A Project Report on

Survey on Crowdsourcing Technologies

Submitted by

C. Swetha (R170370)

Submitted to

Mr. N Satya Nanda ram

HOD CSE

Computer Science and Engineering

Rajiv Gandhi University of Knowledge Technologies

Idupulapaya, Vempalli, Kadapa-516330

Andhra Pradesh, India

As a part of

Partial fulfilment of the degree of Bachelor of Technology in Computer Science and Engineering

Date:02-05-2023

Acknowledgement

I would like to express my sincere gratitude to **Mr. N Chandra Shekar** for providing your invaluable guidance and suggestions throughout the course of the project.

I would like to thank **Mr. N Satya Nanda Ram HOD CSE** for constantly motivating me to work harder and creating a nurturing environment for progressing with my project.

At the outlet, I would like to thank my guide Mr. N Chandra Sekhar for providing all the necessary resources and support for the successful completion of my project. At last, but not least I would like to thank my teammates and other students for their physical and moral support.

Table of Contents

DECLARATION

I hereby declare that the report of the B.Tech Major Project Work entitled "**A Survey on Crowdsourcing Technologies-Initial Experiences**" which is being submitted to Rajiv Gandhi University of Knowledge Technologies, RK Valley, in partial fulfilment of the requirements for the award of Degree of Bachelor of Technology in Computer Science and Engineering, is a bonafide report of the work carried out by us. The material contained in this report has not been submitted to any university or institution for award of any degree.

C. Swetha – R170370

Dept. Of Computer Science and Engineering.

RAJIV GANDHI UNIVERSITY OF KNOWLEDGE TECHNOLOGIES

(A.P Government Act 18 of 2008)

RGUKT, RK VALLEY

Department of Computer Science and Engineering

CERTIFICATE OF PROJECT COMPLETION

This is certified that the project entitled "**A Survey on Crowdsourcing Technologies-Initial Experiences**" submitted by C. Swetha (R170370), under our guidance and supervision for the partial fulfilment for the degree Bachelor of Technology in Computer Science and Engineering during the academic semester-2 2022-2023 at RGUKT, RK VALLEY. To the best of my knowledge, the results embodied in this dissertation work has not been submitted to any University or Institute for the award of any degree or diploma.

Project Internal Guide   **Head of the Department**

Mr. N Chandra Shekar   Mr. N Satya Nanda Ram

Assistant Professor   HOD OF CSE

RGUKT, RK VALLEY   RGUKT, RK VALLEY

Abstract

The emergence and development of crowdsourcing provide a new way of business or organization innovation. Crowdsourcing model is researched based on the theoretical analysis eight cases study. First, the concept of crowdsourcing is defined from the perspective of theoretical analysis. Its general process is summarized. Compared to outsourcing their similarities and differences are summed up. Its emergence reason and advantages are analysed based on transaction cost theory and business management theory. Related research of participate motivation is reviewed. The problems and limitations are pointed out. Then the theoretical framework of crowdsourcing model is established. Second, based on the theoretical framework, two successful crowdsourcing cases are selected to study on six dimensions. New findings are obtained. The crowdsourcing model is understudied clearer and deeper. Some further research points are found. The conclusion can provide theoretical and practical support of crowdsourcing model for researchers and companies.

Over the years a great number of different websites have emerged that offer crowd-sourcing services, which aim at taking advantage of the vast number of anonymous workers globally available to complete tasks. In this paper we review and analyse existing websites providing crowdsourcing services in an attempt to establish a framework that will allow systematic discussion, comparison, and assessment of existing crowdsourcing platforms.

I. Introduction:

I. Background information on crowdsourcing technologies

Crowdsourcing is the practice of turning to a body of people to obtain needed knowledge, goods, or services. The term crowdsourcing is a combination of crowds and [outsourcing](#) and was coined in 2006 by *Wired* magazine author Jeff Howe in his article "The Rise of Crowdsourcing."

In today's digital age, our ability to communicate with many minds on a mass scale has made it a lot easier to turn to large group of people for innovative new ideas. crowd sourcing can be used to find solutions to all kinds of tasks. Crowd sourcing typically involves the use of internet to attract people to dived tasks or to achieve a target. Crowd sourcing involves obtaining work, information, or opinions from a large group of people who submit their data via internet, social media, and smartphone apps.

