Environment and Climate Change Canada
Environnement et Changement climatique Canada
Canada

INTERNATIONAL BENCHMARKING STUDY

CHALLENGE-SOLVING CROWDSOURCING PLATFORMS

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The conclusions and recommendations contained within this report are those of the consultant, Jesse Goldhammer, PhD.

Cat. No.: En4-310/2017E-PDF
ISBN: 978-0-660-09446-5

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May 2017

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Executive Summary

The purpose of this benchmark study is to provide the Government of Canada (GoC) with an assessment of the current global state of *reward-based crowdsourcing platforms* for Science and Technology (S&T) related challenges. Since the early 2000s, crowdsourcing has become a critical open innovation method widely used by public and private sector organizations. The term "crowdsource" is a portmanteau of the terms "crowd" and "outsource" and broadly refers to the notion that working with people outside one's organization can be a highly valuable source of ideas, expertise, and insight for solving a wide variety of problems. Dozens of private sector, online-based software platforms now offer crowdsourcing services to customers that aspire to innovate either with the help of external crowds or by harnessing the skills and ingenuity of their own employees. Organizations with S&T missions have enthusiastically embraced reward-based crowdsourcing because it allows them to only pay for viable solutions. This study offers a detailed evaluation of 26 platforms that support S&T challenges, including a technical discussion, industry assessment, and strategic considerations.

The reward-based crowdsourcing platform industry is comprised mainly of North American and European small businesses that offer software tools in support of advisory services for crowdsource-based challenge design, management, and execution. These platforms cluster into four general groups: (1) public good challenges, often addressing social or environmental problems; (2) highly specialized technical domains, such as data science, additive manufacturing, and coding; (3) technology scouting, research and development (R&D), and patent research, and; (4) generalist crowdsourcing, including idea and innovation management tools, often for large enterprises. This industry is growing incrementally, often because talent from more established platforms spin out to start their own companies or because emerging technologies create new crowdsourcing opportunities. Unlike more traditional technology companies, reward-based crowdsourcing platforms do not scale massively, because they provide a niche service that often still requires complementary advisory services from experienced consultants.

Given the state of the reward-based crowdsourcing industry, the GoC may wish to develop a portfolio approach to crowdsourcing, which requires working with several platforms simultaneously and making a set of strategic choices about how best to leverage these platforms to achieve GoC goals. To manage risk while simultaneously building a culture of innovation inside GoC departments, the GoC may first consider internal crowdsourcing with platforms that enable departments to solve critical problems by accessing and engaging their own employees. In this way, GoC departments can build their own teams of crowdsourcing experts who can later work with platforms that support external crowdsourcing with a focus on crowds of Canadian citizens or individuals from other parts of the world. This portfolio approach can also help the GoC to determine what types of platform software solutions, such as software-as-a-service (SaaS) or on premise installations, may best serve GoC departments within the Canadian legal and policy context. Finally, a portfolio approach may enable the GoC to conduct different types of crowdsourcing at the greatest value-for-money without having to know in advance what kinds of future crowdsourcing needs it may have. By working with several different platforms that provide distinct but complementary services, the GoC may enhance the flexibility to innovate across departments with different missions and needs.

1 Introduction

The purpose of this open innovation benchmarking study is to provide the Government of Canada (GoC) with an assessment of the current global state of *reward-based crowdsourcing* for scientific and technical (S&T) challenges. The report looks at private sector mechanisms aimed not only at engaging curated crowds external to organizations but also those that have been developed to facilitate collaboration within and/or between organizations. It is intended that the information provided by the study will allow relevant GoC departments to better understand the nature and value of this novel approach to innovation management and to consider its adoption in order to more effectively and efficiently fulfill their public service mandates.

Private sector online-based platforms (hereafter "platforms") are the mechanisms by which crowdsourcing takes place and may be employed to solve some of the GoC's most vexing S&T-related challenges. Such platforms may also be used to promote an internal organizational culture of innovation, to engage Canadians, and to incentivize citizens around the world to assist the GoC in the performance of its duties. However, because crowdsourcing is a relatively new phenomenon, these platforms are developing within an era of ferment and are thus proliferating to the point where it is difficult to know what services are currently available. It is also challenging to evaluate how the platform industry itself is evolving and shaping the kinds of services to which the GoC may avail itself in the near future. This study therefore aims to address these issues by providing a detailed understanding of the platforms that currently serve the market, how they are differentiated, and to provoke relevant questions related to foreseeable administrative, legal, and technical requirements that the GoC may need to address if they are to engage these platforms.

Generally speaking, the platforms in this study offer a software tool that supports the advisory services of crowdsource-based challenge design, management, and execution. While this study offers baseline information on existing private sector crowdsourcing and related collaborative platforms for GoC procurement consideration, it cannot substitute for detailed follow-up and assessment of individual platforms. Selection of the right platform will require departments to achieve clarity about their own challenge goals and priorities, the existence and nature of relevant crowdsourcing platforms, and the policy, legal, administrative, and financial context within which they operate. The same is true for selection of the right crowd (i.e., their own employees, other GoC departments, international organizations, Canadian citizens, citizens of other countries). This study is therefore designed to provide necessary background knowledge for GoC representatives to be able to pose the right questions when pursuing a crowdsourcing-related agenda.

2 Research Methodology

The platforms selected in this study have headquarters either in Western Europe and North America. Most serve primarily corporate customers around the world, but some specialize in services for governments and nonprofits (i.e., mission-driven organizations). The information presented in this study comes from Internet research and interviews with platform representatives. Both information sources are rich but incomplete, as platform websites and reviews typically exclude key data – such as cost – and some platforms did not respond to multiple interview requests. The author attempted to identify as many platforms as possible that met the criteria of accessibility, reward-based, and S&T-focused, though others may exist.

This study presents all of this data using a template format in Sections 4 and 5, which feature 26 different platforms. Readers are encouraged to start with Section 3 which is a technical discussion that provides context for and analysis of the platform information included in the templates. Despite some data patchiness, there is a relatively coherent platform landscape that helpfully serves to structure this study. This landscape has two major features:

1. Platforms that do and do not support reward-based challenges; and

2. Platforms that do and do not provide access to pre-curated crowds.

Because this study focuses on challenge-solving crowdsourcing, all of the platforms featured in Sections 4 and 5 offer variations on this service. Platforms reviewed for this study that do not offer reward-based challenge platform services *per se* are included in Appendix 8.1 though some do offer general collaborative platforms for internal organizational use.

Crowd curation is slightly more complex. On one end of the spectrum, there are platforms that actively build and curate external crowds of highly specialized experts, such as individuals with data science experience or design backgrounds. These platforms are featured in Section 4 "Platforms with Curated Crowds." On the other end of the spectrum, instead of offering their customers access to an already-curated crowd, some platforms provide a crowd-building service which involves either working with crowds that are already affiliated with a customer, (such as its employees, partners, or consumers), or working with each customer to attract, engage, and reward a new group of individuals who have had no previous relationship to the platform or even to the customer. These platforms are featured in Section 5 "Platforms with DIY Crowds." Many platforms in Section 4 can also help their customers to engage internal crowds.

3 Technical Discussion

The discussion below includes detailed insights about the platforms analyzed in this report. Readers are encouraged to review this technical discussion before turning to Sections 4 and 5, which feature 26 templates, each of which describes the distinguishing features of a particular platform.

3.1 OPEN INNOVATION AND CROWDSOURCING PLATFORMS

The phrase "open innovation" is widely used in industry and academia to describe various tools and approaches that enable the harnessing of ideas, expertise, and resources from those outside an organization to solve a problem or achieve a particular goal.

