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# Voting and commenting mechanisms in ongoing crowdsourcing platforms: A case study of lego ideas platform

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**VOTING AND COMMENTING  
MECHANISMS IN ONGOING  
CROWDSOURCING PLATFORMS: A CASE  
STUDY OF LEGO IDEAS PLATFORM**

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**SINGAPORE MANAGEMENT UNIVERSITY**

**2018**

**Voting and Commenting Mechanisms in Ongoing  
Crowdsourcing Platforms:  
A case study of Lego ideas platform**

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**2018**

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# **Voting and Commenting Mechanisms in Ongoing Crowdsourcing Platforms: A case study of Lego ideas platform**

Alharbi, Khalid Murzig M.

## **Abstract**

Although crowdsourcing, an innovative online call to help solve problems or generate new ideas, has gained much traction in the business world, not much research has been done on the commenting and voting mechanisms. Most of the research has focussed on the why and how businesses crowdsource. To fill the gap, this research focusses on the commenting and voting mechanisms and aims to analyse the effectiveness of the commenting and voting mechanism in an ongoing crowdsourcing platform, Lego Idea. Using Python software, 8663 comments were extracted from the Lego Ideas platform. These comments were then manually categorised into 10 variables based on a taxonomy of categories built from a combination of another scholars' work and this researcher's effort.

The approved and rejected projects set of data resemble each other to a great extent. Hence, the results of both the data sets show very little or no difference in the responses. This further signifies that the chosen variables for the research analysis only play a partial role in determining the success or failure of the submitted projects of Lego. When the contributors share

more of their personal stories and experiences, the number of comments on the submitted idea also increases. Sharing personal stories or experiences of the submitters as well as the commenters, in relation to the project designed, motivated the contributors to make a point about the content or design of the project.

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\*\*\*

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\*\*\*

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**D e d i c a t i o n**

*To the memory of my brother*

*(Ibrahim)*

*who valued education above all else,,*

## I. Introduction

### A. Background of the study

With the help of smart information and communications technologies, organisations can easily coordinate, reach and employ large group of individuals. In the last decade, technological advancements in the communication and information systems repositioned the economic coordination of human capital and had accordingly empowered an optimal form of unified value creation, which is termed as crowdsourcing. The fields of application of crowdsourcing is diverse, it can be used for the creation of new innovations and ideas. As a result, some organisations are adopting crowdsourcing techniques as a cost-efficient alternative to employees.

Crowdsourcing has been successful in influencing several industries and has become one of the core features of several business models. As demands for high-quality ideas keep growing in the business world, along with the progressing automation and digitalisation in every aspect of the society, it is expected that crowdsourcing would be developing further, especially to collect innovative ideas and to develop and evaluate them by the crowd.

As there is an increase in the number of crowdsourcing initiatives, there is an increasing demand for cost-efficient approaches that can be utilised for motivating individuals to take part in the crowdsourcing processes.

In early experiments with crowdsourcing, individuals participating in the crowdsourcing programs were rewarded with extrinsic incentives such as monetary rewards, and other benefits, all of which focussed on increasing the motivation levels of the participants. With the increase in the quantity of crowdsourcing activities, there is an expanding interest for cost-effectual tactics that could motivate individuals to take an interest in crowdsourcing.

A review of past literatures has unveiled crowdsourcing as one of the most prevalent application zones of gamification and different scholarly investigations demonstrate that gamification is a fruitful way to deal with the increasing motivational levels of the crowdsources. Emerging as one of the vital aspects of different business models, crowdsourcing has an impact on most of the business industries and has become a key part of different plans of business processes and actions.

In view of the current ever-growing demand for top quality datasets arising alongside the advanced process of automation and digitalisation in all parts of society, it is likely that crowdsourcing will keep on growing – specifically to gather information that cannot or can barely be accumulated without human help, and also to assess the value of datasets. There is a lack of an extensive review of research and a shortage of comparative examinations that explore the impacts of various types of gamification and other modes affecting crowdsourcing on the practices, behaviours and motivation of the crowd members; an essential learning to devise successful gamification and crowdsourcing activities. Specifically, we do not have a clear review of

which process is best in the various crowdsourcing frameworks, which limits our efforts in utilising their maximum potential in crowdsourcing.

During its lifetime online, a crowdsourcing platform witnesses many activities generated by the continual associations among the crowd and the firm, to discuss the soundness of an idea, develop or choose an idea. These activities rely upon different elements, such as: votes, remarks, points earned, comments, the amount of submitted thoughts, pertinence, plausibility to actualize, and arrangement of a thought with the business process of the associated companies.

A management group of the platform coordinates the general idea generation process guided by a set of criteria on how a thought is refined, popularly voted, and broadly acknowledged by individuals before its execution. Incredible thoughts may garner attention from both network individuals and community member. Subsequently, these thoughts may emerge as focussed issues on the crowdsourcing platform. Additionally, the contributions of the ideators to others' thoughts, for example by voting, examining, commenting, and so forth stands out enough to be noticed as his/her own particular thought from other network individuals and also from stage administration group. It has been found that the success of the crowdsourcing platforms depends on the effectiveness of the platforms in optimising and harnessing the crowds' potential.

The strengthening and expanding relationships between connections and new technological advancements, like the smartphones and internet, have made it openly simple to achieve substantial or collective ideas of individuals and to incorporate them into different types of crowdsourcing activities.

Different types of crowdsourcing have showed up under various names, including peer creation, client produced content, open cooperation, aggregate knowledge, crowd intelligence, mass joint effort, human calculation, crowdfunding, crowd sharing, and crowd voting. To start with, crowd processing approaches depend on the group to perform expansive amounts of homogeneous voting and commenting.

One example of crowdsourcing is crowd solving which is regularly utilized for extremely complex issues or if no previously defined arrangement exists such as in shortfall of ideas. The crowd voting and commenting frameworks ordinarily aim to harness the potential of collective knowledge of groups to perform aggregate appraisals or forecasts. For this situation, the emerging valued system emerges from countless 'votes'. could lead to a heterogeneous community that are committed to contribute and take their ideas to the next level.

Any crowdsourcing activity's success emphatically relies upon a functioning team of members or rather the participating members. In any case, individuals in collaborative platform prefer to present their own particular advantages and inspirations, which makes it troublesome for associations to

connect with and organize group of individuals for specific practices or perform special activities.

Even though some research has been done on crowdsourcing, very few of these studies have thoroughly examined commenting and voting behaviours in the various crowdsourcing systems. Studies have demonstrated that a wide assortment of reasons and inspirations, going from characteristic for extraneous, lead individuals to take an interest in crowdsourcing. There are other studies on particular inducement mechanisms used in crowdsourcing, for instance, idea selection process. Nevertheless, there is a gap in idea development process through commenting behavior, which offers only an impression of all interrelated voting and commenting mechanisms applied in crowdsourcing, in addition to barriers and applied suggestions, which ought to be considered when planning these crowdsourcing applications.

The contributors' evaluations of the viability of a project must be done in a guided manner so as implement positive directions in the improvement of the uploaded project or idea, which can contribute to higher ratio or probability of the project or idea getting accepted or implemented. The process of crowdsourcing requires addition of fresh vitality through addition of new contributors, to consider updated knowledge, thinking levels and higher level of interactions or responses to an uploaded idea that in turn are found to enhance the thinking abilities and innovative concepts encircling the idea. The contributors should be actively involved in the crowdsourcing process to demonstrate their sense of responsibility towards the community. The level

of development or the effectiveness of the enhancement depends on the experience level of the contributors available over a crowdsourcing platform. For a better analysis of the purpose of the study, the aim and objectives are presented in the following sections.

## B. Aims and objectives of the research

This dissertation intends to address the conceptual gap in the literature regarding the investigation of the crowdsourcing process. It seeks to evaluate the understanding or necessity of the commenting behaviour in the crowdsourcing process.

The aim of this research is to analyse how the commenting and voting mechanisms in ongoing crowdsourcing platforms contribute to ideas being ultimately selected for commercial production. Since there are only a few studies to investigate commenting behaviour, we aim to investigate the commenting and voting activities in the Lego Ideas platform and what they provide its community which prompt the members to vote and comment and whether Lego Ideas has succeeded in improving its implementation of ideas by increasing the value of the voting and commenting.

Based on the chosen aim, the following objectives are set:

- I. To evaluate the impact of commenting mechanisms in ongoing crowdsourcing platforms on whether ideas are selected for commercial production.

- II. To appraise the impact of some commenting behaviours on the efficacy of outcomes on the crowdsourcing platform.
- III. Examining the commenting behaviour, which generates such ideas and inputs.

The study is an investigating the ideas of voting and commenting features and commenting familiarization; exploring and presenting several commenting orientations, which stimulate operator aims and inspire involvement in crowdsourcing, stages.



## II. Literature Review

### A. Conceptual framework

The purpose of this study is to investigate the impact of the commenting mechanism on the development of ideas by innovation providers in crowdsourcing. To develop ideas, organizations are using crowdsourcing to generate ideas, but not every firm which gathers or collects ideas also develops them; only a few firms have implemented and developed ideas into viable products. Moreover, this study is narrowed down to the Lego ideas organization, which provides an in-depth view of crowdsourcing and its environment. Using Lego Ideas platform as a case study, this thesis investigates how the commenting and voting mechanisms enable the innovation providers to contribute productively.

This research identifies various factors which help to explain the future of crowdsourcing contributions for innovation in different organizations and also to evaluate the ongoing crowdsourcing activities.

For specific literature review, several databases, comprising ACM Digital reference library, Google searches, Exploration Access, etc. were searched and relevant materials extracted for study. The review of literature shows that most scholars focus on some concerns, which ought to be considered when planning voting and commenting mechanisms, followed by searching for suitable strategy references, which might develop the general user knowledge, as well as intensifying operator constancy.

Scholars first examined important aims and motivations for the public to participate in crowdsourcing systems, and, subsequently, they studied and characterized the incentive mechanisms used in crowdsourcing stages, and recorded crowd communication with their motivations and incentives. To inform this thesis, a small number of crowdsourcing platforms characterized according to the integrated enticement appliances, and some well-known examples of effective crowdsourcing platforms were examined, particularly their successful integration of their mechanisms.

## B. The Concept of Crowdsourcing

In recent years, crowdsourcing, the combination of two words “crowd and “outsourcing”, is an emerging concept that can be defined as an online innovative idea gathering and collective problem-solving model. The famous examples of crowdsourcing are Istockphoto, Threadless, Innocentive, Goldencorp challenge etc. According to Howe (2006f), crowdsourcing is different from outsourcing and open sourcing

The word “crowdsourcing” is accredited to Howe. Lately, there has been a constant attention on crowdsourcing, an activity that was developed with the growth of Web 2.1 technologies and proficiencies. As Howe defined it in 2005, crowdsourcing is “the performance of a firm or organization taking a purpose once achieved by workers and subcontracting it to an approximate set-up of individuals in the form of an open call.”

Meanwhile, crowdsourcing (CS) has progressed, and it can be established in several diverse appearances leading to several explanations, which vary based on the author's perception. In a contemporary study on 50 diverse explanations on crowdsourcing, it was established that it institutes a dispersed online procedure, which needs the involvement of the crowd for the achievement of particular activities.

The term crowdsourcing is coined by Mark Robinson and Jeff Howe in the *Wired* magazine issue of June 2006. They define it as an innovative solution given by numerous individuals in problem solving in response to the call for a solution by an organization. The crowdsourcing definition offered by Howe is, “in simple words crowdsourcing is the action taken by the company or organization to outsource its company’s function to a large crowd through an open call”. This definition implies conditions when some activities can be crowdsourced, such as voting and commenting.

This crowdsourcing can be done by a large number of people or it can also be done alone. Crowdsourcing can also be defined as a company’s online offering to a large number of people for problem solving or for generating ideas for innovation. According to Onisor (2016), the successful ideas receive some rewards from the organization and the company develops the idea for their own benefit. Crowdsourcing allows anonymous persons on one platform to gather and share ideas, resulting in productive outcomes.

Crowdsourcing has previously been effectively functional in several areas, from corporate tasks to non-profit inventiveness. Crowdsourcing can be a temporary operation with a fixed time frame or it can be a permanent one with no exit date. Examples of temporary crowdsourcing projects are: invention challenge, urgent search for data during outbound calls, Permanent crowdsourcing projects like Starbucks' and Lego's are ongoing with no end dates as they seek to continually explore new ideas generated on their platforms. These platforms have mechanisms embedded in them to help extract relevant data for specific objectives. Current versions of crowdsourcing technology have freed management staff from the heavy task of sorting and extracting data from the platform.

Effective crowdsourcing structures are reliant on the involvement of the consumers and their constant participation. The aims for participating in crowdsourcing stem from a wide range of motives such as selflessness, societal inspirations, and financial rewards. Nevertheless, as discussed earlier, there is a necessity for further investigation into the kinds of the crowd's motivation, as they differ significantly depending on the crowdsourcing objectives and participants' background. Hence, a detailed understanding of consumer aims would allow the planning and implantation of suitable motivation appliances, which could sustain consumer involvement in the crowdsourcing stages.

According to Bayus (2013), business organizations are obtaining full benefits of social media and web technologies and are continuously experimenting with new models of innovation. Among these innovative models, crowdsourcing is the most hype generated model, where firms are using the power of online crowd to generate ideas or to solve organizational problems.

Crowdsourcing is reaping the benefits of social media like Facebook, tweeter and LinkedIn where people with the same interests could “meet” and communicate online. But crowdsourcing is different from social media. In crowdsourcing, the users are not only involved in the discussions, but the virtual community is also controlled through different managerial techniques like protected copyrights, compensations and other similar activities.

In other words, the social media puts emphasis on the community’s social factors whereas crowdsourcing puts emphasis on the management of contributors through online sources to combine the crowd’s mutual knowledge and ideas to use them in the realisation of organizational aims. Crowdsourcing is an effective, evolving business model, more than a typical award gaining program or contest.

This research identifies the possibilities of the commenting model through crowdsourcing and the importance of commenting mechanisms. It is the involvement of common individuals in the idea generation phase for the development of a new product.

## C. Crowdsourcing Platforms

Bayus (2013) explains that there are many communities that are using crowdsourcing to generate benefits and also turn individual ideas into real products. (See Table 1 for examples of organisations with crowdsourcing platforms) The following are the most popular crowdsourcing platforms:

- **Crowdsourcing platform according to research and development:** *One billion minds*: website for online challenges, *Innocentive*: innovate ways to solve problems and *Yet2.com*: market place for IP.
- **Freelancer's crowdsourcing Platforms:** *Amazon mechanical Turk*: a cost-effective crowdsourcing, *click worker*: website for solving online small tasks and *Top Coder*: software crowdsourcing based on online competition.
- **Intermediary crowdsourcing:** *Data Station*: website for complete innovation platform and *Big deal group*: organize innovative idea hunt.
- **Public Crowdsourcing platform:** *Fold it*: crowdsourcing to solve science puzzles and *Ibridge network*: university innovation crowdsourcing platform.
- **Peer production crowdsourcing:** *Yahoo answers*: Crowdsourced question and answers and *Wikipedia*: encyclopedia produced by peers.
- **Corporate initiatives:** *Dell idea storm*: idea sourcing eternally, *My Starbucks idea*: redesign the Starbucks' future and *Fiat mio*: crowdsource for ideas on creation of cars.

## 1. Temporary Crowdsourcing Communities

The online crowdsourcing members can comment or rate the other's idea or propose their own innovative ideas. According to Terwiesch and Xu (2008), sometimes the crowdsourcing online platforms also take the shape of different phases of a tournament or a contest, for example, the beta cup challenge, which has gained remarkable attention both online and offline.

Piso and Schelle (2016) observed that, many companies, in order to get fresh and new ideas, outsource the process of idea innovation to the public through online platforms. A neologism, 'crowdsourcing', coined by Jeff Howe, a contributor of *Wired* magazine is gaining popularity. Howe (2008) explains that various organizations are using the online crowdsourcing system to collect new product/service ideas from the large online crowd; they basically approach a temporary crowdsourcing community. An example is a contest to minimize the quantity of non-recyclable cups by offering a convenient and easy substitute for reusable cups. Between April and June 2010, around four hundred ideas were received by organizers from the millions of individuals from across the world, all vying for the award of \$10,000. Another contest held in 2009, was sponsored by the Siemens subsidiary; it was a three - month LED light competition contest where contestants were asked to propose LED solutions keeping in view the concept of well-being or wellness. In the first phase, about six hundred ideas were submitted, and three winners were announced. Subsequently, in the second phase, two winners were announced, and ten ideas were forwarded for improvement.

## 2. Ongoing crowdsourcing communities

Terwiesch and Ulrich (2009) explain that the other crowdsourcing type is the ongoing crowdsourcing platforms where ideators are repeatedly involved in the idea generating process. Dell's idea storm and Starbucks coffee by Starbucks are gaining popularity in crowdsourcing platforms where a large community of consumers discuss, vote and suggest thousands of services and new product ideas.

Unlike temporary crowdsourcing where idea generators are allowed only a one-time idea submission, here in this on-going online crowdsourcing the community members have been asked to keep going on with either big or small idea submissions that further enhance the company's product or service performance. Since February 2007, Dell's idea storm has been gathering consumer ideas and similarly, Starbucks has been doing that since March 2008.

Apart from some research, there is a lack of published research papers on ongoing crowdsourcing communities and the effect of comment mechanisms. As consumers have already used the product, they have their own experienced product knowledge and also they know about the problems. Also, the most important factor is that they are motivated enough to share their ideas. Furthermore, if the organisation finds the idea valuable enough, the organization will start to develop it and the organization would also give a cash reward to the ideator. Hossain (2016) asserts that, crowdsourcing is cheaper, faster and an improved way to gain market insights rather than a



typical market research. It also has an added advantage of connecting with the customers; it also gives infinite idea resources and the process of innovation becomes faster and cheaper.

As discussed above, Dell and Starbucks have obtained from their crowdsourcing platform hundreds of innovative ideas. The efforts involved in the idea creation in crowdsourcing has not attracted much research. Simula and Vuori (2012) explain that by understanding the main factors of idea generation in crowdsourcing and the repetition of ideas favourable for organizations to develop them, organizations must realize the possible efficiency of the crowdsourcing members. Most researchers like Simula and Vuori focus on organisations and their crowdsourcing platforms but few have examined online behaviour of the participants in crowdsourcing platforms.

There are two kinds behaviour in the participants in crowdsourcing platforms; they are explicit and implicit behaviour. The comments and votes provided by members reflect their attributes (page visits, time spent on website) towards the idea or company,; this is known as implicit behaviour while the explicit behaviour refers to giving direct comments and feedback or asking queries directly. The best option for wisdom of crowds is to combine both options so that data and feedback will not be influenced and are clearly communicated with the contributors and company. Voting is also an explicit behaviour; in wisdom of crowd the right vote should be given to the best idea; they assist in identifying the best one for the benefit of the company, though all the given votes are not weighed equally.

