussed the core group in crowdsourcing platform (Erkinheimo and Harjanne 2011; Simonton 1997; Huber 2000; Archak and Sundararajan 2009). This phenomenon has been seen among Wikipedia users. There is always a core group of users that do the most contribution to the platform. This core group of users participate in all challenges regardless to the task and its specific requirements. They are the ones who keep the system running. This would imply that regardless to how diverse the group of crowdsourcing audience would be, the core group would do the most of job. Moreover, some studies show that over time, this core group grows as the members increase (Erkinheimo and Harjanne 2011). Therefore, as it is shown in figure 19, the matter of always attracting new ideators is as important as the matter of attracting rest of the crowd (Bayus 2010). There should be always new ideators to join the core group of the crowd otherwise it would be difficult to develop the purpose of the practice and reach to valuable outcomes. Finally, it is important to have the users, as it is important to have a diverse core group.

4.5.3. Informing Role of the Rules

Rules should not hinder users’ creativity in coming up with innovative ideas. The role of the rules should be informing instead of enforcing. Rules have a direct effect of independency and freedom of users in exploring and exploiting the tasks. The feeling of autonomy is always helpful for the crowd to feel responsible and creative and if this feeling is distributed among a diverse crowd, it would lead to the best formula for user participation.

Also, another challenge is how to reduce the number of spammers, which is one of the great challenges. This highlights the role of rules and monitoring
system to solve this problem. Maki (2012) argues that if a constant monitoring system observes the whole interaction and imparts the feeling to the users, that the content has great importance and is always studied, the number of spams would reduce. Therefore, they should be concrete enough to reduce the impact of spamming. Loose regulations might lead to a chaos and consequently failure of crowdsourcing practice.

### 4.5.3.4 Transparency of Communication

Clarity in communication between users with the platform, users with companies, company with platform should be guaranteed. Lack of transparency would result in vagueness and lack of clarity of the problem definition for users. This would result in that the outcome of crowdsourcing would not have enough potential for innovation (Maki 2012). Sometimes, because of the lack of interaction between the firm and the users, the quality of the final outcome would not be as satisfying as it can be. Moreover, it is very important that there is a strong and constant interaction between the users and the medium exist. As interaction and communication is inevitable for crowdsourcing platform, providing a system of constant feedback and reflection with honesty and transparency in messaging should facilitate this process.

*Matter of learning*

Bayus (2010; 7-11) stated that an individual’s likelihood of proposing a creative idea is positively related to their exposure to others’ ideas. One can say that users always gain experiences and learn in interaction with each other. Learning happens almost anywhere in the platform (Dixon 2012).

A Learning environment would be created if there is transparency in communication existing in the system. A platform should facilitate an environment that users can reflect on each other work and can help each other in case that it is necessary.

### 4.5.3.5 Richness of Tasks

Richness of tasks has a direct relation to creativity of users. A set of limited tasks would lead to boredom and reluctance among users. One needs to pay attention that not every task in a crowdsourcing practice needs creativity. More interestingly, not every user seeks creative tasks or challenging ones (see Appendix 6.4). In the survey (SEE Appendix 6.4), we asked users what kind of tasks you would like to take on. Submitting new ideas (25%),
improving others’ ideas (22%), investing on good ideas (19%), doing little actions (19%) and marketing others’ products (15%) are users’ preferences to take on a role in crowdsourcing practice. The interesting point about this question is that all the options scored in the same range. It shows that users’ preferences contain a range of tasks and not specifically an exclusive one.

As a result, because crowdsourcing aims to attract a variety of users, they consequently look for a variety of tasks and since not all the users have the same preferences, the crowdsourcing practice should provide a richness of tasks for users who have different personalities.

4.5.3.6 Clarity of Reputation System

Huberman, Romero, and Wu (2009) claim that if we design the crowdsourcing practice in a way that values attention as the main capital, it would contribute to overcome the tragedy of commons, in which few of the users do all the work and the rest would taken on no task, and still be considered to have lead to the success of the practice. Sawhney, Verona and Prandelli (2005) give a fresh perspective of how the reputation system should be designed in order to facilitate participation and engagement. They argue that the practice should be designed in a way that facilitates economic incentives for business to business settings but in consumer-oriented settings, intangible incentives such as recognition and attention should be taken into account.

Furthermore, Reputation system and reward system is highly interconnected to each other and they affect each other profoundly. Clarity of reputation system contributes to a better reward system. If we make sure a good reputation system is set up, identifying those users who deserve to be rewarded would follow a fair process and it would increase users’ satisfaction with practice.

There is no such a solid recipe for designing the reputation system. Each platform demands a unique reputation system and practitioners should consider their purpose, the dynamic of the platform and the desired outcome to design the reputation system.

4.5.3.7 Reward System

Reward system provides extrinsic incentives for users to participate in the practice. It is not easy to reach to an effective reward system for platform since it deals with psychological factors. In terms offering incentives, there
is the risk of “minimax” dilemma, which is that “users try to do the least possible of the task for most possible of the reward” (Kruglanski et al. 1977; 141-148). What happens is that they become unified spammers without ever-knowing this fact since the offering system provoke this behaviour. However, Lakhani et al. (2007) gives InnoCentive.com as an example in which its reward system relies on significant monetary incentives. They argue that the possibility of winning significant monetary reward is a strong indicator of success on InnoCentive.com along with intrinsic motivation such as joy of solving scientific problems and filling the free time. This statement is in line with Piller’s opinion on reward system, which is that the reward system is to give extrinsic awards (Piller 2012). Based on istockphoto.com that is a place for armature photographers, Mack proposed a reward system where the bounty contains monetary prizes and also cultural capital such as skills related to learning and developing related skills to get proper future work is also included. Furthermore, Archak and Sundararajan (2009; 1) proposed optimal division of the contest budget among multiple prizes. They claim that ‘When agents are risk-neutral, the principal should optimally allocate its entire budget to the top prize even if it values multiple submissions. In contrast, if agents are sufficiently risk-averse, the principal may optimally offer more prizes than the number of submissions it desires’ Finally, Brabahm (2012) argues that the ideal reward system is when people get to choose what they could get out of it. Threadless.com gives a variety of options. A variety of options for a reward system can be a good approach. The ideal reward system is multi-level awards.

Each user has different characteristics and they are able to do certain tasks. One cannot expect the same results by assigning the same task to different groups. As a result, one cannot expect to assign the same reward for different groups of users. Perceived fairness among members plays an important role and there should be more studies done to understand what the reward and feedback mechanisms in crowdsourcing process should be (Huang, Singh and Srinivasan 2011). One of the good case studies related to this manner is related to studies done on Nokia crowdsourcing system. They concluded that ‘With regards to quality or appropriateness of solutions, we’ve learned that quantity should never be rewarded or encouraged; at least if the potential reach of each idea is on the scale of one’s Facebook friends. Users motivated to win are willing to see incredible effort to collect “likes” or “page views” if the winner is defined based on popularity. The possibility to play the system not only leads to a
risk of rewarding an idea which is not the most innovative one, but also reduces the motivation of innovative community members to participate’ (Erkinheimo and Harjanne 2011; 3). Reward system should be designed to incentivize the quality and not quantity. Business-oriented platforms usually try to solve the dilemma of user engagement with defining monetary incentives. However, having monetary incentives would not completely be the solution for user engagement.