Coined in the early 2000s, crowdsourcing is a portmanteau for "crowd" and "outsource" and often used synonymously with open innovation, though with a greater focus on discrete projects. It describes the practice of obtaining information or contributions to a project by enlisting the services of a large number of people who typically reside outside the organization that is conducting the project. Platforms are essentially software that facilitates crowdsourcing by making it as easy to build, manage, engage, and reward members of crowds. At the time of writing at least 62 crowdsourcing platforms were identified. This study focuses on a subset of these platforms that support reward-based challenges.

Of the many crowdsourcing methods available, such a crowdfunding or microtasking [1], challenge-solving is one of the oldest, most effective, and most popular [2]. Challenges involve incenting a crowd to solve a problem and then paying a prize purse only for winning solutions. There are now many different types of challenges and incentives that platforms support [3]. Public, private, and philanthropic organizations have all used challenges successfully. Indeed, the United States government in general, and the National Aeronautics and Space Administration (NASA) as well as the Defense Advanced Research Projects Agency (DARPA) in particular, have been among the earliest adopters of challenges for public sector open innovation.

Despite the fact that the phrase "open innovation" was coined only in 2003 and "crowdsourcing" in 2005 by Henry Chesbrough and Jeff Howe, respectively, these concepts have come to describe a wide array of services offered by a growing number of platforms [4]. No matter whether they specialize in advisory services, technologies, or some combination of the two, most of these platforms operate in a marketplace that can be broadly defined as innovation management.

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1 Crowdfunding involves funding a project or venture with small amounts of money from a very large number of people. Similarly, microtasking is the process of splitting a large job into small tasks that can be distributed to many people, usually over the Internet.

2 The Longitude Prize, offered by the British Government in 1714 to develop a simple and precise method for determining longitude at sea, is typically cited as one of the first examples of using challenge-solving crowdsourcing. (See https://en.wikipedia.org/wiki/Longitude_rewards [accessed 3/27/17])

3 For additional information on challenge types, please see McKinsey and Company's "And the winner is…" as well as Deloitte's "The Craft of Incentive Prize Design."

4 See Henry Chesbrough's blog on Forbes as well as Jeff Howe's seminal article in Wired. (accessed 4/7/17)

That is, these platforms help other organizations to adapt and change, sometimes internally (i.e., organizationally and culturally), sometimes externally (i.e., new markets, products, and services), and sometimes both.

Within the innovation management marketplace, there is a subset of platforms that focus uniquely on public good challenges, which often address social or environmental problems. These include XPrize, OpenIdeo, CMNTY, and We Thinq. These platforms are mission-driven and seek to improve the human condition. A related set of platforms, including HeroX, InnoCentive, Common Pool, and Skild, also focus on reward-based challenges but cater to a broader set of for- and non-profit customers.

There is a second group of platforms that embrace open innovation and crowdsourcing, but do so in highly specialized technical domains, such as data science (Kaggle), additive manufacturing (GrabCAD) and software coding (TopCoder). These platforms and others that feature less technical (and more creative) specialties, such as graphic design, marketing, and videography, are essentially gamified and competition-oriented resources for outsourcing.

A third group of platforms, such as Yet2, Presans, and Patexia, occupy a highly specialized market niche that involves technology scouting, research and development (R&D), and patent research. They help customers to identify and acquire existing sophisticated technologies, typically with the help of a large network of scientists and technical experts.

Finally, there's a fourth group of platforms that fill a generalist niche, providing idea and innovation management tools, often for large enterprises. Companies such as IdeaConnection, NineSigma, Idea Drop, Ideascale, Spigit, and Wazoku work with customers to build innovation programs, often concentrating on the generation of new ideas and the innovative processes required to implement them.

Two critical features unite all of these platforms and explain why they are included in this report: they all use prizes, competitions, and contests (hereafter: challenges) for open innovation and expert crowd curation. Challenges are well-understood mechanisms for incenting individuals and teams to work on a wide range of difficult technical and non-technical problems that are amenable to solution by outsiders [5]. These mechanisms are often characterized by a "pay for success" feature, according to which participants are paid for their efforts only after they fulfill the criteria for winning. There are myriad types of prizes, competitions, and contests, which are most commonly distinguished by the goals they are trying to achieve. To underscore this point, there is a significant difference between a prize for generating good ideas that will help to increase the efficiency of a corporation's supply chain and one that rewards the development of a breakthrough technology for space travel.

This report highlights platforms that enable customers to host challenges with varying degrees of autonomy. A minority of the platforms discussed below offer nothing but challenge-related services, including hosting. Most, however, feature challenge services as part of a larger open innovation and crowdsourcing offer.

5 The following basic insight underlies all challenges: no matter how large or expert any organization may be, the lion's share of knowledge, creativity, and insight always lies outside, dispersed among millions of people who can be incented to help the organization solve its fundamental problems.

Crowd curation is the other common feature of all of the platforms discussed in this report. Roughly half of these companies and organizations curate very large expert networks, which serve as a major point of differentiation for their services. In some cases, these crowds are highly specialized and uniform, such as Kaggle's data scientists. In other cases, they are heterogeneous, as illustrated by InnoCentive, which boasts access to a broad network of nearly 400,000 professionals and academics. The other half of the platforms examined below offer their customers a do-it-yourself (DIY) network building services. These platforms work with their customers to identify the kinds of experts needed for an open innovation or crowdsourcing projects and then build an *ad hoc* network to meet those needs. There are also a small number of platforms that have designed their software to provide customers with self-service challenge hosting and crowd curation functions, expecting that their customers will bring their own internal crowd - often employees, partners, and consumers.

3.2 PLATFORM TYPES

This report distinguishes between four different platform types and identifies their major areas of specialization. Platform types describe the underlying infrastructure and physical location of the software (Software-as-a-Service" vs. "on premise") as well as how customers can use that software ("Internal" vs. "External" to their organizations) for collaboration. Specialization refers to the areas of focus and expertise (i.e., ideation, S&T, design/build, software/coding, data science, and patent/IP) featured by particular platforms. The platform type and specialization categories included below will assist the GoC in matching platforms to specific organizational needs. Please see Figures 1 and 2 below for a quick reference.

Software-as-a-Service (SaaS) Platforms. SaaS platforms are the most common software-based product on the market. All such platforms featured in this report work with cloud service providers, such as Amazon, Microsoft, Google or IBM, which provide the backend, elastic computational infrastructure, virtual machines, and applications required to offer always-available online open innovation tools and services. In other words, SaaS-based platforms use a third-party computational infrastructure to provide open innovation services, which means that all applications, data storage, and processing takes place outside the customer's network. For most commercial needs, cloud services are widely considered to be more reliable, efficient, and secure than on-premise servers. In some cases, platforms strike partnerships with other SaaS-based application companies, such as Microsoft 365, allowing customers to benefit from highly integrated business applications. Despite the fact that SaaS-based applications store data in privately owned servers and sometimes outside of national boundaries, some governments prefer them because they are highly efficient and secure. For example, NASA's Center of Excellence for Collaborative Innovation uses a SaaS-based platform to run its NASA@work[6] program.

6 An agency-wide, virtual platform that seeks to increase innovation by fostering collaboration within the NASA community through the contribution of interactive discussions and the submission of solutions to posted challenges.