Table 1 Examples of Ongoing crowdsourcing communities		
Corporate	Industry	Calling for
Local Motors	Automotive	Designing and building cars
Amazon Studios	Film	Creating Movie ideas
Quirky	Non-specific	Any invention ideas
Starbucks	Coffee	Ideas to improve coffees and buying experience
Coca-Cola	Beverage	Snacking occasions and branding ideas
InnoCentive	Non-specific	Any challenges that need solving
Jovoto	Identity Creation	Designing products & packaging
Dell Idea Storm	Software	Any Software invention ideas
Idea Scale	Non-specific	Any invention ideas that needed to be developed
SAP	Software	Any Software invention ideas
99 Designs	Identity Creation	Creating an Identity and Logos and so on.
Threadless	Retail Apparel	Design Clothes
NASA	Space	Any challenges that need solving
Crowd Spring	Identity Creation	Creating an Identity and Logos
Lego company	Toys	Creating new toys

#### D. Voting and Commenting in Crowdsourcing Platforms

The idea of crowdsourcing is becoming widely accepted and many firms are using this strategy not only for solving problems but also for gathering ideas and implementing the best idea. (See Table 1) According to the study of Mooker (2010), the selection of ideas to be implemented are meant to be decided through the commenting and voting system. The idea which receives more positive comments will be the award-winning idea and the company will start working on the idea by keeping the benefits for both parties.

In crowdsourcing these tools are used to analyze the quality and exchange ideas about services offered along with product development; it is also used to view the past history. Neroth (2009) points out that the unique feature of commenting in crowdsourcing is directly proportional to the decision of firms and the organizations to embed the voting and commenting results into their compensation schemes and process of decision making.

These tools are known as “strategic virtual management tools” that are used by the firms to review and evaluate product ideas, to gauge customer preference about the products, and to control the quality of contributions by community members and the product ideas. These tools are also used to design the compensation systems.

One of the main successful examples in creating a soft competition environment within the crowdsourcing community is *Threadless*. They use a commenting and voting system to identify the best submitted design for their t-shirt.. For that, the designs are rated on a scale of zero to five with the “I’d buy” available option; then the design of t-shirt becomes visible on the scoreboard of the commenting community. The t-shirt design with the highest number of votes will be selected by *Threadless* and hence approved to be printed.

For voting and commenting, the design availability on the scoreboard is for two weeks. After that, the voting option would be closed. As a representation of consumer preference idea, *Threadless* is using commenting and voting system in the crowdsourcing participation to generate the best idea..

Bayus (2013) explains that most websites of online business like eBay and Amazon benefit from the information available and user reviews and comments about the product. But these users are not involved in the innovative or development phase of the product they give reviews on. They only review the end product or the results of product after using it. Rating, voting and commenting are the ways to express one’s views about the product, service or even the quality of other’s ideas in social media.

It is through the participants’ comments and votes that enable firms to identify and reward the best selected idea innovator and the decision of selecting product. Thus, the commenting system in crowdsourcing provides a basis for giving rewards to innovators. At *Cambrian house*, the commenting

and voting system has enabled the company to develop marketing strategies, refine the chosen ideas for product development, to identify and analyze the best product ideas and to make a decision about giving rewards,

*Connexaion* is an online platform for giving two-way educational material production; they also rely on the commenting system to improve the quality of textbooks written by peer authors. Being an open platform for the production of collaborative educational material, the commenting and voting system is not a foreign feature in their business level strategy. In the review process through the commenting and voting system, *Connexaion* includes school administrators, superintendents, and faculty staff members in their platform.

Working online is always risky and uncertainty is always there; the trust factor cannot be developed, until the specific objective is completed by the worker or until the worker is being paid by the buyer. Majchrzak & Malhotra (2013) explains that to make successful crowdsourcing transactions, the uncertainties and risk factors must be minimized.

One strategy to promote the trust and reduce the risk and uncertainty is to have a commenting and voting system in which community members rate their idea or work. Studies reveal that these voting and rating systems are used to build trust and encourage participation.

According to Osram and Nadiah, (2015), the commenting and voting mechanism that leads to a final decision to implement an idea in the crowdsourcing community can be identified as the wisdom of the crowd. The theory of wisdom of crowds (WOC) is based on the fact that a crowd of individuals can provide a better solution to the problem and also make perfect and timely decisions, as compared to a single person no matter how expert he or she is in that field.

It has often been said that, “Large groups of people are smarter than an elite few, no matter how brilliant”. A large number of individuals can be utilized for creating innovative ideas, solving problems and making difficult decisions. Lorenz et al. (2011) explain that they are also sometimes better for future prediction. Basically, when companies are asking for human idea innovation, a large number of groups are available to answer them and provide their ideas; the more the diverse group, the more productive ideas will be the outputs. So, for the success of wisdom of the crowd diversity is the key factor.

A group of problem solvers with more diverse members are more effective in idea generation than a group with less diversification, no matter how good they are in solving issues/problems. To make successful crowdsourcing, wisdom of crowds is necessary as they include a large group of individuals that participate in the idea generation process through commenting and hence they convert customers into producers and also collect data from the discussions.

To make wisdom of crowds more effective the following factors must be present:

**Opinion diversity:** According to Zolkepli et al. (2015) an effective crowd wisdom comes from the decisions, judgements and comments that are independent from the remaining ones.

**Independence:** the wisdom of crowd becomes less efficient, due to the influence of the opinion/judgement of other community members.

*Decentralization:* makes the user to enable specialization and also have local knowledge.

The system that enables the user to convert sole judgements into efficient findings is known as aggregation and it must be there in wisdom of crowds to make them effective. The crowds of wisdom do not consist of intellectual minds, but they are given the right interface to develop the findings and this leads to wise decisions.

The following are the factors that can be implemented *to* improve the wisdom of crowds/ commenting mechanism:

1. **Simplicity:** the tasks should be simple, and the user interface should be easy to use, and the given idea or accomplished task must be easily understood. Sheng and Hartono (2015) explain that if the user interface is complex, the community interaction will be decreased, hence there will be less participants. Also, time is an important factor to be considered.
2. **Aggregation and participation:** According to Piso and Schelle, (2016), the more individuals participate and are involved in wisdom of crowds, the outcomes will be more productive.
3. **Gamification:** gamification is considered to be a motivation factor where the rules of a game are applied to engage and involve humans in a certain task. It is a high form of motivation, and keeping scores is one of the simplest ways to play games. The scoring feature of gaming theory can be helpful in the various activities like scoring other ideas, commenting on another people's idea, etc.
4. **Leader boards:** According to Bostwick (2010), building effective leader boards requires an organized wisdom of crowds and google result is an example in this case. An influenced wisdom of crowd is not as good as the independent one; their effectiveness is destroyed under influenced circumstances. To avoid bad leader boards companies can take steps to disclose results after the voting is completed, instead of an actual list disclosed, a random list of the successful ideas is shown to avoid influencing and disclosing the votes after it has been given.



## 1. My Starbucks's Idea:

Developed in March 2008, *My Starbucks* idea is the platform for crowdsourcing of Starbucks; they have defined their positioning statement as the initiator in incorporating and engaging social media websites. Their social media strategy includes the platforms of Facebook, G+, Twitter along with my Starbucks idea. In the very first year of my Starbucks idea, the company successfully received about 70,000 ideas from their customers. Within the time period of seven years, over 190,000 submitted ideas were received out of which 300 had already been developed. Through this platform of Starbucks, customers managed to make tremendous improvements in product development and service provisions. They were able to share ideas over the hub that connects the customers specially in the areas of involvement (community generation, social responsibility, etc.), products and in store experience.

Some of the successful my Starbucks idea include: Sugar free syrups, Continuing the key chain card, Free Drink with Purchase of Reusable Cup, Bring back 25oz Bag of Holiday/Christmas Blend, Cake pops, Skinny mocha, Tall reusable cold cup tumblers and K-cups.

## 2. Dell's Idea storm:

A handful of ideas, out of thousands of ideas presented by ideators have been implemented by the organization. Di Gangi et al. (2010) explain that basically most ideas that have been implemented by the organizations are from those who submitted their ideas on minimum of two or more events; these are the serial ideators. Therefore, the assumptions developed by the cognitive theory states that it will create a negative impact on the organization to develop the idea received by the earlier ideator because this will make the firm enthusiastic and eventually the ideators would propose ideas similar to the earlier one and organizations will eventually develop the idea similar to the previous one.

The more diverse organizations become, the more quality ideas they get in crowdsourcing. (Von 2016). The diverse crowdsourcing communities should have a positive effect on the commenting mechanism while generating new ideas for the organizations that are of value to them. The Dell's idea storm works in the manner that allows innovators to publish their article with the clear concept of the idea that they are proposing. While other contributors may comment, promote or demote the idea based on their liking. Dell has also built up "storm sessions" to collaborate and interact with the community. In storm sessions, a specific topic would be discussed by Dell and the community members can submit their proposals within a given time frame. The time frame restriction allows the users to stay relevant and discuss the given topic only (Dell, 2016).

## E. Benefits from having Ongoing crowdsourcing communities

### **Free Ideas**

Simula and Vuori (2012) demonstrate how Starbucks is deriving greater advantages with an open platform as they are gathering a huge amount of free ideas as well as numerous website visitors. With an open platform, any visitor in the website can participate in the tasks and in this way, ideas are freely generated for the organisation.

### **Voting and commenting**

With the Starbucks idea platform, customers can connect and communicate with each other through the commenting and voting system for best and worst ideas. This also helps Starbucks to tune in to the current demand of people in the coffee industry and enable them to make the user experience much better.

### **Implementing ideas with maximum votes**

According to (date of publication), one of the ideas gathered through the crowdsourcing platform is a suggestion for electronic payment at a Starbucks drive thru, through cell phones. This idea also calls for a customer tracking system to enable the barista to prepare the order for the customer to collect and pay on immediate arrival. Hafkesbrink and Schroll (2011) describe the process of how this idea moved from the point of it being posted to the point of implementation - the idea was posted on the

platform; numerous votes had been received and the ideator received encouraging comments; Starbucks started working on the innovative idea provided by ideator.

#### F. Summary of the literature review chapter:

The literature review identifies crowdsourcing and what the different companies can achieve from crowdsourcing. This research identifies various platforms for crowdsourcing, so by keeping our research narrower to one platform - the Lego ideas platform of crowdsourcing - we hope to better test and assess the benefits they are obtaining through crowdsourcing. The comments received by Lego ideas and the effectiveness of such comments will be discussed in the next chapter. In this literature review, studies on the ongoing crowdsourcing and temporary crowdsourcing were discussed. This research fills the gap in the area of commenting behaviour and their positive effects on the ideators and how they are used to smooth the interactions between the company and ideator/innovator.

### III. Research Methodology and framework for analysis

#### A. Introduction:

This research aims to examine the commenting behavior of participants such as requesting or posting comments. A research design is helpful in classifying the commenters' and submitters' relationship and to analyse the factors that impact on the interactions between community members.

#### B. Research Problem:

The research problem of this study is to examine the problem of information overload and classify the commenting quality on crowdsourcing platform. Before the advent of technology, firms used custom methods like surveys, focus groups, brainstorming, etc to develop a new product. In the early days of crowdsourcing, technology was not able to deal with the mass of data generated on the platform; hence the take-up rate was low. But now with advancements in technology like 3D technologies, different platforms and wide use of internet, this is no longer a problem. Firms are now transferring the product development process from the traditional to advanced online methods and there is a trend in companies adopting crowdsourcing to achieve their objectives.

However, companies still find it challenging to build their own online communities and call for ideas or solutions. Instead of adding more costs by having their own online platforms, some companies such as Unilever, Nestle, P&G, and Coca-Cola used to ask eYeka (<https://en.eyeka.com>) to run idea

competitions. However, recently, the Coca-Cola company is running its own innovation community (<https://www.cokesolutions.com>) and has found the quality of the ideas and solutions that come from its crowdsourcing community better than the ideas and solution that came from the former agency partners' community. So, the Coca-Cola company might find it more useful to set up their own call and to build their own crowdsourcing community.

The decision to seek ideas and solutions through an online platform is often viewed as a process motivated by cost. However, the cost is associated with the number of individual contributors. Therefore, because they struggle to cope with such costs as well as other challenges, many firms interviewed for this study have refused to engage with the crowd and take advantage of more modern methods of ideation in favour of traditional ones.

As crowdsourcing is a comparatively cost-effective method, the companies want to attract more community members. In crowdsourcing different minds come to a platform and share their ideas in the problem solving or product creation task. This process is driven by the comments received in favour or against the product idea given by any participant (Tsou et al., 2014).

It can be said that new minds are needed more than ever for idea sharing and innovation. The online communities are also built to gain the trust of potential customers and also act as knowledge –sharing platform, but these initiatives of crowdsourcing are not always successful (Beretta et al., 2018). The reason is that companies have to struggle in crowd navigation as the crowd grows

gradually and the comments received on the platforms have become difficult to manage and the managers have to struggle with these information overloads. According to Boudreau and Lakhani (2013) a manager does not clearly understand how to manage the process of the crowd.

Firms are struggling to let the exchanging ideas and solutions run smoothly between innovation contributors in the crowdsourcing community. The main reason firms resist intervening in the crowd's activities is that they are striving to raise innovative outcomes. Of course, this problem should not be separated from the aggregate of contributions that are embedded in the crowd.

Some management staff are hesitant about firms' intervention in the crowd directly and this has attracted scholars to study this phenomenon. Accordingly, it is observed that some firms are hoping to increase the number of contributors as well as the number of innovation outcomes simultaneously. But some companies are putting in significant efforts to provide capable crowdsourcing platforms. However, most of them are striving to benefit the most from their crowd efficiently. However, firms' coordination may or may not prompt the crowd innovation outcome.

According to Boudreau and Lakhani (2013), "most corporate crowd initiatives involve an only modest amount of coordination." Therefore, the primary focus of this thesis is on investigating how Lego Ideas coordinates, runs and controls their online innovation community (the Crowd). This may lead us to understand how individuals exchange knowledge with one another

as well as how a submitted original idea should be developed through the crowdsourcing activities.

Demanding further involvement by the firm in its crowdsourcing activities is a common dilemma amongst many crowdsourcing platforms. Therefore, the practice of such activities varies from one platform to another. In this study, an assessment framework is developed to integrate the roles of commenting and voting mechanisms in the creation of a new product and lowering the uncertainty between innovation contributors during their interactions.

Companies hope to attract the right contributors who will affect positively on their contributing behaviours. Therefore, innovators are needed now more than ever before. However, most crowdsourcing initiatives fail to engage innovators within the crowd efficiently and lower the uncertainty within the online community that was built to be a trusting knowledge-sharing mechanism. Also, it is observed that when the number of innovation contributors grows over time, companies struggle to navigate the crowd. Boudreau and Lakhani (2013) found that “manager[s] do not clearly understand how to manage the process” of the crowd. However, there is no denying that in order to create a better call for innovation, scholars and practitioners should pay more attention to how to navigate the contributing behaviours within the crowd.



There are not many studies investigating the value of building an ongoing call in the crowdsourcing community, and how should it be controlled in real-time, and what kind of activities should be demanded? However, controlling such an innovation community is a common dilemma amongst practitioners. Scholars investigating this dilemma reveal that the practice of controlling such a community varies from one platform to another. Hence, this study develops an assessment framework, which integrates the increasing innovation outcomes with ideas developing from contributors. This assessment is afforded by investigating Lego Ideas' innovation community. This allows the identification of which crowdsourcing activities should be eliminated and which should be extended.

This study uses a case study of Lego Ideas innovation community. Some executives assume that contributors should not be forced to be involved in commenting and voting but an original idea or solution cannot be developed without extra involvement in another innovation activity such as commenting and voting; in other words, any original submitted idea cannot be developed to an actual product without the crowd's inputs.

### C. Research Hypothesis

Our review of the literature and extant cases of crowdsourcing leads us to posit two hypotheses:

Our hypotheses focus on examining whether and how the received comments have a significant effect on the developing ideas. Theoretically (and as roughly observed in practice), when a number of comments and votes on the idea are received by the submitter, he or she should respond, and this encourages more interactions and helps to encourage more contributions. This also motivates them to put in more efforts in the project repeatedly. However, in developing a project, the role of comments and votes that come from the crowd is vital. It is also possible that “noise” from having too many comments or less important comments may affect these positive outcomes.

The first-hypothesis will highlight how the ideas and solutions were developed by commenting and voting activities. Therefore, in this study, the number of ideas submitted by the crowd is not the focus, but our emphasis is on how crowds can make an idea successful enough to be implemented. Therefore, to improve outcomes of the innovation, voting and commenting plays a significant role. Part of this study is also to examine the impact and benefits a crowd could have from the comments received from the committee and the community (Galton, 1907).

Hypothesis 1 (H1):

**Certain comments will have positive determining effects on the idea, but variability in the types of comments and the nature of comments that causes problems such as noise may have a negative influence on these effects.**

The second hypothesis will highlight the synergy between commenting mechanisms in ongoing crowdsourcing. For innovation process to succeed, the commenting mechanisms should be considered as a tool for enhancing innovation outcomes.

It is assumed that the more significant the contributions on the Lego platform, the more the chances of innovations increase. Conversely, the reverse pattern can negatively affect the quality of the voting and commenting mechanism problems. Schelle (2016) and Herrmann et al. (2017) state that "65% of the contributors do not come back more than twice." This hypothesis thus investigates how actual voting and commenting are operated and whether the nature of such mechanisms has a positive impact on Lego's crowdsourcing.

Hypothesis 2 (H2):

**“Projects that received more Comments on a submitted idea than on the Contributor(s) have a greater impact, and lead to a greater chance for the idea to be commercially adopted for production within the crowdsourcing community.”**

## D. Research Approach

The aim is to explore the orientations of received comments from the crowdsourcing community. In general, we want to know if the received comments on the Lego Ideas platform are perceived to be helpful. To test the above two hypotheses on this, the following guiding research questions are further used to help frame the research:

Do submitters gain assistance on their ideas from commenters?

Can commenting behavior be guided in constructive directions?

Can the community's commenting/voting behavior influence the corporations' implementation decision?

Has Lego succeeded in creating the conditions that generate positive results from the crowdsourcing community that they have built, such as by enhancing the voting and commenting activities?

The research approach utilizes a quantitative approach, some descriptive statistics, and then qualitative approach. The qualitative method is used for in-depth analysis of the research topic (Malhotra, 2013). List of qualitative observations that were extracted from our dataset was posted in Chapter VI; Page No. 121. It provides more specific observations into the mindsets of the target audience.

The research design adopted in this research consists of both quantitative and qualitative approaches. As the number of received comments are not sufficient indicators by which one can measure the success of submitted projects (Wendt et al. 2016) it is necessary to determine whether the received comments are helpful to Lego's community or not. Also, there is a need to classify the content of received comments first qualitatively and then quantitatively so one can explore patterns of comments. Also, without qualitatively analyzing the received comments, the research questions cannot be answered.