People involved in crowdsourcing sometimes work as paid [freelancers](#), while others perform small tasks voluntarily. For example, traffic apps like Waze encourage drivers to self-report accidents and other roadway incidents to provide real-time, updated information to app users. crowdsourcing allows companies to farm out work to people anywhere in the country or around the world; as a result, crowdsourcing lets businesses tap into a vast array of skills and expertise without incurring the normal overhead costs of [in-house](#) employees.

Crowdsourcing is becoming a popular method to raise capital for special projects. As an alternative to traditional financing options, crowdsourcing taps into the shared interest of a group, bypassing the conventional gatekeepers and intermediaries required to raise capital. Crowdsourcing usually involves taking a large job and breaking it into many smaller jobs that a crowd of people can work on separately.

Crowdsourcing can either take an explicit or an implicit route. Explicit crowdsourcing lets users work together to evaluate, share, and build different specific tasks, while implicit crowdsourcing means that users solve a problem as a side effect of something else they are doing. With explicit crowdsourcing, users can evaluate particular items like books or webpages, or share by posting products or items. Users can also build artifacts by providing information and editing other people's work. Implicit crowdsourcing can take two forms: standalone and piggyback. Standalone allows people to solve problems as a side effect of the task they are doing, whereas piggyback takes users' information from a third-party website to gather information.

The benefits of crowdsourcing include the ability to improve quality, solve complex problems faster, and lower the cost of a project by leveraging the skills of a vast group of people. Major companies such as [Starbucks](#), McDonald's, General Mills, Samsung, and Airbnb have used this technique for various purposes, including naming products, developing, and deciding on new flavours for foods, and collecting images and videos that can be used to promote the brand.

B. Purpose and objectives of the report

The main purpose of a report is to provide information on crowd sourcing. This report contains:

- History and evolution of crowdsourcing

- Advantages and disadvantages of crowdsourcing

- Types of crowdsourcing

- Key Players and Platforms in crowdsourcing industry

- Trends and developments in the field of crowd sourcing

- Future Growth and market potential

- Challenges and Opportunities in the Industry

- Prediction and recommendations for the future of Crowdsourcing

- Future Prospects of Crowdsourcing Technologies

C. Methodology used in Report

We selected several popular websites offering crowdsourcing services for review. In selecting these websites, we were guided by following criteria

a) Language: All crowdsourcing websites reviewed had to present their services in English.

b) Presentation of services provided: Websites had to provide the information required in order to facilitate their review.

II. Literature Preview

A. Definition of Crowdsourcing

The practice of obtaining needed services, ideas, or content by soliciting contributions from a large group of people and especially from online community rather than from traditional employees or suppliers.

- Typically, the "crowd" in crowdsourcing is a third party unrelated to To the business seeking results. You may crowdsource insights from customers and online communities, rather than employees or shareholders.

- Crowdsourcing describes the processes for sourcing a task or challenge to a broad, distributed set of contributors using the web and social collaboration techniques. include mechanisms to attract the desired participants, stimulate relevant contributions and select winning ideas or solutions.

- Crowdsourcing is a creative way of gathering information, ideas, or services from the public in order to accomplish a task or goal.it is fascinating and highly modern concept that is transforming the way we do business.

B. History and Evolution of Crowdsourcing

- The origins of crowdsourcing can be traced back to the 18th century. In 1714, the British government invited tenders for the "Longitude Prize." This prize was endowed with 20,000 Pounds and was to be awarded to someone who could develop a reliable method of calculating the longitude of a vessel while at sea.

- In the 19th century, several extremely smart people called for a re-examination of the entire English language. This was the birth of the Oxford English Dictionary. No, not quite the birth – they we are not ready to go into labor yet. Individuals could not carry out a project of this magnitude.

Three examples of Crowdsourcing Projects in the Analogue Era

1. In 1919, Planters Peanuts started a design contest to develop their logo.
2. In 1979, Tim and Nina Zagat established the "Zagat Restaurant Guide" for which they initially used the ratings given by their friends and later a larger community.
3. 1981 marked the publication of the third "Lonely Planet" travel guide. Travellers provided this guide with tips and tricks and corrected information relevant to the destination.

C. Advantages and disadvantages of crowdsourcing

Advantages:

1. Unexpected solutions to tough problems

   The most significant benefit of crowdsourcing is the ability to find unexpected solutions. By involving a broader group of people in solving a problem, a company can gain access to hundreds or even thousands of different approaches to problem solving.