On-Premise Platforms (On prem). On-prem installations are typically offered by only the largest platforms and are becoming increasingly rare because they are costly and complex. It is difficult to estimate the upfront cost of on-prem installations, because there are many variables to consider, including a customer's existing hardware and software, network configuration, use cases, number of users, etc. Rather than support on-prem installations, many platforms will suggest that customers buy a "white-labeled" version of their platform. White labeling means that, when the platform's customer's employees access the platform (via SaaS or on-prem), it will be configured with a look and feel that mimics the internal websites available on the customer's network.

Internal Collaboration. Many of the platforms included in this study provide support for internal collaboration, which means that they offer a range of open innovation and crowdsourcing tools for their customers' employees. The rationale for internal collaboration is straightforward: organizations hope to innovate by tapping into their employees' ideas and insights. At a high level, these platforms provide innovation management functionality for building crowds, curating ideas, fostering communication, executing challenges, facilitating workflows, analyzing collaboration, and measuring impact.

Internal crowdsourcing platforms typically provide a laundry list of different types of features and controls. The names and specific functions of these attributes vary widely from one platform to the next. Many of the platforms reviewed in this study do not offer full public feature listings, as they strongly prefer to provide prospective customers with live demos. For a robust public example, however, see Skild's features and InnoCentive@work's datasheet.

External Collaboration. Most of the platforms reviewed below also support external collaboration, meaning they offer their customers tools to undertake open innovation with individuals outside their organizations. These tools and their underlying features and controls are generally the same as the ones that platforms offer for internal collaboration. The major distinction is the crowd and some complementary services, such as legal support. When organizations use platforms to engage the public for open innovation, they often need to carefully specify the terms and conditions for participation in ways that are distinct from internal collaboration requirements. While all of the platforms that support internal collaboration also support external, some of the platforms that facilitate external collaboration do not at the same time offer internal collaboration services.

Specializations. Platforms fall along a specialization spectrum, from generalists to specialists. Many generalist platforms, perhaps best illustrated by Idea Drop, MindSumo, and OpenIdeo challenges, tend to cluster around support for ideation, which includes generating, managing, refining, and rewarding good ideas. Some generalist platforms, however, also allow their customers to focus on a broad set of technical domains, as illustrated by InnoCentive's contests. In contrast, specialist platforms tend to focus in one technical area or type of investigation:

- **S&T Research** – Highly complex technical and scientific problems that are typically addressed by academics, corporate labs, and government researchers. This category also includes basic R&D problems that can span a wide range of sub-specializations, from material and food science to astrophysics and fluid dynamics. For example, see Hypios-CI's challenges.

- **Design/Build** – Highly complex engineering challenges, including prototyping, often involving the identification of new designs for known problems. For example, see GrabCAD's contests.

- **Software/Coding** – Moderate complexity app development, front-end, back-end, database, and algorithm-oriented problems. For example, see TopCoder's crowdsourcing projects.

- **Data Science** – Moderate to high difficulty machine learning, modeling, algorithm, and AI challenges. For example, see Kaggle's competitions.

- **Patent/IP** – Highly complex, often narrowly technical patent challenges and technology scouting. For example, see Patexia's contests and Yet2's active projects.

REWARD-BASED PLATFORMS WITH CURATED CROWDS								
PLATFORMS	**INTERNAL**	**EXTERNAL**	**GENERALIST IDEATION**	**S&T RESEARCH**	**DESIGN/ BUILD**	**SOFTWARE/ CODING**	**DATA SCIENCE**	**PATENT/IP**
Battle of Concepts		■	■		■			
GRABCAD		■			■	■		
heroX	■	■	■	■	■			
hypios		■		■	■			
ideaCONNECTION	■	■	■	■	■		■	
INNOCENTIVE	■	■	■	■	■		■	
kaggle	■	■					■	
MindSumo		■	■		■	■		
NineSigma	■	■	■		■		■	
open IDEO		■	■					
Patexia		■	■	■	■			■
Presans		■	■	■	■			
topcoder		■	■			■	■	
yet2		■		■	■			■

Figure 1: Reward-based platforms with curated crowds

REWARD-BASED PLATFORMS WITH DIY CROWDS								
PLATFORMS	INTERNAL	EXTERNAL	GENERALIST IDEATION	S&T RESEARCH	DESIGN/ BUILD	SOFTWARE/ CODING	DATA SCIENCE	PATENT/IP
Common Pool		■	■	■	■	■	■	
CMNTY	■	■	■					
IDEADROP	■	■	■					
ideaken collaborate to innovate	■	■	■	■	■			
ideascale	■	■	■	■				
LUMINARY LABS		■		■	■			
IdeaEngine	■	■	■					
Skild	■	■	■	■	■			
SPIGIT	■	■	■					
wazoku	■	■	■					
WE THINQ	■	■	■					
XPRIZE		■	■	■	■			

Figure 2: Reward-based platforms with DIY crowds

Platform specializations are not rigid categories. Just because a platform may not have a strong track record in a particular area of specialization does not mean that it is ill equipped to support internal or external collaboration in that domain.

3.3 PLATFORM CROWDS

It is difficult to ascertain from company websites or even interviews how accurate or useful the aggregate crowd estimates actually are. Some platforms claim to have millions of experts, but they rarely explain how many are active, have participated in previous challenges, or have been successful. More importantly, given the diversity of customers served by these platforms, and given the diversity of challenges that these customers seek to solve, it is almost certainly the case that even the pre-curated crowds cannot provide all of the expertise that is required for any given challenge. All platforms must do some measure of *ad hoc* expert identification and crowd curation.

This report distinguishes between platforms that do and do not curate crowds, with Section 4 focused on the former and Section 5 on the latter. For procurement purposes, this distinction highlights whether the platform is able to offer its customers the assistance of experts for external collaboration. For instance, a platform like InnoCentive offers a service called InnoCentive@work to its customers for internal collaboration, including the ability to execute challenges in which only customer employees participate. Using the same platform, customers can also launch external collaboration challenges designed to engage InnoCentive's curated crowd and/or the public. Here's an example of an external challenge that InnoCentive runs on behalf of NASA.

For customers who wish to engage in open innovation and crowdsourcing and do not bring their own crowd (i.e., their own employees, partners or customers), crowd curation processes become critically important. How much time and effort does the platform expend to help its customers build, engage, and deploy crowds to solve their challenges? At one end of the spectrum, some platforms assume that all this work should be done by customers themselves. At the other end of the spectrum, perhaps best illustrated by IdeaConnection, the company hand selects crowds, facilitates their working together and manages their productivity, so that their solutions have the highest likelihood of meeting customers' needs. It is a significant amount of work to find and incent the right experts to crowdsource a solution for a company that, in some cases, may want its identity

CROWD SIZE STATISTICS FOR REWARD-BASED PLATFORMS WITH CURATED CROWDS

PLATFORMS	CROWD SIZE
Battle of Concepts	Unknown
GrabCAD	3.25M engineers
HeroX	Unknown
Hypios	950K – highly diverse
IdeaConnection	15K – highly diverse
InnoCentive	375K – highly diverse
Kaggle	800K – data scientists
MindSumo	250K (100K active) – highly diverse
NineSigma	2M – highly diverse
OpenIDEO	100K – highly diverse in 200 countries
Patexia	Unknown
Presans	5M – highly diverse
TopCoder	1M – software engineers, coders
Yet2	150K – marketplace users

Figure 3: Crowd Size Statistics for Reward-Based Platforms with Curated Crowds

to remain anonymous. Unless the GoC intends to build these types of capabilities in-house (i.e., crowd curation and management), it is advisable to work with a platform that does this well.

