European Commission

Business Innovation Observatory

Collaborative Economy

Crowdsolving

Case study 50

Internal Market, Industry, Entrepreneurship and SMEs

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Collaborative Economy

Crowdsolving

Business Innovation Observatory
Contract No 190/PP/ENT/CIP/12/C/N03C01

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European Union, August 2015.

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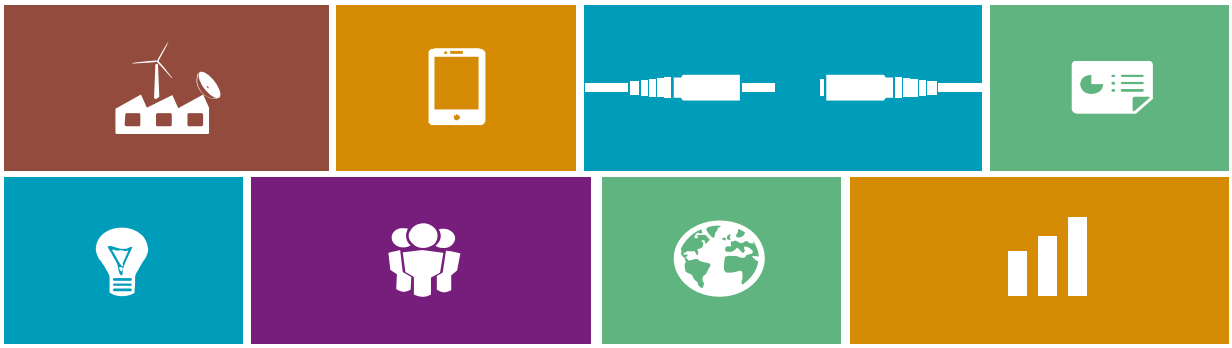


1. Executive summary

Crowdsolving is the oursourcing of a job (in this case a problem that requires a solution), traditionally performed by a designated agent, to an undefined, often large group of people in the form of an open call. New and emerging solutions implement this through the use of technologies to guide crowds to collective decisions, or interpret solutions provided by the results of a wide survey. Crowdsolving enables individuals and organisations to engage crowds to submit, discuss, refine and rank ideas and submission in relation to a specific question or problem.

The use of crowdsolving is on the rise in both the commercial and public sectors. Revenues of business-focused crowdsourcing firms grew 166% between 2009 and 2011, with North America and Europe collectively hosting more than 90% of crowdsourcing clients.

Crowdsolving has been used to tackle a range of societal and technological problems, and to activate citizen engagement. In turn, crowds have shown to offer incentives such as benefits of scale and diversity, allowing for a broad group of individuals to focus on a given problem, and are often more cost-effective per worker or per output than typical organisational solutions. In some instances, crowds have enabled problems to be solved more efficiently. Crowdsolving also creates access to a wide range of talent, and allow for solutions to emerge from an intersection of disciplines.

Companies and organisations are increasingly seeing the need to better leverage their employees and customers in order to generate new innovations as well as significant improvements to existing solutions. By engaging crowds (often comprising of current or prospective customers), crowdsolving solutions can further serve to generate greater commitment to the organisation's brand. In turn, these organisations need tools that allow them to automatise and scale their reach to larger crowds, while allowing them to gather detailed analysis faster and more resource-effectively. The Internet and related social and mobile technologies have also served to facilitate, expand and accelerate the interactions behind crowdsolving by encouraging attitudes towards digital sharing and collaboration.

The showcased companies provide a third-party platform to crowdsolving (MindSumo, Crowdsite, Mathesia) or allow companies to customise and embed the crowdsolving platform within the companies themselves (Innopinion, SkipsoLabs). These companies are undergoing a continued learning process in identifying the right business / monetisation models, while keeping up with emerging technological platforms, and their flexibility, agility and resilience have paved the way for their market success.

Interviewees identified challenges relating to the need to raise finance in order to educate and raise awareness of crowdsolving approaches to accelerate market absorption as well as market their product globally. They would also like to see support for internationalisation efforts, as well as lowered barriers to accessing public funding. In particular, crowdsolving might raise concerns relating to confidentiality and intellectual property.

Policy makers could therefore facilitate the spreading of awareness of the use of crowdsolving through funding marketing efforts as well as having government and public sector entities being a "first buyer" of such solutions. There should also be support for internationalisation efforts, as well as provision of education and training on IP and taxation issues.

2. Crowdsolving

2.1. Trend presentation

Crowdsourcing was first defined in 2006 as "**the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call**"[1]. While the "job" in question could apply to product development and manufacturing processes, as described in case study 27 on crowdsourced manufacturing[2], **in relation to crowdsolving the "job" becomes a problem that requires a solution**. These problems could be identified by individuals (e.g. a question on a personal medical condition) or by organisations (e.g. a company needing a new logo design). New and emerging solutions implement this through the use of technologies to guide crowds to collective decisions, or interpret solutions provided by the results of a wide survey. Crowdsolving enables individuals and organisations to engage crowds to submit, discuss, refine and rank ideas and submission in relation to a specific question or problem[3].