One of the leverage points for user engagement is that a crowdsourcing platform needs intrinsically motivated people more than extrinsically ones. It is because that the latter would be easily demotivated after a certain task will be finished but the former would keep participating since they have grown certain "belongingness" with system. Moreover, through survey we asked participants what a fair reward system is (see Appendix 6.4). 79% answered based on the contribution time and quality of the work. Only 10% of participants responded that as the same wage as one gets in real job. It shows that users themselves admit this fact that the system should reward enough but in a fair way. Users might not get paid the same wage as they normally do in a real setting but instead they receive other achievements such as recognition, attention and developing their skills by contributing to the cause, which is good for their resume and future. These secondary achievements to monetary rewards follow a more explicit and clear process than to real setting. These are leverage points of online setting.

Finally as Pissano and Verganti (2008, 6) put it well ‘Designing incentives – both financial and non-financial – that attract external collaborators is crucial with any of the four modes of collaboration. Non-financial rewards like high visibility in the job market, an enhanced reputation among a peer group, the psychological fulfilment of pursuing a strong interest, and the chance to use solutions in one’s own business can replace or complement monetary rewards.’

4.5.4 Step 5: Strong Internal Department (Balance)

There are challenges in terms of organizing the crowdsourcing practice. The main challenge is what the best balance of combining internal staff with external resources is (Sawhney, Mohanbir, Verona, Gianmario, Prandelli, Emanuela). Ulrich and Eppinger (2008, p. 62) argue that between needs-based and solution-based information, firms should focus on the former and rely on their internal capabilities to come up with the best solution. As Kristensson et al. Puts it well ‘professionals are more driven
by a convergent thinking style that results in less novel ideas. Users are divergent thinkers. They do not have to worry about the cost's implementation or technological feasibility of the ideas’ (Kristensson et al. 2004). Internal capabilities and employees are good at proposing solutions to a problem by considering the firm’s cost structure and technological capabilities of the firm (Poetz and Schreier 2012). Therefore internal forces and employees are mostly good at convergent and incremental ideas and external forces are good divergent and outside-of-the-box ideas.

Therefore, an ideal crowdsourcing endeavour should provide a balance between internal and external resources for innovation. Since professionals are good at offering feasible solutions, they should be in charge of monitoring, processing, and developing the crowdsourced ideas.

4.5.5 Step 6: Measuring the Quality of the Outcome (Measure)

The outcome of each design process should be measured. Without measure, one cannot make sure that the desired outcome has been achieved. Bayus (2004) in his comprehensive study argues that potential of ideas should be assessed based on the three-way interaction of novelty * customer benefit * feasibility terms (Bayus 2010). He further argues that in terms of novelty and customer benefit, customers’ ideas are scored higher than professional ideas but in terms of feasibility, professionals’ ideas are scored higher.

To realize whether the outcomes of practice are successful or not, assessing the results based on the novelty, customer benefit and feasibility terms seems to be a good recipe. Also, it is necessary to consider that how much the proposed solutions support and cover the challenges around the problem. The potential of ideas VS the cost of lunching and running the practice should be compared as another measuring factor.

4.6 Strengths of Research

To the author, the strength of research can be deemed as the strength of literature review. More than 70 literary references were considered to shape this research. Not only papers related to user innovation were considered but also, papers that could help to give a good image of existing situation around crowdsourcing were considered as well. Consequently, areas such as user motivating, gamification, online community, internet studies,
product-service systems, Sustainability, and design thinking were considered. Moreover, the other strength of this research is to carefully explain the existing situation and draw the success model based on the findings. Furthermore, the strategic guideline can be used by practitioners to scale up their project. Almost every concerned issue are considered to shape the guideline.

Xinmade exploratory study was really an opportunity to tap into the really challenges in the way of the crowdsourcing process. Interviews with experts in the field and scholars from the academia are the other turning point of this research. This did help us to get a good understanding what has been done in the field through experts. Also, interviewing with scholars from academia helped through discussing the findings with them. Some of the main elements of the success model were impossible to conceive without these interviews. Finally the survey helped us to get a fresh perspective on different related issues from the user side. Some of the finding such as findings related to reward system totally changed our perception on the issue.

4.7 Limitation of Research

One of the limitations was the lack of time to test the model with actual data using data from one of the platforms that is currently running. Lack of time also inhibited us from interviewing more scholars, which could lead us to more concrete and detailed results. In terms of survey, lack of time and limitation to reach a broader audience were the limitation that faced this stage of research. Since this is a thesis on crowdsourcing, it would have been good that a crowdsourcing tool or experiment would be planned out. Although there were some schemes for this matter, lack of time, budget and good team inhibited us in doing so.
5 Conclusion

Henry Ford once stated, “If I had asked people what they wanted, they would have said faster horses.” However, in this past 20 years, we have seen new implications of consumers’ involvement in the product and service development process that would challenge Henry Ford’s statement. This phenomenon started to increase especially since a realization occurred in the business and academia environment that we are in need of novel and sustainable approaches toward products and services due to the global challenges that we are facing. Therefore, innovation methods became the centre ground of the development process.

In terms of implication of PSS, the difference between PSS and conventional methods is that PSS is an ongoing process in tight and constant interaction with customers. Therefore, customers become main part of the co-creation process of developing products and services. Because user innovation methods especially crowdsourcing increase the role of customers in development and decision making process, these methods are genuinely positive tools for PSS innovation. Moreover, PSS is genuinely a business model towards the path of sustainability. It would contribute to sustainability through opening up different possibilities such as dematerialization, sale of use instead of sale of products, and closing the loop of material and energy flow. In order to walk through the path of sustainability and to stay competitive and beneficial at the same time, PSS design highly demands innovation methods that can boost different phases of PSS process.

Furthermore, this research is aimed to have a comprehensive look on the matter of user innovation especially crowdsourcing and how it can contribute to the process of Product-Service System (PSS) innovation process. The main reason to focus on crowdsourcing is that crowdsourcing, by removing barriers of time, space and scarcity in the way of participation for users, has the most potential to attract large group of users to the co-creation process among other user-innovation methods.

In order to answer the research question, as research methods, we did review many papers, we did hold a series of semi-structured interviews with experts and scholars and we did run a survey. The findings were used to develop a success model for crowdsourcing practice. This was done by
providing an initial model based on preliminary findings. The final success model covers all influential factors that have been discussed out there in the field and some factors that are overlooked as well.