For GoC departments, there may also be important legal or ethical issues that arise when considering different ways to engage crowds. For instance, some platforms offer mediated access to external crowds. In this case, a departmental employee would not interact or communicate directly with external experts or teams. Rather, the departmental employee simply places the organization's challenge on the platform, but leaves crowd communications and engagement to the platform's employees. In other cases, however, platforms provide their customers with the unmediated ability to interact and communication with crowds. This more self-service model of engagement puts the departmental employee in the role of directly managing how the crowd engages the challenge. Finally, many full-service platforms offer their customers both of these types of crowd engagement (mediated and unmediated) as well as variations on those models. Any GoC contract for platform services will need to clarify the types of crowd engagement that are permitted by assessing any pertinent legal, policy, or ethical considerations.

Mediated or unmediated crowd engagement raises one additional complexity that merits consideration: whether the software used to engage those crowds sits on a government-owned server inside a government building or on a platform's externally-hosted cloud server. In the former case, which is commonly labeled an "on-prem installation," the software that the departmental employee is using to engage the crowd sits inside the organization's firewall on the organization's computers. In many of these cases, agencies that choose on-prem platforms use them to facilitate challenges among authenticated government employees. But, even an on-prem platform installation could be used to engage an external crowd in a mediated or unmediated fashion, depending upon the platform's services.

Similarly, in the latter case, which is called SaaS, the software that the department employee is accessing to engage the crowd sits on commercial cloud servers rented by the platform. The department employee accesses this software the same way that she accesses any commercial website (i.e., via a web browser over the Internet). Depending upon the platform's services, the employee may be able to engage crowds in mediated or unmediated ways. Finally, a third option, which can work with either SaaS or on-prem installations, is called "white labeling." In this case the platform's software is customized to looks exactly like – or is even integrated into – an organization's network, thus appearing to have the same look and feel as any other departmental-owned webpage. Data privacy and security considerations may affect whether one approach to software hosting is preferable to the other.

3.4 REWARD-BASED CHALLENGES

In daily use, platform references to "reward-based challenges" remain subject to considerable ambiguity. Platforms use a variety of different words, including "competitions," "prizes," and "contests," to describe reward-base challenges. Even when companies use the word "challenge," it can often possess different meanings. In some cases, for example, "challenge" simply means

a hard problem, but not a reward-based open source method for acquiring a solution. In other cases, platforms use the word "challenge" as a synonym for "competition" or "prize."

In this report, "challenge" refers to the use of pay-for-results processes to incent and reward members of a crowd for their individual or team-based problem-solving efforts.

Generally speaking, the platforms featured in this report help customers to host reward-based challenges. There are, however, a few platforms, such as TopCoder, that dispense with the contest-like features of such challenges and instead simply publish payment terms for the type of expertise desired. These platforms resemble competitive labor markets.

Challenge Problem Definition. Most reward-based challenge platforms assume that customers will come bearing different types of problems that can be put to an internal or external crowd. However, customers usually require assistance in articulating the challenges since they often have little experience with challenge problem scoping and design. As a result, many of the platforms featured in this study offer advisory services for problem definition. In some cases, highly technical organizations such as NASA may dedicate significant time and effort to formal challenge problem definition processes, taking sometimes up to a year to hold internal meetings, consult with outside experts, and refine challenge problems until they are suitable for release. Platforms that do not provide these types of services typically cater to well understood technical challenge problems. For example, the US National Oceanic and Atmospheric Administration's challenge on Kaggle asks for the development of an algorithm to count sea lions in aerial photographs.

Problem definition for moderate-to-complex topics can be time and resource consuming, because it requires that a diverse group of individuals evaluate several interdependent variables. For multifaceted technical challenges, it can be difficult to constrain the essential problem to one that is manageable and solvable by a crowd. Asking a crowd to build a quantum computer is an example of an important problem that is not necessarily manageable or solvable via crowdsourcing, as it likely requires technical innovations and equipment that are found mainly in government labs and large technical corporations. This raises the question of what kinds of individuals are likely to want or are even able to participate in the challenge. Consider that a problem that is too narrowly defined may be solvable by only a tiny fraction of experts in the world and thus unsuitable for crowdsourcing. Similarly, one that is too broadly defined may not yield valuable solutions.

Finally, there is inevitably the difficult question of what constitutes a winning challenge prize entry. Technical challenges typically require the creation of objective criteria to determine winners, a task that inevitably falls to a team of experts with deep knowledge about the challenge problem. Given these and other complexities that arise in challenge problem definition, it should come as no surprise that professional challenge designers often advise their clients not to short circuit these critical preparations.

3.5 CHALLENGE VOLUME AND SUCCESS

There are currently no standard measures or statistics for challenge volume and success. Platforms individually report (or not) how many challenges they undertake over a given time period and use a range of different metrics to indicate success. Challenge volume and success can be tricky for platforms to measure, especially when they are providing customers with tools to run their own challenges for internal collaboration and may not have visibility into which are successful.

Figures 4 and 5 below features challenge volume and success metrics (when available) for all of the platforms evaluated in this study.

CHALLENGE VOLUME AND SUCCESS METRICS FOR PLATFORMS WITH CURATED CROWDS	
PLATFORMS	**CHALLENGE VOLUME AND SUCCESS METRICS**
Battle of Concepts	No data
GRABCAD	No data
heroX	Conducted 1800 crowdsourcing projects with a 92% success rate for hosted challenges
hypios	No data
ideaCONNECTION	Conducted 100s of challenges with 85% success rate for selected problems
INNOCENTIVE	Runs ~200 external challenges per year and has awarded $48M over 10 years with an 87% award rate
kaggle	No data
MindSumo	Conducted over 1000 challenges since launch or ~250/yr. Clients see an average of 100 unique concepts delivered in 4 weeks. 60% success rate in customer retention
NineSigma	No data
open IDEO	No data
Patexia	Solves ~75% of challenges
Presans	No data
topcoder	Conducts ~7,000 challenges per year
yet2	Manages ~20 technology deals per year. 92% of clients report that at least one technology solution resulted in or was expected to result in a deal transaction

Figure 4: Challenge Volume and Success Metrics for Platforms with Curated Crowds

CHALLENGE VOLUME AND SUCCESS METRICS FOR PLATFORMS WITH DIY CROWDS	
PLATFORMS	**CHALLENGE VOLUME AND SUCCESS METRICS**
Common Pool	Conducted more than 30 challenges over last 5 years. Has no general metric for success
CMNTY	Success measured by crowd retention. Low churn rate among CMTY customers
IDEADROP	No data
ideaken collaborate to innovate	No data
ideascale	Has 300 enterprise clients, many of which run challenges. IdeaScale's self-service platform, IdeaBuzz, hosted 10-challenges in 2016
LUMINARY LABS	Conducted 16 challenges over last 5 years and given away ~$5M in cash and millions more in goods/services to prize winners
IDEngine	Heavy focus on challenge design. Most customers have previous relationship with IDEO.
Skild	Conducted ~400 challenges over past 12 years
SPIGIT	High volume of challenges. IBM alone ran 362 internal challenges since July 2016
wazoku	No data
WE THINO	No data
XPRIZE	Has designed some of the highest profile challenges since 1990s

Figure 5: Challenge Volume and Success Metrics for Platforms with DIY Crowds

3.6 SCIENCE/TECHNOLOGY FOCUS

An S&T focus is one of the key criteria used to select platforms for inclusion in this report. Many of platforms below focus uniquely on S&T topics. Some of them, however, especially those that specialize in innovation management and serve diverse corporations, host a variety of challenges, only a subset of which have S&T themes. Platforms that offer challenges but lack an S&T focus (i.e., crowdfunding, graphic design, marketing, product development) are included in Appendix 8.1.

