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Crowdsourcing and Digital Platforms Innovation: a Comparative Analysis

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Alla mia famiglia e ai miei cari che mi hanno sostenuto in ogni momento.

Abstract

Crowdsourcing aims to develop a new digital context in which individuals participate and turn the community's power into innovation. In this process, there is a shared willingness to represent the environment into which an organisation calls to design strategies and operate. This process consists of the opportunity for companies to enhance their relationship with customers and users. Crowdsourcing is an innovative, implementing and necessary way to increase business productivity. It should not be misunderstood as a means of production but as a tool for enriching the production process. The business model examined is connected to various characteristics of an economic and digital essence. It provides the opportunity to create, around the company that embraces it and the environment with which it interacts with, an ecosystem qualified to be conducted by digital transformation. Companies adopt it to get more information about customers' wishes, increasing company's profitability and the relationship with customers. For instance, the Yambla platform is considered one of the most engaging software which allows people to innovate and improve their work conditions. The software fosters an intuitive and easily accessible use for those who join the platform and their workplace. Given that start-ups excel thanks to their relationship with ideas, individuals contribute to making innovation a main character of the company culture. Furthermore, organisations provide social innovation management platform that can impact by transparently managing the company's innovation process and turning it into a simple, social and addictive experience. Yambla permits people to customise every event highly, and it is helpful for different purposes. With the opportunity to choose every ideation process step manually for every occasion, users could bring about cooperation that fits most of their needs. This phenomenon focuses on those organisations that want to involve all stakeholders in their disruptive process. The main point of the analysis also deals with the comparison between this type of platform and other operating systems which provide the same services. Via this research, it is possible to elaborate on a valuable market strategy to strengthen customers' needs. There is a willingness to apprehend the level of utility that a presented crowdsourcing platform could furnish to third parties who want to employ it.

Index

Introduction

The thesis aims to describe the crowdsourcing model and its effects accurately. The first chapter generically introduces the concept of crowdsourcing of ideas by referring to the background of the term and its history and the specific type of Internal crowdsourcing. After making a quick introduction about its history, we wanted to analyse the gears behind this innovative model in the second chapter. Specifically, the practical application has been expressed through the example of the renowned Topcoder company and its approach to the digital revolution. It will further analyse this latter feature anticipated in the second chapter in the third; the advent of digital transformation has pushed the individual to rely on digital platforms essential for most jobs. In the text, this concept has been accentuated during the pandemic, but it made a significant contribution to cooperation and collaboration between employees. In light of this, the example of the Yambla digital platform has been introduced in the last chapter. It has been investigated its qualities and the basis of its flaws compared to other operating systems such as IdeaBridge and Brightidea. In conclusion, the results of the research conducted on a sample of one hundred passing individuals were presented, each with different characteristics. Although most are completely unaware of this phenomenon, people could positively and comprehensively evaluate the use of an operating system as a means of evolution on one's workplace.

CHAPTER 1

CROWDSOURCING AIMS TO TURN THE POWER OF THE COMMUNITY INTO INNOVATION

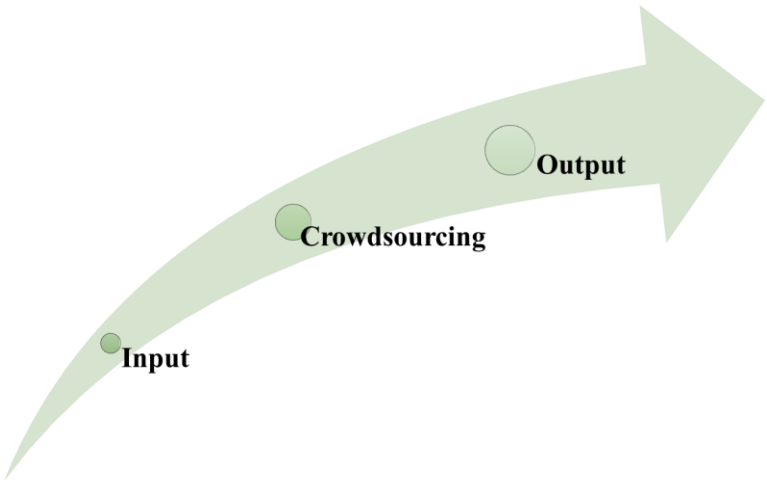
This chapter will lead the reader through the concept of crowdsourcing and how it has evolved over the last decade, thanks to the possibility for companies to develop it. It concerns the chance for individuals to join an organization or firm actively by contributing directly to their progress. For instance, Rohyt Belani[1], in one of his magazines, supports the role of crowdsourcing applied to the Waze app. It provides people with an unreplaceable service that consists of an open-space network made by users. Supporters are principal contributors inside an evolving organization that can be developed commonly by drivers who decide to download Waze for their travels. That consists of a disruptive element that points out the gap between the old way to travel and nowadays devices, nevertheless influenced by a new conception of digital evolution. It is first essential to look through the main actors of this process and the implications related to its use.

1.1 Crowdsourcing as a problem solver

Crowdsourcing is the process of gathering ideas online for the betterment of services and products through the contribution of company employees and the public. It is a business model able to turn ideas into innovations via the involvement of users linked to the same platform by soliciting for opinions. For the most part, crowdsourcing deals with a specific topic and uses any obtained data to enhance a product development and strenghten customer relation. Used as a customer survey instrument, it aims to provide a profitable experience by improving upon company organisation, encouraging creativity, positively supporting attitudes and preferences. Comprehending how to interact with customers is the key to building customer relations. Likewise, firms can accumulate valuable feedback in order to correctly plan their interests. Throughout this process, there are different steps, each of which has a specific aim. First of all, crowdsourcing seeks to hone customer service satisfaction. Moreover, employees can be encouraged to take part in evaluation processes freely. To this regard, crowdsourcing platforms aim to integrate the company-client relationship. It is a proven system that provides benefits contributing to a competitive edge. Federico Cabitza, Carlo Batini and Massimo Magni in "Organising for the digital world"[2] sustain that social and crowd methodology comprises four processes: Data gathering, automatic data validation and automatisation, crowdsourcing data validation and geolocalisation and information aggregation and visualisation. This relies upon public participation which is essential and the main path to pursuing this is to collect data via social media.

[1] Belani, R. (s.d.). The network effect: Crowdsourcing for phishing defense. Forbes.
[2] Batini, C., Cabitza, F., & Magni, M. (2018). Organizing for the digital world: IT for individuals, communities and societies. Springer.

Figure 1 - Crowdsourcing output



Source: the Author

This business model depends upon having access to innovation channels. In addition, it is advised to come up with the best solutions and turn the power of the community into a socio-collective phenomenon. The social revolution and the digital transformation locate clients at the centre of a process that enables any organisation to evolve constantly. Oguz A. Acar successfully emphasises this concept in "Why Crowdsourcing Often Leads to Bad Ideas"[3], highlighting that managers can do so by promoting intrinsic motivation. One of the most common questions that those who doubt this system is concerning the distribution of problem-solving, in comparison to the required investment. In particular, companies who have had a chance to implement this strategy, have found its results to be directly associated with a proper organisation. Covid-19 has matured in people the awareness of being able to make a difference in a digital dimension. Specifically, users feel much more self-fulfilled while at the same time, companies are able to increase their profits through a more efficient problem solving distribution. In software crowdsourcing, interactions among participants are performed either to form virtual development organizations or exchange development details. For example, solicitors generally post their needs and interlocutor submit their feedback. These data-exchanges are performed via the internet and necessitate Web 2.0 technology platforms. Lastly, software developers seek to form a team based on mutual cooperation, while at the same time each actor is delegated a specific task. Collaborations among participants in software crowdsourcing can be various, though are always based upon participation and cooperation. Users compete among each other for software crowdsourcing tasks by negotiating with the company.

[3] Acar, O. A. (2019). Why crowdsourcing often leads to bad ideas. Harvard Business Review.

1.1.1 What problem solving really means

Various crowdsourcing platforms aim to provide solutions which focus on satisfying diverse requirements and problem-solving**.** Regarding complex development requirements, software crowdsourcing needs multiple participants with various skills to cover different roles. In addition to traditional development activities, users need to perform several crowdsourcing activities including posting and advising. There are generally collaborations, according to software development requirements, in order to realize a problem-solving response. Therefore, effective mechanisms and tailored approaches for crowdsourcing activities are needed to guarantee an organization suited for the task. Topcoder is a crowdsourcing platform that provides “Co-pilots” that divide the development tasks into several modulars. In this way, contributors who participate in the software projects, can undertake tasks individually. Upon completion, the individuals submit their software input, while firms then assess the quality of the contributions.

1.1.2 Crowdsourcing through the history

The term "crowdsourcing" date back to ancient times, in fact, it has been reported that in the year 618 the Tang Dynasty introduced the Joint-stock-company which is considered by many as a milestone. Later, a thousand year later King Louis XVI rewarded individuals who were able to come up with an innovation for producing decomposing salt. In the Modern epoch, specifically in 1916, in a form of crowdsourcing, the Mr Peanut logo was designed by a 14-year-old lad. In the contemporary era, in the year 2000, JustGiving was established, and online-platform providing people to donate to needy causes. Finally, in 2009 a community-oriented GPS app called WAZE, provided users with submission road information and route data based on location, car accidents and traffic.

1.1.3 The rise of the relationship between technology and users

Technology was developed by linking satellite offices to mainframes via dumb terminals by way of landlines. Jack Nilles coined the term telecommuting and later, some IBM software programmers engaged in remote working. A decade later, offices and person working at home could connect to mainframes utilizing PC and terminals. To this regard, at the beginning of 2000, the number of Americans working from home grew by millions over few years. Remote working was utilized in a response to the Covid 19 as well, students were asked to partake in long distance learning. Telecommuting requires different kinds of devices to be realized, this includes the telephone and e-mail services; both do not permit to view each other.
Satisfaction rates expressed by employees are rather high.

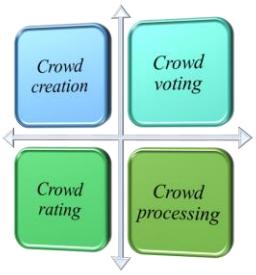
1.2 Internal crowdsourcing features

Company managers do not rely on only external sources, another important player is their employees: internal crowdsourcing. In fact, employees will have insight; specifically, in terms of client needs and product features. Considering this, internal crowdsourcing enables the realization of promising ideas. It was Villarroel and Reis who described the concept of internal crowdsourcing as "distributed organizational model used by the firm to extend problem-solving to a large and diverse pool of self-selected contributors beyond the formal internal boundaries of a multibusiness firm [...]."[4] Zuchowski et al. suggested a further definition: "IT-enabled group activity based on an open call for participation in an enterprise."[5] The major issue to overcome is the fact that employees are reticent to explore new strategies. Therefore, companies often need to implement an Internal crowdsourcing plan which estimates modification needed in management roles. The establishment of internal company network can often require intra-departmental shuffling of employee, and this can provide opportunity for workers to explore their new areas within the company, thus leading to innovation.

1.2.1 Types of internal crowdsourcing and what they imply

In agreement with Geiger and Schader, Ulbrich et al.[6] described the main types of internal crowdsourcing: Crowd rating, crowd creation, crowd processing and crowd solving. Regarding the first, it concerns many contributions whose value does not come from individual contributions, but from the collectivism. Crowd creation, instead, highlights value, which is influenced by many heterogeneous contributions. These are described has being complementary in order to achieve a comprehensive body of work when aggregated. Whereas, the third type regards contributions that can guarantee a high degree of homogeneity. As for the crowd solving type, a heterogeneous set of contributions is submitted, representing an individual and different solutions to a given problem.

Figure 2 - The four types of Internal crowdsourcing



Source: the Author

[4] Villarroel, A., & Reis, F. (2010). Intra-corporate crowdsourcing (ICC): Leveraging upon rank and site marginality for innovation. In: CrowdConf, San Francisco, CA, USA, 4 October.
[5] Zuchowski, O., Posegga, O., Schlagwein, D., & Fischbach, K. (2016). Internal Crowdsourcing: Conceptual Framework, Structured Review, and Research Agenda. Journal of Information Technology, 31(2), 166–184.
[6] Ulbrich, H., Wedel, M., & Dienel, H.-L. (2021). Internal crowdsourcing in companies. Springer International Publishing.