2. A greater diversity of thinking

   Putting a wider pool of people to work can also unlock greater Diversity of thinking, as well as unexpected ideas. By inviting a Broader group of thinkers to participate in a problem solving exercise, a company can get access to a mixture of knowledge, experience, expertise, and contexts it would not have been able to otherwise.

3. Reduced management burden

   The management aspect of crowd sourcing is not something that is as well-understood as the other benefits. But it is a significant advantage. With crowdsourcing, a business organization just sets clear terms and conditions for the exercise, then lets the idea roll in.

4. More marketing buzzes

Because it is an engaging public spectacle, crowdsourcing can be

great source of marketing buzz. Rather than just resorting to the same old traditional problem-solving processes within business, this not only helps to build a greater network of fans, but gives something to talk about, too.

5. Faster problem solving

   Crowdsourcing is not just about getting access to the best Ideas-it is also about finding ideas as quickly as possible. By Inviting a wider pool of people to participate in the process,

6. Companies can get great ideas in a shorter timeframe

   Finally, crowdsourcing also offers businesses and organizations a detailed window into their most dedicated fans and customers. Crowdsourcing can also generate compelling customer insights.

Disadvantages:

1. Confidentiality and intellectual property

   While turning the questions over to external parties creates a lot of benefits, it also has intellectual property implications.

2. Less control over the process

   While this can be a good thing, it also means that crowdsourcing projects are not easy to manage and controls

as traditional internal projects. That is because company can't control the behaviour of every participant in the process.

3. Risk of inconsistent outcomes

Crowdsourcing can result some amazing off-the-wall suggestions. Sometimes these are useful, but sometimes they can be simply inconsistent with the desired outcome.

4. Potential for failure

Most organizations have this concern. What if you put lots of time and effort into conducting a crowdsourcing challenge and then end up with nothing to show for it? That would be devasting, especially if the problem is time sensitive and you are out of options.

D. Types of crowdsourcing

There are four main types of crowdsourcing. they are

1. Wisdom of the crowd

It is a collective opinion of different individuals gathered in a group. This type is used for decision-making since it allows one to find the best solution for problems. Many brands pay attention to the collective opinion of their customers because they help bring their businesses new ways of thinking, ideas, and strategies. As a result, the overall performance of a company improves.

2. Crowd creation

This type involves a company asking its customers to help with

new products. This way, companies get brand new ideas and thoughts that help a business stand out. For instance, McDonald's is open to new ideas from its consumers. The famous fast food company asked customers to create their perfect burgers and submit their ideas to the brand. The company released winners' burgers each week, including the creator's short bio.

3. Crowd voting

It is a type of crowdsourcing where customers are allowed to choose a winner. They can vote to decide which of the options is the best for them. This type can be applied to different situations. Consumers can choose one of the options provided by experts or products created by consumers. For instance, if a brand asks its consumers to create a new taste, package, or design of a product, other consumers vote to identify the best one.

4. Crowd funding

It is when people collect money and ask for investments for charities, projects, and startups without planning to return the money to the owners. People do it voluntarily. Often, companies gather money to help individuals and families suffering from natural disasters, poverty, social problems, etc.

E. Key Players and platforms in crowdsourcing industry

1. **Innocentive**

   Innocentive has helped global businesses, governments, public

   sector organizations, and charities harness the power of a crowd by

   providing opportunities for anyone to get involved and change lives.

   with so much innovation coming from challenges, governments and

   organizations are looking to solve crucial problems and this is

   where human collective intelligence and all the bright minds

   come together to find solutions to complex projects.

2. **Openideo**

Openideo is a platform that makes it easier for people around the world to come together and share new ideas about how we might solve complex problems in our communities. By using this platform, anyone with an Internet connection can access tools like IDEO's Toolkit or collaborate on challenges from anywhere in the world.

3. **Amazon Mechanical Turk**

   The platform has been growing rapidly over the years and they have expanded their marketplace to include everything from micro tasks, simple data categorization tasks, asking workers to gather data and even more complex work involving product generation.

   Mechanical Turk is a huge marketplace where companies and developers put up available small tasks and projects, known as "HITs," or Human Intelligence Tasks. Workers then go through the existing HITs on offer, choose ones they like, complete them, and get paid via Amazon's MTurk crowdsourcing site. One of the biggest attractions ofusing Amazon's Mechanical Turk is that you can use this online platform as a starting point before turning to external options for outsourcing tasks that need more specific, high-quality attention.