Among the platforms that concentrate on S&T, there is a meaningful question of degree. For example, platforms such as Hypios CI, Patexia, Presans, XPrize and Yet2 arguably uniquely focus on S&T challenges. Others, such as TopCoder, Kaggle, and GrabCAD, mainly work on applied S&T topics that solve business needs. Finally, some platforms will undertake S&T challenges opportunistically, based on clients' needs. For instance, Luminary Labs is a traditional consultancy that works closely with clients on "strategy,"

"program operationalization," and "organizational design & competency development," none of which are obviously S&T related. Nonetheless, Luminary Labs is one of several vendors on NASA's open innovation Indefinite Delivery, Indefinite Quantity (IDIQ) contract, which allows them to bid on highly technical challenges that NASA wishes to make publicly available.

3.7 COST OF SERVICES

The willingness of platforms to publish their cost of services is directly proportional to the standardization of their offer. Platforms on one end of the spectrum provide an almost self-service platform for which customers can sign up, typically paying an access fee for basic functionality and additional fees for challenge hosting. On the other end, platforms that focus mainly on advisory services will rarely publish fees, because the cost of their services is almost entirely dependent on their clients' highly variable needs. Finally, platforms that specialize in challenges have moved toward price standardization, often charging tens of thousands of dollars for each customer challenge.

Most of the platforms evaluated in this report do not publish their cost of services. Many, but not all, of the price data featured below come from live interviews.

3.8 LEGAL ISSUES

Most of the companies evaluated in this report have standard privacy statements as well as terms and conditions associated with platform software access and use. Whenever possible, the templates below include links to these documents.

In the case of companies that serve customers who wish to develop customized and often complex challenges, the terms and conditions statements typically get highly tailored as well. Indeed, in some of these cases, the companies have no standard terms and conditions because they assume that all of them will need to be customized. These companies work with their customers to develop new terms or will provide references to outside legal counsel with experience in reward-based challenges.

3.9 SECURITY AND TECHNICAL ISSUES

The available data about platform security and technical features depend largely on the platform type. SaaS-based platforms have a fairly standard set of features and are highly configurable by both the platform and the customer. Fewer details are available regarding on-prem installations, because the exact technical and security specifications are customizable and contingent upon the customer's existing systems and willingness to pay for specialized features. In other words, for on-prem installations, the exact security and technical features are subject to negotiation and price, thus making it difficult to specify *a priori* what such an installation can and cannot do.

For most of the platforms, common features include:

- Multi-lingual interfaces
- Help menus, tutorials, and tips
- Administrative functions, including user account management
- Compatibility with all major web browsers
- Universal, 24/7 accessibility via the Internet
- 99% uptime
- High available architecture, including backup systems
- Unicode compliant
- IPv6 compliant

In the vast majority of cases, platforms do not require the installation of software on users' computers. There is one important exception to this rule: several platforms that support internal collaboration have developed mobile applications that must be downloaded and installed from the Apple or Android Stores.

Every SaaS-based platform evaluated in this report hosts and maintains its application code and data. For on-prem installations, the application code and data will sit on the customer's servers. Maintenance of this code and data is subject to negotiation of a master services agreement between the customer and platform. See Appendix 8.2 for data related to platform security and technical issues.

A Reader's Guide to Platform Templates

All of the platforms featured in Sections 4 and 5 below offer reward-based challenges. Section 4 platforms offer their customers access to a pre-curated crowd of experts who can help to solve reward-based challenges. In contrast, Section 5 platforms help customers access or build new crowds for reward-based challenges. Section 4 and 5 platforms offer different configurations of SaaS and on-prem installations, internal and/or external open innovation support and various specializations, all of which are noted on the templates.

Platforms reviewed for this study that do not offer reward-based challenges appear in Appendix 8.1. However, many of the platforms listed in this appendix do offer collaborative platforms for internal use by organizations.

4 Reward-Based Platforms with Curated Crowds

info@battleofconcepts.nl
Bilthoven, Netherlands

Battle of Concepts

GENERAL DESCRIPTION AND DIFFERENTIATORS

A basic challenge-hosting platform, currently available only in Dutch. Focuses on corporate challenge problems and provide access to a pre-curated crowd of design- and product-oriented experts. Prizes are relatively small and focused on idea generation, such as a challenge "to tackle litter in [the city of] Ede." Platform uses gamification to incent crowd engagement.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Uniform Crowd Size: Unknown	
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

CROWD CHARACTERISTICS

Heavy focus on product design expertise.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

Like OpenIDEO, Battle of Concepts is focused on social and environmental impact challenges that can improve corporate branding and customer engagement. The platform appears to concentrate on incentives and rewards for idea generation.

COST OF SERVICES

Unable to determine.

KNOWN BUSINESS IN CANADA

None.

Notes: Unable to reach Battle of Concepts for an interview.

challenges@grabcad.com
Cambridge, Massachusetts

GrabCAD

GENERAL DESCRIPTION AND DIFFERENTIATORS

GrabCAD is an online community of mechanical engineers who collaborate on Computer Assisted Design (CAD) projects to design and 3D print consumer and industrial products. The platform provides access to free CAD collaboration software and files and supports incentive prizes, which are a minor platform feature.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Curated Crowd	■
Crowd Type: Uniform Crowd Size: 3.25M	
Science/Technology	■
Case Studies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

CROWD CHARACTERISTICS

Very large community of mechanical engineers and technical designers who wish to collaborate on digital (and additive) manufacturing projects.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

Platform provides a variety of benefits, including collaboration, knowledge management, CAD resources, tutorials, and challenge hosting.

COST OF SERVICES

The collaboration platform, called "Workbench," is free. Cost of challenges is unknown.

KNOWN BUSINESS IN CANADA

Unknown.

Notes: Unable to reach GrabCAD to conduct interview.

CHRISTIAN COTICHINI
c@herox.com
Vancouver, British Columbia

HeroX

GENERAL DESCRIPTION AND DIFFERENTIATORS

A recent spinoff from the well-known XPrize Foundation, HeroX is an online crowdsourcing platform for running incentivized competitions to solve local and global problems. The platform benefits from XPrize's deep challenge design and execution knowledge, permits crowdfunding of prize purses and treats crowd like a social network.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Diverse Crowd Size: Unknown	
Science/Technology	■
Case Studies	■
ECCC Relevant	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

CROWD CHARACTERISTICS

HeroX cultivates a diverse crowd of experts called "Heros" and also helps clients build custom crowds for distinct challenge problems. Drawing upon XPrize crowd experience, HeroX clearly prefers to assemble crowds that meet clients' needs by leveraging existing social media platforms, such as Facebook and LinkedIn.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

One of the few platforms that is uniquely focused on incentive prize hosting. Software platform provides a full suite of challenge hosting tools and analytics, which are heavily supported by additional HeroX advisory services and prize purse crowdfunding. Strong preference for clients who bring smaller, less complex challenges (i.e., $1M, not $10M prize purses). Works with corporate partners who build HeroX into larger innovation management software and services.

COST OF SERVICES

For basic services, a platform fee of $99/challenge + 9% of the prize amount up to $250K, 7% from $250,001 - $1M and 5% of any prize amount above $1M. For crowdfunded challenges, hosting is free until the purse amount is raised; then, the basic services fees apply. For a white labeled crowdsourcing page that enables community engagement over time, the cost is ~$1K/year, plus standard percentage charges on prize amount. Additional fees for challenge advisory and supplemental services.