Afuah and Tucci investigated when crowdsourcing might be a better mechanism for solving problems instead of the alternatives of either solving them internally or designating an exclusive contractor to solve them. According to the authors, there is an established manner of exploring such firm boundaries. Specifically, they explored when crowdsourcing may be better for solving problems and for which type of solutions would require distant search instead of the alternatives of do-it-yourself or designated contracting. The authors briefly provide background on problem solving and distant search that could provide insight into the query. In the article intitles "Crowdsourcing as a solution to distant search" by Afuah and Tucci, they differentiated between collaboration-based crowdsourcing and how the results were generated within the crowd.[7] To this regard, each participant provided an independently developed solution in tournament-based crowdsourcing, and the content owner ultimately selected the best solution. In collaboration-based crowdsourcing, on the other hand, a joint solution was developed by the entire crowd. "Similarly, Boudreau and Lakhani classify crowdsourcing according to whether the participants worked independently or collaboratively on the solution of the task"[8]. Leimeister distinguished between crowdfunding, crowd voting, and crowd creation according to the type of task the crowd performed[9]. In crowdfunding, the participants from the crowd were used to achieve a particular financing goal. In crowd voting, each participant from the crowd provided a ranking of options suited for the context of a specific question.

1.3 Strategic process connects crowdsourcing to firms

James Surowiecki outlines the advantages in disorganized decisions into three main types: cognition, coordination and cooperation. According to the journalist, thinking and information processing such as market judgement can be much faster. As for coordination, he describes how common understanding permits quite precise judgments. Concerning cooperation, the author explains how crowds of can build networks of trust in the absence of a central system. The book's subtitle is "Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations."[10] With regard to the word "smart", the author is covering in an arc of means. Thus, the belief that the public is more clever than a few experts cannot be easily accepted only however when one weights that ambiguity. James Surowiecki describes how large group of persons can better comprehend the dynamics of situations compared to small expert groups. Additionally, Mr. Surowiecki noted some optimistic consequences on societies affecting the management, economics and policy decisions associated with markets and democracies. According to the journalist, in the middle of a crisis like Covid-19, the belief that markets and democracies could be optimal solutions for the organization of collective needs has matured. However, the author did conclude that: "decisions that

[7] Afuah, A., & Tucci, C. L. (2012). Crowdsourcing as a solution to distant search. Academy of Management Review, 37(3), 355–375.
[8] J. Boudreau, K., & R. Lakhani, K. (2013). Using the crowd as an innovation partner. Harvard Business Review.
[9] Leimeister, J. M. (2012). Crowdsourcing: Crowdfunding, crowdvoting, crowdcreation. Zeitschrift für Controlling und Management (ZFCM), Ausgabe/Number: 56, (388-392).
[10] Surowiecki, J. (2005). Wisdom of crowds. Non Basic Stock Line.

democracies make may not always demonstrate the wisdom of the crowd." Subsequently, Jeff Howe famously coined the term "Crowdsourcing"[11] in 2006. To describe how internet had challenged inter-company relations, with the effect of stimulating the birth of spin-off. The result is that we all have become book reviewers on Amazon, filmmakers for YouTube. It has revolutionized the way the manner companies carry out their strategies and has transformed how they deal with their customers. Moreover, this wave of change has impacted our cultures by putting the consumer at the centre. A more recent test, published in 2013, and written by Daren C. Brabham and, entitled "Crowdsourcing"[12], has been well-received by the community. From the chapter, in the text, with the title "Moving the Crowd" the author writes that everyone involved in crowdsourcing is in some fashion, has an interest in participating and learning the rules of the game. Deci and Ryan, went on to distinguish between intrinsic and extrinsic motivators in their self-determination theory. According to the authors, "intrinsic motivation is defined as the doing of an activity for its inherent satisfactions rather than for some separable consequence"[13] and that extrinsic motivation "pertains whenever an activity is done in order to attain some separable outcome". More specifically, When the former and the latter interact, extrinsic rewards tend to disrupt intrinsic motivation and this can lead to an engagement in an activity motivated by recents both intrinsic and extrinsic. Does crowdsourcing improve customer relations? One of the aims of crowdsourcing is in fact to improve customer relations, but a company should follow the golden rule which is not to ask too much from users. Also, contributors are not full-time, so it is not recommendable to rely on a specific sample of person. Then, there are the incentives and these do not always need be of a monetary kind. In the end, companies should aim to strike a balance between the two parts in terms of satisfaction.

CHAPTER 2

THE MECHANICS OF CROWDSOURCING INNOVATION

Information gathering, as an opportunity for business improvement, aims to improve economic performance. First, there is often an invigoration of the client-company relationship concerning results obtained by crowdsourcing. Crowdsourcing organization, which is a denominated requester, launches open call participation for a specific task for an unlimited group of potential contributors. As a response to this call, an anonymous group of people decide whether they are willing and able to fulfil their respective duties as contributors. This self-selection phase is also referred to as "contributor self-identification" therein accentuating, even more, the acquisition of data, information and ideas. Making use of information technology, crowdsourcing systems lead socio-technical structures to select the contributions of the public, intelligence,

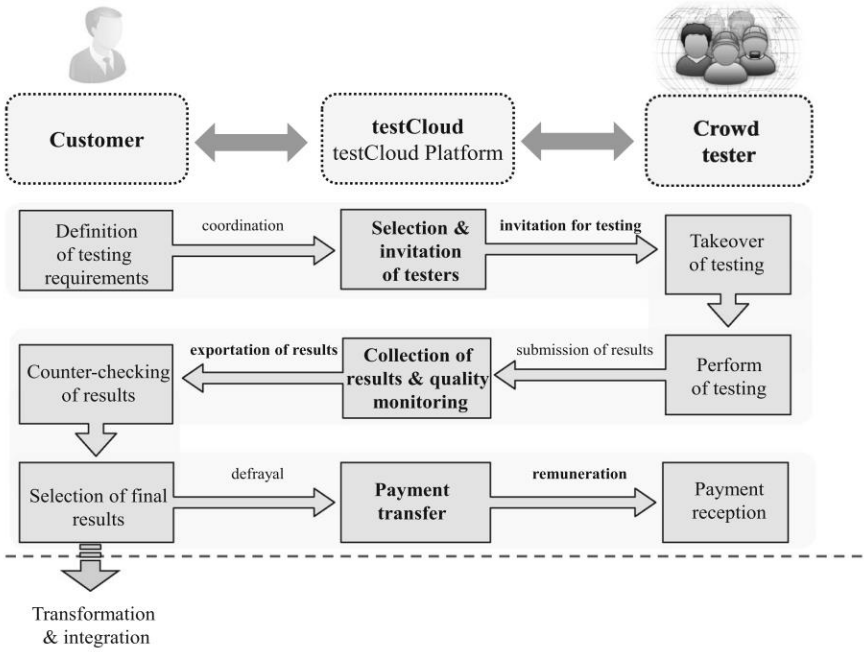
[11] Howe, J. (2006). The rise of crowdsourcing. Wired.
[12] Brabham, D. C. (2013). Crowdsourcing. Cambridge, Massachusetts: MIT Press.
[13] Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. Contemporary educational psychology, 25(1), 54-67.

skills, or attitude within organizational borders into the generation of digital information resources. For this reason, the crowdsourcing network has been increasing in assuming organizational responsibilities, such as problem-solving and data processing.

2.1 The collection of suggestions from large and diverse crowds of exterior contributors

Contributors are often rewarded with either remuneration and status. If the firm could benefit from this offer, the crowd is stimulated to participate for numerous reasons that often do not consist of monetary gains.

Figure 3 - Settlement process



Source: Zogaj et al.,(2014)

Specifically, businesses will prefer to provide customers with benefits in exchange for profitable ideas, by offering material compensations. The client is treated as if he were at the centre of the process. Two additional types of interaction models are responsible for assessing contributor reaction for recommended task[14]. Whenever contributors are attracted to a recommendation, they can investigate by clicking on the recommendation. They are also able to turn down recommendations if the task that is offered does not appeal to them. Whatever the case, an open-ended question survey is used to evaluate the satisfaction of the experience. Also included in the survey is a list of individual items that are randomized to avoid bias. In the case of 'no opinion' or 'unsure' answers, these are eliminated as they do not carry to a significant value. By providing meaningful textual feedback, are highly valued, while responses that are deemed to be the fruit of little or no cognitive effort, these are not considered. According to Fontana, in his text intitled "Economia e

[14] Geiger. (2015). Personalized Task Recommendation in Crowdsourcing Systems. Springer International Publishing

gestione delle imprese"[15] there are different ways of involving stakeholders. The transfer of information to stakeholders by the company is the simplest. Additionally, what the author defines as one-way, includes training initiatives that the company performs for the benefit of stakeholders with the aim of providing them with better mechanism for judgement. Finally, dialogue aims to offer recipients to interact by gathering suggestions and opinions. This approach relies on forming work groups with valid representatives, who have the task of understanding issues and therein coming up with practical measures. When the rules and methods for reaching a fully shared decision are implemented, this can lead to a more valuable solution. However, in this situation the development process is delegated to a third party. According to M. Shilling in his text intitled "ISE eBook for Strategic Management of Technological Innovation"[16], there are four recognized challenges in crowdsourcing. The first of these is a need of translation. In fact, clarity is required for the need statement, that reduces the challenge to the most basic science. Issue number two is Connecting. The challenge offered to a qualified group who are most suitable for responding. The third issue deals with evaluation or selection. Whenever proposals are submitted, they are reviewed, and the most promising solutions are selected. As to the last issue, this is acquisition. Here, the firm works with the solution provider and try to make an agreement, so to transfer knowledge, a license, patent, and other necessities. The author also touched upon how public bodies used crowdsourcing to resolve issues. For example, he talks about reducing the amount of plastics in our waters, or the opioid crisis, both of which are being addressed through crowdsourcing. Shilling, in his text, also talks about when firms make decisions about projects on only financial considerations. According to the author, this might produce incremental product updates that suit pre-existing business practices. Therefore, the screening decision needs to focus on novel product advantages that appeal to the consumer. Finally, distributors can also be valuable partners in this process, due to their knowledge of the consumer profile, how the product is used, and they are often the first to understand the rate of customer satisfaction.

2.2 Crowdsourcing impact on Topcoder

Topcoder is renowned as a crowdsourcing company with an open global community that pays its members for their contribution to projects and provides clients with community services. Topcoder brings the world's software talent together in order to construct a competitive global community. Topcoder Open Innovation Community creates digital assets, including applications, analytics, software, and creative designs as well as solutions for a wide-ranging client. Software managers who require services that are beneficial for evaluating and assuring the availability of qualified professionals. In fact, existing rating systems are currently facing challenges concerning the provision of limited information regarding on employee skills. To offer a better understanding of worker performance, the aim should be to investigate how fast crowd workers respond to a

[15] Fontana, F. (2019). Economia e gestione delle imprese (5. ed.). McGraw-Hill Italy.
[16] Schilling, M. (2019). ISE ebook for strategic management of technological innovation (6. ed.). McGraw-Hill Higher Education (International).

task call. Empirical evidence is utilized to explore options that could improve team elasticity in software development process. The founder and president of the X Prize Foundation, Peter Diamandis, took a shining to both the methodologies that power crowdsourcing and to Topcoder's global community of designers and developers. He is regarded as an expert of prized-based contests and his work carries exponential themes to their very core. In fact, Robert Hughes, Chief Operating Officer of Topcoder, describes how his company's designs enable entrepreneurs to recruit and support communities of available engineers to help realize a software project. A group of Topcoder users set challenges, along with a prize and a deadline for completion. Whereas, another group discovers and accept these challenges. At termination, the winner is selected and awarded. In fact, contributors are stimulated by compensation, on the other hand, in the crowdsourcing setting, users are encouraged to cooperate with others. The text "Crowdsourcing Cloud-Based Software Development"[17] describes the process of the software development project, saying that it consists of three actors: researchers, catalysts and the crowd. Regarding the first, these are experts who collaborate with catalysts to realize the submission to the crowd which consists of reporting problems, preparing test data, and scoring algorithms. Catalysts, however, are responsible for gathering the funds for researchers and the crowd. Finally, the crowd is designated the role of Topcoder contributors. Therefore, they need to possess programming skills in order to come up with solutions posed by researchers. Crowdsourcing can be an effective means for creating software, with current available options such as ODesk and Topcoder that were designed to support the development of large-scale distribution. For Software programmers, there are many advantages associated with crowdsourcing including the ability to reach a wide range of contributors which potentially could translate into a higher ROI (return on investment). Additionally, crowdsourcing can provide other advantages, including greater liberty regarding office work and a lower level of commitment to any singular employer.