4. **uTest**

uTest has over 500,000 testers in their community who are looking for freelance work and new challenges to grow their careers. They also have a team of community managers who connect testers with clients on an ongoing basis to provide the best software testing experience. They also have a team of community managers who connect testers with clients on an ongoing basis to provide the best software testing experience.

5. Upwork

They also have a team of community managers who connect testers with clients on an ongoing basis to provide the best software testing experience. They also have a team of community managers who connect testers with clients on an ongoing basis to provide the best software testing experience. When you post your task or crowdsourcing project online either via mobile app or desktop browser window, you type in what kind of work is needed and a list of freelancers will be provided to you. Once selected, you can chat with them via the platform itself and negotiate a pay rate. Upwork has managed to take away thousands of hours that would otherwise have been used on finding and hiring freelancers.

6. 99Designs

Best for finding a great graphic designer to create engaging designs.

99designs is a crowdsourcing site where you get to create a graphic design contest for a business logo, website, or packaging. From here,

you will receive dozens of designs from talented graphic designers around the world who will submit their graphic design based on your requirements. You have the opportunity to choose the best graphic design and then purchase the rights to that design. This is great for businesses who want expert graphic designers to design their branding
and logo but don't have the time or skill set themselves.

7. **Cad Crowd**

Cad Crowd is a creative community of 3D modelers and designers who work on real creative projects from clients worldwide using all different types of CAD Software. They are not just another graphic design marketplace — they are the place to find the next best ideas and turn them into reality. Their platform offers you access to thousands of CAD modelers, designers & drafting contractors for your designs, 3D printing or any product project. You can choose between freelancers with different levels of experience in some of the most relevant fields. The best thing about using their services is that there are no long-term commitments required; you simply post your project and wait for responses.

F. Trends and Developments in the field of crowdsourcing

Most people are unfamiliar with the term crowdsourcing. It is one of the significant trends on the World Wide Web. Crowdsourcing is the outsourcing of internal partial tasks to an external group of users on the Internet. Trends are when something is developing or changing towards a certain direction.

- Past, Present Future Trends:

Since "crowdsourcing" is a combination of several words it is therefore, a neologism, the creation of a new expression. Jeff Howe initially mentioned it in 2006, in his article "The Rise of Crowdsourcing." **Crowdsourcing trends** might well be significant in the future too. An increasing number of companies are falling back on this clever system and make use of the knowledge and ideas scattered all over the world. In the long-term it could actually become a standard business model and provide a platform for the ideas of the crowd on the Internet. The trend is going towards the outsourcing of externs who do not belong to the core business of the company.

Current Top Trends

Crowdsourcing has come a long way since the use of wikis and open-source websites. Below are few top trends.

- **Crowdfunding**

This has become more popular in recent years yet companies still use it to fund new ideas and services. Individuals may even us i.e., to pay for their expenses or for charity. Examples here are sites such as IndieGoGo and GoFundMe.

- **Decentralisation**

Efficiency is focused here. Instead of the traditional hierarchy of a

company the crowd is used. Instead of decisions just coming from higher management, jobs are given to mid management and then shared to the crowd. A good example of this would be Uber and Lyft. Standard transportation companies would have a central office who delegated jobs to employees. With Lyft, upper management has more time to focus more marketing and innovation whilst mid-management oversee the crowd workers who drive their own cars in their own time.

- **Marketplaces**

    These specific marketplaces are growing in popularity. They work in the respect that creators and inventors put forward their ideas and the crowd or company votes on them. Therefore, those who get the highest votes will see their wares sold on the platform. An example of this is Amazon Launchpad. Whilst it's aimed mainly at companies already on the site it does welcome those outside of it. Lego and Minted are other organizations that follow the voting method.

- **Micro Tasks**

    these tasks are often part of a much larger project. AI is often trained with large numbers of tasks done by humans usually, online. clickworker.com is a prime example of this method. Micro tasks are often used by AI companies, data scientists, museums, manufacturers, and more.

- **User-Generated Content**

   Getting the crowd involved can be highly beneficial if you're wanting to create awareness of a product or service. Content campaigns can also create brand awareness, these are often done via social media. The audience is invited to create content for prizes. However, companies need to set rules and regulations in order to sift out bad or irrelevant content. Netflix once offered a $1M prize for someone who could create the best ratings prediction algorithm.