Besides, we did not finish here and we developed a strategic guideline for those who want to embark on crowdsourcing initiative. The main problem to develop the guideline is that there is not any guideline as comprehensive and reliable to embark on crowdsourcing practice. We confidently would like to state that almost all the necessary factors are included in the guideline, and their relations to each other are described.

In terms of implications of results, the success model and the guideline can be used by the firms and practitioners to facilitate better decision-making process in order to embark on the crowdsourcing endeavour. Since the aim of this study is to carefully gather all the main elements affecting the success of the practice, it can help practitioners to have a clear image of different aspects related to crowdsourcing concept.

Finally, future work would be to test the model on real projects to get actual data. Based on these data, the model and guideline should be improved and developed. Likewise, there should be more in-depth research regard to each element. Each element demands comprehensive studies in order to develop them. Finally, similar studies are needed for crowdsourcing applications in regard to social and global purposes which author would believe demands more in-depth and more experimental research.
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Raymond, E.S., Homesteading the Noosphere, The Cathedral & the Bazaar (O’Reilly, Sebastopol, CA, 1999).


Sawhney, Mohanbir, Gianmario Verona, and Emanuela Prandelli. 2005. “Collaborating to create: The Internet as a platform for customer


6 Appendices

6.1 The Definition of Crowd, And Their Motivation

To the author, without having a concrete understanding of what the crowd is and what they are capable of, it seems to be difficult to initiate any venture that demands a large network of online users. Here we would like to introduce the online crowd and their motivation for participation.

6.1.1 Definition of Online Crowd

Andrew and Matthew (2004) did a study and categorized internet users in online communities. They divided online users into:

- Netzien
- Surfers
- Lurkers
- Privateers

Michael Hauben (1997) was the first that coined the word ‘Netizen’. Netizen is a person who is actively contributing online through being engaged in online communities. Surfers are those users on different pages that are sometimes active and sometimes not. What they do is just to surf. Lurkers are those members of an online community that offer no profound activity although they are present. Privateers are those who use the net for profit. They are business-minded users and look at the net as an opportunity to generate revenue. This categorization seems to be applicable to a crowdsourcing community.

In terms of demographics, some studies have been done. Demographic studies on members of crowdsourcing platform show that the most productive users in the crowd are likely to be young and are certainly under 30 and probably under 25 years of age. (Lenhart, et al., 2004; Lenhart and Madden, 2005) Also Brabahm in their study on istockphoto.com showed that the crowd is more likely to be majority white, middle– or upper–class,
male, college-educated, and with high-speed Internet connections in the home (Brabahm 2008).

6.1.1.2 Motivation of Crowd

There are studies done on the motivation of online crowds to participate in different online groups. Some scholars argue their discussion around the Uses and Gratifications theory (U&G) (Dholakia et al; Lampe, Wash and Velasquez 2004). Dholakia et al. (2004) suggests that there are five motivational factors that affect user participation in online groups.

- **Purposive value**, which refers to user’s pre-expectation of joining the cause
- **Self discovery**, which relates to societal aspect of interaction and communication which is to obtain social resources and self-knowledge.
- **Maintaining interpersonal** is about the feeling of belonging and security, social support and friendship.
- **Social enhancement** is connected to the attention, recognition and reputation that one can get by building status within a community.
- **Entertainment** is all about fun and enlightenment that is derived from interacting with others users through different ways that are provided by the platform.

On the other hand, Allen and Meyer (1990) proposed the organization commitment theory. This theory rose based on the assumption that individuals develop a sense of belonging to the group eventually. Individuals think that they are a member of the group and their actions affect the group. They become attached to the group and they develop emotional bonds with the group (Tajfel 1978). User satisfaction with the group is the main determinant to keep them committed to organization matters (Jin et al. 2008). Allen and Meyer (1990) break down organizational commitment into three different types: Affective commitment, continuance commitment, and normative commitment. Normative commitment resonates a sense of obligation among employees to remain within an organization. What an organization should see in their members are affective and continuance commitment which are organic and self-motivating and perpetuating (Allen and Meyer 1990).
Some scholars (Füller 2010; Bayus 2010) tend to discuss the issue of motivation in terms of intrinsic and extrinsic motivation. Mostly they argue that there should be a balance between intrinsic and extrinsic motivation. Imbalance between these two in the system could lead to failure of the practice (Füller 2010; Bayus 2010). Further on, Füller (2010) gives a very interesting view on people’s motives. He refers to Self-Determination Theory (SDT), which is ‘a theory of motivation. It is concerned with supporting our natural or intrinsic tendencies to behave in effective and healthy ways’ (Self Determination Theory 2012), and based on that, he argues that there are various reasons for consumer engagement which are ranging from purely intrinsic motives (e.g. as fun and altruism) through internalized extrinsic motives (learning, reputation) to purely extrinsic motives (e.g. payment and career prospects). Further he argues that extrinsically motivated people's preferred behaviour is that they are goal-oriented and they look for the valued outcomes. They like to take on specific tasks; they lean towards monetary benefits. On the contrary, intrinsically motivated people's preferred behaviour is that they are experience oriented and they look for enjoyable experiences. They like to explore and they would like to take on tasks that are broad and demand various activities. The main incentives for these type of people are reward, experience, feedback and recognition. As an example, Amabile (1996) argues that people will be creative when they feel motivated. He further elaborates that primarily, interest, enjoyment, satisfaction, and challenge of the work itself are different ways that people feel motivated.

### 6.2 Summary of Interview Results

<table>
<thead>
<tr>
<th>Element(s)</th>
<th>Degree of Repitition</th>
<th>Interviewee(s)</th>
<th>Result(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Definition</td>
<td>****** Bernardo A. Huberman  Marion Poetz  Yannin Roth  Frank Piller</td>
<td>- If you ask exactly the questions that company asks themselves from users, the practice would definitely fail.</td>
<td></td>
</tr>
<tr>
<td>Diversity of</td>
<td>****** Marion Poetz</td>
<td>- Diversity is not just related to</td>
<td></td>
</tr>
</tbody>
</table>
| **Users** | Frank Piller  
Kara Maki  
Daren Brabahm  
Alexander Vossen | ethnicity but diversity of experiences and background should be taken into account. Diversity is generally a positive factor for the success of crowdsourcing.  
- Diversity is the factor that drives novelty.  
- Diversity is in crowdsourcing literature is defined as contextual differences in terms of background. Crowdsourcing platforms are social systems. Creating social capital is a must in a good design. |
| **Social Aspect** | **** Kara Maki  
Alexander Vossen  
Dan Dixon | |
| **Types of Exchange** | *** Alexander Vossen | In terms of economic exchange it is more likely Reward. In terms of social exchange it is more likely fun and enjoyment. |
| **Spare Time of Users** | *** Daren Brabahm Yannin Roth | Lacking spare time for some users are a very crucial thing. |
| **Informing Role of the Users** | *** Daren Brabahm Yannin Roth | The range of crowdsourcing manager’s intervening in the process of user participation affects the outcome of practice. Need to be studied further. |
| **Richness of Tasks** | **** Kara Maki  
Alexander Vossen  
Yannin Roth | It is very important design factor  
- Should be studied more |
| **Human-Value Based Design** | *** Dan Dixon | People will not do tasks for business purposes for nothing. They should see value in the tasks. They are looking for values. Wikipedia users do not work for Wikipedia. People write in Wikipedia for themselves. They found a value in it. |
| **Reputation System** | ***** Bernardo A. Huberman  
Frank Piller  
Yannin Roth  
Dan Dixon | Reputation system is kind of a systemized system to build up online representation. The idea behind reputation system is to give intrinsic awards.  
- A good reputation system |
<table>
<thead>
<tr>
<th>Internal &amp; External Resources</th>
<th>Martin Schreier, Marion Poetz</th>
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</thead>
<tbody>
<tr>
<td>Propagates trust in the whole platform.</td>
<td></td>
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<tr>
<td>A good balance between internal and external resources depends on the product category. If you design the T-shirt, theoretically everything can be done by community.</td>
<td></td>
</tr>
<tr>
<td>The role of internal designers and developers is to take the final crowdsourced ideas to the next level and develop them.</td>
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<table>
<thead>
<tr>
<th>Richness of Multimedia Tools</th>
<th>Kara Maki</th>
</tr>
</thead>
<tbody>
<tr>
<td>A crowdsourcing platform can be successful if it is still not as rich as platforms such as Google doc but it needs to have essential tools to let users express their opinion and ideas.</td>
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</table>