KNOWN BUSINESS IN CANADA

None.

hypios
HERE YOUR PROBLEM IS OUR SOLUTION

contact@hypios.com
Paris, France

Hypios CI (Crowd Innovation)

GENERAL DESCRIPTION AND DIFFERENTIATORS

This French company uses crowdsourcing, crowd building and challenge hosting to solve R&D problems. The platform enables a transactional marketplace where problem owners and solvers can find each other. Hypios tries to monetize solutions that are not rewarded with prize purse money.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Diverse Crowd Size: 950K	
Science/Technology	■
Case Studies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

CROWD CHARACTERISTICS

Hypios makes bold claims about the size and diversity of their curated network, though there is little evidence on their website or online to suggest that the network is really almost 1M individuals. The platform's active challenges suggest that the network is composed of scientists and engineers who work in varied disciplines, including material science and chemistry.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

The platform enables challenge hosting, customized crowd building/curation and a solution marketplace (called HyStore). Hypios helps clients to build experts crowds that are well suited to solving particular types of challenge problems.

COST OF SERVICES

Uses a subscription model, which covers two years of service and whose cost varies by the number of challenges desired. The website does not feature prices.

KNOWN BUSINESS IN CANADA

None.

Notes: Unable to reach Hypios CI to conduct interview. According to Crunchbase, Hypios may have closed sometime in late 2014. The company appears to have re-opened recently, as it has posted new challenges.

PAUL WAGORN
paulw@ideaconnection.com
Victoria, British Columbia

IdeaConnection

GENERAL DESCRIPTION AND DIFFERENTIATORS

IdeaConnection is a multi-functional platform that offers clients software and advisory services for open innovation, idea generation, challenges as well as technology and executive scouting. More so than the competition, this company has developed a highly customized process for getting the greatest value from outside experts.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Diverse Crowd Size: 15K	
Science/Technology	■
Case Studies	■
ECCC Relevant	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

CROWD CHARACTERISTICS

IdeaConnection has a diverse and heavily curated group of about 15,000 experts with whom they work to solve client challenges. Most of these experts come from highly technical fields.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

The platform enables (internal) team building, challenge scoping and hosting, technology sourcing, and problem solver collaboration. IdeaConnection is distinctive in how it hand selects experts into groups of ~6 and then uses expert facilitators to help these experts work together effectively. Small teams of solvers are heavily managed by IdeaConnection and in some cases are shielded from the client's identity.

COST OF SERVICES

The only up front fee is $9,995/yr for access to the open innovation portal, which also covers the cost of advisory services to define problems for ~2.5 projects. Governments receive a $5K discount. Customized services incur additional variable costs. For challenges that are successfully solved, IdeaConnection gets 50%. Clients pay nothing for unsolved challenges. Most prize amounts on the platform range from $20K – $100K.

KNOWN BUSINESS IN CANADA

None.

JOHN ELLIOTT
jelliott@innocentive.com
Waltham, Massachusetts

InnoCentive

GENERAL DESCRIPTION AND DIFFERENTIATORS

An established leader in challenge scoping and hosting, InnoCentive provides clients with the advice and tools needed to execute a range of incentive prizes for internal or external audiences. The company has extensive experience working with government agencies and a large, curated network.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Diverse Crowd Size: 375K	
Science/Technology	■
Case Studies	■
ECCC Relevant	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	■

CROWD CHARACTERISTICS

Like many challenge platform companies, InnoCentive claims to have curated to a large, diverse network of technical experts. It is difficult to verify how many of these experts are active; how many have participated in past challenges; and how many are relevant to future challenges.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

InnoCentive's platform is full service, providing clients with the ability to engage and communicate with crowds, scope and execute challenges, generate innovation-related analytics and manage challenge administration. The company executes about 200 challenges/year, has paid out almost $50M in prize purses over 10 years and has an 87% award rate.

COST OF SERVICES

InnoCentive has standard pricing for government and corporate clients and uses a licensing model: $50K for annual access and $10K for challenge. For white label, continuous use of the platform, called "innoCentive@work", the price is $120K/yr for unlimited users. Training and workshops incur additional fees.

KNOWN BUSINESS IN CANADA

Oil Sands Leadership Initiative

MEGHAN O'CONNELL
meghan@kaggle.com
San Francisco, California

Kaggle

GENERAL DESCRIPTION AND DIFFERENTIATORS

Kaggle is the world's largest community of data scientists who compete with each other to solve complex data science problems. Kaggle helps businesses solve data science challenges across numerous sectors, including energy, life sciences, financial services, aviation, information technology, and retail.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Uniform Crowd Size: 800K	
Science/Technology	■
Case Studies	■
ECCC Relevant	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	■

CROWD CHARACTERISTICS

Unlike the diverse, curated crowds that work with many of the competition platforms, Kaggle's is uniquely focused on data science. These experts tend to focus on analytics, data mining, big data, machine learning, deep learning, artificial intelligence, predictive analytics.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

The Kaggle platform hosts competitions as well as dataset and code sharing, and collaboration. While most of Kaggle's challenges are featured on its public site, it does offer clients the ability to access high performing members of the crowd (master's competitions) or to customize the platform for internal uses. Kaggle now also hosts academic competitions: inclass.kaggle.com.

COST OF SERVICES

Cost has three components: 1. The prize purse must be >$25K for public competitions and >$100K for masters' challenges (which are restricted to curated, high performing members of the crowd). Competitions run for internal client crowds have no prize purse limits. 2. The platform license fee depends on type of competition: $30K for public competitions, $50K for master's competitions and $20K/month (3 month minimum) for internal client competitions. 3. Consulting fees (ranging from $30K - $100K) are mandatory to properly scope challenges and determined on project-by-project basis.

KNOWN BUSINESS IN CANADA

None.

ALEX ARRIGO
alex@mindsumo.com
San Francisco, California

MindSumo

GENERAL DESCRIPTION AND DIFFERENTIATORS

MindSumo is a marketplace that helps companies connect with millennials through real-world, skill-based competitions. By solving interesting problems, students gain experience, win cash prizes, and stand out to potential employers. Companies receive innovative ideas, and can identify top candidates based on actual work samples.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Diverse Crowd Size: 250K	
Science/Technology	■
Case Studies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	■

CROWD CHARACTERISTICS

Mindsumo's crowd is diverse with 250K users and 100K active users representing 140+ academic disciplines and professional domains. The company heavily focuses on students and university relationships in US and Canada, targeting engineering, designer, and computer science majors.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

Mindsumo is primarily a job searching platform that uses competitions to engage millennials, test their skills and help them to find employment. The platform is geared toward companies who create challenges for real problem with the goal of getting solutions and identifying talent. Prize purses are relatively small and reflect Mindsumo's distinct point of view about how much to pay college students in exchange for their engagement.

COST OF SERVICES

Individual challenges are $10K, including all support services and prize payment ($1600). Customers can use a white labeled version of platform to engage their own crowds or the Mindsumo community for ~$200K/year.

KNOWN BUSINESS IN CANADA

AIG Canada (in collaboration with the Consulate General of Canada in San Francisco and Silicon Valley), TD Canada Trust.

FRANK TROPPER
tropper@ninesigma.com
Cleveland, Ohio

NineSigma

GENERAL DESCRIPTION AND DIFFERENTIATORS

Founded in 2000, NineSigma is one of oldest full-service open innovation platform. In addition to software (SaaS and on-prem), the company offers a range of services, including innovation management, challenges, technology scouting, and training. NineSigma also claims to have curated one of the largest networks with 2M experts.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Diverse Crowd Size: 2M	
Science/Technology	■
Case Studies	■
ECCC Relevant	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	■

CROWD CHARACTERISTICS

NineSigma claims access to a global cross-disciplinary network of 2 million solvers and inventors from industry and academia. Like other large, curated networks, it is nearly impossible to verify the size or utility of these experts. NineSigma will also cultivate new networks of experts for clients who have specialized needs.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

The company focuses on open innovation broadly understood with a heavy emphasis on technology. NineSigma's platform supports challenge scoping, execution, and administration, but incentive prizes are not the company's or the platform's primary focus. Like other platforms, NineSigma concentrates on advisory services and relies on a strategic partner, Hype Innovation, to build platform software on client networks.