The basic practices of crowdsolving, presented in the form of contents, welcoming submissions solutions from a crowd for a particular problem, have been around for some time. In 1714 this approach was used to find the winning solution (out of more than 100 submissions) for a way to determine longitude at sea, a problem which stumped top scientists such as Edmond Halley and Isaac Newton but was solved by John Harrison, a carpenter and clockmaker[4]. In recent years, the Internet and related social and mobile technologies have served to facilitate, expand and accelerate the interactions behind crowdsolving, by encouraging attitudes towards digital sharing and collaboration. In parallel, tools for development, design and collaboration are becoming more powerful while increasingly cheaper and easier to use. These factors combine to drive the advent of the collaborative economy and by extension, crowdsolving.

Crowdsolving goes beyond manufacturing; it has been used to tackle a range of societal and technological problems, and to activate citizen engagement. For instance, Innopinion carried out the *Queen Silvia Nursing Award campaign*, which involved activating a large group of Swedish and Finnish nursing students to come up with new ideas for elderly care. Sites like StreetJournal.org coordinate the efforts of individuals who are promoting a cause, and the site has been used to stop illegal logging of forests, complain about broken lifts in apartment blocks, and call for the replacement of broken streetlights.[5]

Crowds have shown to offer incentives such as benefits of scale and diversity, allowing for a broad group of individuals to focus on a given problem, and are often more cost-effective per worker or per output than typical organisational solutions. In some instances, crowds have enabled problems to be solved more efficiently. A famous example is protein-folding game Foldit, whose gamers helped unlock the structure of an AIDS-related enzyme that the scientific community had been unable to unlock for a decade.[6] Some companies engage directly with the crowd, while others, especially when it comes to difficult technical problems, use intermediaries or "expert networks"[7].

Crowdsolving is most commonly enabled in the form of a crowd contest, where a sponsor (generally a company) identifies a specific challenge or problem, offers a cash prize, and broadcasts an invitation to submit solutions.[8] The best solutions are then identified either with the help of the crowd or by the sponsor. The winning solution is finally awarded the cash prize and the solution adopted by the sponsoring organisation (see Figure 1).

Figure 1 : A simplified model of crowdsolving in action

Source : ClickWrite[9]

Other forms of crowdsolving include the use of gamification (as in the forementioned example of Foldit) and social networks, the latter is best illustrated by a startup called Figure 1[10], an "Instagram for doctors" where doctors can share photos of patient conditions for other doctors to comment and suggest potential diagnoses.

"Perhaps more importantly (than monetary incentives), we have noticed that the students really like using the platform as an opportunity to showcase their skills when pitted against their peers."
*- **MindSumo***

These various forms point to how, beyond monetary incentives, crowds are energised by intrinsic motivations such as the desire to learn and to gain a reputation among peers.[11]

The following section will describe five startups which have used crowdsolving as a key component of their business models.

2.2. Overview of the companies

Table 1: Overview of the company cases referred to in this case study

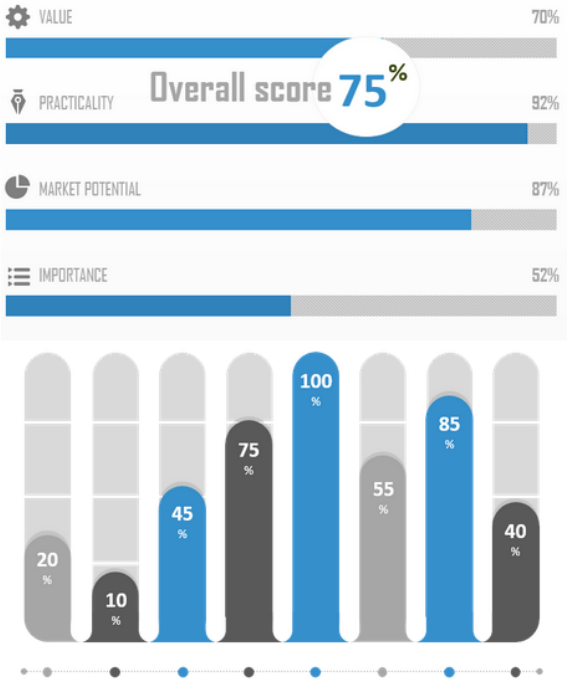
Company	Location	Business innovation	Signals of success
Innopinion	Finland	Innopinion has developed a process to automate the gathering and quantifying of freeform content using targeted crowdsourcing. Compared to similar tools, Innopinion excels at boosting people engagement and gets more usable data.	- Innopinion was chosen among the "50 Most Investable Startups in Europe" by the European Investor Gate in late 2014. - Innopinion has contracts with the second-largest city in Finland, as well as the Queen Silvia Nursing Award. - It has experienced significant revenue growth as well as growth in the number of customers and resellers/partners.
Mathesia	Italy	Mathesia is a crowdsourcing platform dedicated to applied mathematics, data intelligence, modelling and simulation. It allows companies ("Pitchers") to reach a wide community of scientists and researchers ("Brainies"), while giving these experts opportunities to apply their know-how in sponsored projects.	- In the first six months of operation, Mathesia generated 0.2 million EUR worth of revenues over 10 projects. - Its user base comprises of 1,000 high qualified experts (professors and researchers) from 50 different countries.
Crowdsite	Netherlands	Crowdsite grants companies access to more than 40,000 designers. Via design contests. companies get to choose from a large variety of design proposals from competing designers, increasing the likelihood of receiving a suitable and high quality design.	- Crowdsite is Europe's biggest crowdsourcing platform for graphic design. - It generated revenues of 1 million EUR this year, and is targeting to reach 20 million EUR over the next five years.
SkipsoLabs	UK & Switzerland	SkipsoLabs provides a suite of turn-key software platforms and support services to help any private or public organization easily launch its own branded Open Innovation or Crowdsourcing website and initiative. SkipsoLabs helps companies, governments, universities and not-for-profits find ideas, talents and solutions to their most critical challenges.	- SkipsoLabs has offices in the UK and Switzerland, and has recently opened an office in the US. - SkipsoLabs has an active user base globally covering countries such as the US, Mexico, Italy, UK, Spain, Switzerland, China, Australia, India and Uganda. - Its clients include XPRIZE, Microsoft, Intesa Sanpaolo, Cleantech Open, NYSERDA, Electrolux, and EXPO.
MindSumo	USA	MindSumo provides an online marketplace of company-sponsored projects called "challenges." These challenges are open to college students (undergraduate, graduate, and PhD) and let them showcase their real-world problem solving skills and impress potential employers. Companies benefit by generating creative new solutions and building a pipeline of smart and innovative talent.	- MindSumo is backed by, among others, Google Ventures and Voyager Capital, and has to date raised US$1.7 million (EUR 1.5 million) in financing. - Its clients include Facebook, Microsoft, Google, PepsiCo, and Walmart. - Its user base comprises of 150,000 active users from around the world, including US, Canada, Brazil, Argentina, UK, France, Germany, Australia and India.