III.   Main findings of survey

Overview of the technology

   Crowdsourcing involves obtaining work, information, or opinions from a large group of people who submit their data via the Internet, social media, and smartphone apps. People involved in crowdsourcing sometimes work as paid freelancers, while others perform small tasks voluntarily.

During the past decade, there were rapid developments in the Internet, computing technologies, wide-spread, and use of location-aware technologies such as GPS and mobile phones. These developments influenced how people communicate and share their opinions, views,

knowledge, maps, and many others throughout software platforms.

There are many online Crowdsourcing applications such as Amazon

Mechanical Turk, Open Street Map, and Yahoo Answers amongst others.

Thus, crowdsourcing is a collaborative process which involves four main

components (requester, crowd, open call and platform). People might

benefit financially or intellectually from participation in crowdsourcing. This

 chapter serves as a general overview of crowdsourcing research and

envisages future research directions.

Applications of crowdsourcing technology in various industries

1. Application of crowdsourcing in health: Diagnosis was the most
   common usage of crowdsourcing in health. Crowdsourcing has been
    used multiple times for diagnosing malaria, specifically, and then for
   grading images in order to diagnose various conditions and
    diseases. It has also been used to assist physicians in diagnosing
   conditions.
2. Crowdsourcing application in marketing activities
       Active deployment of information communication technologies
         between consumers' enables them contribute actively to various
         business activities. A crowdsourcing phenomenon is observed

recently from perspectives ranging from users' involvement in company's communication activities to various crowdfunding models.

3. Crowdsourcing as comprehensive literature review

   Crowdsourcing has much unused potential, and the use of crowdsourcing is increasing rapidly. The study provides a thematic review of various applications of crowdsourcing. Successful applications of crowdsourcing include idea generation, micro tasking, citizen science, public participation, wikies, open-source software and citizen journalism.

Case studies and examples of successful crowdsourcing Projects

Case Study 1. Coke "Open Happiness"

Coca-Cola connected with their audience by appealing to consumers' hearts through the inspirational Tippy Tap video and story and finding personal commonalities and celebrating individuals by putting popular given names on its bottles and cans. Their solution was to focus not on the health benefits or drawbacks of their product but instead to promote the brand as feel good, long-lived, and positive.

Case Study 2. Domino's Pizza

This feedback was incredibly important for Domino's survival as a business, as it provided an opportunity to reconnect with its customer base and show that the brand really was listening to its customers. When the feedback was negative, Domino's took the criticism seriously enough to completely redesign its product from the crust up. At this point, Domino's launched its "Pizza Turnaround" campaign, which focused on being open with consumers and encouraging them to try the newly designed Domino's pizza. The campaign resulted in increasing revenues by 14.3% in the first quarter of 2010.

Case Study 3. Ben & Jerry's

Ben & Jerry's developed the global "Do the World a Flavour" campaign that used crowdsourcing as a way to both promote the organization's values and generate ideas for new ice cream flavours and product designs. Ben & Jerry's ran a contest across seventeen countries that challenged consumers to go to the brand's website and invent their own variety of ice cream. Winners would have their ice cream made into an official Ben & Jerry's flavour and receive a trip to the Dominican Republic to see first-hand where the Fair-Trade ingredients used in Ben & Jerry's ice cream is grown.

Ben & Jerry's used crowdsourcing to harness the passion of its fans in order to promote the brand in a positive way, generating deeper interaction with consumers along with a slew of new ice cream flavours. With 10,000 new flavour suggestions in the US alone (including iconic hits like "Cherry Garcia" and "Chunky Monkey"), Ben & Jerry's "Do the World a Flavour" campaign was a resounding success.

IV. Future Scope of the Work

It is certain that the power of the crowd will drive the future of businesses, because paid crowd work offers remarkable opportunities for improving productivity. Moreover, with such labour force arrangements, the global economy can complete complex tasks on demand and at a large scale with no geographic boundaries. Research in this field is currently undertaken so as to investigate, understand and facilitate this new form of supplying and demanding labour. In this context, we have presented an initial attempt to review contemporary crowdsourcing websites considering how they offer their services. We reviewed 98 top websites, as ranked by Alexa, which offer crowdsourcing services and have presented descriptive statistics related to their country of operation, the kind of services provided and the mechanisms used to ensure the quality of work performed.