## E. Case study method:

Due to the limited research on participant behaviour in crowdsourcing platforms, the Case Study research method will reveal deep insights into the behaviour of the Lego Ideas platform community. The case study method is ideal for studying issues like, developing a deeper insight into the activities of participants; how these processes work; what functions are involved and what is the role of different participants; the users, manufacturers and the community members in the developing phase. (Nadiah, 2015).

According to Yin (1984) the research method of the case study is defined "as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used." A case study is also defined as "a unique way of observing any natural phenomenon which exists in a set of data".

Through the case study method, a researcher can also be able to assimilate the perspectives of different participant's viewpoints within a certain platform, resulting in its application in a different field of research such as brand communities and technological opportunities. In this method of case study, different varieties of data collection sources like on-site visits, web pages, articles, interviews, reports and participatory observation can be used to develop a basis for future research. It also provides innovative insights. Thus, the researcher is able to move beyond statistical findings and easily

understand the behavioural conditions with the perspectives of the participants.

We have chosen the single case method, which allows for detailed theorizing on the phenomena, but we have also looked at a sample of multiple projects within that single case and split it further into successful and unsuccessful projects so as to gain more robustness from the approach. In this study, both qualitative and quantitative data are used to present a holistic picture of an ongoing platform community.

### 1. Why Study Lego ideas Platform

According to Andersen & Ross (2016), the most prominent and clear example of crowdsourcing in the industry is Lego ideas. In 2008 with the collaboration of Cusoo, Lego ideas was launched internationally in 2011. Now Lego ideas is completely run by Lego since 2014.

LEGO ideas platform is considered to be a leader in the crowdsourcing community. LEGO has several successful examples like huge user community base and a track record of idea creation platform; it is considered the best practice in this field (Al-Ghamdi, 2017).

This platform was chosen according to the following criteria:

#### 1. Accessible:

Lego Ideas platform (LIP) is one of the most easily accessible crowdsourcing platforms because it runs in real time without a

specific time frame. No shared background knowledge and no prior knowledge is required to access this platform.

## **2. Fast Paced:**

It is a fast-paced collaborative environment which allows everybody to see everyone's contributions, to see how solution and ideas were derived, to see everyone's idea state and see the committee's comments.

## **3. Transparent:**

It is the most transparent crowdsourcing platform because it gives every contributor the right to know everyone's updates; everyone can comment and see the other contributor's state.

## **4. Visualisation features:**

This platform provides contributors with a software that enables them to create pictures of their So, contributors can continuously improve their ideas and amend the images by using such a technology.

There are about 250 designers from more than 40 countries who are involved in the innovation process of product development. The innovation process generates creativity to an extent that includes a broad array of different activities like current market trends, and the product development. According to Kleinberg (2010), Lego group is also investing in various educational and research projects, that include new technologies and trends in the way children play.



Lego group has partnered with Lucas Film to produce licensed toys that George Lucas was going to make into Star War series movies. The first series of the movies was released in 1999 and was a huge success and generated much attention for their first licensed toys seen in the Lego Star Wars.

The Link

<https://ideas.lego.com/dashboard>

Lego ideas is a crowdsourcing platform where users submit their ideas to create Lego products and the potential ones can move towards manufacturing process and subsequently, it will be sold to the potential customers. Lego ideas are a crowdsourcing idea generation platform that started in 2008 in collaboration with Cuusoo, a Japanese website (Bonabeau, 2009). Now it is solely run by LEGO group.

## 2. History of the LEGO Group

The full form of Lego is “leg godt”; they are the two Danish words meaning “play well “which is also their logo and slogan. In 1932, the Lego Group was founded by Ole Kirk Krittinaian; the company has a heritage value and was passed from father to son and to the grandson. Now the owner of Lego is the grandson of the founder, named Kjeld Kirk Kristansen.

Over the past 80 years since its foundation, the company has progressed tremendously and has reached a leader position in the industry of toy making. The Lego story started in a tiny workshop of a carpenter, and now it has achieved the position of a worldwide enterprise and has become a giant in

the production of toys. Lego has been awarded twice with the title of “toy of the century”, the most important product of Lego is the Lego brick. No matter how much fame Lego will achieve, they never leave behind their source of foundation - the Lego brick.

In 1958, the current shape of the Lego brick was introduced. Schenk and Guittard, (2009) explained that the Lego brick was built on the principle of interlocking where the tubes of bricks provide infinite ways to build and play. Lego provides amazing creativity through playing and building with the bricks. Lego is present in more than 70 countries with a workforce of more than 18000 employees.

The first Play Day was introduced by the Lego Group where employees left their tables and played for four hours. Tomas Kirk is the new CEO and deputy chairman of the Lego Group. Lego has expanded in China where the new outlet is in Jiaxing. The Lego Group also partners with UNICEF to save children’s rights. It is a three-year agreement. The product chosen by Lego for the year 2016 is LEGO Nexo Knights. On February 2014, Lego launched its first movie “Awesome” in a number of countries; it was a cinema hit with more than \$480 billion dollar., It was the first time the Lego universe was picturized in a film. The producers of the movie were Warner brothers and it was written by Chris Miller and Phil Lord.

### 3. Digital Development of Lego

Besides branching into film making, Lego has also gone into the digital games market as it keeps an eye on current market trends, Lego has done tremendous development and advancements in the digital side of innovation and product development and some of these are: LEGO Island, a computer game; Lego Mindstorms, an interactive website; Lego.com for its fans; Life of George, an augmented reality app game. The following paragraphs detail these digital developments. to Lego Island is the first Lego computer game launched in 1997, (Andersen & Ross, 2016). It was the initiative taken by the company to make the Lego brick digitally available. In the following years, Lego brick has grown up into Lego Mindstorms which was built with the collaboration of MIT, Boston. Ringen (2015) explained the Lego brick is based on artificial intelligence concept where the user can ask the intelligent Lego to perform various actions, after connecting with the computer. The Lego brick can convert into a Lego model.

Chwialkowska (2012) states that the company launched its first presence digitally as a website, named as – LEGO.com on March 22, 1996 to virtually entertain the fans of Lego universe, Lego Group has developed an online platform. It offers the web users and Lego fans the benefits of having multiple ways to get connected with each other. It was among the few of the websites in Denmark to offer such benefits.

“Life of George” is the first app-accessory launched by Lego Group in 2011. In the Life of George, users combine reality with the digital world where the Lego brick is combined with the iPhone /iPad application. Life of George is known to be the first game which combines reality and virtual and gives the game a most exciting gaming experience both in reality and in the virtual world. Life of George was a finalist in the nomination for (TOTY) “toy of the year” award in the US in 2013.

#### 4. Lego and crowdsourcing for ideas

Crowdsourcing is another area that the Lego Group has branched into. According to Prabhakar and Strakova, (2017), in the toy industry, demand creation is to develop the product through in-depth marketing research, rather than developing the products with user collaboration or reviews. The main reason for this is that the users of toys are young children who obviously are not good product designers. But sometimes adults or parents of the children also seem to be interested in their children’s toys and they want to design and customize them with their choices and ideas.

It is a crowdsourcing platform which allows Lego fans to come on to the website and give their ideas for improvement or become designers and creators of their own Lego toy set. To give ideas and create toy designs, there is an age limit of 13 years and above. Majchrzak and Malhotra (2013) explain that Lego idea members have the options to share Lego ideas over the website, can provide feedback and vote for one’s idea.

The Lego ideas platform is designed for easy navigation. The following sections detail the platform.

## 5. Platform Process of Lego ideas

The idea submitting process starts with the users writing a detailed description of their idea and attaching a picture/image of their concept which they want to develop. After submission, the idea will immediately appear on the website and will be visible to the community members of Lego ideas. The goal of the idea submission is to receive 10,000 votes to become eligible for review by the review board of Lego.

The board comprises a marketing personnel and expert designers who examine the submitted project that has 10,000 votes, according to their own criteria. The idea submitter is allowed to have a limit of two years to gather 10,000 votes for their project. If they fail to do so, the idea is considered to have failed and will be withdrawn from the website. The review process for the eligible projects will occur thrice in a year; January, September and May (Ringen, 2015). Although an idea may garner 10,000 votes, the review board has the right to reject it. Initially, there was no rule for idea submission but recently the rules have changed. Now the participants are not allowed to submit real-life weapon ideas and third-party licensed models. After clearance from the review board, it goes into the manufacturing process and will be labelled as “LEGO ideas”. The product designer will gain 1% royalty on net sales and 10 copies of the model (Amy et al., 2013).

## 6. Platform design of Lego ideas

There are 5 segments in Lego ideas platform that include “Discover”, “How it works”, “Submit”, “Community” and “Blog”. The discover page includes all the submitted ideas from ideators in a list form, which includes name of the project, name of the idea submitter, an image, number of votes received for the project and the deadline to receive more support (Al-Ghamdi, 2017). The rules, guidelines and rewards can be found on the page of "how it works". It also gives the detailed mechanism of Lego ideas in written and in video format. On the "submit" page, users can submit their idea and on the "community" page, all the Lego ideas participants are listed there. Moreover, their contact information (links to Facebook, LinkedIn, and Twitter) are given with their short introduction and nicknames. On the comments page, the number of ideas and votes are also given in this section. The “Blog” section is operated by Lego ideas team. Interviews of idea submitters who have gathered 10,000 votes and updates are also available.

## 7. Benefits of Crowdsourcing for Lego:

### 1. Increased product availability:

Majchrzak and Malhotra (2013) explain that the new set of products that has been designed by Lego Ideas' contributors (submitter & commenters) are performing well in the market and giving benefits to Lego as well as the standard Lego toys. Also, some of the ideas that have gained much popularity are available not only online, but they are also taking their place on the retailers' shelves and are sold both online and in the retail shops..

### 2. Commercial Viability:

Chwialkowska (2012) explains how through the support and votes from crowds, the product has acquired sustainability even before its release. The organization knows that if they release the product the market has already been created for that product and people are waiting for it to be available in the market. The supporters of the idea also provide their information to Lego group, like their location, age, and the future market response of the upcoming supported product.

### 3. *Capturing Insights:*

According to Hossain (2012), another benefit is value and collection of market insights which is also obtained side by side through crowdsourcing, as sometimes the community members have some

expert level knowledge that even the company's employee does not have, so by assessing these ideas and suggestions, Lego Ideas have enhanced insights of current market trends and future trends.

4. *Mobilize communities:*

Sheng and Hartono (2015) explain that contributors (submitter & commenters) also act as salespeople for the Lego Group in order to gather more comments and member support for their idea; here they are using community mobilization strategy. Lego ideas invest only a little in its marketing campaign to promote the Lego ideas platform because the users gave Lego this advantage of promoting and mobilizing.



## F. Research Variables

Although commenting structures are complex in crowdsourcing platform, they help to lower the uncertainty and enhance the life expectancy of such crowdsourcing communities. To find out the patterns of commenting mechanisms and what type of comments are involved in expanding the idea into a developed product, the focus is on those comments which are based on the following ten independent variables. These variables are based on the taxonomy developed by Madden et.al (2013), Qin (2010) and Meldrum et.al (2017).

### 1) Commenting on the submitted idea:

**Variable Definition:** Contributor makes a point about the content or design of the submitted idea.

**Explanation:** Commenting on the submitted idea may take the form of answering crowdsourcing calls. Therefore, it is advisable to immediately keep the flow of commenting to the original submitted idea or solution. This study is the first to attempt to distinguish commenting orientations. It is really hard to navigate a community to comment only on a submitted idea. Therefore, "many firms fail to appreciate the capabilities involved and might not be able to classify these without expert help"

**Examples of comments:**

- i) *“I would guess the boat is wider than the lower part of the dry docks entrance. Instead of sliding into the water it would get stuck between these poles*
- ii) *“It also seems like something LEGO is already planning”*
- iii) *“The only thing I noticed that might not fly with Lego is the use of minifig legs as decorative pieces or any other "illegal" use of parts.”*

**2) Commenting on Submitter(s):**

**Variables' Definition:** Contributor makes a point about the submitter.

**Explanation:** we assume that contributors who are interested in closely connecting with their community purposely comment on submitters. In this way, we are examining the length of interest in contributors / submitters; how contributors are tied to each other in such an ongoing crowdsourcing platform. This may uncover whether Lego Ideas community are strongly tied to a few central individuals within the community.

**Examples of comments:**

- i) *“you are an amazing builder”*
- ii) *“your skills are amazing”*
- iii) *“Make more projects!!! you are an awesome creator!!!”*

3) **Personal Story** (experience) relating to the submitted idea:

**Variables' Definition:** Contributor mentions a personal story or experience related to the submitter.

**Explanation:** This variable may reveal the level of the relationship within such community and interconnectedness in such a crowd community. People tend to tell their personal stories when they are comfortable. Therefore, platforms such as crowdsourcing should enhance “interpersonal relationship” to allow people to share and contribute willingly.

**Examples of comments:**

- i) *“It reminds me of a seafood restaurant near Jacksonville, Florida called the fish camp”*
- ii) *“I remember trying to build dinosaurs as a kid”*
- iii) *“I always dreamed about a Power Rangers set”*

4) **Personal Story** (experience) relating to **Submitter** (s):

**Variables' Definition:** Contributor mentions a personal story or experience related to the content or design of the submitted idea.

**Explanation:** any personal interactions with the contributor and he shares it with the community.

**Examples of comments:**

- i) *“I was incredibly impressed and inspired by your original yet accurate trash receptacle concept.”*
- ii) *“I asked about a possible collaboration (your TARDIS in his set) and he said that you could contact him via his Facebook or Flickr.”*

**5) Respond to the Previous comment:**

**Variables’ Definition:** Contributors reply to a previous comment or commenter.

**Explanation:** Commenters engagement in crowdsourcing community is important because ideas and solution need to be devolved by engaging in communication.

**Examples of comments:**

- i) *“I was a bit disappointed when you said that you didn't think that you would have it as a Lego project.”*
- ii) *“I agree - some minifigs are required”*

**6) Replication:**

**Variables’ Definition:** Contributor votes again.

**Explanation:** This kind of commenting creates an information overload problem.

**Examples of comments:**

- i) *“Supporters Support!”*
- ii) *“Take my support”*
- iii) *“I'm supporter #7811”*

## 7) Commendation:

**Variables' Definition:** Contributor shows appreciation for the submitted idea or support one.

**Explanation:** a supportive impression is given by the contributor in favour of the idea.

**Examples of comments:**

- i) *"I HOPE Lego will make this into a set!!"*
- ii) *"I would absolutely buy this"*
- iii) *"I really hope they approve this and restore my faith in the system."*

## 8) Questioning:(Requesting Information)

**Variables' Definition:** Contributor raises a question to a submitter or about a submitted idea.

**Explanation:** any ambiguity in the idea submitted by submitter leads to question generation by the contributors.

**Examples of comments:**

- i) *"How many pieces does the set contain all together?"*
- ii) *"What did you use for the pictures; was it a software or was that a built mode"*
- iii) *"Did you build this construction on Lego digital designer? If yes, how took you the photo so that he has a white neutral bottom behind this one there?"*

## 9) Pointing:

**Variables' Definition:** Contributor makes a point about external information.

**Explanation:** mentioning irrelevant knowledge or experience or so obvious information.

**Examples of comments:**

- i) *“Wow both your projects have 10,000 supporters”*
- ii) *“Yes!!! We did it! Finally!!!!”*
- iii) *“20 days until the review. Going to be a long wait”*

## 10) Others:

**Variables' Definition:** Does not match any of the above labels.

**Explanation:** it includes giving emoji's, or certain short forms of laughing (lol) or sadness (☹) or disappointment, that are not included in any of the above label.

**Examples of comments:**

- i) *“I just realized the entire third row on the Discover page has "Cat" somewhere in the title”*
- ii) *“I wonder why Lego has suspended the program”*
- iii) *“How about we all ask Lego Ideas for a Creators Forum where we can exchange tips and ideas? “*

## G. Research Samples:

Our research sample consists of 2 groups: one consisting of successful projects which have been implemented by Lego ideas, and the other group consisting of unsuccessful projects which have been rejected by Lego ideas. (See Tables 2 and 3) Both sample groups consist of 20 projects each. The reason for analysing each group separately is to identify the commenting patterns of successful and unsuccessful projects.

Table 2 Research Samples

Group Number	Description	Similarity	Dissimilarity	
		Received Votes	Received comments	State
1	10 Non Implemented Projects	10,000 Votes Each	4551	Not Approved
2	10 Implemented Projects	10,000 Votes Each	4112	Approved

The entire population that had collected 10,000 votes of both the unsuccessful and successful projects for this study is 73 projects. This research sample is 20 projects (in Table 2) and is quite a representative sample that was chosen based on the following criteria:

1. The received votes were 10,000 Votes.
2. The received comments were written in English. It was found that two of 73 projects were submitted in languages other than English.

There were three steps in the extraction of comments from the two groups of projects. The first step was to extract the comments from the 20 projects in each group. The second step was to classify the comments into the ten research variables. The final step was to manually code and cluster the comments.

(Table 3) list of Sample (1) Not Approved LEGO projects

	Projects' Name	Received Comments	Received Votes
1	Boat Repair Shop	486	10000
2	Particle Accelerator	526	10000
3	Indominus Rex	434	10000
4	Fossil Museum	414	10000
5	Merchant's House	483	10000
6	Modular Western Town	410	10000
7	Johnny Five	366	10000
8	Lothlorien	473	10000
9	Modular Apple Store	491	10000
10	Jedi High Council Chamber	468	10000



Through crowdsourcing, there are Not Approved Ideas that are not implemented and developed with the interaction of ideator and the community members who gave comments and supported the best choices; these are in Table 3. These were the projects which were rejected by the review board even though they won the maximum number of supporters and comments through the commenting mechanism or wisdom of crowds. On the other hand, there are implemented projects (Ideas) that are implemented and developed with the interaction of ideator and the community members who gave comments and supported the best choices; these are in Table 4.

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(Table 4) List of Sample (2) Implemented Projects.

	Projects' Name	Received Comments	Received Votes
1	Ghostbusters 30th Anniversary	350	10000
2	Apollo 11 Saturn-V	530	10000
3	Old Fishing Store	454	10000
4	Caterham Super Seven	455	10000
5	Doctor Who and Companions	637	10000
6	WALL•E	301	10000
7	Mars Science Laboratory Curiosity	319	10000
8	Tron Legacy Light Cycle	408	10000
9	Women of NASA	195	10000
10	Voltron - Defender of The Universe	463	10000

## H. Comments Extracting & Classification

This study used Lego ideas platform as the source for the data collection. Python programming was used to extract the comments. The unstructured received comments data were converted into the structured ones by coding and classifying them manually. Then these programming codes were converted into a table to simplify the information and to narrow down the huge flow of comments for evaluation. For each submitted project, a list was created of all extracted comments.