<table>
<thead>
<tr>
<th>Reward System</th>
<th>Dan Dixon, Frank Piller, Marion Poetz, Yannin Roth, Bernardo A. Huberman, Daren Brabahm</th>
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</thead>
<tbody>
<tr>
<td>The ideal reward system is when people get to choose what they could get out of it.</td>
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<tr>
<td>The ideal reward system is multi-level awards.</td>
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<td>Reward System is to give extrinsic awards.</td>
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<table>
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<tr>
<th>User Engagement</th>
<th>Bernardo A. Huberman, Yannin Roth, Frank Piller</th>
</tr>
</thead>
<tbody>
<tr>
<td>The most important factor for user engagement is the value of the practice to the user.</td>
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<tr>
<td>All crowdsourcing platforms have one thing in common which is engaging users.</td>
<td></td>
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<tr>
<td>Platforms should find creative ways to stimulate users' creativity, to motivate them.</td>
<td></td>
</tr>
<tr>
<td>One of the reasons of users not wanting to get engaged is that there is something wrong with your incentive system.</td>
<td></td>
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<tr>
<td>The main motivation for users who want to participate in a profit-oriented crowdsourcing practice is money.</td>
<td></td>
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<tr>
<td>The term ‘crowding out’ cannot apply to any product.</td>
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<tr>
<td>The risk might be cases of stealing ideas.</td>
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<th>The Pitfalls of</th>
<th>Bernardo A. Huberman</th>
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### Crowdsourcing

#### Purpose of the Practice

- One of the pitfalls is that you ignore professional ideas which are generated by professionals
- Crowdsourcing outcomes are still missing “highlight products” as such that lead users have developed.
- Crowdsourcing might not be successful in high-tech products or certain components
- Main risk is that you do not have the same organization power as you had in the traditional methods. The second is that users are dispersed. The results might not have enough potential because of lacking focus.

- The purpose of the crowdsourcing plays a very important role in the success of practice. For example, in baby category, the problem is strongly tied to the need based information. It is the consumption problem. Here consumers have enough exposure to the problem. If the problem is complex, here the designers are more useful

#### Future of Crowdsourcing

- A good thing about crowdsourcing is that it makes a very low threshold to participate with high incentives.
- Crowdsourcing as a complementary approach to conventional approaches.
- including external distributed inputs into your internal innovation activities is the something that last strong in future.

#### User Motivation

- One of those is the opportunity to get money. Another is to get their skills developed. Another is to get recognition and the last one is the opportunity to develop their resume for future possibilities. However, one cannot say that what type of motivation has the most effect.
- The motivation for users who want to participate in a practice that is initiated by a profit-oriented
Collaboration

The Potential

Valuability of Crowdsourced Ideas

Crowdsourcing Process

Likelihood of the Success of Big Brands

Transparency of Communication

User Effectiveness

Organic Design of Platform

Company is money. Crowdsourcing practice could be very competitive or very collaborative. Knowledge and novelty lies in spots and locations that you never search there. Crowdsourcing will enable you! You should identify people who have strong experience with the problem in the past. If you move to products that in more complex categories, the likelihood of getting good ideas decreases since it demands knowledge and experience.

Crowdsourcing is a variation of top-down and bottom-up models. It is a blend of both top-down process and bottom-up process. The main challenge towards the design the process is how to scale the project. Big brands are more successful since they can instantly to a large group of customer.

Crowdsourcing platforms should act as mediators between firms and users. Their role can highly affect the quality of solution and quality of interaction in the platform. It also can reduce spamming. In terms of efficiency of users' and their effectiveness, it is hard to draw a fine line. Top-down Platforms such as Innocentive are efficient in a way, organizational-wise. an organic platform that ideas are generated, boiled and developed is needed.

The approach to design should be an ecological approach. Designers should consider the whole socio-
Feedback to Users

Yannin Roth

- If you don’t give feedback, you don’t allow people to improve, you don’t allow them to be visible etc.

Gamification

Daren Brabahm
Yannin Roth
Dan Dixon

- Gamification can be accomplished by enabling users to have Autonomy, to feel mastery and freedom, and to feel sense of play. Without giving meaning to the process, every design would face failure.

Importance of Social Media

Dan Dixon

- A crowdsourcing practice is successful when it reaches to social media environment, when it exists in social media.

- Using social media in ideation contests would lead to share easier and increase collaboration.

Learning Environment

Daren Brabahm

- Learning happens simply by looking at other works. Learning is one of those things that often happen in crowdsourcing.

- You can use crowdsourcing to identify lead users.

Lead Users

Alexander Vossen
Martin Schreier
Frank Piller
Marion Poetz

- It is tricky to attract lead users to our crowdsourcing practice. For example, if you define a very narrow problem, it might be not interesting for lots of lead users to join.

- You give freedom to users to choose. You empower consumers which lead to higher loyalty and novelty.
6.3 Interview Results (complete)

6.3.1 Interview Poster

Master thesis project

How Crowd Sourcing can contribute to
Design-Driven Innovation?

We would like to interview with you

Interview Questions

1. What are the key elements of user participation?
2. What is the user motivation to participate in crowdsourcing process?
3. What kinds of task are genuinely suitable to demand from users in crowd sourcing platform?
4. How to address the right group of users for crowdsourcing purpose? Is diversity of users genuinely a success factor?
5. Compared to the professional ideas, what are the advantages of crowd sourced ideas?
6. How a crowdsourcing reward system can affect the outcome?
7. What are the elements of a good reputation system?
8. How to integrate crowdsourcing with internal R&D department?
9. What is the risk of using crowdsourcing for innovation?
6.3.2 Interview with Kara Maki

**Diversity of users**
Diversity was one of the main issues that was discussed. A diversity of users is essential for crowdsourcing practice and needs to consider highly when it comes to design.