Problem 1 – Gathering and analyzing qualitative data is costly, resource intensive and slow. Qualitative research provides deep understanding of content, but lacks scalability and statistical analysis of quantitative research.

Innovative solution 1 – Innopinion has developed a process to automate the gathering and quantifying of freeform content using targeted crowdsourcing. Innopinion is a web-based tool for companies and organizations to systematically gather, evaluate and rank purpose driven thoughts and ideas from employees, customers and other stakeholders. In a typical Innopinion campaign, 100 participants will send 200 thoughts (including ideas, problem statements, and feedback), provide 2,500 evaluations and 1,700 comments within a four-week period.

Compared to similar tools, Innopinion excels at boosting people engagement and gets more usable and actionable data – it provides detailed and customisable quantification of data with higher participant activity levels than other online tools, by leveraging on gamification to maximise participant activity as well as algorithms to distribute evaluation tasks optimally.

Innopinion is ideal for gathering and refining qualitative feedback such as thoughts and ideas from the targeted community.



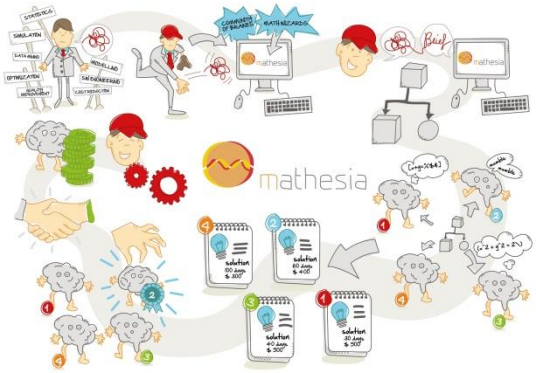
Source : Innopinion

Problem 2 – Existing crowdsolving platforms are too generic for complex mathematical problem solving. There is also a communication gap between mathematic experts and the business world.

Innovative solution 2 – Mathesia is a crowdsourcing platform dedicated to applied mathematics. Mathesia enables businesses ("Pitchers") to get solutions and ideas by means of applied mathematics, data intelligence, modelling and simulation. Mathesia also gives opportunities to mathematicians ("Brainies") to take part in serious research projects sponsored by universities, foundations or private organisations worldwide.

Mathesia facilitates the matching between Pitcher's demand and Brainies' offer by letting Pitchers post their projects through a user-friendly wizard, setting the reward in money, and Brainies work on the Pitchers' projects, providing several solutions among which the Pitchers will choose the one they judge to be the best, who will earn the reward.

Mathesia connects businesses to experts in applied mathematics.



Source: Mathesia

Problem 3 – When hiring a design firm, companies are limited to the creativity of the firm's designers (small pool), and in turn may receive unsuitable designs at high cost.

Innovative solution 3 – Crowdsite connects companies to more than 40,000 designers. Companies write their design brief, describe their wishes and the designers will compete in the design contest. Companies will then receive professional and custom designs that suit their company, and after 7 days determine the winner and receive the relevant files. The designer in turn will be awarded prize money.