- Projects Submitted 20.
- Individuals (submitters) 20.
- Total Received Comments for the 20 projects is **(8663)**

A taxonomy development process was applied to manually label and classify the comments. By labelling and coding, the aim is to classify comment types and specific types of interactions, for example, community interactions, etc. A manual process to label and code the comments was used instead of artificial intelligence machine learning or algorithms as detecting ideas and comments through a community is still in progress.

It is believed that the crowd still does not know how to comment and what to comment about the problem or idea. Therefore, there is a need to tell them or train them which orientation they should take. (Wasko, 2009). Hence this research will help in solving the problems of information overload that arises from the flow of unwanted *comments*. So, this

classification and identification will reveal which comments are more needed than others. The taxonomy development process that has been used in this study which contains comments coding and clustering are validated and suggested by the previous research papers and literature (Xiao, 2012).

## I. Summary of the Research Methodology Chapter:

In this chapter research study is outlined and the research design is explained. The information in this chapter includes the study problem, researcher's assumption, target population and the research instruments. Data are collected through Lego ideas case study. Python programming is used for comments extraction and the cluster method for clustering and labelling the comments. Through taxonomy development process, the comments are manually classified. The research sample consists of 10 successful and 10 unsuccessful projects of Lego ideas. In the next chapter, data collection will be discussed in the context of ease of navigation in the comments section of the platform. This will be followed by data analysis. In chapter 5 a summary of the results and recommendations for future research will be provided.

#### IV. Findings and Analysis

The crowdsourcing platform is utilized to generate ideas, but not every firm who gathers or collects ideas also develops them; only a few firms implement and develop the ideas into a practical one, which is evident from the high ratio of voting in cases that have not been accepted. Rather the purpose of involvement of the contributors on a generated idea or innovative concept is solved through the process of outsourcing platform at Lego. The involvement or consultation regarding the ideas from different participants may then result in validation or acceptance of the presented idea. The table below summarizes our results of the coding process for each of the commenting variables.

Variables	Unapproved Projects	Approved Project	Total Value
Commenting on the submitted idea	606	453	1059
Commenting on Submitter(s)	30	14	44
Personal / to the submitted idea	98	110	208
Personal / to Submitter (s)	3	3	6
Respond to the Previous comment	30	55	85
Replication	648	351	999
Commendation	1318	1507	2825
Questioning / Requesting	339	360	699
Pointing	1352	993	2345
Other	127	266	393

The table shows that the commendation variable, pointing and commenting on the submitted idea appear to be significant determinants involving the interaction regarding the project. However, it does not validate anything about the factors regarding the success and failure of a project. Rather this evidences that the interaction of the contributors is significant in the development of a submitted project, which does not guarantee the success or failure of a project.

The process of replication seems to complicate the submitted process, where it has been observed that in most of the projects - where the contributors have voted again for the project – were still been rejected, possibly due to the well-known issue of overload of information. The tendency of the submitter sharing personal experience or personal information regarding the submitted idea does not seem to interest or attract any of the voting or commenting activity.

It has also been found that there was a lower interest level towards voting for the replication and the reporting or questioning process. However, the contributors are mostly found to show appreciation to the submitters for their innovative ideas, and to be motivating them to develop the idea, thus adhering to the purpose of a crowdsourcing platform.

However, the analysis also showed that the contributors are mostly eager to show appreciation to the submitted idea for encouraging the creativity of the submitter - this was irrespective of whether the project was implemented or rejected. The number of commendations clearly signifies

that the projects uploaded for crowdsourcing leave impressions on the minds of the contributors, some even supporting the idea of a project which has been rejected later. Therefore, it can be seen that the commenting behavior must be guided if the purpose is still to use the comments to analyze the viability of the projects. This can then be assumed to contribute to a probability of the project or idea getting accepted or implemented.

In the data, it is quite surprising to see contributors making a certain point or statement about external information, particularly related to unrelated experience (sometimes being obvious ones). The problem is that the interventions or replies to prior posts or comments are rare, evidence that the platform members are not very interested in developing personal relations or comments on the submitter. However, the submitters do feel highly motivated from the positive responses regarding the project from the contributors.

All of the above-mentioned results have demonstrated a common trend or pattern that validates the need or rationale for guiding the commenting behavior of the platform members or the contributors.

It can be seen that the ideas submitted at the Lego platform requires comments and feedback responses from the contributors on the platform, ones that could definitely develop or enhance the project idea, but this development or enhancement does not guarantee the chance for getting accepted. However, the interaction and communication among the

contributors and platform members will definitely result in the consideration of certain facts brought up by other members, and mostly external ones at that, which can tend to make the idea more practical.

The process of crowdsourcing requires the addition of fresh vitality through additional new contributors: ones with updated knowledge, thinking levels and higher level of interactions or responses to an uploaded idea; these in turn are found to enhance the thinking abilities and innovative concepts encircling the idea. This is the theoretical ideal. This requires the contributors to the crowdsourcing process to demonstrate their sense of responsibility towards the community. However, this process of crowdsourcing required the submitters to possess a self-discovery and self-actualization sort of intrinsic motivation. This can then further fuel the high level of support and appreciation from the contributors, as interacting through the crowdsourcing platform.

From our investigations, any submitted information after receiving comments from the contributors or rather expert opinion seems to get enhanced. It is definitely difficult to direct or navigate the contributors to comment on a submitted idea, which if taken care of may lead to appreciation of the potential of the idea at the Lego. In numerous situations it has been found the contributors tend to put forward statements or questions that are not germane or relevant to the submitted idea (as evidenced by the large number of comments in categories that are generally not about the idea, e.g. the replication category). The emojis and

abbreviation comments are not transparent or clear; and therefore, can create a lot of confusion for submitters trying to analyse the comments and derive the desired outcomes. If the contributors re-vote upon the same submitted idea, an overload of information takes place, which further creates bewilderment and uncertainty for the process of project approval. Furthermore, the comments or votes commented by the contributors again may perhaps mislead the submitters from the specific objective of the research; thus, affecting the outcome and findings of the study.

The high interaction and involvement of the contributors is vital in developing a project; in particular, the role of comments and votes that come from the crowd is vital. However, it is worth noting that the lower level of involvement in regard to personal information about the submitter's experience or even about the submitted idea, clearly demonstrates that they (commenters) are least interested about past or previous information related to the project. There is no relevant importance of the personal stories in the process of crowdsourcing. It has also been observed that the more the contributor mentions a personal experience related to the submitter, the more the contributor to the submitted idea shows less appreciation. The commenting process is most useful when discussing the idea itself.

In general, the level of development or the effectiveness of the enhancement also depends on the experience level of the contributors available over a crowdsourcing platform. In the Lego community, a



submitted idea should generally be developed through the comments from the contributors. Therefore, we assume a higher level of interaction from the contributors should also motivate the submitters in the submission of new ideas.

In the above findings, it can be seen that the received comments can be helpful in taking the crowd to the next level to collaborate and contribute to the individuals and crowd through crowdsourcing platforms. However, it is definitely difficult to direct or navigate the contributors to comment on a submitted idea. If taken care of, this may lead to more appreciation of the potential of the ideas at Lego. The number of votes and commendations clearly signifies that the projects uploaded for crowdsourcing leave impressions on the minds of the contributors, some even supporting the idea of a project, which has been rejected later. So as to make this system useful for evaluating the viability of a project, it is imperative to understanding the contributors better and to guide their manner of contributions to positively direct the improvement of the uploaded project or idea. This can then contribute to a higher ratio or probability of the project or idea getting accepted or implemented.

It is quite surprising to see in the data the contributors making a certain point or statement about external information. The augmentation of the voting activities at Lego is conducted with the viewpoint of generating productive results from the crowdsourcing community, however, from the above findings, their effectiveness cannot be deduced; this may require

techniques such as linear regression to identify the determinants from the correlation process. From the current data, we can only surmise that the implementation decision is not directly affected by the commenting and voting behaviour, from the simple observation that people have shown equal interest in both the cases of successful and unsuccessful projects.

For the contributors to evaluate the viability of a project, the process must be done in a guided manner so as implement positive directions in the improvement of the uploaded project or idea, which can contribute to a higher probability of the project or idea getting accepted or implemented.

The implementation decision appears linked with the number of votes or comments received, but a similar trend has been observed for the rejected cases, hence another related factor is required to shed light on research question RQ4. The identification of the factor has presented an understanding about the commenting and voting behavior of the contributors, particularly their level of enthusiasm to respond to a creative idea being submitted at the Lego platform. The lower level of involvement in the personal information about the submitter's experience or about the submitted idea clearly suggests that they (commenters) are least interested about past or previous information related to the project. The level of development or the effectiveness of the enhancement depends on the experience level of the contributors available over the Lego platform. Rather the sharing ideas and expressions about a presented idea appears to be fruitful in enhancing the project's successful outcome.

The findings reveal that some received comments will encourage the crowd to contribute to the individuals through crowdsourcing platforms. Especially, when the submitter shares the personal ideas, stories or experiences regarding the submitted idea does attract some other commenting activities. For instance, in Project Number 09, the flow below shows different types of interaction presented a variety of variables:

<i>Helaku</i>	<i>Questioning / Requesting</i>	<i>Somebody explain to me how this would make an interesting Lego set?</i>
<i>CarrollFilms</i>	<i>Commenting on the submitted idea</i>	<i>I like the interior more than the exterior. There are two things wrong with this: #1. It has a straight up company logo, so, that's a no fly zone. #2. With all those glass pieces the price is going to be pretty high up there. (LEGO standards wise)</i>
<i>hunter27</i>	<i>Commenting on Submitter(s)</i>	<i>"listen, you've got a great mind and that sure isn't a thing that will ever be wasted. So, I'm saying right now, anyone in the top page of supporters you have my word of support. - Someone awesome"</i>
<i>123bear</i>	<i>Commenting on the submitted idea</i>	<i>"Don't take me wrong, but I cannot see this as a modular set. It just does not have enough detail for me to want this set. And I don't want people to reply saying, "But that's how Apple stores look!! Dumbo!" This set could have a different design. :)"</i>
<i>Jarren</i>	<i>Respond to the Previous comment</i>	<i>"In response to what people have said about the whole "branding" my verdict is as follows: The whole point of licensed products is to increase brand loyalty and bring in others who wouldn't normally give LEGO a try ...."</i>

When contributors show appreciation for the submitted data, there appear to be more interactions on the questions that are raised by the contributor about the submitter or the submitted idea. In most cases, the contributors appreciate the submitters for their creation of new ideas, but that did not help to receive more comments in the category of "*Commenting on the submitted idea*".

Our second hypothesis relating to the undertaken projects was "Most of the commenters are commenting on the Contributor(s) more than commenting on a submitted idea". Gauging from the ratio analysis of both the variables, 'commenting on the submitted idea and commenting on the submitter', it could be concluded that the incidence of commenting on a submitted idea was far more predominant than the incidence of commenting on the contributor, in the case of the unapproved projects. The percentage of the comments received against commenting on the contributor was found to be 0.65%, which is negligible in comparison to the 13.31% received against the variable commenting on the submitted idea.

In the context of the approved projects, the ratio analysis of the considered variables ("commenting on the submitter" and "commenting on the submitted idea") illustrates that the occurrence of commenting upon the submitted ideas was considerably predominant to commenting on the contributors.

The percentage of comments derived against commenting on contributors was calculated to be 0.34 %, which is much less than the 11.01 % established against the variable commenting on the submitted idea.

The data also reflects the possibility that when a commenter expresses a personal story, there is an impact on the increase in comments made by the contributor about the content or design of the submitted idea. Thus, when the contributor shares a personal story or experience related to the submitter, there is an impact on the contributor's reply to the previous comment or commenter.

Sections A and B will look at the comments in detail, for the unsuccessful and successful projects, and then section C will summarise the findings.

## A. Sample 1 (*The unsuccessful / disapproved projects*):

### 1. Commenting on the submitted idea

To facilitate commenting on the submitted idea, one requires crowdsourcing calls. There can be trouble as the comments of members of the crowd on the submitted idea might be invalid or might (not) benefit the company, owing to the fact that many comments on the idea might be irrelevant. Due to this reason, the firms are often unable to know the full potential of ideas and need to hire experts specifically for solving the challenges and providing effective solutions. By comparing the ten unapproved projects in our Lego sample, it has been found out that ‘commenting on the submitted idea’ had a high count of comments, suggesting that this could be happening. In particular, it had the most comments for the ‘Modular Apple Store’ project and the least for the ‘Modular Western Town.’ On the other hand, the total comments on the submitted idea for the ‘Fossil Museum’ stood for 77, ‘Jedi High Council Chamber’ accounted for 74, ‘Particle Accelerator’ for 61 and ‘Boat Repair Shop’ for 54. While determining the correlation between ‘commenting on the submitted data’ and ‘commenting on the submitter’, it was found that sharing personal stories or experiences of the submitters as well as the commenters, in relation to the concerned project designed, appears to be

associated with the contributors making a point about the content or design of the project.

## **2. Commenting on submitter**

Contributors who are connecting with the community input, comment on the submitters intentionally. In general, this should help in the investigation of the interest of the submitters and identification of the role that the contributors play, on the crowdsourcing platform. By examining the ‘commenting on submitter’ variable, among the ten failed projects, it has been found that for the project ‘Boat Repair Shop’, the value of the variable, ‘commenting on submitter’ stood at 0 while on the other hand, for ‘Lothlorein’, ‘commenting on submitter’ amounted to 8. However, the total of ‘commenting on submitter’ of Fossil Museum is 1, Merchants House is 1, Modular Western Town is 4, Johnny Five is 4 and Jedi High Council Chamber is 2. Reading from this, the low number appears to suggest the possibility that the sense of community on these projects is marginal, since they seem unwilling to talk about one another. Accordingly, this is helping to confirm that our second hypothesis may be failing to hold.

## **3. Personal Story related to the Submitted Idea**

The ‘Personal story related to the Submitted idea’ category provides a personal link, say between commenter and the submitter, via such devices as a description or history of the submitter. Here, people share their

personal stories only if they are comfortable in expressing it. This happens as platforms like crowdsourcing can provide an opportunity to the people to build their interpersonal relationships by stories and other devices. In this context, by comparing the ten failed projects, it was witnessed that personal stories shared by the Boat Repair Shop was just six in number. However, the personal to the submitted idea was more for projects like project number 7 i.e. Johnny Five and project number 2 i.e. Particle Accelerator. The total personal to the submitted idea of Johnny Five is 23 and Particle Accelerator is 16. Other projects like Fossil Museum, Merchant's House and Lothlorein had comparatively less comments as compared with projects like Johnny Five and Particle Accelerator.

#### **4. Personal story relating to Submitter**

In the personal story relating to submitter, the contributor shares a personal story or experience associated with the content or design of the submitted idea. The contributor shares his personal experiences with the community. By comparing the personal to submitter relationship among the 10 unapproved projects, it was found that the contributors of all the projects except for project 9 and 10 i.e. Modular Apple Store and Jedi High Council Chamber had 0 comments. This means that the contributors of all the eight projects did not share their personal experience associated with the content or design of the submitted idea. It is also possible that the contributors in this case had no personal experience to share.



The correlation between a contributor making a point about the content or design of the submitted idea and the personal story shared by the contributor is strong. However, it reflects the relationship between the contributor sharing the personal experience related to content or design, and contributors replying to previous comment – this suggests one having a moderating influence on each other.

## **5. Response to the previous comment**

‘Response to the previous comment’ denotes the reply of the contributors to a previous comment or commenter. The involvement of the commenters is essential in crowdsourcing because new ideas can be developed by engaging in communication that is more effective. By comparing the four unapproved projects, it was revealed that the project Johnny Five has had no responses made to previous comments and project nine i.e. Modular Apple Store’s response to the previous comment had the highest count of 9. However, the comparison among the ten projects reveals that ‘response to the previous comment’ for all the projects has been minimal. This suggests that there is little interactivity in the community. There is a negligible correlation between the reply of the contributors to a previous comment and contributor’s votes. This suggests that when commentators are engaged in the crowdsourcing community to develop the ideas, there is no influence on the contributor making a point about external information.

## **6. Replication**

The replication variable deals with the re-comments or re-votes of the contributors. This may be a contributing factor to the issue of information overload, that itself may add to confusion in the ideas and comments of potential projects to the company – the point made in hypothesis 1. While ordinarily, some votes of confidence, e.g. someone seconding a vote, might help reinforce perceptions of an idea's quality or other thoughts, in this context, the total number of replications is calculated to be 648. However, in reference to the project no 5, the number of replications is 88, which is quite high; thus, resulting in information overload. On the other hand, the number of replicated comments for project no 5 is 12. Thus, the amount of information overload varies from project to project. Therefore, it is possible that the re-vote of the contributors on the submitted ideas may not always be appreciated, but the actual effect depends on the actual project. For instance, even if contributors state that they are “voting” again for the same submitted idea, they still may not have any personal story or experience to put forward in favour of the submitted ideas.

## **7. Commendation**

The commendation variable deals with the actions wherein the contributors show appreciation towards the submitted ideas, that is, the contributors tend to provide a specific impression in favour of the submitted idea. In this context, the number of comments in favour of

project no 1 is 242; whereas, for project no 7, the number of comments was 66. On the other hand, the number of comments in favour of project no 8 is 129.

## **8. Questioning / Requesting**

The questioning or requesting variable deals with the actions where the contributors raise questions of the submitted idea or the submitter. The questions put forward by the contributor generally arise out of ambiguity or vagueness relating to the submitted idea or on the part of the submitter. In this context, the number of comments received for Ghostbusters 30th Anniversary is 45. On the other hand, the number of comments in favour of Old Fishing Store is 34. Furthermore, for project no 5, the number of comments is 79. Thus, the contributors could raise questions for almost every submitted idea and of the submitter himself.

## **9. Pointing**

The variable pointing deals with the actions wherein the contributors put forward points or statements concerning external information. This involves the possibility that unrelated information or experience may be received for the submitted ideas. In this context, the number of pointing comments for project no 6 was witnessed to be 224. On the other hand, the number of such comments for project no 1 is 71. Furthermore, the total number of comments in relation to the mentioned variable was 1352.

Therefore, it can be stated that crowdsourcing results in acquiring a number of external information irrelevant to the submitted idea.

## **10. Other**

The other variable refers to the comments that are does not match any of the other variables. For instance, comments such as, different types of emojis or other abbreviations. Here, the number of other comments received in favour of the project no 9 is 17; whereas, for project no 6 is 21. On the other hand, the number of comments in favour of project no 2 is 5. Such comments hold no significance in influencing the interactivity within each project. In this context, it can be assumed that the contributors do not make use of emojis or any casual abbreviation while commenting upon the submitted ideas; thus, providing the submitter with legitimate and valid comments.