Figure 4 - Six steps to use crowdsourcing inside companies

Source: the Author

On the contrary, utilize the desire data may be unavailable due to a malfunctioning of the tracking system. Additionally, as metrics change over time and behaviours likewise, so it becomes imperative to adjust the standards. Therein, approaches need to be continuously reformed with the assistance of out-of-the-box thinking. A broad spectrum of activities may be implemented by pulling together human and artificial

[17] Li, Huhns, M. N., Tsai, W.-T., & Wu, W. (2015). Crowdsourcing Cloud-Based Software Development /. Springer Berlin Heidelberg

intelligence. Here, interaction and flexibility are essential to effectively contribute to crowdsourcing implementation. The optimal scenario is where a group of users is encouraged to come up with valid solutions to pressing issues. This has been well demonstrated in the article entitles "Monetary and Social Rewards for Crowdsourcing"[18]. The authors have stated that "Monetary incentives were shown to be beneficial in crowdsourcing of routine activities while Lepper and Green introduced the concept of the hidden cost of rewards as monetary rewards can also be detrimental to motivating the crowd to participate. Consequently, the effect of monetary rewards in the crowdsourcing of inventive activities requires further analysis". From the "Proceedings of the Twenty-Fourth International Joint Conference on Artificial Intelligence (IJCAI 2015)"[19], the two authors reported that they obtained results led to significant improvement in requester utility but not fixed and random bonus schemes.

2.3 People and firms ride the digital wave together

Thanks to the introduction of specific operating systems online sales are possible. The need to come up with new methods for increasing corporate profit has been guided, not so much by the technological revolution, as by the fact that online experimentation has played out in certain sectors and especially in situations during the Covid19 pandemic. Trading practices, that were well established before Covid, such as showrooming and web-rooming, and these saw online stores gain the lion's share. In this context, currently, most platforms have ridden the digital wave rather well, thanks in part, to user contributions. This process of emotional involvement has become characteristic of the digital transformation. It has gone from a face-to-face debate where people were publicly subjected to active encounters, to a new dynamic. Now, the individual is a point of reference and is often competent in expressing his opinion in a much more certain way than before. Users are asked in ambiguous situations to make decisions that could negatively influence his response. These moments could be equivalent to condominium assemblies, meetings between family members and acquaintances and even interactive meetings between different companies. That was the previous (apparently bland) way of collecting opinions that failed in the face of the technological and digital transformation, which was an integral part of a now irreversible method of acquisition and interaction with the customer. This background was a parachute that allowed many companies to capture a greater market share. Crowdsourcing is composed of distinctive characteristics, as it does not recognize borders that could limit its operations. Users can be anywhere in the world and specialists can perform from their offices. Every day, whoever is responsible for crowdsourcing, can operate remotely from any part of the globe. The routine behind this process is conditioned by a flexible workspace in which the approach to work is from a new perspective. Likewise, people tend to identify with different layers of emotional involvement. We move from the most interactive to those less interested and

[18] Cappa, F., Rosso, F., & Hayes, D. (2019). Monetary and social rewards for crowdsourcing. Sustainability, 11(10), 2834.
[19] Yin, M., & Chen, Y. (s.d.). Bonus or not? Learn to reward in crowdsourcing. In Proceedings of the twenty-fourth international joint conference on artificial intelligence (IJCAI 2015).

impressed by the offer that is put in place by the company. Among these, those who can come up with attractive ideas for the company, stand out by personal will and are motivated by rewards. In fact, many platforms and companies use crowdsourcing not so much to seek approval for future projects, but to increase the relationship with the customer. This phase is crucial as customer loyalty allows to build customer relations with third parties.

2.3.1 Looking at changes affecting core business

Every now and then, a business will need to implement change, which prods a capable CEO to make the necessary changes to long-term strategy. Specifically, crowdsourcing aims a resolve issue, emerging for the most part from changes within develop societies. Most firms need to respond to evolving tastes by improving their products. The focus is the acquisition of information in order to adapt to changing markets and this also requires the capacity to attain particular skills. To date, those businesses that have been able to match their abilities to the marketplace have been more likely to succeed. The digital wave, which is made up of devices and publishing services, has led companies to embrace online advertisement. This requires novel thinking so to overcome obstacles associated with the implementation and running of a digital based organization. Additionally, marketing executives need to recognize the fundamental potential of consumers contributions. This process consists of soliciting for suggestions and opinions on products, therein consumers can be a source of untapped wealth for a company. These opinions and suggestions are what many consider to be the best judges of a company's product. Often the most efficient approach includes reorganizing core assets. The digital revolution has affected every corner of the planet and if there is an unwillingness to comply, the balance sheets are generally hurt.

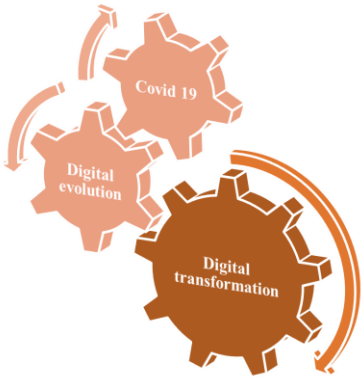
2.3.2 Elements of digital transformation

This cultural transformation is an aggregate experience incorporating multiple channels. Within this, transmediality is defined as a horizontality message sharing across space. Here, content, being indifferent to media, prevails. Being so, media borders often blur, though there is the impression of a seamless medium. According to Professor Donatella Padua, in her book entitled “Digital Cultural Transformation”[20], she states that “We are in front of a multiplatform and widely distributed story creation, production, and participation-based process enabled by transmediality”. The same author, with regards to the Covid 19 pandemic, reminds us that companies have had to implement changes across the board and one of these is the adoption of remote working, by favouring gig economies and freelancing. In fact, employer–employee relations have been

[20] Padua. (2022). Digital Cultural Transformation: Building Strategic Mindsets Via Digital Sociology. Springer International Publishing AG

generally upended, forcing institutions to re-think their 'physical' workforce. There is underway a progressive deregulation of the job market towards a gig economy.

Figure 5 - The mechanics of the digital revolution



Source: the Author

Consequently, social needs take center court. A recent topic of crowdsourcing is Design Thinking (DT). Here, participants are asked to provide their ideas on an open call platform, which are simultaneously reviewed by other participants, in a series of pairwise comparisons. Contributors then vote on and select their preferred ideas. The obtained votes determine a ranking. The technology also allows users to propose incremental edits that are useful in stimulating generative co-creation. Idea edits that encompass a change of greater than 30% are considered a new idea. Indeed, any idea can involve contributions from several users over multiple iterations of co-creative edits... However, according to authors Mount, M., Round, H. and Pitsis, T. S., in their text intitled "Design Thinking Inspired Crowdsourcing: Toward a Generative Model of Complex Problem Solving" claim that the use of DT "has led to a misguided view that the approach is formulaic, linear, and highly prescriptive"[21].

2.4 The impact of broadband aspects

According to the 2020 New America's Open Technology Institute report[22], the ongoing COVID-19 has resulted in many households relying heavily on the internet for work, school, commerce, and social connection. In 2020, internet access became essential, however, it was unaffordable for many. In the same report, we find that internet service is more expensive in the USA compared to Asia and Europe. With regard to affordability, the US ranked 119th out of 206 countries, at $50 per month on average, and because of a lack of competition Americans pay more than they should. Increased corporate concentration has been blamed for this. Apart from consumer prices, another topic is the access to broadband, which is high-speed internet access

[21] Mount, M., Round, H., & Pitsis, T. S. (2020). Design thinking inspired crowdsourcing: Toward a generative model of complex problem solving. California Management Review, 62(3), 103–120.
[22] The cost of connectivity 2020 (NEW AMERICA). (s.d.).

that provides faster speeds. A lack of choice in the U.S. market is well documented. In fact, most households have access to no more than two ISPs: a monopoly. High costs are the main obstacles to internet subscription. According to a 2020 survey, more than 53 percent of U.S. adults claimed that internet access had been necessary during the pandemic. As the economy slowed and companies laid off millions of workers, more and more people began to struggle to pay for their service. In conclusion, the digital divide became starker. We then present our findings in three parts: First, we examine our global dataset, focusing on the total cost of connectivity, network technologies, monthly prices, advertised speeds, value and broadband affordability. Second, we study hidden costs that customers must navigate to select the total price of internet service. Thirdly, it has been analysed the U.S. market, concentrating on its municipal networks and lack of pricing transparency. Finally, we present recommendations for U.S. policymakers that build off our research. Worldwide, broadband internet is defined as a minimum of 25 megabits per second (Mbps) download speed and 3 Mbps upload speed. Overall, independent research by groups such as Broadband Now reports that 42 million Americans do not have broadband access: low income and elderly populations and people of colour. Research on the US situation claims that the social returns associated with an investment in broadband can be relevant, therein leading to higher property values, higher occupation rates and a stimulus for increased birth rates. The World Bank estimates that a 10 percentage increase in broadband users would translate into a 1.2% increase in real per capita GDP growth for developed economies. Additionally, concerning fair access, many low-income households are not able to pay for broadband services at present day prices. Globally speaking, Western Europe, the US, Canada, Australia, and Japan have the highest internet access rates. As for broadband access, the differences between those with and those without is something to be considered by any company thinking of investing in crowdsourcing.

CHAPTER 3

THE BENEFITS OF CROWDSOURCING FOR COOPERATION AND INDIVIDUALS

The aim of this chapter is to investigate the features and instruments of platforms, which have roles in the current co-creation processes. Digital storms can impact the lives of company employees and thus lead to rifts between the past and present worlds. This is evident in the recent digital change that took place at the start of this century. The individual at the center of the process plays a key role by expressing his needs. Numerous channels are available for interacting with digital platforms. Specifically, each device aims to bring together the customer with the supplier, therein shaping the marketplace. How could a traditional brick and mortar company survive this challenge? A solution would be to invite clients to participate in development stages of the product or service. The pioneers of crowdsourcing platforms included Opeideo, Amazon Mechanical Turk and uTest. They were the first to position the user at the center of innovation, focusing on strengthening and

modifying strategy. Indeed, when communication channels are more open, they tend to furnish greater input to platform users. In the absence of access points, this process is usually much slower. This means that there is a need to turn the page towards a revolutionary mechanism to create a break from the past. In this context, considering the transformations that have taken place over the years, crowdsourcing is strongly linked to the new digital dimension.

3.1 The management of innovation associated with crowdsourcing

Management of ideas is made up of evaluators, including quality measurement, and evaluation metrics. The first of these is related to selecting proper experts to evaluate the outcome quality from the crowdsourcing process. To this regard, Riedl et al.[23]suggested that, for innovation management, the crowdsourcing organization should organize a team to evaluate any new ideas. The second point is the criteria for evaluating these ideas. For example, it has been proposed to use four distinct dimensions to measure idea quality: novelty, feasibility, relevance, and elaboration. The final issue needs to focus on developing evaluation metrics for crowdsourcing. Concerning this, several evaluation metrics have been identified as key metrics for R&D innovation. four components have been suggested to build a framework, that serves as a roadmap, providing insight into problematic issues related to crowdsourcing organizations. this could be beneficial for studies in this field. Behavioral topics include the examination of the impact of crowdsourcing on employee stress and well-being. Technological topics include the impact of task-technology fit on crowdsourcing utilization and performance. According to Majchrzak and Malhotra,[24] while crowdsourcing for innovation is not a new concept, the move towards open innovation and innovation as a strategic competitive advantage for the firm has accelerated its focus by academics. Crowdsourcing for innovation is a type of task which can be applied to management. Innovative solutions tend to be novel and implementable for the organization and any such solutions may include new sources of revenue. For example, Heineken's 2012 crowdsourcing challenge yielded a new product design. It is held that external crowds can be more diverse in their contributions and backgrounds compared to other units. Certainly, diversity triumphs as has been suggested in literature. This has been suggested in computing, science, along with many other fields. With regards to Participation architecture, it is composed of so-called sociotechnical system designs that aim to foster participant contributions. A pair of distinct design dimensions of participation architectures have been s production and co-creation boundary management.

[23] Chiu, C. M., Liang, T. P., & Turban, E. (2014). What can crowdsourcing do for decision support? *Decision Support Systems*, *65*, 40-49.
[24] 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.