Crowdsite is now Europe's biggest crowdsourcing platform for graphic design, and seeks to differentiate itself by focusing on ensuring the quality of the submissions from its design community. For example, 97% of all its design contents were successfully completed, with only 2% requesting money back for unsuccessful design campaigns – this is compared to competitors which only have a 30% project completion rate.

Crowdsite helps companies engage a community of designers through design contests.

Source: Crowdsite

Problem 4 – More and more companies are looking to engage in open innovation and launch their own dedicated competition or crowdsourcing platform - rather than relying on third party applications or websites.

Innovative solution 4 – In 2008, the founders of SkipsoLabs saw the need to connect the fragmented innovation hubs and communities around the world in a way that would allow the benefits of open innovation – i.e. finding solutions by tapping into external communities – to flourish. Initially focusing on cleantech, SkipsoLabs has expanded to include a host of other industries, and now provides a suite of turn-key software products and support services to help any private or public organization easily launch its own open innovation or crowdsourcing website and initiative.

SkipsoLabs' innovation management platforms include: SkipsoContest – to automate and streamline every step in a competition or open call; SkipsoCrowd – to source ideas from internal or external communities; SkipsoCluster – to map, profile and bring together any geographic or industrial cluster; and SkipsoMarket – enables matching of supply and demand within your innovation ecosystem.

SkipsoLabs differentiates itself from other open innovation platforms by not only providing customers with the engine for open innovation, but also linking customers to marketplaces and communities which allow for continued engagement beyond a one-off project or crowd contest.

SkipsoLabs has a number of customisable solutions that engage with crowds in different ways.

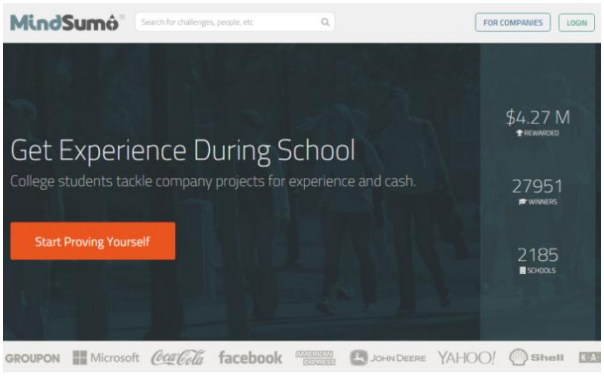
Source : SkipsoLabs

Problem 5 – Students do not have sufficient exposure to real-world corporate situations while they are still in college. A lot of their creativity and out-of-the-box thinking also goes untapped.

Innovative solution 5 – MindSumo creates the opportunity for college students to gain experience while still in school, by tackling company projects for experience, cash prizes, and career opportunities. It provides an online marketplace of mini competitions ("challenges") sponsored by companies and organizations looking for solutions to real problems. The challenges give college students a way to show off their skills and gain experience while impressing potential employers and earning money in the process, and it gives the companies access to new ideas and talent.

MindSumo is unique because of its specific focus on college students and "millennials" as its problem-solving community, as well as it offering companies not just innovative solutions, but a pipeline of talent. In turn, the students are provided with recruitment opportunities and the chance to make a strong first impression with the company of their choice. MindSumo has a wide international reach, with an active user base of over 150,000 students, and weekly user base growth of between 6-10%.

MindSumo helps students showcase their skills by tackling company-sponsored innovation projects.



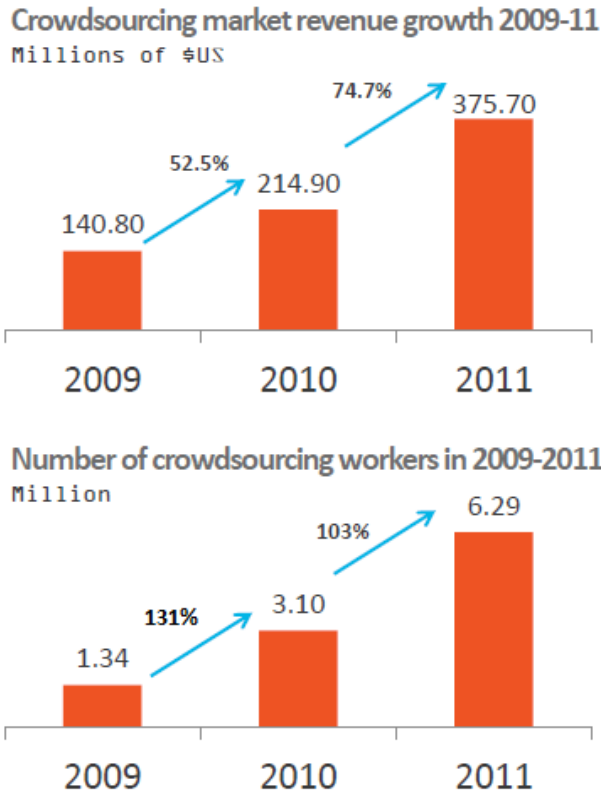
Source: MindSumo

3. Impact of crowdsolving

3.1. The market potential of Crowdsolving

The use of crowdsolving is on the rise in both the commercial and public sectors. According to research conducted by Massolution, **revenues of business-focused crowdsourcing firms grew 166% between 2009 and 2011** (see Figure 2)[12]. Internet services contributed the largest share of revenues (29%), followed by media and entertainment (20%) and the technology sector (18%), with North America and Europe collectively hosting more than 90% of crowdsourcing clients. Yano Research found that the crowdsourcing market is forecasted to increase from 4.4 billion Yen (EUR 32 million) in 2011 to 147 billion Yen (EUR 1.1 billion) in 2017, representing a staggering **3,200% growth over 6 years**.[13]