## B. Sample 2 (The Approved projects):

Some correlations will be reported here, but not in section A, because they are significantly important in sample 2. Also, it was found that the approved and the unsuccessful projects data sets resemble each other to a great extent.

### 1. Commenting on the submitted idea

The variable ‘commenting on the submitted idea’, involves making points or statements on the design itself or the content of the submitted idea. There were 31 comments for this variable for project 1 (Ghostbusters 30th Anniversary). However, for project 2, Apollo 11 Saturn-V, the number comments for the same variable is 18. On the other hand, the numbers of comments for project no 5, that is, Doctor Who and Companions, is 111; which is significantly more. Here, the correlation between commenting on the submitted idea variable and the other variables can be determined to give a preliminary indication of whether the different variables may be influencing each other.

### 2. Commenting on Submitter(s)

The variable ‘commenting on submitter(s)’ encompasses putting forward a statement or point concerning the submitter. This variable helps comprehend the level of interest exhibited by submitters and contributors. Here, the number of comments in favour of project no. 1, that is, Ghostbusters 30th Anniversary is witnessed to be 0; thus, the level of

interest of the contributors was essentially nil. On the other hand, the number of comments witnessed for project no 10 was 8, which shows that the level of interest of the contributors for the Mars Science Laboratory Curiosity Rover project is quite high relative to the other projects.

### **3. Personal story related to the submitted idea**

This variable illustrates the strength of interpersonal relationships between the contributors. In this context, it was witnessed that the number of comments received for this variable in favour of project no. 2, that is, Apollo 11 Saturn-V, was 25; in other words, the contributors have a number of personal experiences or stories to share on the submitted idea. On the other hand, for project no. 10 (Voltron - Defender of The Universe), the number of comments was 13; for problem no 6, the number of comments was only 4. Therefore, it can be stated that in general, the contributors do not have much personal experience and stories to share for the concerned ideas for these ideas. Hence, from the above analysis it can be stated that the contributors are somewhat comfortable in sharing their personal experience and ideas in the Lego Ideas community. It was witnessed that the correlation between the personal story to the submitted idea and Commenting on the submitted idea was -0.55. This low correlation or correspondence between the above variables suggests there may be an almost negligible impact of the incidence of sharing personal experiences related to the business idea and contributors commenting on the ideas.

#### **4. Personal Story (experience) relating to Submitter (s):**

In this context, the contributor shares or discusses certain personal experiences or stories concerning the submitter. Here, the contributors put forward any personal occurrence in order to share it with the concerned community. Here, the number of comments received for most of the projects is witnessed to be 0; thus, stating that the contributors have no personal story to be shared in the community concerning the project, while in reference to project no 3, 5 and 8; (that is, Old Fishing Store, Doctor Who and Companions and Tron Legacy Light Cycle, respectively), the number of comments received was only 1. When determining the correlation between the Personal story to Submitter(s) variable and personal story to the submitted idea, the value was calculated to be -0.25. While the sample is highly limited, taken together, these results suggest that the two variables may not have a positive correlation that could affect the implementation of the projects. On the other hand, the correlation value between Personal story to Submitter(s) and Replication 0.26. This shows that those contributors were not adding value in general. Here, the correlation between both the variables is so low that we may consider that (again, subject to limited sample size) it is possible that there is almost no relationship (between the votes of the contributors and personal experience of the contributors regarding the submitter). All of these correlations are only suggestive and are only used to point to possible relations (or lack of relations). Further proof for this and any of the

correlation analyses cited will require larger data sets and a more thorough analysis than can be done at the current stage.

## **5. Respond to the previous comment**

The response to the previous comment variable refers to the reply of the contributors to the previous commenter or comments. This further helps in determining the engagement level of the contributors in the community, which is necessary in order to develop better solutions and ideas in the crowdsourcing community. In this context, the number of comments for project no 5, that is, Doctor Who and Companions is 21; whereas, the number of comments for the same variable in other projects was only 1. Hence, it can be stated that the contributors of the Lego Ideas community are not constant for all of its projects. When establishing the correlation between this variable and the other concerned variable, it was witnessed that the correlation between Respond to the previous comment and Questioning / Requesting is 0.81. Hence, it can be stated that there appears to be grounds for suggesting that there is very little relationship between the above-mentioned variables; and thus, they may not affect the operations of the concerned projects of Lego. This shows that there are some contributors who really want to know more about specific information on a submitted idea. On the other hand, the correlation between the concerned variable and Pointing is 0.80; suggesting a high correlation (but one that needs further investigating with a larger sample).



## **6. Replication**

The replication variable deals with the re-comments or re-votes of the contributors. This may contribute to the issue of information overload, causing confusion in the ideas and comments concerning the projects of the company. In this context, the number of comments for project no 1 is calculated to be 0; thus, highlighting that fact that no overload information in context to the first project. However, in reference to the project no 8, that is, Tron Legacy Light Cycle, the number of replications is 70, which is quite high; thus, suggesting an information overload is possibly occurring. On the other hand, the number of replicated comments for project no 5 is 14. Hence, the amount of information overload varies from project to project. When determining the correlation between the replication variable and the Commendation variable, the value was calculated be 0.6. Therefore, it is possible that the re-vote of the contributors may not always be done in appreciation of the submitted ideas.

## **7. Commendation**

The commendation variable deals with the actions wherein the contributors show appreciation towards the submitted ideas, that is, the contributors tend to provide a specific impression in favour of the submitted idea. In this context, the number of comments in favour of project no 1 is 137; whereas, for project no 2, the number of comments

was 222. On the other hand, the number of comments in favour of project no 7 is 65.

## **8. Questioning / Requesting**

The questioning or requesting variable deals with the actions where the contributors raise questions concerning the submitted idea or the submitter. The questions put forward by the contributor generally arise out of any ambiguity or vagueness in the submitted idea or the submitter. In this context, the number of comments received for Ghostbusters 30<sup>th</sup> Anniversary is 45. On the other hand, the number of comments in favour of the Old Fishing Store is 34. Furthermore, and for no. 5, the number of comments is 79. Hence, it appears that the contributors can raise questions for almost every submitted idea and submitter. Here, the correlation value between the questioning or requesting variable and the replication variable was calculated to be a negative -0.57. This means that a lot of comments that ask for further information about the submitted idea would likely occur together with fewer comments on replication. Hence, it appears that one interpretation is that the questioning of the contributors may not have a relationship with the replication of comments; thus, there may hardly be any impact upon the projects of the business. On the other hand, the correlation between the 'questioning or requesting' variable and the variable 'commenting on the submitted idea' was estimated to be 0.46.

## 9. Pointing

The variable pointing deals with how contributors put forward points or statements concerning the external information. Here, there is the possibility of unrelated information or experience being received for the submitted ideas. In this context, the number of pointing comments for the project no 1 was witnessed to be 116. On the other hand, the number of comments in favor of the problem no 3 is 53. Furthermore, the number of comments in relation to the mentioned variable was 226. Thus, we can say that crowdsourcing results in the acquiring of a quantity of external information that is irrelevant to the submitted idea. When establishing the correlation between the pointing variable and Questioning / Requesting variable, the calculated value was determined to be 0.92. This suggests that the number of comments pointing to an external reference source also correlate highly with the number of questioning or requesting comments – indicative of contributors trying to make sense of the idea in relation to something else. On the other hand, the correlation value of the pointing variable and *Respond* to the previous comment variable was calculated to be 0.80. This suggests that comments to ‘point to an external reference’ either generate further comments or precede them – possibly indicative of contributors actually reacting to each other’s comments instead of merely putting forward their individual thoughts (and ignoring other’s comments). If these relationships hold at larger sample sizes, this could affect how we view information sources and the community.

## **10. Other**

The other variable refers to the comments that are does not match any of the other variables. For instance, comments such as, different types of emojis or other abbreviations. Here, the number of other comments received in favor of the project no 1 is 13; whereas, for project no 2 is 55. On the other hand, the number of comments in favour of project no 8 is 45. Such comments hold no significance in influencing the operations of the projects. It can be stated that there is no correlation between the above two variables. Therefore, it can be assumed that the contributors do not make use of emojis or any casual abbreviation while commenting upon the submitted ideas; thus, providing the submitter with legitimate and valid comments.

### C. Summary of the findings:

From the complete finding and analysis process, it has been further observed that:

1. ***“Respond to the previous comment”*** can play a useful role in increasing the number of comments on the submitted idea, as well as potentially influence other variables.
2. When the contributors’ reply to previous comments or commenters, there is a significant impact on the appreciation that is showed by the contributor to the submitted idea.
3. Lego being one of the most recognized brands in the world is making use of the crowdsourcing technique in order to determine the approval and disapproval of the different projects it come up with.
4. The findings of both the approved and not approved set of data resemble each other to a great extent.
5. The chosen variables for the research analysis play a partial role in determining the success or failure of the proposed projects of Lego.
6. Crowdsourcing is a significant medium that can be used by business organizations in order to evaluate the success and potency of its projects.
7. Crowdsourcing has helped Lego in obtaining information and different contributors and their comments; thus, allowing Lego

to analyze and evaluate those comments in order to derive a conclusion to the effectiveness and success of its projects.

The analysis shows that the interaction of the contributors may be playing a vital role in influencing the development of the submitted project. For instance, when the number of questioning or requesting comments (variable) increases, the number of responses to previous comments will also increase. Some commenting behaviors are not providing the submitters with valid comments. A variable like commendation does not appear to have much purpose in the identification of approved or disapproved projects. Also, it does not appear associated with desirable comments/variables such as " Commenting on the submitted idea". The findings also reflect that variables like “commendation”, pointing and submitted idea can be valuable determinants in creating meaningful interactions around the projects.

Additional statistical data and information can help in determining the success and effectiveness of a project in business context, as it provides the company with quantitative data; thus, providing better insights into the concerned projects. Business decisions based upon empirical evidence such as statistical data helps in determining the effectiveness and impact of the project in a much practical manner. We have developed some basic statistics to provide some indication of their potential value in informing future research. The different statistical parameters such as standard deviation, mean, and so forth have been considered in order to help verify

whether the concerned variables of the statistical analysis can be used in helping the company determine approvals for projects.

Statistical parameters can allow the researcher to evaluate the larger set of collected data in different ways other than the qualitative means currently used. In this context both standard deviation and mean plays a significant role in determining the success of the concerned projects of Lego. In particular, parameters such as the standard deviation and mean value of the different commenting variables will then help with the project evaluation and can help determine the approval and non-approval of the concerned projects.

For the first variable, that is, “*Commenting on the submitted idea*”, the standard deviation value was calculated to be 31.; whereas, the mean value of variable no 1 has been calculated to be 53. The coefficient of variation has therefore come down to 58. The low standard deviation suggests that the variable stands apart from the key objectives of the research subject; and therefore, may not be playing a significant role in the approval of the projects. The comments of the contributors upon the submitted projects may not be supporting the success of the projects very much *and* may simply provide a baseline level of comments on a specific idea. At the same time, later contributors likely had read these earlier comments such that the total number of comments in this category remains relatively constant across different ideas submitted.

In reference to the second variable, namely, ***“Commenting on Submitter(s)”***, we have found that the point or statement made by the contributors in favour of the submitters may not be affecting the success or failure of the project approval. The statistical measures appear to suggest some of the same, especially given the low standard deviation. Hence, we can propose that the comments of the contributors upon the different submitted projects may not be helping much in determining the approval of the projects, but this will have to be verified with additional analysis.

For variable number 3, ***“Personal story or experience to the submitted idea”***, our analysis lays some ground for the possibility that this variable can be useful for determining the approval of the concerned project of the company. Personal stories or experiences that are shared by the contributors show that they are able to connect to the submitted idea; thus, showing positive response. In this way, this variable can be considered in the evaluation process for project approvals.

For this reason, we suggest that variable number 4 can help in determining the approval of the concerned projects. We can shed a bit lighter on this by looking at the standard deviation and mean. From the analysis, the standard deviation value of the concerned value is 0.6, but on the other hand, the mean value of the variable was calculated to be 0.3. In general, it is still possible that variable number 4 can help determine whether the projects of the company will be approved or not. In part, this is because



when contributors share their personal stories and experience in the crowdsourcing portals of the company, they can create good relationships with the submitters, and help people feel comfortable in presenting their ideas and opinions.

Furthermore, while considering the statistics and data of variable no 5, that is, ***“Respond to the previous comment”***, it can be stated that the concerned variable may help determine the approval or non-approval of the concerned projects. The responses of contributors to the previous comments on the submitted idea highlights the interest of the contributors towards the idea. With this, and recognition of the basic statistics such as the mean and standard deviation of such comments for a given project and for each of the commentators on this project (taken across all their other comments), the company can support the analysis of the level of approval of its projects by the potential consumers.

For variable no 6, that is, ***“Replication”***, it appears that this variable has minimum or no impact upon the determination of the approval of the project. Therefore, it can be concluded that it is possible that, if the contributors re-vote upon the same submitted idea, it is possible for an overload of information of spurious origins to take place, which can further create bewilderment and uncertainty in the determination process of project approval. The comments or votes commented by the contributors again may perhaps mislead the submitters from the specific

objective of the research; thus, affecting the outcome and findings of the study.

In addition, the statistical analysis of variable number 7, that is to say, "**Commendation**", illustrated the standard deviation value of the collated data to be 53. The mean value was further calculated to be 141. From the determined values of standard deviation and mean, it can be observed that the difference between both the values is quite high. Therefore, it can be assumed that this variable cannot determine the approval of the concerned projects. If considering the basic standards and norms of project approval of a company, the commendation variable is witnessed to determine the approval and success of the project to a great extent. In context to crowdsourcing, the appreciation of the contributors towards the submitted ideas is considered a significant component in determining the success of the project. However, in this case, it has been observed that this variable play very little or no significance in determining the approval of the project, which is a bizarre or unusual observation. Hence, from this it can be further concluded that the commendation variable in context to crowdsourcing is differently significant in different cases.

In reference to the eighth variable, namely, "**Questioning or Requesting**", it can be stated that the questioning or requesting variable of the research does not determine the approval or disapproval of the projects. It has been observed in a number of situations that the contributors tend to put forwards statements or questions that are not germane or relevant to the

submitted idea. Such questions or requests pay no significance to the research. If most of the comments in context to this variable are negative, the submitters will not be able to derive any valuable finding from this variable. Therefore, such variable is not considered important in determining the level of approval of the projects.

In context to variable number 9, that is, ***“Pointing”***, where the contributors provide external information in the crowdsourcing portals that may or may not be apparent or evident for the research. It can be further concluded that this variable holds no significance in determining the approval of the concerned projects. The pointing variable is also witnessed to play a significant role in determining the approval level of the project in a number of cases. However, in this context, it has been witnessed that the deviation value is not supporting the determination of approval in reference to this variable. As a result, it can be further concluded that the pointing variable holds little value in determining the success of the projects.

Therefore, it can be assumed that this variable does not help in determining the success or approval of the project. This is for the reason that, the comments obtained under this variable are generally emojis and short forms, which do not provide clear information concerning the submitted ideas. Therefore, this variable cannot be taken into consideration in order to determine the approval of the projects. The emojis and abbreviation comments are not transparent or clear; therefore,

creates a lot of confusion on side of the submitters to analyze the comments and derive the desired outcomes.

From the above analysis carried out with the help of standard deviation and statistical mean value, it has been observed that every variable plays a different and significant role in determining the approval of the projects. It has been further observed that the some of the variables such as, Commenting on Submitter(s), Replication and so forth, do not play a significant role in determining the approval or disapproval of the concerned projects of the company. On the other hand, factors or variable like, *“Personal story or experience to the submitted idea”*, *“respond to the previous comment”*, and so forth, play a significant role in determining the approval or disapproval of the concerned projects. The standard deviation value has facilitated the researcher in determining the key factors or variables in the research, which will facilitate the company in comprehending the success of its projects.

Furthermore, from the above analysis it has been observed that the highest p-value in context to the unapproved projects, has been derived between the variables *“personal story or experiences to the submitters”* and *“respond to the previous comments”*. The p-value calculated for the above-mentioned variable or factors was 0.94. Hence, it can be stated that *the “personal story or experiences to the submitters” and “respond to the previous comments”* are the most significant variable that can facilitate the company in determining the approval or disapproval of the

projects. On the other hand, the least derived p-value, in context to the unapproved projects, of the analysis was 0.33, which was determined between the variables, “*commendation*” and “*questioning or requesting*”. Hence, it can be stated that these two variables or factors do not play a significant role in the determination process of approval and disapproval of the project.

## V. Conclusion

From the previous findings and analysis, it can be said that crowdsourcing is a significant platform used by several organizations to evaluate and analyze the success and potentiality of the projects. The analysis reflects that crowdsourcing assists the businesses to obtain information and analyze the comments provided by the contributor. This helps the organization to evaluate the comments and understand whether the completion of the project has been successful or unsuccessful.

Therefore, consistent finding, answering research questions, recommendations and Limitations of the study are posited:

### A. Situating the Findings

By connecting our findings with three strongly related articles, are able to shed light on a number of points:

#### **First article:**

**“Distant Search, Narrow Attention: How Crowding Alters Organizations’ Filtering of Suggestions in Crowdsourcing”.**

By analyzing the paper, ‘Distant Search, Narrow Attention’, it was found out that that organizations have the liberty to get suggestions from the external contributors (Piezunka and Dahlander, 2015). One of the forms of distant search is soliciting suggestions. This is because it permits the organizations to gather more knowledge that are not found within the

boundaries of the organization. When organizations engage themselves with distant search encounters, a myriad of suggestions and outcomes known as crowding result. As soon as the crowding appears, the organizations have limited time span and can attend to only subset of suggestions. One of the drawbacks of crowding is that it reduces the attention of the organizations, even though the organization puts all its efforts in the reaching out to the external contributors and access all the suggestions that considers the distant knowledge. Organizations pay attention more to the familiar suggestions compared to the distant. By differentiating the three dimensions of distance, it has been found out that that all the three types of distance can have a negative impact on the likelihood of attention and crowding escalates these negative impacts. There is a high chance of differentiation among the likelihood of attention.

Organizations often filter out those suggestions that have gathered the distant knowledge. This has been confirmed by measuring the three dimensions that includes content, personal distance and structural quality. By analyzing the second research findings, it has been found out that crowding escalates the filter out the suggestions of the organizations that represents the distant knowledge. However, there are several challenges associated with crowding. Such challenges were identified through the organizational research. There is a challenge between the several stimuli to which the organizations are being exposed and the total amount of stimuli that are actually used in the process (Piezunka and Dahlander, 2015). Ocasio opined that when organizations attend the environmental

stimuli, there are several bandwidth problems. These bandwidth problems are associated with the various documented contexts. Thus, the key challenge of dealing with the crowd is that there is an issue with the organizations' attention as this attention is dependent on the particular decision. However, in any non-controversial baseline, the attention towards the organization will plummet, as the given suggestions will decline with the increase of crowding.