**Social aspect of the crowdsourcing practice**
Societal aspect of the crowdsourcing platform was discussed. Having a social network embedded into the platform can empower the societal aspect of the practice. One cannot claim that social network structure can bring more users to the platform since maybe the platform is being used for competition-oriented contests. In contest-base platforms, users are very goal oriented and very competitive. In this environment, the quality of challenges and problems are more appealing to them than setting up a social network to communicate with each other. They do care more about the contest.

**Richness of multimedia tools**
In terms of richness of multimedia tools, a crowdsourcing platform can be successful if it is still not as rich as platforms such as Google doc but it needs to have essential tools to let users to express their opinion and ideas.

**Transparency of Communication**
Crowdsourcing platforms should act as mediators between firms and users. Their role can highly affect the quality of solution and quality of interaction in the platform. It also can reduce spamming considering this fact that users have self-awareness that a serious team behind the platform checks the quality of data.

6.3.3 Interview with Bernardo A. Huberman

**Purpose of the practice**
The most important factor for user engagement is the value of the practice to the user.

**User Engagement/Motivation**
The second is the recognition in the form of attention by the others, awards for most productive, quality, etc.. Except from attention, monetary reward tend to drive use at the beginning, and unless they are large, participation in
exchange for a few cents every time won't be enough. Given that you have a finite budget, creating a public recognition system might be more effective.

**Importance of Reputation System**
A good reputation system propagates trust in the whole platform. One can say that the outcome of the reputation system should result in distrusting trust in the platform.

**The Pitfall of Relying Merely on Crowdsourcing**
The risk of using merely crowdsourcing for innovation might be cases of stealing ideas, that someone sees a good idea in the platform, steal it and starts making money out of it.

### 6.3.4 Interview with Yannin Roth

**How crowdsourcing works**
There are two general processes to all crowdsourcing platforms: Top-down process and bottom-up process. Top-down is like innovative.com that a company just propose a problem and users come up with solutions. bottom-up is like platforms such as Quirky that users come up with a good idea and in collaboration with platform they develop the idea. Accordingly we have two types of creativity: Pro-active creativity and re-active creativity.

**User Engagement**
All crowdsourcing platforms have one thing in common which is engaging users. One of the main points about users' engagement is that platforms should find creative ways to stimulate users' creativity, to motivate them.

**Organic platform for boiling the ideas**
Crowdsourcing platforms should create an organic platform that ideas are generated, boiled and developed. Platforms such as quirky created a cohesive community. They are in between of crowdsourcing platform and online community. Users they feel so belonged to quirky. There is a sense of community but we should be careful about community since there is a sense of belonging and purpose behind it which is in contrary with crowdsourcing platform.
**The matter of constant feedback to users**

As long you have a contest mechanic, it would be really hard for people to feel that they belong to somewhere => This is true only if the contest mechanism is not well designed i.e. you don’t give feedback, you don’t allow people to improve, you don’t allow them to be visible etc. It is important to give a sense of being community to their users. Approaches such as storytelling and TV shows are very effective.

**Lack of Time, The hinder against participation**

One of the drives that might hinder people to submit ideas are lack of time. These users who are skilled but they do not have enough time are very valuable to each crowdsourcing platforms but the majority of users are amateurs and students.

**Transparency of Communication Between Companies and Participants**

In terms of if it is a positive factor, transparency of communication between companies and participants, the first answer is yes. Second is no. You cannot just hand over the communication to users and firms. There is a need to some sort of mediation.

**The importance of how well you define the problem**

If you ask exactly the questions that company asks themselves from users, the practice would definitely fail.

**Competitive or collaborative**

Crowdsourcing practice could be very competitive or very collaborative.

**Reputation system**

Reputation system is very tricky. It might work or not.

**Richness of tasks**

It is very important.

**Big brands are more successful**

The bigger the brands, the more possible that crowdsourcing success would gurantee
6.3.5 Interview with Daren Brabahm

How Crowdsourcing works
Crowdsourcing is a variation of top-down and bottom-up models. It is a blend of both top-down process and bottom-up process. Wikipedia is not a crowdsourcing platform since there is not top-down. Linux is organised by crowd but it has not any top-down process. The two ends of spectrum, Wikipedia and Linux at one end and at the other end, simple marketing contexts are not crowdsourcing.

User Effectiveness
In terms of efficiency of users' and their effectiveness, it is hard to draw a fine line. Top-down Platforms such as Innocentive are efficient in a way, organizational-wise. For example, for all the energy spent on a contest, Innocentive is not efficient. If 8 or 9 scientists work on a problem, one wins the works of others would not considered.

Diversity of Users
There is a lot to research to know how diverse users should be for a crowdsourcing platform with a specific purpose. Diversity is not just related to ethnicity but diversity of experiences and background should be taken into account. Diversity is generally a positive factor for the success of crowdsourcing.
One should attract different type of people. You don’t want to attract just goal oriented people.

Reward System
Crowdsourcing offers a different set of motivation and opportunity from open source activities. One of those is the opportunity to get money. Another is to get their skills developed. Another motivation is to get recognition and the last one is the opportunity to develop their resume for future possibilities.
The ideal reward system is when people get to choose what they could get out of it. Threadless gives a variety of options. A variety of options for rewarding system can be a good approach. The ideal reward system is multi-level awards.
**Users**
Thos who just participate in crowdsourcing platform in their spare time are not as motivated as users who don’t have a job and just want to make money. They participate because of the fun factor.

Nobody has studied that which motivation is the most important that connect the motivators to quantity and quality of participation.

**Importance of the design of the platform**
The reason that threadless is a very successful platform because that Threadless has a very **fun environment**. There is a discussion board where people who engage with threadless for years, they share jokes, they comment on others ideas. They have created a unique environment for creative people.

**Competition as A Positive Factor**
Competition for crowdsourcing platform is not a bad thing. It is considered as a good factor.

**The matter of Learning**
Learning happens simply by looking at other works. Learning is one of those things that often happen in crowdsourcing.

**Gamification**
Gamification is kind of the heart of lots of stuff. There is a gamification system going on with crowdsourcing platforms.

**Types of task**
3 types of task can be defined for crowdsourcing practice: simple tasks, complex tasks, creative tasks. Although this is a simple division and there is more to define, it is a good start. However, this kind of categorization should be extended.

**The Pitfall of Relying Merely on Crowdsourcing**
One of the pitfalls of relying too much on crowdsourcing is that you ignoring professional ideas which they are generated by professionals who are practiced to design. It is a trade-off. It should be a **blend between**
crowd and professionals. Another one is that it is difficult to get the crowd going. It needs resources and money to do that.

**Informing role of the rules**
The range of crowdsourcing manager’s intervening in the process of user participation is something the needs to be studied further.