Figure 2: The market for crowdsourcing is accelerating year-on-year



Source: Massolution[14]

Massolution also found that the total number of **crowd workers** is **doubling year-on-year**, from 1.34 million in 2009 to **6.29 million in 2011**. In addition, nearly 60% of all crowd workers live in North America and Europe.

3.2. The social potential of Crowdsolving

Companies and organisations are increasingly seeing the need to **better leverage their employees and customers in order to generate new innovations as well as significant improvements to existing solutions**. By engaging crowds (often comprising of current or prospective customers), such crowdsolving solutions can also serve to generate greater commitment to the organisation's brand. In turn, these organisations need tools that allow them to automatise and scale their reach to larger crowds, while allowing them to gather detailed analysis faster and more resource-effectively. Many of these companies and organisations are also increasingly looking at developing their own crowdsolving platforms instead of using intermediaries. For example, "Connect + Develop" is Proctor and Gamble (P&G)'s program for encouraging crowdsourcing and open innovation, and has led to the company establishing more than 2,000 agreements with innovation partners worldwide [15]. While crowdsolving and open innovation approaches are gaining traction, many companies are just beginning to embark on the journey towards incorporating such approaches as a core part of their strategies.

Crowdsolving further has applications within the non-profit sector to solve societal challenges. For instance, SkipsoLabs facilitated the "GSMA mWomen Design Challenge", which invited designers, programmers and innovators of all kinds to consider the user experience of resource-poor women and reimagine a smartphone's core user interface to be more intuitive and accessible, thus potentially enabling women in developing nations to become more proficient at using mobile technologies and bridging the gender gap.

*Companies need to engage, understand and benefit from their employees, customers and partners in order to do better and more business with less effort and resources spent – in return, participants become more involved, engaged and loyal to the organisation. - **Innopinion***

Accordingly, crowdsolving has especially high relevance for governments – for instance, SkipsoLab's crowd engagement solutions not only serves to attract startups and innovations, but creates ecosystems by connecting stakeholders together, complementing offline efforts to spur innovation.

Indeed, crowdsolving solutions have the potential not only to address **individual and organisational challenges** (e.g. personal health issues or the need for a new logo), but **societal problems** as well (such as global climate change

and the cure for AIDS). It has even been used to **encourage citizen engagement** by coordinating the efforts of individuals who are looking to solve a solution in their neighbourhood, as was the case of Streetjournal.org. Streetjournal.org has spread from Perm to other major cities in Russia and carries 8,000 problems, of which more than a third have been solved since they were first posted.[16] In 2010, the White House urged US federal agencies to use challenges and prizes to crowdsource innovative approaches to government initiatives and programs.

4. Drivers and obstacles

4.1. Cost efficient solution

Crowdsolving tends to be **more cost and time effective** than traditional approaches to problem solving within organisations. Crowdsolving platforms provide the interface that allows organisations to access a great number of potential solutions to a problem in a very short time frame. Because companies and organisations can set the price and schedule for the crowd to generate a solution, while the public or targeted crowd decides if they wish to participate given the reward offered, the approach can allow companies to find innovative solutions catered to their specific budgets and time plans.

Cost savings can also be found in helping the company understand at an early stage whether a problem can in fact be solved, given the insights that the company receives from the crowd. This could prevent companies and organisations from wrongly pursuing an idea or solution, thus saving them from erroneous investments. This however has to be balanced with the cost of evaluating and analysing the numerous responses that are received from the crowd; understanding and being able to measure the impact of the collaborative economy is therefore a necessity. Solutions such as the one provided by Innopinion can help address this, by helping to gather, evaluate and rank the inputs received from a crowd in a way that makes sense to the company or organisation.

Crowd solutions help to stimulate a competitive environment where small platforms can compete with big corporations, by offering solutions available for bigger groups off customers.

4.2. Access to untapped skills

"Millennials are great at discovering new breakthrough solutions because they approach these problems without the biases that can form with decades of experience."
*- **MindSumo***

Crowdsolving creates **access to a wide range of talents**, and allows for solutions coming from an **intersection of disciplines. It helps to find solutions addressins complex social and ecological problems**. Researchers find that the more diverse the problem-solving crowd, the higher likelihood the problem would be solved, with people linking problems that are far away from their field of work with solutions that they encounter in their own work. [17]

Furthermore, solutions can come from unexpected places, **bridging the distance that normally separates talent from other parts of the world**. For instance, the solution for a challenge posted by US' Air Force Research Laboratory came from a mechanical engineer in Lima, Peru.[18] As such, crowdsolving has the potential of disrupting and transforming the way services are delivered. Innopinion sees itself providing an alternative and strong solution in the online survey market, which is currently worth more than EUR 1.8 billion, and one of Innopinion's competitors, Idescale, has a three-year growth of almost 1000%. Crowdsite believes that less than 1% of design solutions in the graphic design market are being generated by crowds, indicating a tremendous space for growth.