From pervious analysis, it was found out that the idea that has the maximum votes will get the highest crowd sourcing. When organizations see that a particular idea has the maximum number of likes, they will use it for the improvement of the organization with the motive of getting positive feedback. However, the analysis revealed that commenting on the submitted idea needed crowd sourcing calls. Thus, these escalate trouble as the comment of the crowd members or the submitted idea can be inaccurate and invalid. Thus, Lego can be in trouble if the form is unable to comment on the potentiality of the idea involved. However, the organization will benefit in case of 'commenting on the submitter variable'. This is because it will examine the interest of the submitters and identify the role of the contributor on the crowd sourcing platform.



Thus, Lego can profit when its submitter concentrates on distant search, as it will provide them with myriad of information. It will help the organization to get more idea and knowledge that are beyond the boundaries of the company through distant search. Not only this, when the organization will opt for distant search, it will get several suggestions, which will help, in the outcome of the results. On the other hand, this will not provide any help to the submitter who shares the personal stories and ideas on the crowd-sourcing platform. Sharing personal stories and ideas are completely different compared to that of the distant search. The submitter who shares the personal story is not required to be involved in any distant search. As personal stories and ideas can be written without gathering knowledge from the external source and suggestions, distant search and crowding do not hold much importance to the submitter of personal story.

When the variable “Personal story relating to the submitter’ is taken into consideration in this scenario, the contributor shares his personal experiences about the content or the design of the submitted idea. In this case also, crowding or distant search do not play an essential role. As the submitter is inclined in sharing his experiences on the submitted idea, he does not require to have a distant search to get suggestions and clarifications. The personal experiences are shared with the community ((Piezunka and Dahlander, 2015). Thus, the community also does not need to have knowledge about the distant search and suggestions. The above analysis has found out that correlation between the personal story relating

to submitter and commenting on the submitted idea is strong which denoted that the relationship between the contributors designing the content of the submitted idea and the personal story shared by the contributor is also strong. On one hand, the contributor can look for distant search to get idea and knowledge and receive the suggestions; on the other hand, the submitter who is sharing the personal experiences can share his own views and opinions without relating much with the distant search, suggestions and knowledge.

**Second article:**

***“Should You Really Produce What Consumers Like Online? Empirical Evidence for Reciprocal Voting in Open Innovation Contests”***

In the present scenario, with the increased consumer demand in the market, it has become necessary for every business organization to identify and comprehend the needs and demand of their potential consumers as well as the current market trends in order to meet the customer expectations; thus, maintaining customer satisfaction and loyalty. Furthermore, it has been witnessed that with the advancement in technology and communication, the seller and buyer relationship is experiencing a new phase where the business organizations are being able to directly communicate with the consumers in order to avail their feedbacks and reviews. This has further facilitated the business organizations to comprehend their level of market acceptance and brand value; thus, being able to assess their strengths and weaknesses in a much

effective manner. Presently, the business organizations are witnessed to make use of different digital mediums in order to interact and communicate with the consumers and identify their needs as well as perspective concerning the products of the concerned company. One of the most popular mediums being Crowdsourcing, is widely used by every business organization including Lego in order to gather votes and comments from different contributors in order to assess the business or product ideas of the company. Therefore, the company is able to get a better insight upon the approval and disapproval of the ideas in the market (Hofstetter *et al.*, 2018).

The votes or comments of the consumers corresponds to the cost-effective or commercial external information concerning the quality of ideas of the business organizations, which can facilitate and inform an organization's task of screening and evaluation of ideas in the initial level of innovation process. However, the votes and comments of the contributors are not always effective for the business organizations as the votes and a number of factors such as, peer pressure, social influence, brand biasness, family and background influence, and so forth may influence comments of the consumers. For instance, as per the above analysis of Lego's crowdsourcing platforms, it has been witnessed that the variable such as ***Replication***, other variables and so forth may affect the approval or disapproval of the submitted ideas as it increases the flow of unwanted information and vagueness and imprecision in the submitted ideas. This

further creates confusion and misinterpretation on side of the business organization.

Furthermore, the validity and accuracy of the votes or comments of the contributors is highly significant for the company in order to effectively determine the approval or disapproval level of the submitted ideas. However, in most of the cases the validity of the contributed votes cannot be analysed (Hofstetter *et al.*, 2018). This is for the reason that the contributors belong to different backgrounds and have different perspectives and viewpoints concerning a particular subject matter. Therefore, it is necessary for the company to ensure that authentic contributors are majorly voting for the submitted ideas; thus, assuring validation and accuracy. In addition, the involvement of the contributors towards the submitted ideas also helps in determining the validity of the votes. From the above analysis, it has been observed that, the contributors who are well-involved with the submitter or the submitted idea do not hesitate in putting forward their personal stories or experience related to the submitted idea in the crowdsourcing platforms. Hence, it can be stated that the ***“Personal story or experience to the submitted idea”*** and ***“Personal story or experience to the Submitter (s)”*** play a significant role in determining the involvement level of the contributors towards the submitted idea as well as the submitter. This will further facilitate the business organization in comprehending the validity and reliability of the votes and comments of the contributors; thus, being able to derive better and effective understanding concerning the success of the submitted idea.

Social influence and online rating also play a significant and imperative role in determining the success and failure of the business operations of the concerned business organization. These ratings and feedbacks obtained with the help of different online mediums further helps the business organization in determining its organizational objectives and goals. From the above analysis and findings, it has been witnessed that the different variables of crowdsourcing platform of Lego has different impact and influence upon different submitted ideas (Hofstetter *et al.*, 2018). It has been further observed that a single variable or set of variables are effective or significant in determining the approval of a particular submitted idea; whereas, the same variable or set of variables do not facilitate in determining the approval of a submitted idea. This is for the reason that, the contributors have different perspective and point of views for different submitted ideas in context to same variable; thus, resulting in different quality and quantity of votes or comments on same variables for different submitted ideas. Here, the online ratings in the crowdsourcing platform of Lego has provided different outcomes or conclusion for different submitted ideas; however, the variables upon which the analysis was conducted were same. The analysis of the collected data and information with the help of crowdsourcing was carried out with the help of correlation, regression, standard deviation, standard mean and coefficient of variables; thus, providing the researcher with quantitative information, which has further facilitated in getting accurate and precise findings.

**Third article:**

***“Open to suggestions: How organizations elicit suggestions through proactive and reactive attention”***

By analyzing the research paper “How organizations elicit suggestions through proactive and reactive attention”, it has been found out that organizations depend on the external contributors for future actions of the organization (Dahlander and Piezunka, 2014). The findings of the research revealed that organization put all their efforts to this kind of involvement and this are likely to wither and die. The increase in the likelihood of getting suggestions from the external source is due to the proactive attention and reactive attention. The proactive attention is submitting the suggestions that are internally developed to the external that give rise to debates and arguments. On the other hand, reactive suggestion is associated with concentrating on the suggestions provided by the externals and enhance that these suggestions are listened to and given attention. The hypothesis of this research paper relates with the fact on how the organizations motivate and inspire the external contributors to design the suggestions.

By comparing the situation with the above analysis, it has been found out that Lego can itself become active contributors themselves by submitting their own suggestions instead of relying on the external sources (Dahlander and Piezunka, 2014). Thus, by submitting its own ideas and suggestions, Lego can attract many contributors for providing essential

and valuable information. This assists the external sources to look after the suggestions that are considered by the organization and not only the subset of suggestions that the external contributors have submitted. This also assists the contributor to learn more about the other stages of suggestions like implementation, review and scheduling. This is more valuable when contributors are the customers and the suppliers of the organization as they can produce new ideas about the products or the services. By comparing the situation with the above analysis, it can be denoted that Lego's contributor can benefit by sharing the suggestions to the external contributors, as this will help the external sources to depend and rely on the organization. Thus, the variable *commenting on the submitter can be taken into consideration in this scenario. When the submitter of Lego shares a suggestion, it provides an opportunity to the external sources to carry an in-depth analysis of the suggestions that help them in the development of any other planning. The external contributors can take effective suggestions from Lego's submitters and understand the ways, system and processes that are incorporated by Lego.*

In order to motivate and encourage the contributors or consumers to provide their suggestions concerning the submitted idea of the company, Lego needs to have a strong market presence and a strong relationship with its key stakeholders. In this context, the key stakeholders of the company are the shareholders, consumers, employees and so forth. The submitted ideas of the company must be designed or developed in such a manner that it motivates and influences the contributors to actively take

part in the crowdsourcing platforms and put forward their comments and votes (Dahlander and Piezunka, 2014).

The company can obtain the suggestions and recommendation in favour of the submitted ideas in two significant manners. Firstly, the submitter(s) can become the contributors themselves; thus, avoiding external contributors and secondly, the submitter(s) can include external contributors. In this context, Lego has included the external contributors in order to receive votes and comments on their submitted idea.

With the help of the regression and standard deviation carried out with the help of the data obtained upon the different variables, it was further witnessed that *“personal story or experiences to the submitters”* and *“respond to the previous comments”* are the most effective and significant variable in reference to the submitted ideas of the company. These further highlights that these two variables have helped the research in determining the number of submitted ideas or projects that were approved and the number of projects or submitted ideas that were not approved. On the other hand, by applying the same process, it was witnessed that the variables, namely, *“commendation”* and *“questioning or requesting”*, contained the least P-value; thus, stating that these two variables do not hold a significant position in the analysis process and does not facilitate in determining the number of approved or not approved submitted ideas or projects. These values were derived in favor of the unapproved projects. However, in context to the approved projects, it was



witnessed that the most effective variable was “*comment on submitted idea*” and “*other*” variables; whereas, the most ineffective variables were “*respond to previous comment*” and “*questioning or requesting*”. Therefore, it can be further concluded that the same variables play different roles for the approved and not approved set of submitted ideas.

#### B. Answering research questions:

An exploratory analysis was done with more advanced statistics, but this is only tentatively reported, since the small size of the sample has severely reduced the explanatory power of the technique. The following is reported in a “exploratory” manner. The above findings have revealed that the highest p-value for the unapproved projects have been found in the variables like “**personal story or experiences to the submitters**” and “**respond to the previous comments**”. The total p-value for the above variables accounted to 0.94. Thus, “personal story or experiences to the submitters” and “respond to the previous comments” are the most valuable variable that helps in the comprehension of the approval or disapproval of projects. The least p-value for the unapproved projects was 0.33 for the variables: “commendation” and “questioning or requesting”. Thus, these two variables do not play an essential role in determining the approval or disapproval of the projects. The highest p-value for the approved projects has been “*comment on submitted idea*” and “*other*” variables that were estimated to be 0.99. These two variables assist the organization in understanding the success of the project. The least p-value for the

disapproved projects were, “respond to previous comment” and “questioning or requesting” that was estimated to be 0.00, which shows that they are not significant in understanding the approval of projects.

#### RQ1

Do submitters gain assistance on their ideas from commenters?

The above analysis found out that commenting on the submitted idea needs crowdsourcing calls. Thus, this can lead to trouble, as the comment on the crowd members on the submitted idea might be invalid or inaccurate. It can also benefit the company if the comment on the idea is relevant. Thus, it depends on the contributor’s idea in determining the success or the failure of the original idea or the project. The above analysis found out that the correlation between the commenting on the submitted data’ and ‘commenting on the submitter’ for the unapproved projects is negligible between the two factors as the coefficient stood at 0.30. On the other hand, the correlation between ‘commenting on the submitted idea’ and ‘response to the previous comment’ stood at 0.63, which exhibited a moderate influence of the former variable on the latter.

#### RQ2

Can commenting behavior be guided in constructive directions?

The contributors always comment on the submitter intentionally. This is beneficial as it helps in the inspection of the interest of the submitters and identifies the role of the contributor on the existing crowd sourcing

platform. Thus, commenting behavior is guided in a specified direction. The analysis has found out that correlation between the ‘commenting on submitter’ and ‘personal to submitter’ was estimated to be 0.55, denoting that the former has a moderating effect on the latter. However, the correlation between commenting on submitter and personal to the submitted idea was estimated to be 0.34, which denotes the fact that there is minimal correlation between the two variables. Thus, there is no apparent relation between the contributor making a point about the submitter and the submitter sharing a personal experience or story, related to the idea put forward.

### RQ3

Can the community's commenting/voting behavior influence the corporations' implementation decision?

The analysis has found out that the voting behavior influences the implantation decision. When a submitter shares good ideas and thoughts, he gets high votes from the commenter's who are influenced by their ideas and thoughts. The commenters can use these thoughts and ideas to decide whether it will help in the success and failure of the project. However, there is scenario when the commenter can put negative comments on the submitted idea. This results into negative influence on the decision-making about a success or failure of a project. Thus, voting plays an important role in the decision-making of an approved or disapproved project.

#### RQ4

Has Lego succeeded in creating the conditions that generate positive results from the crowdsourcing community that they have built, such as by enhancing the voting and commenting activities?

The analysis has found out that the voting and the results of the approved as well as unapproved projects have similar results. Thus, the above analysis and the entire research was not valuable for Lego as the company was unable to comprehend which projects were successful and the projects that were unapproved, as both had same outcome or results. Thus, it is essential for the company to take different variables other than the ten existing variables to determine the actual voting for the approval or disapproval of projects. It provides a future scope to the researcher to analyze on other variables and conduct the research to get a systematic outcome.

## C. Recommendations

In order to improve the crowdsourcing processes of the company, Lego should consider the following recommendations:

- Owing to the fact that, Lego is mostly involved in toys, games and so forth, the target consumers of the company are mainly the younger sections of the society. However, crowdsourcing is not a very popular platform for the younger generation to use. As a result, it has been witnessed that the maximum number of contributors in the crowdsourcing platform of the company does not belong to the younger generation. Therefore, the company lacks in being able to get the feedback and reviews of its target consumers. In order to avail feedbacks and ratings from the younger generation, the company must make use of other platforms and sources such as, social media. This is for the reason that the social media platforms are highly used by the young people and therefore is the best platform for the company to interact and communicate with its target customers.
- In a number of cases, it has been observed that the contributors tend to put forward comments and voting that are irrelevant and inappropriate in reference to the submitted ideas. In such a scenario, the research or survey being carried out by the company loses its significance, as the comments put forward does not help in deriving any conclusion. Therefore, the company must make use of the advanced technology in order to incorporate different filters so as to ensure that only the

appropriate and necessary comments and voting are received. This will help the in identifying the key contributors of the company; thus, being able to target them for future requirement.

- As discussed above, the target consumers of Lego are the younger sections of the society and the individuals involved into gaming and play. Therefore, the company is suggested to carry out surveys in the different gaming platforms in order to avail first hand feedbacks from the gamers; thus, being able to improve and enhance its operations and function in accordance to the needs and demand of the consumers.
- In order to ensure that the crowdsourcing platforms of the company are being managed and controlled effectively, Lego must hire experts and professionals who will work towards handling the crowdsourcing portals; thus, ensuring effective and successful use of the portals. Furthermore, the company must provide the employees involved in the crowdsourcing operations with effective development and training programs in order to improve and enhance their performance and productivity. This will further facilitate the company to effectively make use of the portals for availing comments and feedbacks from the contributors; thus, being able to develop better games and other products.
- In the view of the fact that, crowdsourcing is a cost-effective method, the Research and Development department of the company is recommended to make frequent investments in favor of effective

research so as to ensure better use of resources; thus, benefiting the financial system of the company.

- One of the major disadvantages of crowdsourcing is that it has no confidentiality; thus, acting as a significant downfall for the company. By putting forward petition for suggestions and recommendation for the plans and ideas of the company makes the plan as well as the competitive advantage of the company or its products. This further increases the risk of imitation or emulation of the plans and ideas of the company by its key competitors; thus, affecting the business operations and functions of the company. It further affects the customer base of the company, as by imitating the ideas and plans of the company; the competitors can easily draw the attention of the consumers towards themselves. Therefore, the company is suggested to take under consideration all the legal implications prior to publicizing its ideas and plans for crowdsourcing such as, copyright. This will help the company to avoid replication of its ideas; thus, keeping the confidentiality of its ideas.
- Another significant step that can be taken under consideration by the company in order to maintain the confidentiality of its ideas and plans is to exclude external crowdsourcing and only involve the key stakeholders of the company for availing suggestions and comments. This will help the company in disclosing the plan or idea to a limited group of individuals; thus, maintaining the privacy of the ideas and plans. Furthermore, this will facilitate the company in involving its

stakeholders in the planning and idea generation process of the business; thus, being able to maintain a strong and healthy relationship with its stakeholders, which is highly crucial for the company in order to operate smoothly in the market.

- Crowdsourcing at times is misleading in nature or it has been also viewed that the outcome of the crowdsourcing process is highly negative or not obtained from authentic and genuine sources. Therefore, it is extremely necessary for the toys and gaming company to take primitive measures in order to deal with such issues. In order to overcome such problems in the crowdsourcing process of the company, Lego is suggested to set up a strong and effective IT department who will work towards ensuring the reliability and authenticity of the sources from where the comments and suggestions are being uploaded. The company must further provide the IT professional with effective and successful training and development programs in order to improve the productivity and performance of the employees as well as enhances their technical skills and keeps them up to date. This is highly significant for the company in order to ensure that the crowdsourcing processes are carried out effectively and maximum positive outcomes are availed out of them; thus, benefiting the decision-making process and operations of the company.
- Communication issue or language barrier is witnessed to be a major issue, which hamper the quality of the comments or articles being uploaded by the contributors upon the submitted ideas. Therefore, in



order to avoid such language barriers and obligations, the IT department of the company can come up with effective technological solutions in order to translate the contents being uploaded; thus, being able to avail better and more suggestions and information from the crowdsourcing process.

- Lego should take under consideration the proactive crowdsourcing type for gathering suggestion and votes upon its submitted ideas. However, the company can even choose for reactive crowdsourcing; thus, being able to involve a greater number of contributors, which will further help the company in getting a better insight upon the approval and disapproval of the submitted ideas. Furthermore, reactive crowdsourcing will facilitate the company in sharing the ideas and plans to a larger section of consumers or contributors, therefore, being able to include a greater number of people. This will further help the company in availing different perspectives and viewpoints concerning the submitted ideas. As a result, the company will be able to identify and comprehend whether the submitted idea or plan will be accepted in the market post its actual launch; thus, providing the company with an overview of the future perspectives of its project ideas and plans.

#### D. Limitations of the study

The primary challenges of this research consist of Data availability – this part is related to the inaccessibility of the relevant data. The subject of crowdsourcing has gained attention from various researchers and scholar all around the world, resulting in abundance of credible sources for formation of the literature. However, the lack of data in the commenting and voting behaviour or rather the factors of motivation of the participant in online crowdsourcing platform rationalises the need for this research. However, there are certain company specific data, which is considered to be confidential within the agreement of the companies thus restricting their access by the researchers and authors, which could otherwise have contributed significantly to the outcomes of the research.