3.1.1 How to demonstrate crowdsourcing efficiency

A recent survey was conducted on 57 Polish companies[25], with the criteria for enrolment including cooperation with users, as a part of innovation activity in R&D. It focused on assessing the cooperation levels with users in the economy as well as analysing connections between crowdsourcing and R&D. The endpoints of the study include highlighting any relationship between crowdsourcing and the innovation process described in literature and what impact of crowdsourcing has on the specific attributes of the innovation activity of enterprises, particularly R&D. The research examined if crowdsourcing has an impact on features of innovative activity. The main hypothesis put forward was that crowdsourcing can affect the number of product and process innovations. The opinions of customers can reduce the costs of the innovation process, being hailed as the swiftest to innovation. It has been suggested that crowdsourcing is mostly used when seeking ideas or innovation process. This indicated that entrepreneurs obtain knowledge on the most cost-effective way to match product evolution and to satisfy the needs and preferences of customers. Marketing agents have become increasingly convinced that coming up with ideas is no longer the exclusive domain of experts, therein, crowdsourcing fits perfectly with contemporary societies. One might think that a shortage of employees forces companies to use crowdsourcing, however, results have shown that the use of crowdsourcing is not influenced by the number of people employed in the R&D area. On the other hand, competences of employees, and their academic degrees, do not significantly influence their rates of participation. This suggest that company managers do not need to hire individuals with scientific backgrounds. It can be concluded that crowdsourcing is important for companies. As a result, the use of digital devices has greatly reduced the transaction costs of information. Additionally, it has become more difficult for governments to monitor its citizens. With its declared objective of enabling citizens to contribute directly to the formation of policy, open-source governance aims to provide a more direct means. Crowdsourcing is often characterized by high-tech data solutions and business applications, in both developed and developing countries. Vukovic (2009)[26] analysed crowdsourcing possibilities in enterprise marketing, and he came up with three areas: innovations, development and testing as well as support. The author also defined crowd analytic possibilities, where companies use prediction platforms that allow news readers to make predictions and have discussions. As the support example Vukovic (2009) mention Amazon's Askville initiative, which might be described as "social community site", as it facilitates question answering, where contributors earn rewards whenever they answer questions. From a marketing perspective, crowdsourcing is suited for various marketing activities such as product, communication, and distribution managements. However, companies need to be aware of any possible limitations and ethical issues related to the use of crowdsourcing. Moreover, Deng et al. reported that "The duality of microtasking crowdsourcing is reflected in two contrasting yet coexisting feelings of

[25] Szopik-Depczyńska, K., Dembińska, I., Barczak, A., Kędzierska-Szczepaniak, A., Szczepaniak, K., Depczyński, R., & Ioppolo, G. (2021). Does crowdsourcing as part of user-driven innovation activity affect its results? An empirical analysis of r&d departments in poland. *Energies*, *14*(18), 5809.

[26] Vukovic, M. (2009). Crowdsourcing for enterprises. In *2009 IEEE Congress on Services (SERVICES)*.

empowerment and marginalization experienced simultaneously by the same crowd workers"[27]. These two experiences emerge whenever the crowd interacts with crowdsourcing structures responsible for mediating their activities. Crowd workers' feel empowered when the structures offer choice whereas, they experience marginalization whenever the same structures restrict actions. The structures of compensation and governance often evoke stronger sentiments of exclusion. In fact, this feeling is deeply rooted in the current microtask compensation structure, where the lowest payments are associated with exploitation. Likewise, the governance structure is often accused of favouring requestors over crowd workers who have no bargaining power. However, the crowdsourcing platform might fail to provide adequate technological tools and functions to meet workers' communication and microtask management needs. Specifically, the impact of crowdsourcing started to become apparent over a decade ago, and today it continues to expand. The demand for microtask crowdsourcing is still one of the most rapidly expanding trends, and according to a survey of registered workers on Amazon's Mechanical Turk (MTurk), the average U.S. MTurk employees reached $2.30 per hour in 2009 (Ross et al. 2010)[28]. Although crowdsourcing can afford worker independence and flexibility, it has also implicated in marginalization of the same employee. However, some studies have also stressed the challenges that firms must face in order to benefit from crowdsourcing. Any implementation of crowdsourcing will call for reorganization, something that all firms are not able to undertake. Secondly, firms may become overwhelmed with solicitations and in this case, often find it difficult to react. finally, firms can also face what is known as the overcrowding effect, which can lead to an overreliance to familiar solutions, instead of seeking out more suitable responses.

3.2 Platforms tend to enhance user needs

Digital platforms permit external contributors to enlarge the functionality beyond the platform's central function. digital platforms are can also furnish users with a wider range of functionality. It is also held that greater functionality is made available by way of code fragments. These are also known as applications and add-ons. Regarding the former, they are made available through the market. contributors can utilize applications for their devices. Within this process, Platform-specific Software Development Kits permit third parties to create their application on an individual platform. Whereas Application Programming Interfaces permit applications to use platform resources and therein, leading to integration. This is often considered a more significant type of participation. Certainly, positive effects have been recorded for participation, however, there is a paucity of literature on this topic. Device Ecosystem Integration, on the other hand, is made up of five so called group of indicators that describes the diverse sub-ecosystems associated with an application. To rate customer satisfaction, the aggregated application system is used, indeed, with positive and negative ratings a balanced evaluation can be reached. Most digital devices have digital platform included.

[27] Deng, X. (., Joshi, K. D., & Galliers, R. D. (2016). The duality of empowerment and marginalization in microtask crowdsourcing: Giving voice to the less powerful through value sensitive design. MIS Quarterly, 40(2), 279–302.
[28] Polaschek, D. L. L., & Ross, E. C. (2010). Do early therapeutic alliance, motivation, and stages of change predict therapy change for high-risk, psychopathic violent prisoners? *Criminal Behaviour and Mental Health*, *20*(2), 100–111.

Platforms provide necessary resources that permit the development of these applications via third parties. Search engines are also regarded as a digital platform in light of the fact they permit third parties to extend functionality. For platforms, the greater functionality is an important feature for differentiating.

Figure 6 - Digital platforms topics

Source: the Author

It is well-known that platform innovation is a critical success, however adding features could inflict harm on the ecosystem. From literature it has been reported that developers tend to utilize countermeasures whenever complementary entry is regarded has been unattractive. At the same time, intrinsic motivations can contribute to a positive judgement concerning any entry into the marketplace. The identity of the owner's influence perception among users. these owners need to be prudent whenever evaluating any entry into extended markets. As for platform coring, it has been reported that it induces a change in digital platform innovation. Recent results suggest that platform coring is associated with decreased use of applications, none of these effects have been investigated. Platform owners are often required to move demand towards platform core. This calls into need further research on this lack of understanding. Due to rivalry among platforms, coring is often viewed as a valuable strategy able to add resilience to the platform. In fact, the more popular applications, are deemed attractive for the platform core. Indeed, owners can lessen uncertainty before coring. It has been reported that developers who invest in coring, the communication of its use is viewed in a positive manner. For developers who welcome coring of their extensions, communicating the use of coring is perceived positively. The role of social media places a key role, in fact they are considered major platforms in themselves: Twitter, Instagram and Meta. Additionally, their roles have expanded to a place for advertising and commers. In conclusion, these platforms have turn digital marketplaces. Social media has become ever more pervasive, necessary and culturally influenced. At the beginning, social media activity was restricted to a couple of platforms, Facebook and Twitter. Later, numerous websites and applications have entered the scene by embedding social media into their interfaces. Thereby, this has led to a situation where social media is used by all, and with this, these platforms have become governments in the clouds. consumers have adopted this reality to partake in services they consider beneficial, not to mention, both convenient and money saving.

Consequently, companies have been attracted to this change in commers. In doing so, they have organized labour and capital in response. Platforms have created significant value by fostering first-time interaction between producers and consumers. More specifically, players aim to maximize customer satisfaction. To better manage customer relations, greater attention must be paid to what consumers are saying on platforms. To realize a more significant market share (in the internet economy), each transaction needs to have a higher average value. It is known that a grander scale typically leads to more excellent value, attracting more customers. These can come together with the idea that they gain from the union. Of course, this can disrupt the environment whenever a better opportunity arises. Specifically, in 2010, Samsung launched its mobile operating system Bada. However, the company's efforts to make Bada more popular were hampered by its focus on hardware sales, leading to undesired consequences. As of 2022, Samsung has not abandoned this system, but its emphasis on Android alienated its fan base and developers.

3.2.1 Looking inside the most famous social network

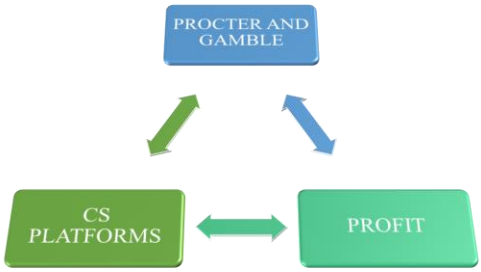
When selecting a platform, consumers tend to be primarily concerned with user friendliness, velocity of service and price. In early 2022, Meta reported its first-ever decline in daily active users, falling by 500,000. This was interpreted by many that the company might have reached market saturation. If so, this would mark the start of a shift in global supremacy regarding social media. Meta seems to have interpreted this as a battle for millennials, the principal users of current-day social media. Moreover, the future of Snapchat is being challenged as well. TikTok has captured a more significant market by providing access to compelling and attractive formats; whether it's Stories or the TikTok video feed, they have the potential to steal user attention quickly. Whereas Snapchat had invented a widely popular design, currently, along with Meta, both are playing catch up. Behind the success of TikTok, it has been written by Forbes (January 2020) that, first and foremost, it's convenient to use and easier to edit and upload compared to competitor apps, including Instagram and Snapchat. Forbes has also written that you can easily create and post content with a smartphone. Additionally, Forbes considers TikTok to be a very niched app that is seemingly made for today's younger generation. Likewise, it is appealing to their short attention span, plus the short comedy video clips are comforting.

3.3 An analysis based on the most suitable software

Although CS can include diverse configurations, dependent on context and type, regarding innovative activities, for the most part, it is represented as contests with a problem to solve. The problem is introduced online, and solvers step up to offer solutions. So far, literature has focused on the merits and disadvantages of CS used by askers. By using the crowd, the asker can benefit from many contributors. Crowd diversity aids the realization of original solutions. Conversely, CS could lack a necessary benefit when the proposer cannot communicate the problem satisfactorily. Whenever the solution requires intense knowledge and is difficult to transform, this reduces the risk of opportunistic behaviour. The use of intermediaries, which are used to

address and solve difficulties that may arise, can, be highly diverse include: consulting, brokering, and mechanisms that facilitate technology transfers. Similarly, CS platforms can differ; they can be implemented and controlled by either the seeking firm or externally by an intermediary service supplier. It has been reported that: "Among other reasons, an open platform offers more challenges and therefore attracts more solvers"[29]. According to Huston and Sakkab[30], in 2006, the Procter and Gamble company was more likely to reach a large crowd on its own CS platforms because it is an established multinational company with worldwide sales of more than 76 billion US dollars. While open media can foster network externalities, diversly, proprietary platforms have another advantage; the solvers can develop a closer relationship with proposers. According to Schenk et al., the Lego company and its contributors are loyal supporters and, therefore, more likely to respect the Lego philosophy and provide the firm with relevant ideas. However, in situations where the problems are technical, they can be faced without any personal attachment between proposers and solvers. A recent survey reported by the Harvard Business Review[31], including 500 sales professionals, found that workers kept as many as eight screens or windows open simultaneously to do their jobs. Those who participate in the survey are asked to honestly compare the use of their software with other unpleasant activities. This can make it difficult for companies to compete in the digital age. Many companies are attempting to upgrade and develop their systems to solve specific problems.

Figure 7 - The triangle of the profit



Source: the Author

Many people try to lead a digital transformation. However, they do not very often know what that process might entail. It will not make a big difference in acquiring the latest software unless these tools can integrate and work well. The speed and adaptability are helpful for companies that have already been able to develop different software models. Platforms may sometimes provide different levels of flexibility and adaptability to the software, allowing a wide range of applications to work with the same data. Businesses can develop a peer-to-peer platform ecosystem. To build an ecosystem of digital platforms, it would be essential to conduct future

[29] Schenk, E., Guittard, C., & Pénin, J. (2019). Open or proprietary? Choosing the right crowdsourcing platform for innovation. Technological Forecasting and Social Change, 144, 303–310. https://doi.org/10.1016/j.techfore.2017.11.021
[30] Huston, L., & Sakkab, N. (2006). Connect and develop: Inside procter & gamble's new model for innovation. *Harvard Business Review*.
[31] Chakravorti, B., Bhalla, A., & Shankar Chaturvedi, R. (2020). Which economies showed the most digital progress in 2020? Harvard Business Review.

research to discover specific business models' technical, economic, and ecosystem capabilities. Technical capabilities refer to how companies transform their legacy system into a digital infrastructure that implements economies of scale and digital innovations. Regarding economic capabilities, the company can further improve its business model by transitioning from a unilateral to a bilateral business model. Regarding the ecosystem, it is necessary to understand how companies can direct their network today toward a co-creation perspective of value dominating services. Digital platforms and ecosystems, comparing them to today's models, are combined to create new types of research from an economic point of view. This process can help distinguish the ecosystems of digital platforms. The distinctive features that cannot be overlooked in analysing a digital platform are the platform fees and the methods of creating value. Another factor that influences the characters of the operating system can be the multi-homing behaviour of the users. Amazon, for example, used its profits to tap into new markets by funding cloud computing services or using its information superiority. Therefore, the platform governance mechanisms used in digital platform ecosystems can be applied but need to adapt to the specific situations related to their existing network of stakeholders.