"(One of our early partners) saw a lot of amazing talent in Mexico and other countries that were not part of the equation, and he asked, 'Why don't we try to reach out to these talents given the amazing technology and network we have now available?'"
*- **SkipsoLabs***

4.3. An innovative, collaborative and community approach to service delivery

Though the concept of crowdsolving is still not well known in the industry, which creates the challenge of accessing the market, the market is growing – **companies are becoming increasingly innovative and willing to try new things**. In particular, SMEs seem more inclined towards flexible and innovative solutions such as crowdsolving, while bigger companies are making the shift as well. For Crowdsite, most of its client base is made up of startups, as well as schools and governments, which indicates the potential for crowdsolving solutions in the public sector.

In the same vein, companies have been **building their businesses based on trial-and-error**, given that their business model was based on an entirely new concept. There is a **continued learning process** in identifying the right

business / monetisation models, while keeping up with **emerging technological platforms** such as Big Data, analytics, and the Internet of Things, which are seen as adjacent to crowdsolving solutions, but currently not at the core. At the same time, **tools for development, design and collaboration** are becoming more powerful while increasingly cheaper and easier to use.

"If we have to do a lot of administration for 10,000 EUR, it's not worth it."
*- **Crowdsite***

Sharing is not new but the Internet has allowed people to connect with each other and to coordinate their activities. The **Internet and related social and mobile technologies** have served to facilitate, expand and accelerate the interactions behind crowdsolving, by **encouraging attitudes towards digital sharing and collaboration**. Companies are also focused on **building communities** – i.e. the "crowd" which they have access to. Social media and community platforms are particularly important in the **marketing efforts** of these crowdsolving firms – advertising tends to be informal and via word-of-mouth, so good customer reviews and reputation of service and product quality are considered important to these firms. At the same time, some are considering investing in traditional advertising to promote their companies, especially outside of the countries where their companies are based.

4.4. Funding linked to raising awareness and competitiveness

"We have to go to the States to get large investments to have the same kind of marketing budget as our competitors in the States. In Europe we could raise about 1-2 million, and that's not enough for us to become a worldwide player."
*- **Crowdsite***

Given the need to educate and raise awareness of crowdsolving approaches to accelerate market absorption, companies view marketing and client education as an important part of their business. European startups were however concerned that they were **not able to spend as much on marketing as compared to their US counterparts**, which they viewed as having easier access to higher amounts of venture capital (VC) funding.

At the same time, some founders also **did not want to relinquish ownership and control of the companies** in order to obtain funding. One refused funding from an incubator because the incubator wanted to take 8% of the company's shares – which the founder felt was too much for an incubator. Tom Laine, the founder of Innopinion who has started over eight companies since 1999, has purposely kept overheads for Innopinion extremely low so that it can remain lean, small and flexible, thus ensuring that the company remains in control of the founders by not needing to relinquish control to outside investors.

This perspective has led some companies to avoid getting VC investment, and instead seek for public funding – but that has its own issues. Many feel that accessing public funding and grants is too onerous and the duty on reporting is too high for startups. For those who attempted to apply for EU funding, they viewed the process as **complex and paperwork-heavy**, and when their request for funding was denied, they weren't given clear or transparent feedback as to why their proposal was declined. In addition, some view that public funding tends primarily to go towards the development of a product, while there is also a need to fund marketing efforts in order for the product or solution to be actually absorbed and taken up by the market.

This avoidance of VC funding is not universal, however. **Some companies would consider seeking for VC finance and investors in order to scale up and finance promotion activities**, though one has not seen the need to thus far given that the self-funded company has thus far been profitable. Finding funding between early and mature stage funding is therefore difficult but necessary, especially since companies from the sector often need more time to gain competitiveness and grow.

Aside from financing, some companies are concerned about the **lack of skills in furthering marketing efforts** of crowdsolving solutions, since their founders tended to come from engineering backgrounds.

4.5. The local context is important

The perspectives towards operating in Europe seem to be a mixed bag. Although compared to the US, entry and failure costs in the EU are quite high, some European startups believe that there is an **advantage for European companies in terms of the EU market. Indeed,** local clients seem to prefer working with EU companies as opposed to US companies, with more trust in EU companies to deliver on quality, as well as EU companies being closer to home. For Crowdsite, 95% of its revenues comes from Europe (namely the Netherlands, Germany, Switzerland and Austria). It is thus focusing its expansion within Europe, and plans to open new offices in Germany, France and Italy.

From the newcomers' point of view laws in Europe are designed for traditional players and are a barrier for crowdfunding platforms.