COST OF SERVICES

Scoping, management, and hosting of grand challenges are ~$200K. Using the platform for internal innovation management is less expensive, though long project timelines increase costs. Installing a hosted Hype Innovation platform is ~$100K, depending on the number of seats.

KNOWN BUSINESS IN CANADA

Natural Resources Canada.

Notes: Additional ECCC-relevant case study.

hello@openideo.com
Palo Alto, California

OpenIDEO

GENERAL DESCRIPTION AND DIFFERENTIATORS

OpenIDEO is a web-based open innovation platform that engages a global, design-driven community to generate ideas for solving complex social and environmental problems. The platform is explicitly oriented toward non-commercial challenges and enables crowdfunding. Only Amplify Program features prizes for international development.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Uniform Crowd Size: 200K	
Case Studies	■
ECCC Relevant	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

CROWD CHARACTERISTICS

OpenIDEO claims to provide access to a network of 100,000 design-oriented experts in 200 countries. These experts have a diverse range of sub-specializations, as they are united by their interest in applying design thinking and tools to social challenges.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

OpenIDEO's platform is an extension of the well-known IDEO consultancy and features IDEO-branded tools and design thinking techniques that anyone in the world can access and put in the service of improving the human condition. The platform itself functions as a collaboration hub to generate and incubate ideas that can potentially attract funding. Challenge scoping and hosting is only a small feature of this platform.

COST OF SERVICES

There is no cost to use the platform, as it is no specific commercial application. Organizations that wish to use the platform to host social impact prizes will have to negotiate with the OpenIDEO team.

KNOWN BUSINESS IN CANADA

None.

(424) 239-9714
Santa Monica, California

Patexia

GENERAL DESCRIPTION AND DIFFERENTIATORS

Patexia applies crowdsourcing to technology to global intellectual property sourcing and protection. The company claims the largest global community of intellectual property professionals. Its platform enables legal and technology IP experts to collaborate and solve contests related to patent due diligence.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Diverse Crowd Size: 1000s	
Science/Technology	■
Case Studies	■
ECCC Relevant	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

CROWD CHARACTERISTICS

Patexia is an online community of IP professionals with thousands of members worldwide, connecting all stakeholders in IP such as patent attorneys, patent agents, scientists, and inventors all over the world.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

Patexia's platform enables four types of services –
1. Community: Publishing and sharing perspectives on legal, business, and technical aspects of patents;
2. Marketplace: Connecting IP professionals such as patent attorneys, agents, and technical experts to corporations and law firms for employment;
3. Contest: Patent due diligence, such as prior art or evidence of use searches; and
4. Research: Tools providing visualization and analysis of patent and lawsuit data including US patents and patent applications, patent lawsuits, and other resources.

COST OF SERVICES

Unknown, as prices are not publicly specified. Services, including contest posting, requires membership. Most costs have relatively small prize purses (<$5K)

KNOWN BUSINESS IN CANADA

None.

Notes: Unable to reach Patexia to conduct interview.

contact@presans.com
Paris, France

Presans

GENERAL DESCRIPTION AND DIFFERENTIATORS

Presans is an open innovation and crowdsourcing company that spun out of the École Polytechnique in France. It helps corporations to scout technology solutions using a large global network of experts. Presans specializes in scientific and technology problems, offering rewards to individual experts who submit solutions.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Diverse Crowd Size: 5M	
Science/Technology	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	×
On-Prem	×
White Label	■

CROWD CHARACTERISTICS

The Presans crowd is wildly diverse and assembled by web crawlers that gather data about science and technology experts around the world. Presans curates this data when they reach out to specific experts on behalf of a client.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

The Presans platform is mainly for internal use by Presans employees, but can be white labeled. The platform is an expert database with crowd management functions. While Presans has offered this functionality to select clients in the past, it is not really a commercial feature and not advertised on the Presans website. The Presans platform does not host prizes and challenges per se; rather, it offers rewards to experts who sign up to solve R&D problems posted on the Presans website.

COST OF SERVICES

The typical technology scouting project takes about three months and costs between €35K - €50K.

KNOWN BUSINESS IN CANADA

None.

CLINTON BONNER
cbonner@topcoder.com
Glastonbury, Connecticut

TopCoder

GENERAL DESCRIPTION AND DIFFERENTIATORS

TopCoder is a development and design community that hosts online programming contests for developers, analysts, and designers. It is the world's largest competitive software development community with more than one million design and technology experts representing over 200 countries.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Uniform Crowd Size: 1M	
Science/Technology	■
Case Studies	■
ECCC Relevant	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

CROWD CHARACTERISTICS

The TopCoder community of over 1M members represents business analysts, algorithmists, software developers, and creative artists from over 200 countries. They create digital assets including applications, analytics, software, and creative designs and solutions for a wide-ranging client base through a competitive, rigorous, standards-based methodology.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

The TopCoder platform enables a technical labor market, where companies can crowdsource talent via competitions to help with a wide range of digital projects. The platform supports project management, technical innovation consulting, algorithm optimization competitions, and staff augmentation. Like other platforms that focus on narrow sets of expertise, TopCoder holds a large number of challenges annually – up to 7,000.

COST OF SERVICES

Unable to determine.

KNOWN BUSINESS IN CANADA

Unknown.

Notes: Unable to reach TopCoder to conduct interview.

TIM BERNSTEIN
tbernstein@yet2.com
Newton, Massachusetts

Yet2

GENERAL DESCRIPTION AND DIFFERENTIATORS

Yet2.com provides intellectual property consulting and licensing services to customers around the world. Yet2 is primarily a services business that helps customers with technology scouting and procurement/contracts. Its platform allows customers to crowdsource their specific technology needs, sometimes using competitions.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Works with OECD Public Agencies	■
Curated Crowd	■
Crowd Type: Diverse Crowd Size: 150K	
Science/Technology	■
Case Studies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

CROWD CHARACTERISTICS

Yet2 features a global network of over 150,000 marketplace users, syndication partners, 800 global brokers, online technical networks, and access to relevant social media.

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

Yet2 mainly serves companies that wish to find and then buy or license specialized technologies. Yet2 employees primarily access the platform in the service of their customers. The company believes that pure incentive prize mechanisms solve only 30% of technology challenges. Yet2 does not focus on ideation. Rather, it hunts for technologies on behalf of their clients and then facilitates deals between customers and technology owners/manufacturers. This point is illustrated by Yet2's definition of success: 92% of its clients report at least one technology solution provided by Yet2 resulted in, or was expected to result in, a deal or transaction.

COST OF SERVICES

Topic specific technology scouting costs $35K per search. Technology innovation tours cost $50K – $100K. Competitive challenge pricing for depends on the nature of the competition and results desired by client; simple ones are $45K – $50k.

KNOWN BUSINESS IN CANADA

None.