3.4 How digital platforms will evolve in the future

In 2022 the trend is clear; the most influential companies worldwide are embracing digital platforms. As of early 2020, seven companies collectively had a 6.3 trillion dollar stock market value, all bonified platform businesses. Most of these platforms do not make a profit. Nonetheless, they still dominate their specific markets with success. Interestingly, platform companies achieved their sales with an estimated 50% reduction in employees. Additionally, these companies have been reported to be 100% more profitable and growing at the same rate compared to their conventional competition. In conclusion, platforms are extraordinary business models, and they are on track to maintain their dominant position over the following decades. However, creating a platform, even when it results in an IPO, is no guarantee of long-term success. The business must still be able to generate a profit and respond to change and competition. According to Cusumano et al., the authors from MIT[32], over the next 20 years, the scene will undergo significant changes. Specifically, digitization and emerging technologies will have better expressed their full power. A more significant number of individual users with competing platforms will become connected. The authors have predicted four trends they expect for the future: More hybrid business models, turbocharged innovation, industry concentration and curation and regulation. Regarding the first, many platforms will become hybrids because of advances in digital technology. Regarding turbocharged innovation, the prediction is that it will be driven to a new level thanks to net-generation platforms. Thirdly, the market is expected to be concentrated in a smaller number of giant platform companies in the coming years. As for creation and regulation, the global platforms will transform from open marketplaces to curated businesses with increasing government participation shortly. The most talked-about driving force behind these changes is AI. AI and crowdsourcing are a perfect couple. For

[32] A. Cusumano, M., B. Yoffie, D., & Gawer, A. (2020). The future of platforms. *MITSloan*.

example, machine learning (ML) is recognized as a subset of AI where algorithms make predictions or decisions. Indeed, combining AI with the information provided by humans, which traditionally has been performed by small numbers of people (usually experts), can allow companies access to datasets at a lower cost, thus reducing R&D and production expenses. Moreover, Crowdsourced-AI enables human-like intelligence, permitting individuals and crowd subsets to be better understood. As well, AI can identify patterns in consumer behavior. As for AI-based crowdsourcing, it should, in the future, be able to fuse a basic level of data with information, with the result that machines can analyze much better than human beings. Another emerging player transforming future digital platforms is the Hybrid Integration Platform (HIP). Its appeal is that it promises to provide organizations with the necessary instruments to integrate data and applications on-premises and in the cloud. Consequently, this should assist in making better evidence-based decisions. Finally, HIP should be able to usher in higher levels of collaboration, democratization and recycling of assets.

3.4.1 Projected pros e cons of adopting artificial intelligence

Among the most talked about advantages that have been associated with the adoption of AI, there are: a reduction of human error, faster decisions and new inventions. Regarding the first, the reason for human mistakes in data analysis has been demonstrated to be due to lack of either experience or attention in reading and interpreting data. AI can correct these humans' made mistakes as it is superior to humans in reducing and analyzing large volumes of data. However, currently, AI is still lacking in human intuition, emotional intelligence and cultural sensitivity. Secondly, companies will be able use AI in their processes to speed their decision process using datasets with AI. In fact, AI will have the ability and advantage of continuously learning. Lastly, AI should be able to train itself to process large and highly complex data sets and build ulterior models that, in turn, should become expert at making reliable predictions. However, admonitions have been expressed numerous times by influential and experts in the field of computing, regarding the inherent danger that societies must be prepared to face. To this regard, the entrepreneur and businessman Elon Musk, warns that societies that adopt the use of AI, will risk being overtaken by technology. Likewise, Bill Gates, a founder of Microsoft Corp., recognizes that the benefit of AI has so far, contributed to the well-being of society across the globe. However, both of these men share the opinion that A.I. could become more dangerous than nukes. Bill Gates, in 2019, at Stanford University, claimed that the "AI threat is like nuclear weapons"[33]. Mr. Musk, in a 2014 interview with MIT, described that the prospect of artificial intelligence as "our greatest existential threat"[34]. Mr. Musk has invested in several artificial intelligence firms, including DeepMind, but remains vigilant. Whereas Mr. Gates, during a Q&A session on Reddit in January 2015, said "I am in the camp that is concerned about super intelligence"[35]. The threats, according to both Musk and Gates are real and worthy of attention. This is despite the benefits that AI can potentially bring to humanity. It is becoming clear

[33] Piper, K. (2019). Bill Gates: AI is like "nuclear weapons and nuclear energy" in danger and promise. *Vox*.
[34] Sainato, M. (s.d.). Stephen hawking, elon musk, and bill gates warn about artificial intelligence. *Observer*.
[35] Sainato, M. (s.d.). Stephen hawking, elon musk, and bill gates warn about artificial intelligence. Observer.

that robots are going to be in situations that require immediate and sometimes drastic responses, and so the possible ethical dilemmas associated with this scenario will necessitate the implementations of preventative measures. At the core of this potential threat is an opinion that many researchers agree upon, that AI will never be capable of exhibiting empathy for humans When Mr. Gates and Mr. Musk refer to nuclear threat, they intend social disruption in the form of job loss, privacy issues and weapons automatization. In fact, regarding the first, in the 2019 World Artificial Intelligence Conference in Shanghai, Elon Musk stated that with the rise of AI, human jobs will be useless. He clearly stated that individuals who develop AI software will be least affected by any radical changes in the job market. Another prominent figure that expressed his concerned of this issue, was the late Stephen Hawking (1942-2018). He openly fretted about the potential consequences of creating something that could take over humanity. He stated that artificial intelligence will be either the best or the worst thing ever to happen to humanity and supported the creation of an institute that would research the future of AI. While it is recognized the potential of AI to eradicate numerous social issues afflicting the world, primarily disease and poverty, attention needs to be paid to avoiding the potential pitfalls. Crowdsourcing platforms are recognized for their important roles in increasing citizen engagement and improving government response. However, analyzing the constant high volumes of input from these platforms is an overwhelming task. The multinational professional services network, Deloitte Touche Tohmatsu Limited, published a report in 2020 on AI-augmention, in which they conclude that natural language processing could help free up 1.2 billion hours of work and save up to $41.1 billion per year for governments worldwide. It was also reported that AI and crowdsourcing platforms might improve the efficiency of democracies. Additionally, it is believed that both governments and citizens will equally benefit from this innovation. In conclusion, in crowdsourcing, whenever the task of allocation is performed properly, it should provide egregious results. However, task allocation can often be troublesome due to specific task requirements, the knowledge required for its completion, not to mention the size and heterogeneity of the participants. In light of this, task allocation generally has several challenges in crowdsourcing scenarios and therefore a role for AI is welcomed.

CHAPTER 4

A QUANTITATIVE CROWDSOURCING ANAYSIS BASED ON THE VALIDITY OF APPROACHES APPLIED TO DIGITAL PLATFORMS

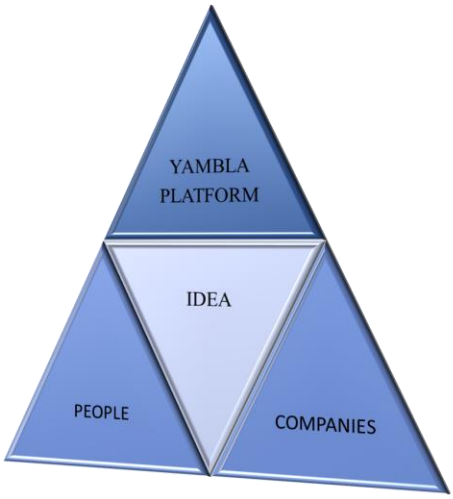
After having articulated the vitality of an approach of such media intensity, it is necessary to comprehend how to apply theory to practice and how many people can exploit this process to increase their production capacity in the workplace, especially by exploiting the means that the digital revolution has made available to individuals. An appealing article from Harvard Business Review reported, "As technology progresses, it has

become increasingly easy for digital platform companies to reach customers around the globe"[36]. People are at a crossroads between accepting crowdsourcing and digital platforms and renouncing their use with the risk of losing an excellent opportunity for their work. Nowadays, there are so many ways to get to people. First, people do not necessarily need a digital platform, but it is also sufficient to use an internet page or a secondary profile on Instagram. When these devices are used, there is the possibility of opening communication forums with users, asking them for their opinions and preferences regarding the launch of products. The more a product is requested and suggested by presumed customers on the platforms, the more companies are encouraged to produce and deliver that type of service. For example, after opening an online business on Instagram through a page, it is possible to understand what customers want to buy most simply by opening a forum and publishing a visible story with the set of choices of the best product. Although this method may seem trivial, it is one of the most common ways to utilise crowdsourcing. In this case, the user is a simple Instagram follower who, looking at the ad, chooses the article that he would like to be produced more or to be discounted. Once specific inquiries have been received, it is much easier for page managers to decide and choose the best possible supply of products for users. This very banal description is an example of crowdsourcing of ideas. By involving many people with different experiences and knowledge, it is achievable to facilitate the solution of difficulties and plan new products and services. In the publications, particular reference is made to crowd wisdom, which is viewed as the crowd's wisdom. It refers to distributed knowledge that people have who can favour the creative businesses of companies. Crowdsourcing prevails from other forms of open innovation because the first concerns the involvement of numerous individuals and not occasionally designated actors. Therefore, with crowdsourcing, a large portion of the information is assembled to search for the most helpful, identified as extreme effects. Regarding this, the challenge that we wanted to face concerns the possibility of adopting specific digital platforms within people's lives. Although it is difficult to compare the lives of many individuals with different preferences and habits, it was instead possible to ask possible people employed in work or student activities to reflect on the possibility of adopting a digital platform within their environment. From this topic of view, the example of the Yambla platform has been suggested; a software able to make people's ideas experience a crowdsourcing process to arouse curiosity from other users of the same forum. The goal is to create an interconnection that unites the Yambla platform, individuals and firms together. To reach this relation, the common characteristics that must be examined are ideas. These allow company employees to establish a relationship of confidence with the functioning system in order to boost the production of ideas within their workspace. As will be found later, this procedure can differ according to people's choices. Closing to crowdsourcing phenomenon, with different states of actuality, it has been supposed the following widespread definition of crowdsourcing: "Crowdsourcing is defined as the act of outsourcing tasks originally performed inside an organization, or assigned externally in the form of a business relationship, to an undefinably large, heterogeneous mass of potential actors"[37]. This can be real by

[36] Chen, L., Li, S., Shaheer, N., & Stallkamp, M. (2022). 3 obstacles to globalizing a digital platform. *Harvard Business Review*.
[37] Hammon, L., & Hippner, H. (2012). Crowdsourcing. *Business & Information systems engineering*, *4*(3), 163-166.

compromises of an open call thanks to the Internet for the intention of available, value innovative service. The encouragement to experience, as viewed before, can be economical or non-monetary. While a business is the first of the open call, defined as a crowdsourcer, other inventors cannot be banned. The community for selecting the crowdsourcer can consequently appear more reasonable as the word "company" often means the ambition of profit-making. That fact is not the single priority of all crowdsourcing tasks. For instance, the effectiveness or exploitation of the possibility of a heterogeneous multitude of supporters (defined as users) is of elementary significance for illustrating and comprehending crowdsourcing. This is due to the essential prerequisite for gaining a new expansion level in worth creation. The public is denoted by a distinguishable cooperative intelligence, especially the proficiency of groups to achieve objectives through their participation on the Internet, which people were not able to execute.