Many companies point out that the lack of real Single Market is the major obstacle in their growth. F**ragmented local markets** within Europe, with different languages, financial and legal regimes (e.g. insurance, licensing, liability, taxation) make it more difficult to scale up or operate cross-border (e.g. crowdfunding regulation differs from one country to another, which implies a high cost of starting operation in other Member States).

These differences can also be an advantage for the European companies which may be more familiar with the European business landscape than their foreign counterparts.

Europe seems to have an advantage in terms of **talent** as well– some believe that it's cheaper to get talent in Europe than in Silicon Valley, where the competition for talent is much higher in the latter, driving up compensation levels.

In any case, most recognise that there are international opportunities for crowdsolving, and would also like to see **support for internationalisation efforts**, especially when crowdsolving solutions for citizen engagement are being explored in public sector organisations outside of Europe. For instance, Innopinion is seeing a lot of demand from South-East Asia, but are facing cultural challenges and language barriers in accessing the local markets there.

4.6. Confidentiality and intellectual property

Given that crowdsolving involves broadcasting a specific problem to a wide audience, there may be confidentiality concerns when it comes to the **use of sensitive company-specific information and data that is needed to frame the problem** in a way that would garner the desired solutions. There is thus a difficult balance to be struck in sharing enough information to generate solutions that are on target and actionable, while retaining information that might erode the competitiveness of the company in question.

Companies such as Mathesia have addressed such confidentiality concerns by requiring crowd participants to sign a non-disclosure agreement before they get access to a detailed project brief. Such approaches work when the crowd is known, as in the case of Mathesia which require crowd participants, i.e. math experts, to be registered first, and thus providing the framework for accountability. When the identity of the crowd is unknown and anonymous, enforcing non-disclosure agreements become difficult. Another way of enhancing confidentially is allowing companies to be anonymous when they post their challenge (as in the case of MindSumo and Mathesia), so that the challenge and related released information cannot be tied to a specific company.

There are also **intellectual property (IP) concerns** at play.[19] Most crowdsolving platforms state that the company or organisation who posts the problem will get the IP for the winning solution. However, what about the other solutions who were submitted and rejected? The **company has to ensure that none of its future works infringe on any of the rejected solutions**, otherwise it might risk being sued for infringement. Given that there can be scores of contributions for each crowdsolving campaign, this might create an unmanageable situation for the company. MindSumo addresses this by stating clearly in its terms and conditions that the IP of all submissions, regardless of whether they are chosen or otherwise, belong to the problem-originating company. In return, the submitters, whether they win or otherwise, get the opportunity to win cash prizes from the community and network with companies for job opportunities.

In addition, even when the rules of engagement clearly state that the problem-originating company or organisation owns the right to the winning solution, the end result may not be as clearcut as hoped. For instance, in some European countries, all inventions by a university's teaching and research staff belongs to the university instead of the individual.

"We worked very extensively with our legal team to draft the terms and conditions in order to make it as safe and transparent as possible for the companies receiving solutions, and the students who are submitting them"
*- **MindSumo***

Some companies also have it included in employment contracts that any ideas generated by its employees belong to the company and not to the employee. In these situations **where the submitter does not him/herself own the IP rights to his/her ideas**, it may become impractical or impossible to transfer the IP for the winning solution to the problem-originating company. The fallout gets magnified if such situations are not brought to light at an early stage, and the solution is used by a company to develop a product that is launched into the market – the legal implications and potential liabilities can be tremendous. To reduce the likelihood of such situations happening, MindSumo's terms and conditions state that the submitter must be the sole owner of the IP of his/her submissions and possesses the full authority to transfer the IP to another party.

5. Policy recommendations

Crowdsolving startups need support and resources to be able to shape and develop their business models as well as raise awareness in a relatively new field of industry. Purpose and value are therefore essential to the success of startups within the collaborative economy.

5.1. Funding marketing efforts

"The funding is there – there maybe just needs to be more transparency, clearer rules of engagement, simplification especially on the process side. The funds are being allocated, that's great. The key is allocating funds to the right things".
*- **SkipsoLabs***

European crowdsolving companies would like to **see rules and regulations made simpler, with increased transparency and clarity in the process, and clearer rules of engagement.** These startups see themselves as being too small to access EU funding, and procedures to get subsidies are too complex, involving prohibitively large amounts of paperwork. **They prefer to focus on growing the company**, building the product and strengthening the business model, **as opposed to spending time on "administrative work"**. These companies also say that because the field is still relatively new, they need to remain flexible in order to test out different business and revenue generating models, and thus cannot make a fixed plan for the next five years, as generally required in order to apply for public funding. Some would consider **applying for public funding more if such opportunities could be identified earlier**.

The startups would also prefer more clarity and transparency in the way that funds are allocated, as well as the **funds being made available to more startups**, albeit in smaller amounts per company, in order to more easily fund efforts in shaping a sustainable business model in a relatively new field. This would also serve to let the market reveal the next success story, as opposed to having public officers pick winners.