### 6.3.6 Interview with Dan Dixon

**On the Matter of Gamification**
There is a misunderstanding in the business environment about the term Gamification. They often misunderstood it of just users playing games. They think of Gamification as here is the game and here is the rule and you have to play by our rules

**Human-Value Based Design**
When designing an information system, one should ask what is it in for user? People will not do tasks for business purposes for nothing. They should see value in the tasks. They are looking for values. Wikipedia users do not work for Wikipedia. People write in Wikipedia for themselves. They found a value in it. Human-Value Based Design! The good example is open-source software. People do contribute because they want an alternative. They make it by themselves. Open source is not about making software. It is about people improving skills. Developing a useful software and improving skills are two main values of participating in making an open-source software.

**Definition of Users**
Most of the users are lurkers. They keen to read and stay passive. However, reading is not a passive act. Data and information can be generated by focusing on what content has been read the most.

**Reputation System VS Rewarding System**
Rewarding system and reputation system have some overlaps with each other. They are kind of in parallels. Reputation system is kind of a systemized system to build up online representation. The idea behind reputation system is to give intrinsic awards. Reward system is to give extrinsic awards.

**User Motivation**
One cannot say that what type of motivation has the most effect. There is not a clear line of what extrinsic value is and what intrinsic value is. Users they want to solve the real problem.

**Organic and Ecological Approach to Design**
The approach to design the system should be an ecological approach. Designers should consider the whole socio-technical approach. The design is not merely about technical stuff but also about societal aspects too. Bringing meaning into the Gamification can be accomplished by enabling users to have Autonomy, to feel mastery and freedom, and to feel sense of play. Without give meaning to the process, every design would face failure. The main challenge towards the design the process is how to scale the project: It is a very important point. Scale is the most important question in the design process. Design is like planting seeds. You kind of know about the fruits but you do not know how exactly going to happen. To consider everything in design would lead to removing the exploration factor. Users need a sense of freedom in action. Interaction happens between human and medium, medium and medium, human and human. Interaction happens all over. A design can only support some sort of behaviour. Crowdsourcing platforms are social systems. People know that they are other people existing. Creating societal capital is a must in a good design for users. In the designing of crowdsourcing page, designing the first page is wrong but you should think where the first place is that users are redirected to your page. Is it a kickstarter project page or first page? Very few people come to kickstarter by homepage. A crowdsourcing practice is successful when it reaches to social media environment, when it exists in social media.

**6.3.7 Interview with Alexander Vossen**

**Different types of exchange within platform**
In terms of economic exchange it is more likely Reward. In terms of social exchange it is more likely fun and enjoyment.

**Importance of the Factor of Social Media**
Using social media in ideation contests would lead to share easier and increase collaboration.
Any crowdsourcing practice should foster collaboration. Collaboration is more important than competition because it evokes cooperative behaviour (one key asset of crowdsourcing).

Diversity of Users

Diversity of users is useful when creative solutions are demanded. For need based does not need for a diverse group of people since you need a close group to walk through the challenges in the way of innovation process.

Pitfalls of Crowdsourcing
Crowdsourcing outcomes are still missing “highlight products” as such that lead users have developed. Crowdsourcing might not be successful in high-tech products or certain components. Main risk of relying too much on crowdsourcing is that you do not have the same organization power as you had in the traditional methods. The second one is that Users are dispersed. The results might not have enough potential because of lacking focus.

Main Advantage
You give freedom to users to choose. You empower consumers which lead to higher loyalty.

6.3.8 Interview with Martin Schreier

Advantage of Crowdsourcing
Crowd has a very efficient self-selection process. Crowdsourcing can lead to an environment that lead-users with great ideas reveal them. So crowdsourcing can facilitate that environment. Big firms advantages of hiring crowdsourcing as an innovation approach is that they can easily activate thousands of consumers that are the fans of the brands which is not the case for any start-up companies. Consumers or users might be sceptical to the whole crowdsourcing practice if a big firm runs that. Maybe they are kind of concern to be abused by the users. However, it is all speculated.
Success of Crowdsourcing Practice
Success of Crowdsourcing Practice follows simple room of statistics: if you have many ideas from a diverse range of people, the likelihood that you get few good ideas increases

Is crowd’s Ideas valuable?
For example, in consumer products, most users who have good ideas are those who had the problem with the products. So they started to think to solve the problems by themselves. You should identify people who have strong experience with the problem in the past.
If you move to products that in more complex categories, the likelihood of getting good ideas decreases since it demands knowledge and experience in the respected field. The consumers with high expertise in this category would decrease too.

The Importance of the Purpose of Crowdsourcing
The purpose of the crowdsourcing plays a very important role in the success of practice. For example, in baby category, the problem is strongly tied to the need based information. It is the consumption problem. Here the consumers are the advantage since they live in usage environment. They have enough exposure to the problem. If the problem at hand, however, is not so much tied to the usage problem, maybe because the problem is more tied to technology and materials, in this kind of situation probably the affect is reverse. Here the designers are more useful because designers have the skills, knowledge and experience regarding any technological matters.

Transparency of Communication
Honestly and transparency are important for big firms when they initiated a crowdsourcing platform.

The Balance between Internal and External Resources
A good balance between internal and external resources depends on the product category. If you design the T-shirt, theoretically everything can be done by community. Ironically, if you lose your community, you lose your business.
6.3.9 Interview with Frank Piller

User Engagement
One of the reasons of users not wanting to get engaged is that there is something with your incentive system. The main motivation for users who want to participate in a crowdsourcing practice that is initiated by a profit-oriented company is money. The term ‘crowding out’ cannot apply to any product. This is very much dependent on the product. Crowding out is more applicable to social goods when a society is behind. For example, for threadless, users participate because of the reputation. In this context reputation equals money, to make the name and to make their business.

The Advantage of Crowdsourcing
A good thing about crowdsourcing is that it makes a very low threshold to participate with high incentives. This is what threadless is good at. Companies do crowdsourcing since competitors are doing it and also because it is cheap. There is a future for crowdsourcing which is complementary to conventional approaches.

Importance of Rewarding System
One of the most important factors regarding to crowdsourcing practice is having a well-designed incentive structure.

What is Crowdsourcing?
Howe’s definition is applicable to profit company. Crowdsourcing is just an organizational form of coordination. You can apply it to different purposes. Crowdsourcing are used generally for 3 purposes: marketing, customer care and innovation platform but mostly is used as a marketing campaign.

Is crowdsourcing ideas’ innovative and valuable?
You cannot compare lead users’ ideas with crowdsourcing ideas. There are very few lead users. They do innovate because of their own needs. The crowdsourcing, if you do it correctly, you get many ideas and few of them are the ideas of lead users. Of course, you get a diverse range of ideas which most of them are not appealing. You can use crowdsourcing to identify lead users.
Most crowdsourcing contests have nothing to do with innovation. They are just conducted by companies because they see it as good marketing campaign. Crowdsourcing could be a good approach to generate innovative ideas for a company that is looking for profit. Crowdsourcing could be good for few tasks maybe one out of ten. It might be feasible for one out of ten. It depends on the tasks. It is feasible for some but not for all. They can use traditional methods. Dell idea storm is more for customer care. It is not a good for innovation platform.