Figure 8 - Ideas are the linkers which can connect companies and people with Yambla platform

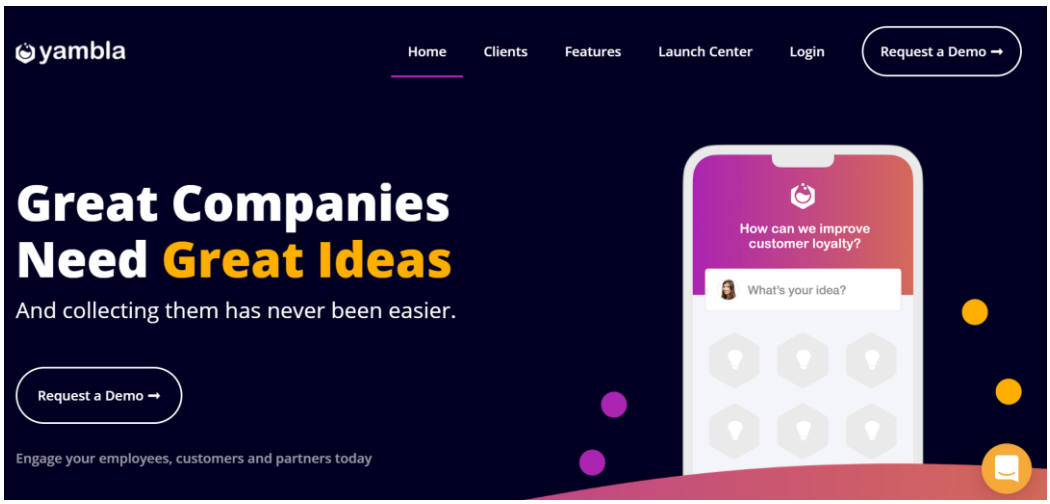


Source: the Author

4.1 Yambla is a platform that compares ideas and innovations

Thanks to the digital transformation, we have had the opportunity to run into many companies competent in making a profit simply through online platforms and websites. There are many types of platforms; some deal with the selling of goods and benefits to buyers, and others are fond of connecting people from different parts of the world, but just a few of them can provide other firms with ideas or innovations. Involving everyone in innovation and promoting idea generation required an easy-to-use forum that adjusts to people's innovation process. Yambla platform can be the perfect functioning system that perfectly fits people's necessities and is viewed as a digital platform that aims to compare ideas and innovations to each other. This kind of software is a startup based in San Francisco and Belgium and is considered one of the world's most fascinating management platforms. The main actions of the software are divided into three points: the launch of challenges, the crowdsourcing of ideas and the prospect of turning them into a tangible result.

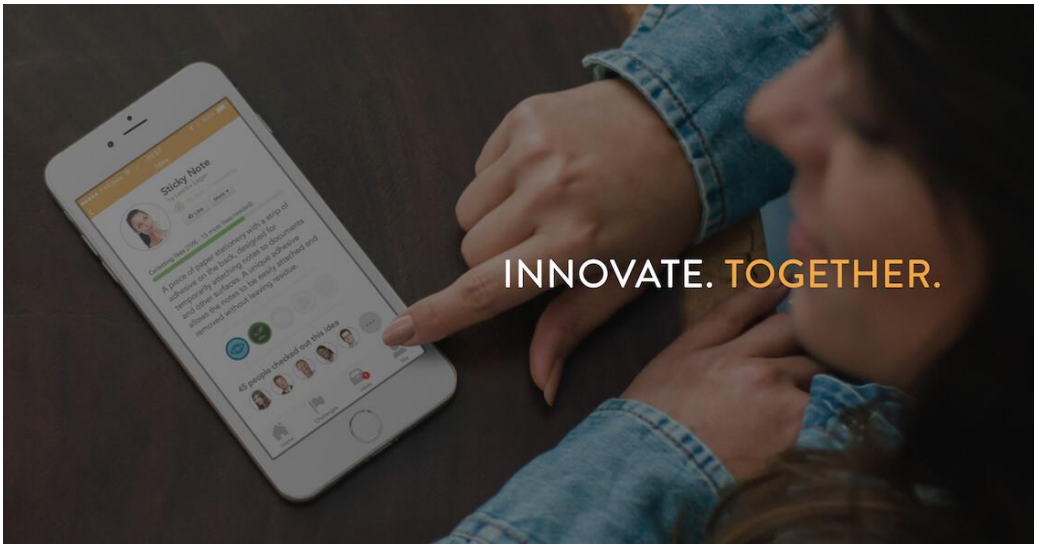
Figure 9 - Yambla platform website



Source: https://yambla.com/

The forum can guarantee employee engagement, interaction with customers and partners, and the development of people's ideas engine. The Yambla Platform is based on an open innovation connecting itself with people's enterprise tooling to ensure a fully integrated experience. According to many users who could utilise and expand their ideas with this operating system, Yambla could be viewed as an outstanding multi-channel and multi-generation idea management platform. It is fond of capturing and handling creative ideas in people's companies. In order to do that, enabling users to enforce and structure the journey of innovation in an uncomplicated and immediate way is one of the critical roles of the primary skills of the company.

Figure 10 - Yambla linkedin images



Source: https://www.linkedin.com/company/yambla/?originalSubdomain=pr

All workers are in condition to contribute to innovation thanks to collaboration and cooperation. Those enterprises that launched a partnership with this kind of business could see interaction at a previously experienced level. Yambla carries the user experience that contributors seek, acquiring the ideal tools to

furnish a product exhibition. Yambla seems to assume that the top way to make companies sustainable is fostering innovation as a necessary detail of the company culture. This process deals with empowering every employee to assume ownership and innovate. Specifically, the digital platform drives to change the way companies perform by delivering social innovation control software that affects the company culture by transparently managing its innovation procedure and turning it into a straightforward, social and addictive experience. From product configuration to company culture, keeping things simple is the first step in order to ensure sophistication.

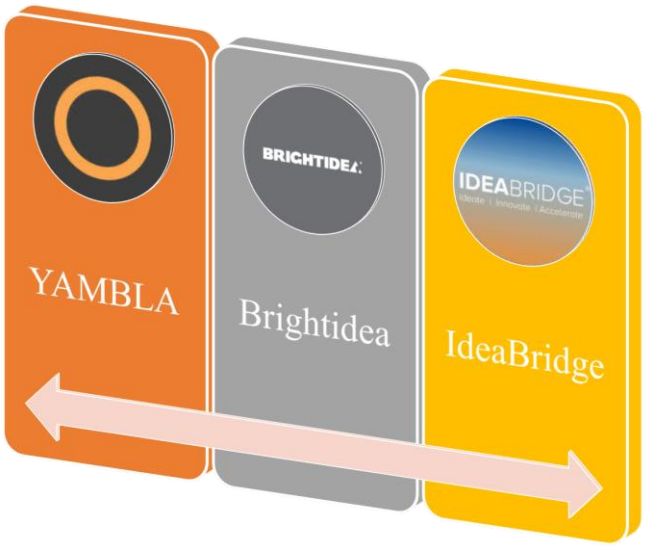
4.1.1 How to preserve innovation

The most numerous organisations ran into trouble innovating. For example, Nokia, Kodak, BlackBerry and Blockbuster are merely a few examples of successful companies that went from hero to zero due to a scarcity of innovation. Yambla seeks to help societies remain inside competition without being stopped by insufficiency of ideas or product configuration. Employee engagement is believed as the key to the triumph of any business, and the task is to support companies assembling a culture of innovation by gathering ideas from workers and turning them into worth. Despite that, some users assumed that analytics might be too restricted in some circumstances, and the platform must be practised to train individuals who desire to utilise it to its full potential. On the contrary, Yambla is a distinguished product and can only be compared with a few contenders. It is also well-known for its comfort of use out-of-the-box, with the lowest formatting required. For example, Yambla fits completely for tracking ideas. Also, Yambla reinforces single-sign-on so that the users could access the platform immediately. Furthermore, customer service is remarkable and chosen by supporters because of the social approach to innovation, instantaneous integration and adequate support from the Yambla crew. Although efficient team assistance is considered excellent, the insufficiency of communication from the platform could quickly reduce the company's market share.

4.2 A summary of platforms and software suitable for evolving ideas

This study was based upon a web-based platform known as Yambla to determine whether this software might support companies in the value co-creation processes of service providers. The system adapts to how companies work as every organization innovates differently and, thus, needs suitable approaches and requirements. Regarding Yambla's competitors, IdeaBridge emerges as one of its formidable competitors. The latter provides comprehensive assistance to users who provide ideas on company quality. From an intercompany comparison, it seems that Yambla satisfies client demands. This hire satisfaction rate can be interpreted as a better focus on adapting to the market characteristics. Even though Yambla does not provide reliable client service for assistance, it facilitates employee training allowing greater productivity.

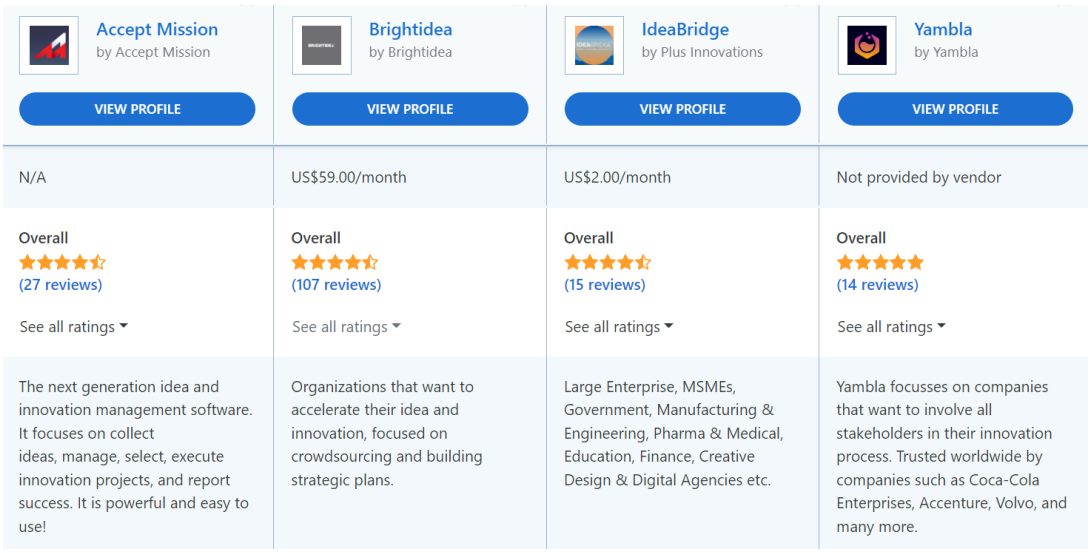
Figure 11 - Yambla, Bridghtidea and IdeaBridge



Source: the Author

Additionally, Yambla requires minimal configuration, given that users like keeping track of their ideas. It best fits the needs of the public and employees. Both groups are satisfied with the software regarding the possibility of crowdsourcing ideas. The real question is: "Why should users choose Yambla and no other platforms such as Ideabridge, Brightidea or Accept Mission?" Although Brightidea is considered a flexible software model, it lacks some fundamental features for developing ideas. Specifically, it is impossible to assign an idea to an evaluator; likewise, activation of the workspace is centralized and accessible only to the administration. Accept Mission might also share these limitations. It has been reported that there may be bugs in the software. Even though these defects appear to be expected, Yambla can best customize a platform for every event. However, thanks to software and the subsequent digital revolution, users are endowed with many more tools leading to a more incredible opportunity. The collection of data concerning these distinct types of digital platforms would not have been achievable without the assistance of the sites: Capterra and GetApp.

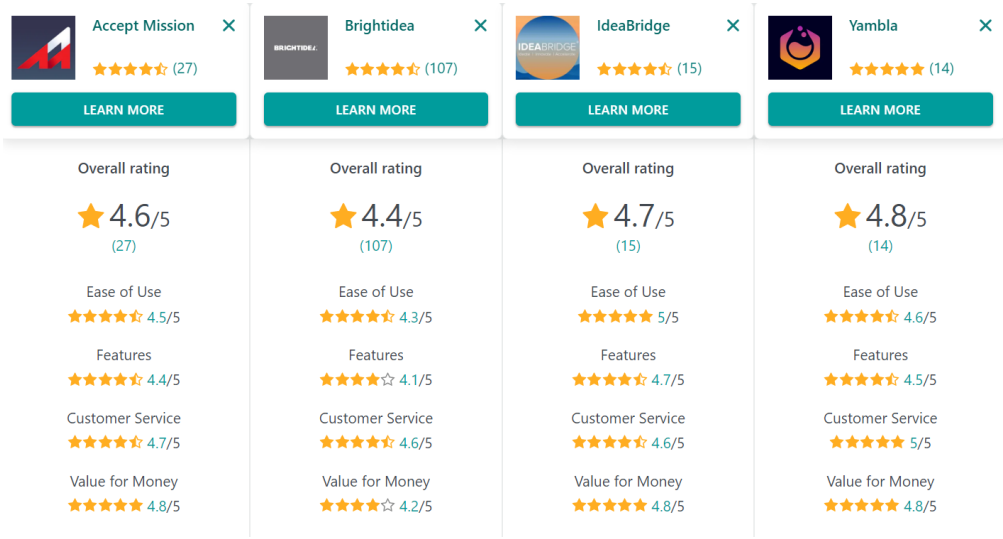
Figure 12 - Accept Mission vs Brightidea vs IdeaBridge vs Yambla Comparison



Source: Accept Mission vs Brightidea vs IdeaBridge vs Yambla Comparison - Capterra Canada 2022..