"(Public officials should) give a little money to more organisations and believe that there will be one or two that will become the global bluechips and billion dollar organisations rather than trying to find (the successes) themselves."
*– **Innopinion***

More importantly, European crowdsolving companies have indicated that one of their biggest challenges is in raising awareness of their products and solutions outside of their local markets, and would appreciate marketing support in helping them become more globally competitive. As such, the **provision of public funding and financing support for marketing activities** could be a concrete way of supporting these companies. Policy makers should also be more active in raising the awareness about the possible benefits and opportunities related to crowdsolving, both among citizens and businesses

5.2. Government as "first buyer" and "door opener"

Public sector organisations and government agencies could act as a "first buyer" by using crowdsolving platforms to engage with citizens and hence raise awareness and appetite for such solutions. For example, ChallengePost was selected by the US General Services Administration (GSA) to act as a platform for hosting challenges. ChallengePost has more than 200,000 users and has run more than 100 challenges as of June 2012, including New York City's BigApps and Apps for Healthy Kids with the U.S. Department of Agriculture and first lady Michelle Obama. As the CEO of ChallengePost noted, such crowdsolving platforms can quickly and affordably provide the government with innovative solutions, concepts and ideas, thus increasing efficiency in government which in turn benefits citizens.[20] It thus can act as a win-win – by benefiting government and citizens, as well as improving the climate and uptake of crowdsolving approaches to problem-solving. For this to happen, crowdsolving startups would like to have easier access to government and public sector entities through the lowering of red tape and other bureaucratic barriers.

European crowdsolving startups have also indicated that they would appreciate increased **government support in internationalisation efforts**, for example by having access to overseas embassies and official government contacts in order to "open doors" into new overseas markets. This is especially crucial if crowdsolving solutions are to experience an increased uptake by public sector and governmental organisations internationally, as Innopinion is experiencing in South-East Asia.

*"We see government as an area where there is a lot of potential to do larger, more society-focused challenges." – **MindSumo***

5.3. Educate on IP and taxation issues

To protect both the companies and individuals involved in crowdsolving, **issues surrounding the ownership of IP in any materials submitted through a crowdsolving project should be clearly articulated**. Ideally, the problem-originating company should make sure to obtain a full grant of rights, including the right to sue for infringement, in relation to submitted works from a crowdsolving project.

Alternatively, if ownership of a solution from a crowdsolving project is less of a concern, the company may consider taking a broad license from the submitter under some circumstances. Provisions should be made clear that confidential submissions, or submissions containing third party propriety information, should not be accepted. All parties also need to be made aware of third party ownership issues that may arise depending on the jurisdiction of the submitting party.

Another issue to consider is that contributors are generally considered contractors as opposed to employees, and thus the IP rights to their contributions would be owned by the contributors themselves unless the contract provides to the contrary. This dimension must also consider other foreign legal provisions which come into play when the contributing crowd is dispersed internationally. Further, with crowdsolving projects, companies must explore whether insurance can cover liability or the full extent of potential damages for an infringement claim. In addition, both crowdsolving platforms as well as problem-originating companies must determine whether third-party website terms of use apply to the crowdsolving method, if these sites, such as Facebook and Twitter, are used to interact with contributors.

The risk of infringement can also be addressed by creating barriers between the problem-originating company's IP and the responses generated through crowdsolving. This can be done by putting in place procedures that ensure only limited individuals have access to submissions. If a third party is being used to supply the crowdsolving environment, an option is to have all submissions retained on the third-party server, with only a limited number of staff having access to all the responses for the initial review. With this approach, a significant portion of submissions will be reviewed and discarded by a small group of people. By retaining a record of who was involved at each stage, future claims can be met with a clear statement of which submissions were reviewed by which staff. In turn, staff training is important to ensure that employees understand the potential consequences of misusing crowdsolved ideas and solutions. Those responsible for reviewing responses (involving the problem-originating company and the crowdsolving platform that may offer such support) should be aware of the risks involved and that submissions remain the property of third parties until purchased by the business. By the same token, the crowd should be asked to acknowledge, as part of submitting their responses, that the business has its own development pipeline and may have developed independently (or may in the future develop independently) something similar to their work.[21] Thus, sharing economy companies need to act responsibly, set solid standards and stay within the legal context.

The **taxation of cash received** arising from the issuance of prizes to an individual in return for a winning idea is another related issue that should be highlighted to individuals engaging in crowdsolving, especially given the international reach of crowdsolving platforms across different tax regimes. Here, incubators and accelerators can play a role in educating startups on such legal and taxation issues.

6. Appendix

6.1. Interviews

Company	Interviewee	Position
Crowdsite	Roel Masselink	Founder
Innopinion	Tom Laine	CEO and founder
Mathesia	Luca Prati	CEO
MindSumo	Keaton Swett	President
SkipsoLabs	Carlo Soresina	Co-founder

6.2. Websites

Company	Web address
Crowdsite	www.crowdsite.com
Innopinion	www.innopinion.com
Mathesia	www.mathesia.com
MindSumo	www.mindsumo.com
SkipsoLabs	www.skipsolabs.com

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