**Crowdsourcing is good for finding solution for a good defined problem.** There are different platforms using it for innovative purposes such as Threadless, Innocentive.

**If you ask the right question and recruit the right people, crowdsourcing can be a good tool for innovation.**

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**Diversity of Users**
For innovation purposes, companies should go for a diverse range of people.

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**6.3.10 Interview with Marion Poets**

**What is Crowdsourcing?**
Crowdsourcing is based on the ideas that users know their needs better than firms and some of them not only know their needs but already have the idea to meet their needs. Crowdsourcing can be one-way interaction that one makes an open call and invites solutions e.g. Innocentive. Also there can be a community model attached to it that you make an open call and users interact and collaborate. Crowdsourcing is about activating self-selection. It is the matter of approaching a large crowd.

**Potential for Crowdsourcing**
Users’ cost of innovation is different from one industry to another. It is easy to shape the baby product but it is probably not so easy to shape very complex technical device. However, we have seen lots of user innovation activities in B2B market. There is potential for crowdsourcing in terms of technical products. But it is important to notice that crowdsourcing for such products are very complex. For these products, there might be needed to design the process in very
different way. You need to be able to **decompose the problem** and offer it in **small pieces to users**.

The complex problems demand **two-ways** interactions. It is important to define the problem as **clear** as possible for the users.

The solution to problem might be in the hands of the group of crowd that is not located in your industry **environment**. They might be somewhere else. That is where real crowdsourcing potential is. Knowledge and novelty lies in spots and locations that you never search there. Crowdsourcing can enable the firms to access to these sources. From Innocentive, scholars realized that best solutions are not necessarily coming from those that have same knowledge background.

If you set your boundary right and define the problem in a way that is clear and at the same time challenging for the users especially lead users, crowdsourcing users might come up with the idea of car instead of fast horses.

Crowdsourced content and knowledge is very heterogeneous in terms of quality. Some of the users for baby products sketched their ideas and some just wrote few lines.

**How can those firms define the problem while they are weak at need finding process?**

If firms know the problem and the problem can be specified in such way that can be used in crowdsourcing platform, the crowdsourcing practice would be successful. So firms can hire different methods in advance to help them to define the problem then with having clear problem definition, they can thrive on crowdsourcing practice or they can go more into the direction of having a community approach which demands more two-ways interaction and having constant dialogues between both sides which is is the key to conversation.

**How to Attract Key/Lead Users to the crowdsourcing practice**

It is tricky to attract lead users to our crowdsourcing practice. For example, if you define a very narrow problem, it might be not interesting for lots of lead users to join. One of the crowdsourcing dilemma is that you might define a problem that might not suit to lead users passion but if we keep that aside, the point is that you make your call known to a very large crowd. I truly believe that the level of novelty in the crowdsourcing is by definition limited because you limit the solution space.

**Crowdsourcing VS Other Product Innovation Methods**
Crowdsourcing does not substitute all product innovation processes. Because when it comes to certain tasks like incremental improvements, you can just rely on the internal designers and developers. Somebody needs to take the crowdsourced ideas and turn it into products and services and of course this is the job of company employees. However many firms’ structure are not prepared for this because for firms’ structures, outside knowledge is something that usually internal people like to neglect because they are threaten by this.

The role internal designers is not to filter thousands ideas. There should be some mechanisms for pre-filtering which is called collaborative filtering. How it works is that within the community, users collaboratively discuss the ideas and try selecting the best ones.

The role of internal designers and developers is to take the final crowdsourced ideas to the next level and develop them.

**Diversity of Users**

Diversity is the factor that drives novelty. The more diverse your crowd is, the more likely that you have knowledge that is not functionally fixed by the target market, kind of existence solutions. Industry and product type are not the issues here. Diversity is genuinely a positive factor. If a firm needs novelty, then it should increase diversity.

It is important to have a comprehensive understanding of diversity. Diversity is in crowdsourcing literature is defined as contextual differences in terms of background. But we have diversity of gender and age. Diversity of demographics is very important too e.g. platforms related to vocational purposes. Therefore how diverse users should be depends on which dimension of diversity are demanded.

You should not design your platform in a way that limits the participation.

**Future of Crowdsourcing**

Crowdsourcing as a marketing purpose does not have long future since crowd will understand eventually that there is nothing interesting and challenging behind these campaigns.

The basic concept is that you include external distributed inputs into your internal innovation activities is the something that last strong in future.

Activating self-selection rather than active searching for it is what it will be demanded from crowdsourcing approach in the future.
Rewarding System
Fairness is a huge deal to crowdsourcing success. There should be a win-win situation both for users and firms.

6.4 Survey
As it is already mentioned, the participants were in a good range in terms of age, gender and the occupation. This was because we tried to attract different range of people by tapping into different online groups. Therefore, the results from the survey can be trusted to a good extent. In this section, you can see the survey results. But here, briefly, we review the results.

In terms of general questions about online participation, 57% of users informed that they spend more than 6 hours per day on the internet while just 3% spend less than two hours. Also 40% of users spend between 2 to 6 hours of their time on the web. Moreover, 31% of users stated that they were a member of between 5 to 10 online groups as 38% said that less than 5 online groups they were member of. An interesting point is 20% of users declared that they were the member of more than 15 online groups that it shows how much online activities are woven in our daily life. The online activities of users are mostly checking emails (28%), professional and technical information (24%), reading news (23%) and chatting (21%). When we asked their opinion of being online, they mentioned that part of their lives are defined by being online (46%), Their jobs demand it (27%) and it is fun to be online (27%).

The third part of the survey was more about the questions related to users’ preferences and motivation of being active in crowdsourcing practice. Users’ satisfactions with crowdsourcing platform were neutral (57%), satisfied (16%), dissatisfied (5%) and not applicable (22%). We put ‘not applicable’ as an option as we may suspect that some of the users might not have crowdsourcing experience. Furthermore, submitting new ideas (25%), improving others’ ideas (22%), investing on good ideas (19%), doing little actions (19%) and marketing others’ products (15%) are users’ preferences to take on a role in crowdsourcing practice. Also, we asked about actual activities that they do in a crowdsourcing platform, 29% mentioned they just share information, 26% mentioned they do nothing and they just have an account, 25% mentioned that they just collaborate with others and 20% mentioned that they do collective action. Moreover, we asked users about
how they are comfortable to work in online groups with others. 54% of them support the cause, 31% of them mentioned it depends and 15% of them said they do not welcome the idea. In terms of type of help users seek in crowdsourcing platforms, 39% stated that to find skilful people for developing their work, 38% stated that to get feedback on their ideas and 23% said that to look for fund for their ideas. Also, we asked users’ opinion about a good reward system. 79% said that based on their time contribution and quality of their work, 11% said just enough to acknowledge and appreciate their effort and 10% said as the same wage as they get in their real job. More so, we asked users whether they have generated money which only 6% of them confirmed that they generated money by participating in a crowdsourcing activity.