Implications of the platform are dependent on the perspective of the individual contributor, given that a combination of various actors provides circumstances in the ecosystem.

Figure 13 - GetApp comparison



Source: Accept Mission vs Brightidea vs IdeaBridge vs Yambla Comparison | GetApp New Zealand 2022..

Although there is evidence of how individual roles can influence the business component by using Yambla, it is possible to verify, through a survey, how much of a voice the individual has in the development of this process. This thesis study describes how the business organization itself can be improved thanks to the contribution of Yambla. The software is not only programmed to increase the individual skills of the employee but also to enhance the crowdsourcing of ideas, forming the sides of the triangle that connect the platform to companies and people. The points are connected, demonstrating the dependency between these and crowdsourcing.

4.3 The definition of customer perception and satisfaction

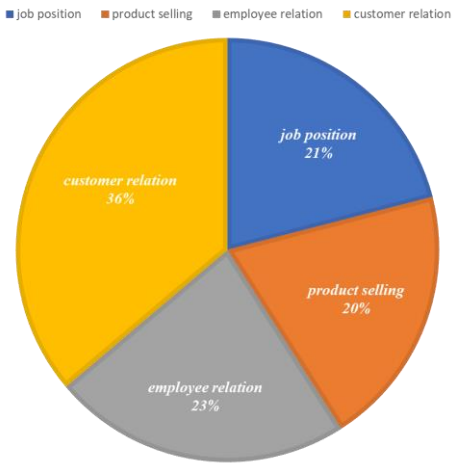
The aim is to understand how digital platforms can be helpful to individuals fully, and a research was conducted on a sample of more than 100 individuals. The analysis concerned nine questions concerning the possible use or adoption of digital crowdsourcing platforms in the workplace. According to this, it was first necessary to provide a brief, clear description of people's characteristics. They were first asked to select their age and occupation and then define, based on their knowledge, the answer to a series of questions that guided them through a new understanding of crowdsourcing and the Yambla platform. Those who have been the subject of the research examination, were mainly young people between 18 and 25 years of age and adults between 49 and 60 years. this percentage was relevant in the analysis as it made up about 90% of the total number of components who responded to the survey. on the contrary, out of the total analysis carried out, 63% of individuals confirmed that they generally carry out their work in contact with a maximum number of 100 employees. Approximately 20% confirmed that they work alongside many employees exceeding 500, while

the remaining portion works together with a number of workers between 101 and 499. These data are essential to understand the background of people and how many probably and presumably would be more willing to use a digital platform. Undoubtedly, this choice depends above all on the different needs encountered by the parties involved. After carrying out the survey, an essential fact emerged that reveals how the digital revolution has increased the use of digital platforms and particularly the safety of people in adopting certain types of digital platforms in carrying out their work. When we refer to the concept of an open mindset from a digital point of view, it is above all the ease of assimilation of creative ideas to the whole of today's society.

4.3.1 A deep balance of the survey

According to the survey's outcomes, the same samples studied were equally allocated among the varied responses being investigated. It was interested to scrutinise how the crowd, belonging to different working sectors, was able to determine the personal service they would make of the software in instants of their employment in a more opportunely way. Regarding the use of the platform, the public preferred, with 36% of votes of the total answers, to employ a possible software to enforce the relationship with customers. Although the selection may be insignificant, crowdsourcing platforms mainly aspire to improve customer service. The feedback obtained clarified how, although most respondents were unaware of the topic, the software is instinctively favoured for long-term applicability. When the mass preferred this option respectively instead of others, which offered improving employee relationships and the position at work, it is evident that the choice to deal mainly with buyers involves an enrichment both for the employee and the business itself. Moreover, the less practical choice for those who would possess certain digital media was relating to product selling. This result is not despised; instead, it is understandable how to make options interact with crowdsourcing and customer service. The product turns out to be the final stage of a process that has a digital platform as its leading actor. Consequently, it is straightforward to catch how the final product cannot be the main object of research and use of a platform but essentially the output delivered by the users' ideas (input).

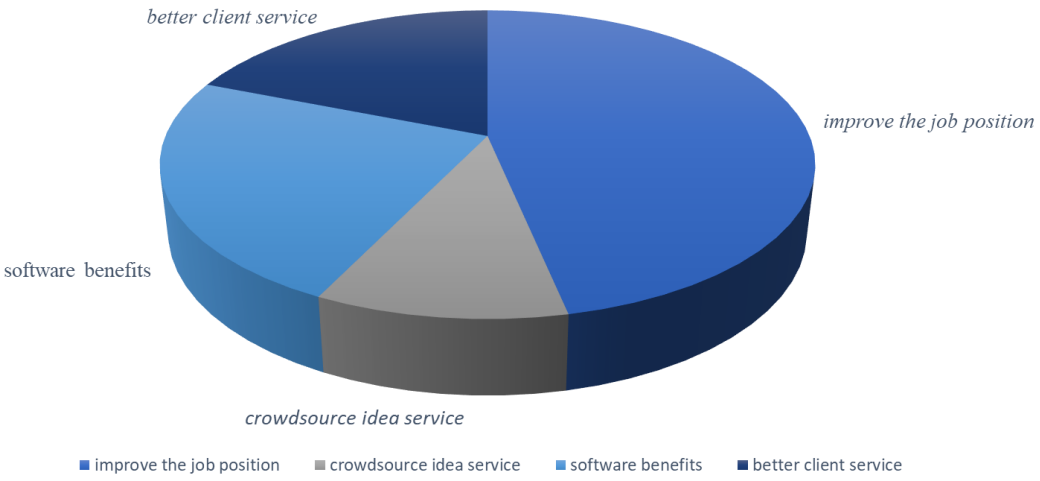
Figure 14 - The use of platforms made by people



Source: the Author

Subsequently, the role of the Yambla platform was made understood. Given the initial survey introduction, it is possible to understand the perception of reliability that the crowd gives to the operating system. The aim is to put the human being in front of a crossroads, a crisis moment or difficulty in the workplace in which the lack of ideas or solutions could be ruinous in them. At this moment, the employee manages to look for the best viable platform that serves their needs. It is known that the platform can be for different uses of an economic-productive type. Yambla provides digitization services that could be useful to the individual, but only one of these can be more appetizing for the user's needs. Most people (almost 46.7%) preferred to be the employee able to evolve within the workplace than the others. In this sense, the worker himself has reasoned under a more selfish logic, preferring to be the first winners and in the conditions to implement the company's innovative structure. Those who responded accurately to evaluation are not included in the approximately 23% who chose "generic software benefits". all individuals should be aware of what is lacking in their work to achieve the top profession or enhance it.

Figure 15 - People were asked to choose the best use of digital platforms in their workplace

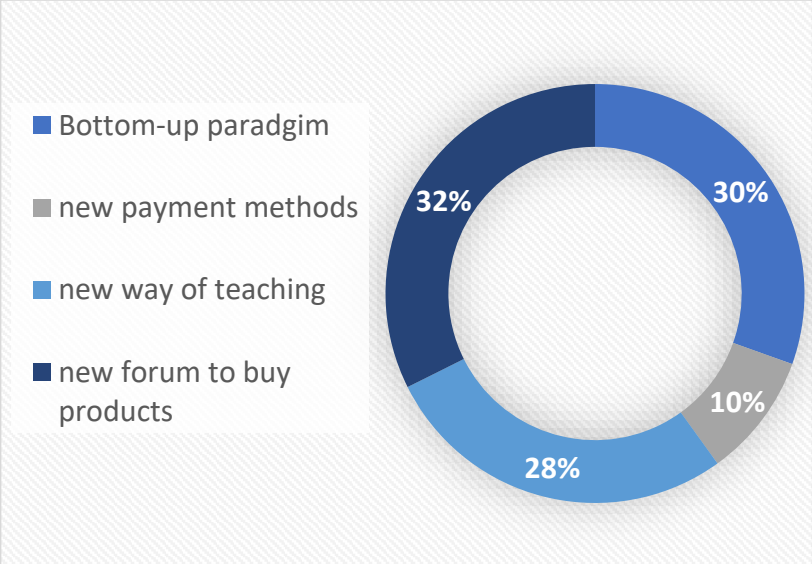


Source: the Author

Many of the readers could not associate this phenomenon with a respective term that could better exemplify the term crowdsourcing. Many have intuitively chosen the effects of crowdsourcing and the consequences of its use, preferring sharing economy and co-creation choices. The sharing economy, or economy of sharing, is related to an idea that has been affirming itself in recent years, dropped into diverse forms and used in different economic and social sectors. Particularly in its early days, the expression sharing economy was an origin of controversy globally because the phenomenon is unique, and the notional area to which it refers is expansive and mixed. Thus, a series of adjacent, equal or parallel definitions has matured: from peer-to-peer to collaborative economy, based on collective consumption. Terms are often used interchangeably but which, according to specialists, mean slightly different actions. In recent times we could consider sharing mobility a subset of the sharing economy: the chance of driving from one location to another through shared automobiles and vehicles like car sharing, bike sharing, scooter sharing and carpooling. These answers may be correct as

they are highly linked to this kind of business model and have arisen from it. The research places the individual in front of an aptitude analysis that clarifies how intuitively the subjects revealed to the first impulse survey can better associate the proposed word. a percentage of the total respondents to the question incorrectly selected the "crowdfunding" option. Therefore, it should be remarked how many, answering quickly, have been misled by the prefix crowd, which similarly but not conceptually is correlated to the word crowdsourcing. Crowdfunding, or collective financing, is a combined process of a group of people who utilise their money together to sustain people and organisations' efforts. Therefore, it is relevant to pay attention to the real meaning of crowdsourcing, which implies prominent participation of individuals who are not called to give funds but rather to express their ideas and opinions. 5% of readers favoured the term Topcoder, which should not be considered inaccurate because it is a crowdsourcing society with a free international community of competitive creators, developers, and programmers. Topcoder can be portrayed as a model company that has embraced this business plan in an avant-garde way. However, it has been fundamental to understand how much information people have regarding the digital revolution. Specifically, the intention was the same as the previous question but may be more complex because the reader is asked to match the term “digital revolution” with four diverse activities. The link between options is based on assumptions characterized by the personal concept of digitalization and how this process has influenced people’s lives. Regarding the graphic, we can indicate the prevalence of three main choices that emerged consistently: A bottom-up paradigm, a new way of teaching and a new forum to buy products. The latter was the most selected answer and appeared congruent with the current e-commerce evolution that has been changing online product selling. In Italy, b2c eCommerce constantly grows at a speed equivalent to the pre-pandemic. Nonetheless, purchases persist in growing at a lower velocity than last year and achieved 30.5 billion euros. After the effective emergency of 2020, service assets show a comeback and reached 8.9 billion euros. The interval considering 2019, when the sector was worth 13.5 billion, has still been noteworthy

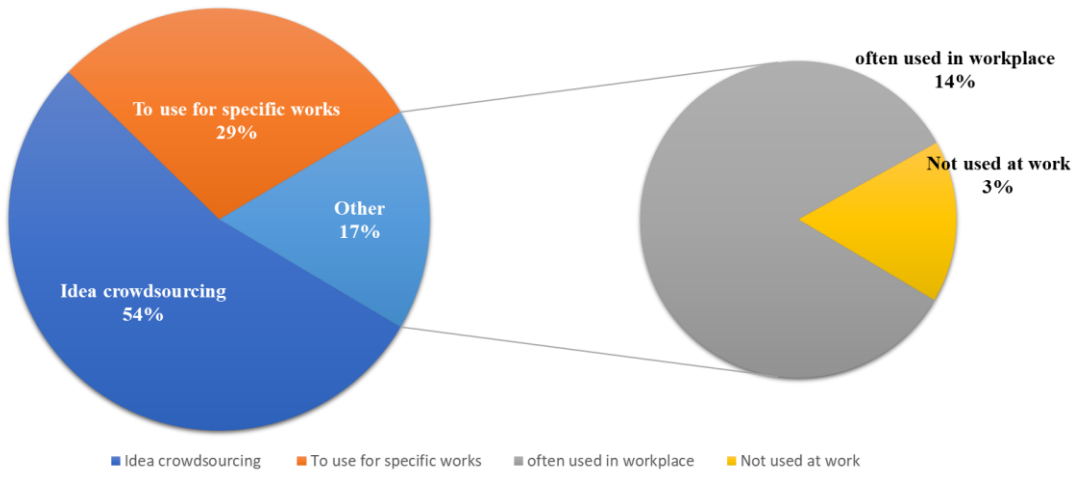
Figure 16 - Digital transformation synonymous



Source: the Author

The most extensive dealers pursue Internet-enabled benefits and cost declines in processes, which could reword to an improved competitive position in strategy and affinity terms. Moreover, customer replies to the new objective and digital proposals will be essential to their success and collapse, but consumer reactions are not entirely comprehended. However, once the customer has "achieved" the online shop, e-retailing techniques can alter traditional preferences and choosing actions. The self-service noticed price efficiency advancements for dealers as the effort of establishing and physically choosing products and methodology related to earnings in some retail sectors. In conclusion, after having illustrated how Yambla can be an efficient digital platform, the public was asked a question associated with a possible service they can make of this operating system in the future. The alternative is debated between the adoption of the software in a working space, the avoidance of using it, the sole use for specific assignments, or the exploitation of the potential of crowdsourcing of ideas.