Research in this field is currently undertaken so as to investigate, understand and facilitate this new form of supplying and demanding labour. In this context, we have presented an initial attempt to review contemporary crowdsourcing websites considering how they offer their services. We reviewed 98 top websites, as ranked by Alexa, which offer crowdsourcing services and have presented descriptive statistics related to their country of operation, the kind of services provided and the mechanisms used to ensure the quality of work performed.

Review results indicate that many websites are located in the US, while Europe and the rest of the world are lagging behind. Most websites provide microwork and crowdfunding services, while other kinds of services are rather under-represented. Moreover, sites offering without supporting any other type of service. Finally, while only half of the sites surveyed offer some form of quality control of work undertaken, only a very small number offers two or more such mechanisms.

The survey presented here is a first attempt at laying down a framework for discussing and analysing the kind of services that are becoming increasingly wide spread. Future work includes laying down a conceptual framework for systematic evaluation and assessment of such service providers, as well as for designing some form of taxonomy of such kinds of services. Furthermore, we will also examine issues related to workers' incentives/motivation and issues

related to quality control and efficiency to this end, we are currently conducting experiments in various environments (controlled laboratory settings, as well as social networking sites, such as Facebook) in order to correlate workers' incentives/motivation and quality of work.

There are some broad avenues for future research. Firstly, there are research opportunities to investigate further how crowdsourcing can be used in market research. Technologies like artificial intelligence improve almost daily, which points to questions about how AI combined with customer 77 intelligence can assist managers to even deeper insight and make better decisions.

V.   CONCLUSION

The development of crowdsourcing will play a key role in the transition process from "made in China" to "Created in China." It provides a new business pattern for companies and other organizations, by integrating a large scale of brainworkers, through the Internet. The two case studies from concept of CS, process of CS, Characteristic of CS, Reasons of CS emergence, motivation of participants, and limitations, effectively verified and supplement the theoretical framework. In a word, as a new business model, crowdsourcing does have its advantages. However, there are also some limitations that can be further studies. It is obvious from the case study that crowdsourcing can do more than we think. As Jeff Howe proposed, tradition business model have been breakthrough, we are standing on a turning point to the future. Therefore, in-depth study of crowdsourcing is important and necessary. Although scholars have done some research on crowdsourcing, it is still in the starting stage, and need more in-depth and extensive research.

Future researches can explore the following directions: (1) Establish and improve the theoretical framework for crowdsourcing. (2) Distinguish the dimensions and standards to classify the types of crowdsourcing, and analyse characteristics and discipline of each type. (3) In-depth study of the problems existing in crowdsourcing with multi-theory, multi-method study, from multi perspectives. For example, fraud that may exists between employers and participants, selecting of the best solution. So as the fully explain the practice of crowdsourcing, analyse its inherent law, and make useful theoretical and practical guidance for the future development of crowdsourcing.

VI.　REFERENCES

[1] T. L. Friedman, The World Is Flat, 3rd ed., Picador USA, 2007.

[2] F. Liu, "Analysis of WitKey Business Model", Beijing: Graduate University of Chinese Academy of Science, 2006.5.

[3] H. W. Chesbrough, Open Innovation: The New Imperative for Creating and Profiting from Technology, Cambridge: Harvard Business School Press, 2003.

[4] F. T. Piller and D. Walcher, "Toolkits for Idea Competitions: A Novel Method to Integrate Users in New Product Development", R&D Management, 2006, 36(3), pp.307-318.

[5] J. Howe, Crowdsourcing: A definition. Crowdsourcing: Why the Power of the Crowd is Driving the Future of Business� Weblog, 2 June at http://crowdsourcing.typepad.com/cs/2006/06 /crowdsourcing_a.html accessed 11 March 2010.

[6] S. Ogawa and T. F. Piller, "Reducing the Risks of New Product Development", MIT Sloan Management Review, 2006, 47(2), pp.65-71.

[7] Coar, K., The Open Source Definition. 2006,

http://opensource.org/docs/osd, accessed 6 April 2008.

[8] A. Bonaccorsi and C. Rossi, "Altruistic Individuals, Selfish Firms? The Structure of Motivation in Open Source Software", First Monday, 2004, 9(1), pp.1-5.

[9] A. Hars and S. S. Ou, "Working For Free? Motivations for Participating in Open Source Projects", International Journal of Electronic Commerce, 2002, 6(3), pp.25-39.