Moreover, as an open question, we asked about motives behind online participation on the web. Some mention that online life is woven tightly to their life. They do most of their meetings through Skype. They do their banking and socializing online. Some even stated that everything they do is through internet. Some mentioned the reasons behind it which they use internet since it is the most current and diverse source of information. Some declared that the internet is their main hub for work, connecting, and entertainment. To bold this, some showed interest to launch a webpage for their commercial idea and make their living in this way. About the motives, some mention that using internet would remove obstacles related to time and space. Some said that having access to many things faster and doing multi-tasking are other important factors to them. Some even said that their life is boring without being online.

Also we asked users if there is more to explain about their crowdsourcing experience. Some mentioned that although they do participate in a crowdsourcing endeavour, they do not fully understand how it works. Some stated the necessity of employing better strategies for user engagement and some put emphasis on this issue by stating that the subject should be interesting and to get meaningful contributions, one needs to find smart ways to motivate people. Some others also highlighted the role of employing smart strategies to scale up the practice. Some addressed the importance of finding the right group of people for the right job. Some stated that a crowdsourcing approach is not good for all kind of tasks and when crowdsourcing is being used for complex endeavours, the results are not that promising. At the end, some emphasized the role of attracting a large number of people to the practice.
More so, we asked them an open question about advantages of crowdsourcing practice. They mentioned that meeting with skilled people and people that might help them in future is one of the advantages. Some pointed out the opportunity of knowledge sharing. Some mentioned checking others' resume. About things that are important for them, they mentioned quick payback system, good reputation system, meaningful tasks and fair sharing system as the main one. Also we asked whether they had generated money or not and the reasons behind it. Just few of them confirmed that they generated money. For the rest, there were different reasons involved. Some mentioned the importance of working in non-profit projects e.g. open-source software. In another words, generating money is not a priority for them. Some mentioned that although they are participating, they don't know fully how to generate money. Some argued that they do not like to generate money in this way since they are losing the direct interaction with people which is more fun to them. Some even took it to the extreme and mentioned that they do not believe in a crowdsourcing mechanism.
Gender

- Male: 55%
- Female: 45%

Number of belonged online groups

- Less than 5: 38%
- 5 to 10: 31%
- 10 to 15: 20%
- More than 15: 11%
Types of help users' seeking for in crowdsourcing platforms

- 38% To get feedback on others' ideas
- 39% To find skillful people for developing my work
- 23% To look for fund for my ideas

Users' Activities when they are in group of people

- 26% I just have an account
- 29% Share Information
- 25% Collaborate with others
- 20% Do Collective Action
Users' opinion about a good rewarding system

- Based on your time contribution and quality of your work: 79%
- Just enough to acknowledge and appreciate my effort: 11%
- As the same wage as I get in my real job: 10%
- Other:

Users' Preferences to take on a role in Crowdsourcing practice

- Submit New Ideas: 25%
- Improving others' Ideas: 19%
- Investing on good ideas: 19%
- Doing little tasks: 15%
- Marketing others' product: 22%
Users' Satisfaction with crowdsourcing platforms

- Satisfied: 57%
- Neutral: 22%
- Not applicable: 16%
- Dissatisfied: 5%

Have you generated money in any crowdsourcing platform?

- Yes: 6%
- No: 94%
### Open Questions

**Please write us about time spent on the internet, why you use internet and how!**

<table>
<thead>
<tr>
<th>I feel like that my life is mostly lived on the internet. As I work with people from many different countries and timezones - skype and all kinds of chat functions have overtaken what used to be meeting in person. I even meet people from my local context on skype.</th>
</tr>
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<tbody>
<tr>
<td>Almost all groups are from Facebook and since I'm using an smartphone I'm always online. I use for banking and socialising but Internet is only a tool and support to my real life, I would never be able to only meet friends on Internet.</td>
</tr>
<tr>
<td>I use the internet because it is the most current and diverse source of information. the internet is my main hub for work, connecting (I use social media, skype &amp; texting more than the phone) and entertainment (movies etc)</td>
</tr>
<tr>
<td>I want to get a website and use it to raise money for commercial real estate projects that I have in my pipeline for acquisition and development.</td>
</tr>
</tbody>
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**Any particular reason of not participating in crowdsourcing? Keen on sharing with us? If you don't know how to say it, just start writing!**

| I have no idea what crowdsourcing is! |
| I'm not sure how to get people to a conversation or how to start a conversation, etc. |
| They are very good for some things, and not so good for others. |
| To get meaningful contributions, you need to find other ways to motivate people. |
| I only participate in 'crowdsourcing' if **the subject is interesting** to me personally. |
| Need better strategies to getting people to engage |
| It's a way for people who no money to begin to raise money for their projects without having to go through the expensive process that is required by the SEC. |
| What you do needs to be marketed and presented extremely carefully. When done right though, the upside is potentially huge. |
| I am not into that |
| When moving into more complex endeavors it has been less easy... |
| . It improves the quality of the product. |
| Find the right partner |
| More people more power. |
Everything that I do is through the Internet. Even when I want to take a break...there is such an extremely large amount of things that the internet gives me access to that it's just odds in a way that so much of what I do will be me online using various resources that I have access to via the internet.

I usually use internet to get connect with the remote things that I don't have access to, due to place i'm living now. In addition, having access to many things faster and doing multi-tasking is another important factor to me.

Stockmarket School (itslearning) Facebook (Will quit this this month) Heroma (work)

Need for finding information

I am online almost all the time, but it does not make me happy! I wish i could find a way to work and do my daily job not siting online on my laptop.

I use the internet to communicate with friends, to keep up my profile back home in terms of work. I also use it a lot now for discovering new shows, art, music as well as keeping up to date with current affairs. I read blogs now more than I did before and having used Twitter, I see it as a dangerous portal for taking over my life. The computer screen already does that enough!

mostly use it for looking at art works and research and for school pages on FB

It is like a gate to any kind of information and unfortunately it became impossible spending 1 day without internet. Although sometimes I just runaway from the technology, it seems boring without being online most of the time. Anyways for any kind of information or communication, the internet appears to be the easiest way and also kind of harmful, the social networking is the most conflicting part of this being online all the time! but if you are really too far from your family and friends this is a good facility to be updated.

internet will be the main part of life in the future

why not using the internet

If you think that you want to explain more, please do not hesitate please write us about different issues related to crowdsourcing and share your experience with us. This will lead to something decent and useful for the community!

meet skilled people or people might help me for future
more interested in knowledge sharing than generating money
should be fair and protect benefit for different stakeholder
quick payback
check others resume
good reputation system
get reasonable payback
meaningul task
fair sharing system