Figure 17 - A possible future use of digital platforms



Source: the Author

Moreover, 17% of the total chose to use the digital platform at their workplace often or not embrace any virtual tool in order to improve their productivity. Of this percentage indicated, only 3% would reject using a similar operating system. Most likely, characteristic businesses do not demand the required benefit of such devices. Assuming the case of Yambla as a reference, the choice to use the platform, by the employee, only in some instances of the working activity could be practical as probably the decision and development phases required of the worker are presented inconsistently. Regarding the crowdsourcing function, the reader could be incentivized to constantly use Yambla to develop ideas exclusively to compare himself with the reality of other users, better understanding which characteristics of his performance could be better implemented. On the contrary, it must be admitted that its development, as also acknowledged by 29% of the respondents to the question, can be efficient only for specific jobs but not for all occupations. A doctor, for instance, can make the most of the platform to compare ideas relating to scientific articles or patents to be developed, but it is difficult for them to go beyond these purposes. Consequently, people are constantly worried when they tend

to approach new working tools. Due to that fact, workers could be inefficient after experimenting with digital platforms because not all jobs are suitable for being associated with a particular operating system.

Figure 18 - Survey's summary

Source: the Author

4.4 The benefits from using digital platforms

Digital teamwork is widely considered for optimizing employees' productivity. Intellectuals have guided intensive study on its benefits, such as teamwork, adherence and decreased anxiety. One of the principal advantages of an innovative digital workplace guided by many actors is lowering distractions that could guide workers far away from the task. This process can break down borders between individuals, knowledge, and approaches. Conferences can become useless because they are expensive, and the prevalence of meeting attendees confess to trance during discussions. People and information tracking are pricey for organizations because workers spend 2.5 hours per week searching for people and information spread throughout the organization. Incorporating workplace technologies like mobile, cloud, analytics and sociable devices into the workplace will entrust employees to work speedy and communicate more skillful. Due to mobile technologies, knowledge staffers are often missing from the office and consume their working time on the road or at customer places. People's workplace is noticed as a zone of interchange, partnership and interaction. It is no longer only the material office room but a mixture of physical and social spaces connected to develop a cooperative working atmosphere. The physical working space is the setting where a job is executed. The virtual area is an electronic working habitat which delivers a forum that can be operated for partnership in a dispersed workplace. The social space is the entire web of team partners, leaders and buyers, and the cognitive area refers to ideas and mental conditions that workers communicate thanks to teamwork. Organizations could develop the strategy by examining the creation of acquaintance workers, and it can be concluded that a digital workplace is a basis for a flourishing business method. Most solutions present new opportunities to many

elements of the physical workplace and applications. Organizing a digital workplace timetable for an extensive organization can be demanding and more complicated.

Figure 19 - A concatenation of developments

Source: the Author

To recognize the company advantages of a digital job position, organizations must qualify for the tremendous workplace transformation. The workplace conversion ambition should provide a proportional work-life program for its workers while achieving managerial objectives. Developed businesses can furnish their employee's reasonable hardware and software collaboration mechanisms that can be elevated and extended with the tiniest activity and actions. The enforcement of digital workplace resolutions supplies a procedure to comprehend better the potential constraining effects of executing digital workplace technologies. The central core of digital platforms are data and the digital technologies that permit them to be collected in real-time and organised in a way between the further operators: the platform economy can be considered on the balance of a given economy or, in addition, a mastership economy, an economic model based on facts. Via digital platforms, it is probable to enhance the customer experience and propose products and benefits better in sequence with the customer's desires by intercommunicating reports regarding him with different supporters of a natural ecosystem. Customers are inclined to willingly transfer their data in the face of the opportunity of appreciating a more stimulating and fascinating customer experience and an offer more congruent with their conditions. According to some studies, most people desire to implement their relationship with those offering a particular service. A high percentage of people would be more stimulated and incentivised to buy and operate thanks to reliable customer service depending on a digital platform. According to Klaus Schwab, “Traditional approaches to demographic segmentation are shifting to targeting through digital criteria, where potential customers can be identified based on their willingness to share data and interact”[38]. The digital process is saturating, on a globe ranking, the most disparate locations of daily life, assembling a multidisciplinary technique necessary to a phenomenon that involves the economic and sociological sciences. Furthermore, it is a truth that is already "current", transforming our daily activities and will constantly alter our regular financial life, also converting work activities into unexpected results and the necessity to meet and decode new issues.

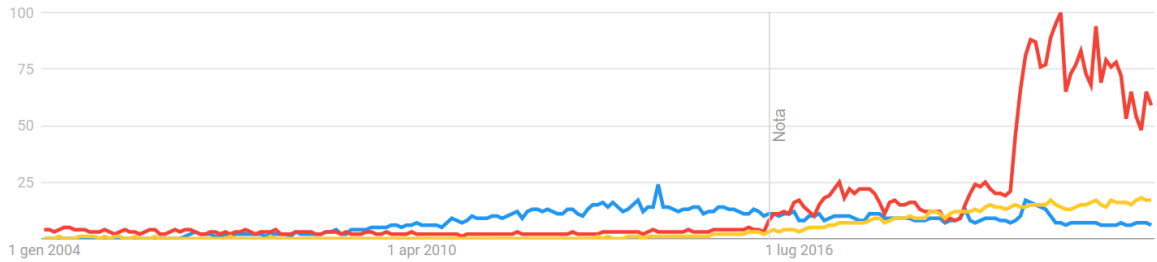
[38] Schwab, K. (2017). *The fourth industrial revolution*. Currency.

Digitisation stimulates the overcoming of traditional presentation and the emergence of new models, which are currently at the centre of economic-business analyses. Thanks to intelligent industrialisation, the term "industry 4.0" is affiliated with the conceptualisation of fast evolution in technology habits and techniques in the 21st century. The word has been employed in scientific writings and, in 2015, was sponsored by Klaus Schwab, the World Economic Forum Founder and Executive Chairman. He declares that the transformations noticed are more than just advancements in efficiency but represent a considerable evolution toward industrial capitalism. A part of this step of industrial transformation is the consolidation of technologies such as artificial intelligence to advanced robotics that obfuscate the lines between the material and digital worlds. Internet authorises to optimise the integration of users and elements, inside and outside the organisations, by changing the standard processes of interchange between the topics, significantly facilitating the intersection between the myriad of operators, with a resultant decline of trade periods and prices.

4.4.1 Statistics of crowdsourcing around the world

The word crowdsourcing, which means crowd "public" and sourcing "contract", is a moderately current model and has had a premature evolution in meaning. Thanks to Google Trends, an instrument that indicates the popularity and attraction of terms on the web over a given period, it is possible to admire the emerging interest in the phenomenon, as illustrated in fig. 15. Despite the phenomenon, starting from 2006, it has constantly been seeking more and more, the web has noticed a greater frequency in terms of searches for the word digital platforms to a greater extent. Moreover, it is curious to report how, since 2020, while crowdsourcing and digital transformation have maintained a roughly constant trend, the word digital platform has undergone a strong surge in searches. This fact is undoubtedly due to digital evolution in that specific historical period and to success in terms of profitability and sales of e-commerce platforms. It is a shared belief these tools have permitted the development and expansion of new types of business.

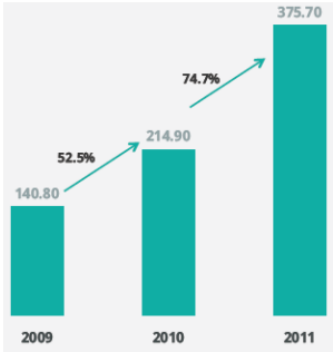
Figure 20 - Research analysis of the terms Crowdsourcing (blue), Digital platform (red) and digital transformation (yellow)



Source: Google trends

According to the Massolution study (2012)[39], the expanding market had a growth speed in incomes of 53% in 2010 and 75% in 2011. The operating systems allow the admission to a vast collection of resources, sustaining people and institutions by putting aptitudes and resources gap in connection with the proper counterpart.

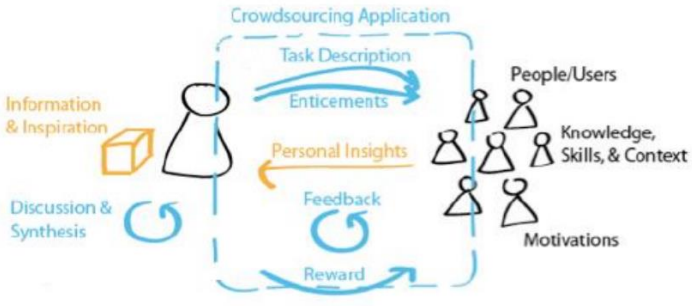
Figure 21 - Crowdsourcing Platform Revenue Growth in Millions of $



Source: Massolution (2012)

The explanations why a business employs digital platforms between demand and service are especially the cost declines and the offer of access to a global group of workers with different experiences and skills.

Figure 22 - Design Market



Source: Tidball et al. (2011)

The activity classification and insight into the motivations push the group to experience a distinct initiative. It will exhibit the value proposition by using the information found on websites, which is the primary reason a consumer decides to choose a distinctive mediator. Business model makes a profit when involved in a considerable market by drawing an adequate number of crowdsourcers.

4.4.2 A prospectus on crowdsourcing use made by companies

Crowdsourcing is considered "an essential part of modern business, with 90% of fortune 500 companies doing at least some kind of crowdsourcing"[40]. It is assumed to be a fantastic way to improve brand awareness and boost sales. According to a report by forbes.com, 85% of the 2014 Best Global Brands used crowdsourcing during the last ten years. Nowadays, thanks to the notoriety of the crowdsourcing example, the world web is

[39] Massolution, (2013). The Crowdfunding Industry Report.
[40] Garvey, J. (s.d.). How enterprise brands do it: The best examples of crowdsourced innovation. Chaordix.

full of hundreds and thousands of such operating systems. The same article cited before reported that: “The most crowdsourced type of content by the Best Global Brands is video content (45% of all initiatives in 2014) followed by ideas (22% of all initiatives in 2014)” and “The Best Global Brands are three times more likely to use crowdsourcing plat- forms than websites and social media for their crowdsourcing efforts”[41]. However, crowdsourcing can assist companies that need a new strategy when standard mechanisms are not so immediate and the company's thinking deviates from traditional solutions. This impact would not have been enhanced without the spread of technology improvements which have made the public more trustworthy and suitable for companies that require information and the people who manage it. For example, according to Pew Research Center[42], it has been evaluated that more than five billion individuals globally had portable instruments in 2019, and most of them were smartphones.

[41] Olenski, S. (2015, December 4). The State Of Crowdsourcing. Forbes.
[42] Silver, L. (2019, February 5). Smartphone Ownership Is Growing Rapidly Around the World, but Not Always Equally.

Conclusions

The work seeks to investigate the characteristics of a business model in which individuals request service or product development to the Crowd via the Internet. Today, the possibility of having digital crowdsourcing tools is the leading business opportunity for companies. In a world where the information available is online, the possibility of using digital platforms has proved to be attractive for the individual and beneficial for the development of work. It was also evident that the survey participants mostly understood the link between digital transformation and the use of digital software. This data is understood from the feedback given by the analysis concerning the potential benefit of selling and developing new products to third parties. However, readers had the opportunity to follow a guideline similar to the thesis path. They have first introduced a new or not common topic; they benefited from evaluating a possible application of it in their lives. At the same time, probably without knowing that, the research called them to participate in a simulation of a crowdsourcing experiment. Thanks to their devices (computers and smartphones), people complete a typical process of gathering ideas and sending helpful information to comprehend their needs and choices. In this case, a company, knowing the high request for digital platforms by companies, would have tried to provide an efficient software to use in certain circumstances to those who indicated it proper for their job. Furthermore, there will never be a crowdsourcing model without this kind of relationship because only cooperation can make firms develop strategies and ideas for their service.

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