## VI. Qualitative Observations:

In Sample (2); the implemented projects, Project Number 05: “**Doctor Who and Companions**” which was submitted by *AndrewClark2* has recorded 637 qualitative observations. It was found that the number of “**Commenting on the submitted idea**” for this project is 111; whereas, the amount of the same variable in other projects was only 18. We can shed light on the interaction between *jangofett2* and *River-Song*.

*jangofett2* asked *AndrewClark2* that:

*“will Tom Baker be included in this?”*

*River-Song* responded *jangofett2* that:

*“I think that it should be the 11th doctor”*

It was found that when *River-Song* replied to previous comments or commenters, there was a significant flow of “**Commenting on the submitted idea**”. For instance, *ickKeeper1* has encouraged to say that:

*“I assume that the console/desktop is based on the Season Seven (new show) version? If so, then, would it be better to have a Season 7 Matt Smith (purple coat and top hat) or Capaldi as the new Doctor? I'm just curious, and I'm pretty sure that the other Doc Who project that made 10k is using Tennant's Doctor as theirs...again, I probably missed something somewhere, so please correct me! Thanks!”*

“**Commenting on the submitted idea**” that was shown by the *ickKeeper1* to the submitted idea has resulted right after the interaction between *jangofett2* and *River-Song*. However, it was found that some interaction like this may play a vital role in influencing the flow of “**Commenting on the submitted idea.**” Moreover, it can be stated that when submitters or commenters respond to the previous comments, the number of commenting on the submitted idea increases.

This interaction is necessary in order to develop better solutions and ideas in the crowdsourcing community. In this context, the number of “**Respond to the previous comment**” for the project no 5, that is, *Doctor Who and Companions* is 21; whereas, the amount of the same variable in other projects was only 1.

Another interaction between Red\_Devils27 and Emillie5.

Red\_Devils27 has responded that:

*“I am with Emillie5. They should have all the doctors!! From the 1st to the 13th doctor!! But with 13 doctors and a lot of companions they should do it about the doctors!! So, you could have the first doctor and Vicki and Ben Jackson. Or the seventh Doctor and Ace. So, there would be 13 sets right now but when a new doctor comes they need to make a new one.”*

When Emillie5 has suggested that:

*“They need to make all the doctors! And you can’t miss out Matt Smith and Karen, and Arthur they have been a major part of the doctor who for the past few years! A whole range of different doctor who sets would be brill.”*

The interaction between Red\_Devils27 and Emillie5 towards the idea has encouraged

Jen Grunwald to say that:

*“That's an insane suggestion, and no one even knows if they'll like him yet! It HAS to be Tennant & Rose (I say that even with Eccleston being my Doctor). Though I would understand Smith & Clara, certainly before Capaldi. I think having the classic is cool too and I think Baker is a good choice.”*

\*\*\*\*\*

The same pattern was founded In Sample (1); disapproved projects, Project Number 09: “**Modular Apple Store**” which was submitted by *gotoandbuild* has recorded 491 qualitative observations. It was found that the number of “**Commenting on the submitted idea**” for this project is 126; whereas, the amount of the same variable in most other projects was below 60. We can shed light on the interaction between tow commenters; *Erthandfiya* and *Jarren*.

Erthandfiya asked that:

*“Not sure Apple would allow this to merge? Technology vs Toy makes no sense to shareholders, and Apple have a brand ethos many are unaware of. But are we getting Lego fans here or Apple?”*

Jarren responded *Jarren that:*

*“In response to what people have said about the whole "branding" my verdict is as follows: The whole point of licensed products is to increase brand loyalty and bring in others who wouldn't normally give LEGO a try. Just look at the currently released CUUSOO projects! All of them are either licensed, or real world things. Why did these get voted for? They had a large fan base, not only within the LEGO community, but also outside it. This project is the same in those regards. Let LEGO decide.”*

It was found that when *Jarren* responded to *Erthandfiya*, there was a significant flow of “**Commenting on the submitted idea**”. For instance, *Elementron* has encouraged to say that:

*“Here are some suggestions; - I like the skylight roof- Your brick built Apple logo is nice, but I think a sticker applied to a smooth plate would be more appropriate to capture the iconic looking Apple.”*

And then; *LIVE2BUILD98* has also encouraged to say that:

*“Don’t get me wrong, i like it, but the building at least has to have two stories. in my opinion, it wouldn't be LEGO Modular if it wasn't. i like the inside but why not make it bigger because your limit is a giant green/grey tile. make the upstairs a meeting-room/business-room. if you wanted, make the third floor (if you add one) a storage room for their products. another thing that i like about modular sets is the roof. an entrance or skylight would be cool.”*

On the same flow, it was notice that Jarren as commenter interacted more and added more suggestions:

*“Reading your response to some suggestions, I think I might have a solution that works for all. The walls of the real store aren't really that colour of grey, it's lighter. LEGO does make very light grey, that would work well. This would then allow you to change the floors to grey, and the tables to tan, without having anything blend in. Regarding the apple logo, I think it will have to be up to LEGO. (Will continue in next post.)”*

On the same flow, *Batonmedved* suggested:

*“Getting better all the time. Maybe one should remove this dark stone grey logo from sides, it doesn't keep up with the rest of design and nothing like this you can see in real world Apple store.”*

\*\*\*\*\*

## VII. References

- Al-Ghamdi, D., Nisar, T. M., Prabhakar, G. P., & Strakova, L. (2017). 30. Crowdsourcing, co-creation and crowdfunding in the video-game industry.
- Amy, M., Ian, R. & David, M. (2013) "A classification scheme for content analyses of YouTube video comments", *Journal of Documentation*, Vol. 69 Issue: 5, pp.693-714
- Andersen, P., & Ross, J. W. (2016). Transforming the LEGO group for the digital economy.
- Antorini, Y. M., Muniz Jr, A. M., & Askildsen, T. (2012). Collaborating with customer communities: Lessons from the LEGO Group. *MIT Sloan Management Review*, 53(3), 73.
- Araujo, R. M. (2013). 99designs: An analysis of creative competition in crowdsourced design. In First AAAI conference on Human computation and crowdsourcing.
- Boudreau, K. J., & Lakhani, K. R. (2013). Using the crowd as an innovation partner. *Harvard business review*, 91(4), 60-9.
- Bayus, B. L. (2013). Crowdsourcing new product ideas over time: An analysis of the Dell Idea Storm community. *Management science*, 59(1), 226-244.
- Behrend, T. S., Sharek, D. J., Meade, A. W., & Wiebe, E. N. (2011). The viability of crowdsourcing for survey research. *Behavior research methods*, 43(3), 800.
- Beretta, M. (2018). Idea Selection in Web-enabled Ideation Systems. *Journal of Production Innovation Management*
- Bonabeau, E. (2009). Decisions 2.0: The power of collective intelligence. *MIT Sloan management review*, 50(2), 45.
- Brem, A., & Bilgram, V. (2015). The search for innovative partners in co-creation: Identifying lead users in social media through netnography and crowdsourcing. *Journal of Engineering and Technology Management*, 37, 40-51.
- Brabham, D. C. (2008). Crowdsourcing as a model for problem solving: An introduction and cases. *Convergence*, 14(1), 75-90.
- Brabham, D. C. (2010). Moving the crowd at Threadless: Motivations for participation in a crowdsourcing application. *Information, Communication & Society*, 13(8), 1122-1145.
- Chanal, V., & Caron-Fasan, M. L. (2010). The difficulties involved in developing business models open to innovation communities: the case of a crowdsourcing platform. *M@ n@ gement*, 13(4), 318-340.

- Chiu, C. M., Liang, T. P., & Turban, E. (2014). What can crowdsourcing do for decision support?. *Decision Support Systems*, 65, 40-49.
- Chua, A. Y., & Banerjee, S. (2013). Customer knowledge management via social media: the case of Starbucks. *Journal of Knowledge Management*, 17(2), 237-249.
- Chwialkowska, A. (2012). Crowdsourcing as a customer relationship building tool. *Journal of Positive Management*, 3(1), 18.
- Christensen, K., Nørskov, S., Frederiksen, L., & Scholderer, J. (2017). In search of new product ideas: Identifying ideas in online communities by machine learning and text mining. *Creativity and Innovation Management*, 26(1), 17-30.
- Collins, J. J. (2012). Wisdom of crowds for robust gene network inference. *Nature methods*, 9(8), 796.
- Dahlander, L. and Piezunka, H., 2014. Open to suggestions: How organizations elicit suggestions through proactive and reactive attention. *Research Policy*, 43(5), pp.812-827.
- Dahlander, L., & Magnusson, M. (2008). How do firms make use of open source communities?. *Long range planning*, 41(6), 629-649.
- Di Gangi, P. M., Wasko, M. M., & Hooker, R. E. (2010). Getting Customers'ideas To Work for You: Learning from Dell How to Succeed with Online User Innovation Communities. *MIS Quarterly Executive*, 9(4).
- Di Gangi, P. M., & Wasko, M. (2009). Steal my idea! Organizational adoption of user innovations from a user innovation community: A case study of Dell Idea Storm. *Decision Support Systems*, 48(1), 303-312.
- Doan, A., Franklin, M. J., Kossmann, D., & Kraska, T. (2011). Crowdsourcing applications and platforms: A data management perspective. *Proceedings of the VLDB Endowment*, 4(12), 1508-1509.
- Easley, D., & Kleinberg, J. (2010). *Networks, crowds, and markets: Reasoning about a highly connected world*. Cambridge University Press.
- Estelles-Arolas, E., & Gonzalez-Ladron-De-Guevara, F. (2012). Towards an integrated crowdsourcing definition. *Journal of Information science*, 38(2), 189-200.
- Ghezzi, A., Gabelloni, D., Martini, A., & Natalicchio, A. (2017). Crowdsourcing: a review and suggestions for future research. *International Journal of Management Reviews*.
- Galton, F. (1907). Vox populi (The wisdom of crowds). *Nature*, 75(7), 450-451.



- Garrigos-Simon, F. J., & Narangajavana, Y. (2015). From Crowdsourcing to the Use of Masscapital. The Common Perspective of the Success of Apple, Facebook, Google, Lego, TripAdvisor, and Zara. In *Advances in crowdsourcing* (pp. 1-13). Springer, Cham.
- Hafkesbrink, J., & Schroll, M. (2011). Innovation 3.0: embedding into community knowledge-collaborative organizational learning beyond open innovation. *Journal of Innovation Economics & Management*, (1), 55-92.
- Hossain, M., & Islam, K. Z. (2015). Generating ideas on online platforms: A case study of “My Starbucks Idea”. *Arab Economic and Business Journal*, 10(2), 102-111.
- Hossain, M., & Islam, K. Z. (2015). Ideation through online open innovation platform: dell IdeaStorm. *Journal of the Knowledge Economy*, 6(3), 611-624.
- Hofstetter, R., Aryobsei, S. and Herrmann, A., 2018. Should you really produce what consumers like online? Empirical evidence for reciprocal voting in open innovation contests. *Journal of Product Innovation Management*, 35(2), pp.209-229.
- Hoornaert, S., Ballings, M., Malthouse, E. C., & Van den Poel, D. (2017). Identifying new product ideas: waiting for the wisdom of the crowd or screening ideas in real time. *Journal of Product Innovation Management*, 34(5), 580-597.
- Hossain, M. (2016). Embracing open innovation to acquire external ideas and technologies and to transfer internal ideas and technologies outside.
- Huang, Y., Singh, P., & Srinivasan, K. (2011). Crowdsourcing “Blockbuster” ideas: A dynamic structural model of ideation.
- Ionita, D., & Onișor, L. F. (2016). Crowdsourcing and Outsourcing: Friends or Foes? *Journal of Emerging Trends in Marketing and Management*, 1(1), 52-61.
- Khan, V. J., Dhillon, G., Piso, M., & Schelle, K. (2016). Crowdsourcing user and design research. In *Collaboration in Creative Design* (pp. 121-148). Springer, Cham.
- Kohler, T. (2015). Crowdsourcing-based business models: how to create and capture value. *California Management Review*, 57(4), 63-84.
- Kohler, T. (2017). How to Scale Crowdsourcing Platforms. *California Management Review*, 0008125617738261.
- Kosonen, M., Gan, C., Blomqvist, K., & Vanhala, M. (2012). Users' motivations and knowledge sharing in an online innovation community. In *ISPIM Conference Proceedings* (p. 1). The International Society for Professional Innovation Management (ISPIM).

- Lee, H., & Suh, Y. (2016). Who creates value in a user innovation community? A case study of My Starbucks Idea. com. *Online Information Review*, 40(2), 170-186.
- Lorenz, J., Rauhut, H., Schweitzer, F., & Helbing, D. (2011). How social influence can undermine the wisdom of crowd effect. *Proceedings of the National Academy of Sciences*, 108(22), 9020-9025.
- Liu, Y., Chen, F., Kong, W., Yu, H., Zhang, M., Ma, S., & Ru, L. (2012). Identifying web spam with the wisdom of the crowds. *ACM Transactions on the Web (TWEB)*, 6(1), 2.
- Lorenz, J., Rauhut, H., Schweitzer, F., & Helbing, D. (2011). How social influence can undermine the wisdom of crowd effect. *Proceedings of the National Academy of Sciences*, 108(22), 9020-9025.
- Madden, A., Ruthven, I., & McMenemy, D. (2013). A classification scheme for content analyses of YouTube video comments. *Journal of documentation*, 69(5), 693-714.
- Majchrzak, A., & Malhotra, A. (2013). Towards an information systems perspective and research agenda on crowdsourcing for innovation. *The Journal of Strategic Information Systems*, 22(4), 257-268.
- Marbach, D., Costello, J. C., Küffner, R., Vega, N. M., Prill, R. J., Camacho, D. M., ...& Welinder, P., Branson, S., Perona, P., &Belongie, S. J. (2010). The multidimensional wisdom of crowds. In *Advances in neural information processing systems* (pp. 2424-2432).
- Marbach, D., Costello, J. C., Küffner, R., Vega, N. M., Prill, R. J., Camacho, D. M., ...& Collins, J. J. (2012). The wisdom of crowds for robust gene network inference. *Nature methods*, 9(8), 796.
- Meldrum, S., Savarimuthu, B. T., Licorish, S., Tahir, A., Bosu, M., & Jayakaran, P. (2017). Is knee pain information on YouTube videos perceived to be helpful? An analysis of user comments and implications for dissemination on social media. *Digital Health*, 3, 2055207617698908.
- Neroth, P. (2009). Lego for life. *Engineering & Technology*, 4(3), 22-23.
- Oeldorf-Hirsch, A., &Sundar, S. S. (2015). Posting, commenting, and tagging: Effects of sharing news stories on Facebook. *Computers in Human Behavior*, 44, 240-249.
- Piezunka, H. and Dahlander, L., 2015. Distant search, narrow attention: How crowding alters organizations' filtering of suggestions in crowdsourcing. *Academy of Management Journal*, 58(3), pp.856-880

- Poetz, M. K., & Schreier, M. (2012). The value of crowdsourcing: can users really compete with professionals in generating new product ideas?. *Journal of product innovation management*, 29(2), 245-256.
- Ramaswamy, V., & Gouillart, F. (2010). Building the co-creative enterprise. *Harvard business review*, 88(10), 100-109.
- Ringen, J. (2015). How Lego Became the Apple of Toys. *Fast Company*, (192).
- Schenk, E., & Guittard, C. (2009). Crowdsourcing: What can be Outsourced to the Crowd, and Why. In *Workshop on Open Source Innovation, Strasbourg, France* (Vol. 72).
- Sheng, M., & Hartono, R. (2015). An exploratory study of knowledge creation and sharing in online community: A social capital perspective. *Total Quality Management & Business Excellence*, 26(1-2), 93-107.
- Shen, X. L., Lee, M. K., & Cheung, C. M. (2014). Exploring online social behavior in crowdsourcing communities: A relationship management perspective. *Computers in Human Behavior*, 40, 144-151.
- Sigala, M. (2012). Social networks and customer involvement in new service development (NSD) The case of www. mystarbucksidea.com. *International Journal of Contemporary Hospitality Management*, 24(7), 966-990.
- Simula, H., & Vuori, M. (2012). Benefits and barriers of crowdsourcing in B2B firms: Generating ideas with internal and external crowds. *International Journal of Innovation Management*, 16(06), 1240011.
- Stevens, G. A., & Burley, J. (1997). 3,000 raw ideas= 1 commercial success!. *Research-Technology Management*, 40(3), 16-27.
- Tran, A., Hasan, S. U., & Park, J. Y. (2012). Crowd participation pattern in the phases of a product development process that utilizes crowdsourcing. *Industrial Engineering and Management Systems*, 11(3), 266-275.
- Tsou A, Thelwall M, Mongeon P, Sugimoto CR (2014) A Community of Curious Souls: An Analysis of Commenting Behavior on TED Talks Videos. *PLoS ONE* 9(4): e93609
- Von Hippel, E. A. (2016). Free Innovation.
- Westerski, A., Dalamagas, T., & Iglesias, C. A. (2013). Classifying and comparing community innovation in Idea Management Systems. *Decision Support Systems*, 54(3), 1316-1326.
- Wooten, J. O., & Ulrich, K. T. (2017). Idea generation and the role of feedback: Evidence from field experiments with innovation

- tournaments. *Production and Operations Management*, 26(1), 80-99.
- Wexler, M. N. (2011). Reconfiguring the sociology of the crowd: exploring crowdsourcing. *International Journal of Sociology and Social Policy*, 31(1/2), 6-20.
- Xu, C., Qin, S., & Xiao, Z. (2012, September). Crowdsourcing-based product innovation design service model for small-and medium-sized enterprises. In *Automation and Computing (ICAC), 2012 18th International Conference on* (pp. 1-5). IEEE.
- Zolkepli, I. A., Hasno, H., Mukhiar, S., &Nadiyah, S. (2015). Online Social Network Citizen Engagement on Instagram Crowdsourcing: A Conceptual Framework. *Electronic Journal of Knowledge Management*, 13(4).
- Zhao, Y., & Zhu, Q. (2014). Evaluation on crowdsourcing research: Current status and future direction. *Information Systems Frontiers*, 16(3), 417-434.
- Zahay, D., Hajli, N., & Sihi, D. (2017). Managerial perspectives on crowdsourcing in the new product development process. *Industrial Marketing Management*.

## I. Appendices

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### List of Ongoing crowdsourcing communities

Corporate	industry	Platform address
Local Motors	Automotive	<a href="https://localmotors.com">https://localmotors.com</a>
Amazon Studios	Film	<a href="https://studios.amazon.com">https://studios.amazon.com</a>
Quirky	###	<a href="https://www.quirky.com/">https://www.quirky.com/</a>
Starbucks	Coffee	<a href="https://ideas.starbucks.com/">https://ideas.starbucks.com/</a>
Coca-Cola	Beverage	<a href="https://www.cokesolutions.com">https://www.cokesolutions.com</a>
InnoCentive	Non-specific	<a href="https://www.innocentive.com/">https://www.innocentive.com/</a>
Jovoto	Identity Creation	<a href="https://www.jovoto.com/">https://www.jovoto.com/</a>
Dell Idea Storm	Software	<a href="http://www.ideastorm.com/">http://www.ideastorm.com/</a>
Idea Scale	Non-specific	<a href="https://ideascale.com/">https://ideascale.com/</a>
SAP	Software	<a href="https://ideas.sap.com/">https://ideas.sap.com/</a>
99 Designs	Identity Creation	<a href="https://99designs.com.sg/">https://99designs.com.sg/</a>
Threadless	Retail Apparel	<a href="https://www.threadless.com">https://www.threadless.com</a>
NASA	Space	###
Crowd Spring	Identity Creation	<a href="https://www.crowdspring.com">https://www.crowdspring.com</a>
Lego company	Toys	<a href="https://ideas.lego.com/dashboard">https://ideas.lego.com/dashboard</a>

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List of Sample (1) Not-Approved Projects			
	Projects Links	Projects' Name	Submitted By
1	<a href="https://ideas.lego.com/projects/65a584ca-7a48-4996-9b87-4e1f652ac0b5">https://ideas.lego.com/projects/65a584ca-7a48-4996-9b87-4e1f652ac0b5</a>	Boat Repair Shop	RobenAnne
2	<a href="https://ideas.lego.com/projects/c81dfa92-81f0-45aa-821c-e068d215ce75">https://ideas.lego.com/projects/c81dfa92-81f0-45aa-821c-e068d215ce75</a>	Particle Accelerator	JKBrickworks
3	<a href="https://ideas.lego.com/projects/ff5e94a2-301f-4527-8146-44cffe73fad8">https://ideas.lego.com/projects/ff5e94a2-301f-4527-8146-44cffe73fad8</a>	Indominus Rex	senteosan
4	<a href="https://ideas.lego.com/projects/b06575ee-1409-4324-a817-d2e99386b9c7">https://ideas.lego.com/projects/b06575ee-1409-4324-a817-d2e99386b9c7</a>	Fossil Museum	whatpumpkin
5	<a href="https://ideas.lego.com/projects/8e77ca75-5189-409c-8a53-ce39200b96a7">https://ideas.lego.com/projects/8e77ca75-5189-409c-8a53-ce39200b96a7</a>	Merchant's House	bigboy99899
6	<a href="https://ideas.lego.com/projects/7e46bef5-2a6b-443c-99ef-51fdbf784a26">https://ideas.lego.com/projects/7e46bef5-2a6b-443c-99ef-51fdbf784a26</a>	Modular Western Town	mb_bricks
7	<a href="https://ideas.lego.com/projects/a3f1034a-7641-49ed-8066-ac367de22285">https://ideas.lego.com/projects/a3f1034a-7641-49ed-8066-ac367de22285</a>	Johnny Five	PepaQuin
8	<a href="https://ideas.lego.com/projects/dc4f08d5-a166-49e6-bfd8-83b1ec0da28b">https://ideas.lego.com/projects/dc4f08d5-a166-49e6-bfd8-83b1ec0da28b</a>	Lothlorien	RAKRONDEWL
9	<a href="https://ideas.lego.com/projects/d7bb4032-655a-4a1f-a1bb-c53821a41bc1">https://ideas.lego.com/projects/d7bb4032-655a-4a1f-a1bb-c53821a41bc1</a>	Modular Apple Store	gotoandbuild
10	<a href="https://ideas.lego.com/projects/2831e05c-dd7a-4ac9-9da4-ac79ce5888ad">https://ideas.lego.com/projects/2831e05c-dd7a-4ac9-9da4-ac79ce5888ad</a>	Jedi High Council Chamber	lojaco

List of Sample (2) Implemented Projects.			
	Projects Links	Projects' Name	Created By
1	<a href="https://ideas.lego.com/projects/ee095c8d-1ad2-41ab-885d-41ec39740e9d">https://ideas.lego.com/projects/ee095c8d-1ad2-41ab-885d-41ec39740e9d</a>	Ghostbusters 30th Anniversary	BrentWaller
2	<a href="https://ideas.lego.com/projects/3519b723-c59a-43b4-81be-ccb99b631627">https://ideas.lego.com/projects/3519b723-c59a-43b4-81be-ccb99b631627</a>	Apollo 11 Saturn-V	saabfan
3	<a href="https://ideas.lego.com/projects/25822826-4360-4a8d-9665-2766d064677c">https://ideas.lego.com/projects/25822826-4360-4a8d-9665-2766d064677c</a>	Old Fishing Store	RobenAnne
4	<a href="https://ideas.lego.com/projects/4a40a3c8-7bdf-4d2b-a273-f5021e576581">https://ideas.lego.com/projects/4a40a3c8-7bdf-4d2b-a273-f5021e576581</a>	Caterham Super Seven	bricktrix_Carl
5	<a href="https://ideas.lego.com/projects/1513c917-920f-4d72-b437-f5b0bb7d684d">https://ideas.lego.com/projects/1513c917-920f-4d72-b437-f5b0bb7d684d</a>	Doctor Who and Companions	AndrewClark2
6	<a href="https://ideas.lego.com/projects/5fc1530f-9052-4115-b06f-d7b0aa65d3c4">https://ideas.lego.com/projects/5fc1530f-9052-4115-b06f-d7b0aa65d3c4</a>	WALL•E	MacLane
7	<a href="https://ideas.lego.com/projects/a2c285f9-9a6b-49ae-a834-c3c7e938e093">https://ideas.lego.com/projects/a2c285f9-9a6b-49ae-a834-c3c7e938e093</a>	Mars Science Laboratory Curiosity	Perijove
8	<a href="https://ideas.lego.com/projects/6cffaa2-6831-4b3d-a421-9057405b3f1b">https://ideas.lego.com/projects/6cffaa2-6831-4b3d-a421-9057405b3f1b</a>	Tron Legacy Light Cycle	BrickBros UK
9	<a href="https://ideas.lego.com/projects/388ddb3-2f0a-42fb-9f54-93bf3b5f4fe9">https://ideas.lego.com/projects/388ddb3-2f0a-42fb-9f54-93bf3b5f4fe9</a>	Women of NASA	20tauri
10	<a href="https://ideas.lego.com/projects/f9eb3ff9-ef8-42e1-85a5-b7e1107bfedb">https://ideas.lego.com/projects/f9eb3ff9-ef8-42e1-85a5-b7e1107bfedb</a>	Voltron - Defender of The Universe	len_d69

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List of Published Papers to investigate Ongoing Crowdsourcing Communities

Corporate	Published Papers
Local Motors	Norton, M., & Dann, J. (2011). & Langner, B. F., & Seidel, V. P. (2013, January).
Quirky	Kohler, T., Kohler, T., Nickel, M., & Nickel, M. (2017).
Starbucks	Sheng, M., & Hartono, R. (2015) & Hossain, M., & Islam, K. Z. (2015).
InnoCentive	Allio, R. J. (2004) & Hilgers, D., & Ihl, C. (2010).
Jovoto	Mrass, V., Peters, C., & Leimeister, J. M. (2018).
Dell IdeaStorm	Norton, M., & Dann, J. (2011). & Langner, B. F., & Seidel, V. P. (2013, January).
SAP	Kohler, T., Kohler, T., Nickel, M., & Nickel, M. (2017).
99 Designs	Araujo, R. M. (2013, November) & Wooten, J. O., & Ulrich, K. T. (2017).
Threadless	Brabham, D. C. (2010)
NASA	Davis, J. R., Richard, E. E., & Keeton, K. E. (2015).
Crowd Spring	Mo, J., Sarkar, S., & Menon, S. (2016) & Wooten, J. O., & Ulrich, K. T. (2017).

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Reference of classification

Codes No.	Name of the classification	Reference of classification
1	Commenting on the submitted idea	##
2	Commenting on Contributor(s)	##
3	Personal Story (experience) relating to the submitted idea	##
4	Personal Story (experience) relating to Contributor(s)	##
5	Respond to the Previous comment	##
6	Replication of Voting	##
7	Appreciation/acknowledgments	Meldrum <i>et al</i> (2017).
8	Questioning/ Requesting Information	Madden <i>et al</i> (2013).
9	Pointing/ Giving Information	Madden <i>et al</i> (2013).
10	unclassifiable / other	##

## Adult Fan of LEGO (AFOL)



***RobenAnne From  
Netherlands***

<https://www.ramt-brick-design.com>



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Philippine***

[https://ideas.lego.com/profile/len\\_d69/entries?query=&sort=top](https://ideas.lego.com/profile/len_d69/entries?query=&sort=top)



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Study	Ongoing community	Main Issue	Methodological Approach	Main Finding
Bayus, B. L. (2013).	Dell's IdeaStorm	How individual's ideation effort should be described?	Two years of data form the platform	The ideas that come from serial contributors are more likely to be implemented. Therefore, firms need to convert single contributors into Serial contributors
Araujo, R. M. (2013).	99designs	What should affect the quality of contributions?	38,361 logo design contests were extracted from the platform	Financial incentives do not have an impact on ideas' quality.
Sheng, M., & Hartono, R. (2015).	Adobe, Dell and Starbucks	How Social capital facilitate an online community?	3 case studies	No direct value from Knowledge creation and sharing to an online community.
Hossain, M., & Islam, K. Z. (2015).	My Starbucks idea	When ideas could be implemented?	Extracted data from the "My Starbucks idea" platform	One out of 500 ideas have been implemented. unlike the mature stage of the platform, the most implemented ideas have been on the early stage.

Di Gangi, P. M., & Wasko, M. (2009).	Dell's IdeaStorm	How the power of making decision between firms and contributors could be balanced?	Two qualitative cases were selected from Dell Community	Dell should raise their absorptive capacity to reduce ability the complexity of innovation contributors.
Di Gangi, P. M., Wasko, M. M., & Hooker, R. E. (2010).	Dell's IdeaStorm	How innovation community could be sustained and leveraged?	Qualitative cases were selected from Dell Community	Seven recommendations were proposed to sustain innovation community
Lee, H., Han, J., & Suh, Y. (2014).	My Starbucks idea	How to manage the tension between customer expectations and customer interactions?	Using Web Crawler Detection	Proposing five types of customer expectation based on the content of Voice of customer (VOC).
Lee, H., & Suh, Y. (2016).	My Starbucks idea	How information overload problem could be solved?	Using opinion mining software to classify the comments into positive, negative and objective.	They propose a data mining system that could track the potential contributors based on quality and target them in advance.

Westerski, A., Dalamagas, T., & Iglesias, C. A. (2013).	My Starbucks idea, Dell's IdeaStorm, Cisco i-prize & Ubuntu Braintorm	How idea assessment should be run?	Selected comments, ideas and user from 4 different communities	The presented assessment system has worked
Hossain, M., & Islam, K. Z. (2015).	Dell's IdeaStorm	Could factors like votes and comments be associated with selection?	Extracted data from the Dell's IdeaStorm platform	3% of the submitted ideas were implemented

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Correlations the disapproved projects

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	Var. 01	Var. 02	Var. 03	Var. 04	Var. 05	Var. 06	Var. 07	Var. 08	Var. 09	Var. 10
Var. 01	1.000	*	*	*	*	*	*	*	*	*
Var. 02	0.421	1.000	*	*	*	*	*	*	*	*
Var. 03	0.100	0.421	1.000	*	*	*	*	*	*	*
Var. 04	0.851	0.556	0.177	1.000	*	*	*	*	*	*
Var. 05	0.698	0.591	-0.026	0.599	1.000	*	*	*	*	*
Var. 06	0.262	-0.264	0.236	-0.010	0.009	1.000	*	*	*	*
Var. 07	-0.074	-0.536	-0.373	-0.288	-0.260	0.325	1.000	*	*	*
Var. 08	0.454	-0.103	-0.310	0.369	0.329	-0.215	0.343	1.000	*	*
Var. 09	-0.388	0.574	-0.014	-0.085	0.066	-0.684	-0.606	-0.242	1.000	*
Var. 10	-0.081	0.458	-0.165	0.223	0.444	-0.558	-0.417	0.107	0.543	1.000

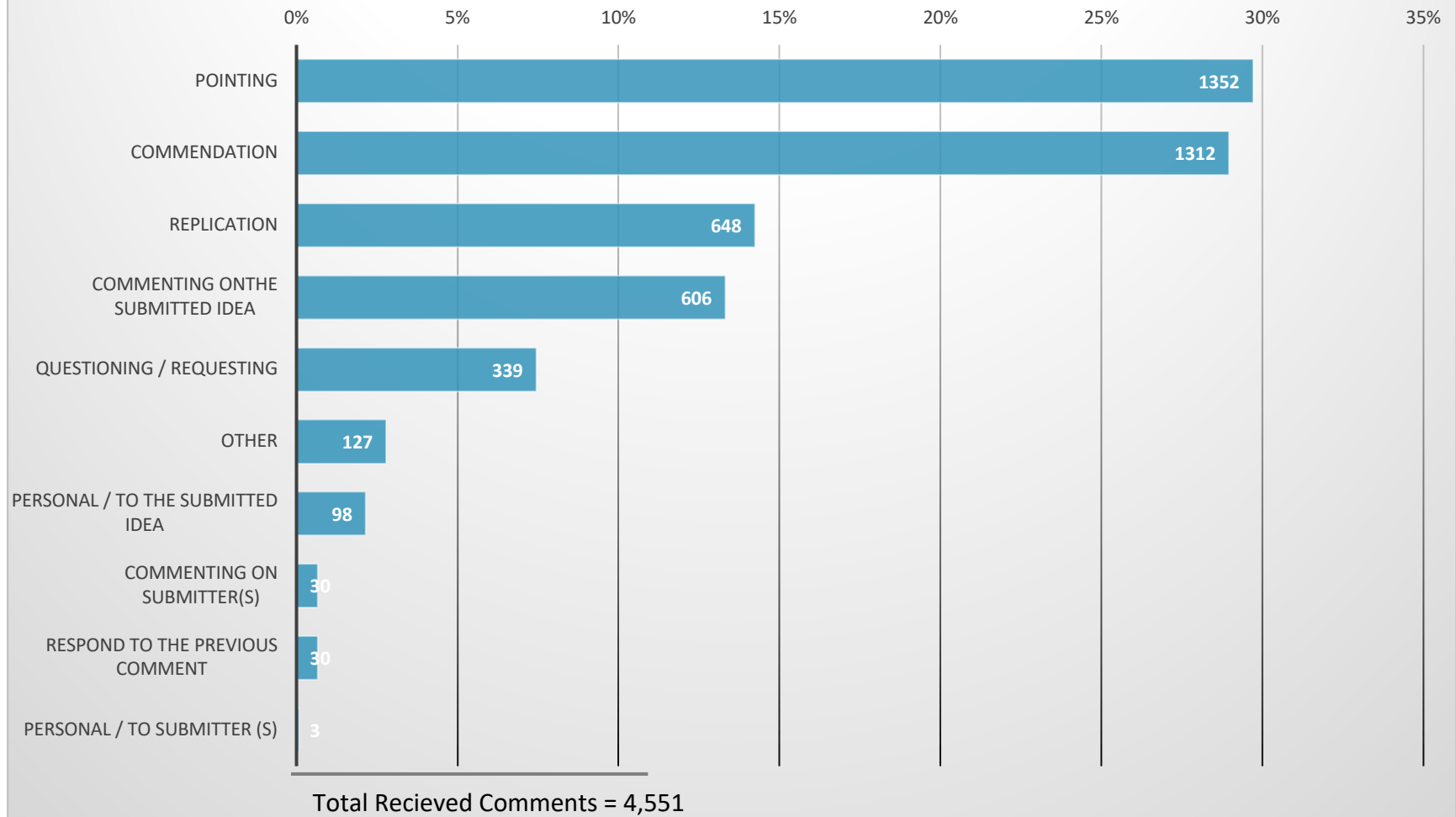
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Observations of the disapproved projects

	No. 01	No. 02	No. 03	No. 04	No. 05	No. 06	No. 07	No. 08	No. 09	No. 10
Var. 01	54	61	53	77	59	30	32	40	126	74
Var. 02	0	4	0	1	1	4	4	6	8	2
Var. 03	6	16	5	8	8	7	23	4	15	6
Var. 04	0	0	0	0	0	0	0	0	2	1
Var. 05	1	2	1	4	5	2	0	5	9	1
Var. 06	64	81	51	82	88	12	74	59	56	81
Var. 07	242	184	149	96	161	73	66	129	80	138
Var. 08	37	37	46	23	44	37	13	22	47	33
Var. 09	71	136	121	115	100	224	142	191	131	121
Var. 10	11	5	8	8	17	21	12	17	17	11
Total / Each	486	526	434	414	483	410	366	473	491	468
Total / All	4551									



### Distribution of the recieved commente



Correlations of the approved projects

	No. 01	No. 02	No. 03	No. 04	No. 05	No. 06	No. 07	No. 08	No. 09	No. 10
Var. 01	31	18	95	52	111	43	20	42	26	15
Var. 02	0	1	0	1	3	1	0	0	0	8
Var. 03	7	25	9	4	3	4	26	12	7	13
Var. 04	0	0	1	0	1	0	0	1	0	0
Var. 05	1	9	6	6	21	3	4	1	1	3
Var. 06	0	38	47	63	14	31	15	70	24	49
Var. 07	137	222	194	191	136	149	65	167	66	180
Var. 08	45	40	34	29	79	16	50	15	19	33
Var. 09	116	122	53	93	226	42	114	55	45	127
Var. 10	13	55	15	16	43	12	25	45	7	35
Total / Each	350	530	454	455	637	301	319	408	195	463
Total / All	4112									

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Correlations of the approved projects

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	Var. 01	Var. 02	Var. 03	Var. 04	Var. 05	Var. 06	Var. 07	Var. 08	Var. 09	Var. 10
Var. 01	1.00000	*	*	*	*	*	*	*	*	*
Var. 02	-0.04264	1.00000	*	*	*	*	*	*	*	*
Var. 03	-0.54672	-0.04264	1.00000	*	*	*	*	*	*	*
Var. 04	0.78430	-0.11026	-0.24862	1.00000	*	*	*	*	*	*
Var. 05	0.69169	0.20571	-0.12811	0.43785	1.00000	*	*	*	*	*
Var. 06	0.00161	0.14709	-0.02075	0.26260	-0.19648	1.00000	*	*	*	*
Var. 07	0.16608	0.25469	-0.01479	0.19742	0.17314	0.59280	1.00000	*	*	*
Var. 08	0.46023	0.18910	0.08320	0.23902	0.80552	-0.56828	-0.10980	1.00000	*	*
Var. 09	0.31615	0.44461	0.05339	0.14832	0.80074	-0.40020	0.03016	0.92269	1.00000	*
Var. 10	-0.00279	0.31747	0.48680	0.31915	0.46965	0.25043	0.43297	0.34007	0.52156	1.00000