5 Reward-Based Platforms with DIY Crowds

JAISON MORGAN
jmorgan@thecommonpool.com
Santa Monica, California

Common Pool

GENERAL DESCRIPTION AND DIFFERENTIATORS

Common Pool creates custom competitions with prize expertise originally drawn from XPrize and software from Rampit. It is a full service prize design and services consultancy that focuses uniquely on prize design and execution as well as the curation of DIY crowds.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Works with OECD Public Agencies	■
Science/Technology	■
Case Studies	■
ECCC Relevant	■

PLATFORM TYPE	
SaaS	■
On-Prem	×
White Label	■

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

Common Pool is especially valuable for clients that need significant prize design and execution support as well as assistance in building a crowd of potential solvers. The company has executed ~30 challenges over the past 5 years. Because of its focus on customization, Common Pool tailors even privacy and terms and conditions statements to specific client needs, as illustrated by its work for the MacArthur Foundation's 100&Change competition.

COST OF SERVICES

Common Pool services typically encompasses two phases of work and can include premium services as well. Phase 1, which takes 4-8 months and costs ~$50K, involves the generation of seven reports on all elements of prize design and administration, including legal. Phase II, which costs $100K for the first year, involves prize execution, including marketing, brand building, website design, and platform customization using Rampit. For additional fees, Common Pool will deliver presentations to client stakeholders and potential solvers about how prizes work; will conduct more extensive marketing; and will design trophies, medal or Shark Tank-like events.

KNOWN BUSINESS IN CANADA

Unknown.

ZACH KATAGIRI
zach.katagiri@cmnty.intercom-mail.com
Eindhoven, The Netherlands

CMNTY

GENERAL DESCRIPTION AND DIFFERENTIATORS

CMNTY features a highly flexible platform that permits customers to build communities for open innovation. Customers use CMNTY to engage crowds with gamification as well as competitions, communication tools, and surveys. CMNTY analytic tools allow customers to measure crowd engagement success.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

Whereas some platforms host competitions and provide complementary DIY crowd services, CMNTY main value proposition is crowd building and engagement. They measure success in terms of their crowd retention rates; CMNTY claims that customers who use their platform experience low churn. CMNTY offers some services to support clients, but mostly considers its platform to be self-service.

COST OF SERVICES

CMNTY offers three basic subscription levels, which range from $100-$800/month. There is also a premium level that features a dedicated project manager, starting at $1199.

KNOWN BUSINESS IN CANADA

None, as most of CMNTY's business is in Europe.

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London, United Kingdom

Idea Drop

GENERAL DESCRIPTION AND DIFFERENTIATORS

Idea Drop is focused on early stage innovation, helping organizations to capture, curate, and act on the best ideas from their employees. Their platform is essentially an engagement and management tool for crowd-sourcing ideas.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Case Studies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

Idea Drop supports competitions and prizes in the service of helping companies to capture and curate the best ideas from their employees. The platform enables idea management and measurement and features a modern, responsive user interface designed for mobile devices.

COST OF SERVICES

7 £/month/user or custom enterprise pricing for up to 250 users. Platform access for more than 250 users requires a site license whose cost depends on the number of users, contract length, payment terms, and how clients want to use the software.

KNOWN BUSINESS IN CANADA

None.

ideaken
collaborate to innovate

Contact
Singapore

Ideaken

GENERAL DESCRIPTION AND DIFFERENTIATORS

Ideaken is a basic open innovation and crowdsourcing platform that features the ability to host challenges. Short on details, Ideaken appears to focus on corporate clients and science- and technology-based challenges.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Science/Technology	■
Case Studies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

While it does not appear that Ideaken has a large volume of challenge-related business, it nonetheless offers the standard set of services typically found in this industry sector: challenge hosting, consulting, and DIY crowd building. Ideaken's website includes references to its open innovation and crowdsourcing methodologies, none of which is distinctive.

COST OF SERVICES

Ideaken features a subscription model that ranges from $750 – $1500 per month, depending upon the number of challenges posted.

KNOWN BUSINESS IN CANADA

Unknown.

TIM SUSSMAN
tim.sussman@ideascale.com
San Francisco, California

Ideascale

GENERAL DESCRIPTION AND DIFFERENTIATORS

IdeaScale claims to be the largest cloud-based innovation software platform in the world with more than 25,000 customers and 4 million users. Its platform allows customers to curate and filter ideas from public and private communities in support of large-scale innovation management.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Case Studies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

While Ideascale does feature science- and technology-based challenges with rewards, these are not the major focus of its platform. Rather, Ideascale is mainly an idea curation and innovation management solution that includes challenge functionality. Idealscale has also recently launched a product called IdeaBuzz that helps customers to build and maintain the engagement of DIY crowds for an ongoing set of challenges.

COST OF SERVICES

Ideascale offers four pricing tiers, from free to enterprise. Minimum platform functionality is $2500/yr. Customers can host challenges on IdeaBuzz for under $10K USD. Enterprise costs vary, because these implementations can be large and complex.

KNOWN BUSINESS IN CANADA

City of Ottawa, University of Calgary, City of Calgary.

LUMINARY LABS

SARA HOLOUBEK
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New York, New York

Luminary Labs

GENERAL DESCRIPTION AND DIFFERENTIATORS

Luminary Labs is a management consultancy firm that focuses on strategy and innovation. It has developed a web-based innovation tool called Lightbox, which is mainly used by Luminary Lab consultants to provide services to their clients. While Lightbox can be used to host and manage challenges, it is not a customer-facing tool.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Works with OECD Public Agencies	■
Science/Technology	■
Case Studies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
Custom Tool	■

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

A boutique consultancy that focuses on strategy, program operationalization, and organizational design, Luminary Labs offers clients hands-on support for open innovation and challenge development. Lightbox, Luminary Labs's open innovation tool, is used by consultants to help their clients build DIY crowds for customized incentive prizes and challenges. Lightbox is thus not a platform in the traditional sense of the term, i.e., software that customers use to innovate. Luminary Labs also uses Nimble, a SaaS-based customer relationship management tool, to help clients build and manage crowds.

COST OF SERVICES

Service costs are highly variable and based on client needs. Luminary Labs has a GSA Schedule for work that it does for the US Government, providing a strong indication of its government pricing.

KNOWN BUSINESS IN CANADA

None.

JODY HALSTEAD
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London, United Kingdom

OI Engine

GENERAL DESCRIPTION AND DIFFERENTIATORS

OI Engine is part of a family of IDEO tools and services that support design-driven innovation. This software platform is primarily a collaboration tool for organizations that wish to undertake disruptive change using open innovation. It can support prizes and competitions, but that is not its primary purpose.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Case Studies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×
White Label	■

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

This external software platform is heavily invested in design thinking to support client innovation. As one of the most successful design and innovation consultancies in the world, IDEO stands behind this platform and offers interested clients a suite of advisory services that helps to increase the value of platform use. OI Engine assumes either that clients bring their own crowds (internal or public) or that clients will pay OI Engine to build crowds for specific purposes.

COST OF SERVICES

OI Engine has two offers. Clients can use the platform on an ad hoc basis for ~$20K/month. The platform can also be "white labeled" for ~$14K/month – and a one-time ~$10K set up fee – with a yearlong commitment.

KNOWN BUSINESS IN CANADA

None.

ANIL RATHI
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Pasadena, California

Skild

GENERAL DESCRIPTION AND DIFFERENTIATORS

Skild helps customers develop and run innovation challenges, competitions, awards, prizes, contest promotions, ideation sessions, and training. It provides a full-service competition management platform and consulting services for challenge design, marketing, and support.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Science/Technology	■
Case Studies	■
ECCC Relevant	■
Privacy	■
Terms and Conditions*	■

PLATFORM TYPE	
SaaS	■
On-Prem	×
White Label	■

**Terms are challenge specific. This is an illustrative example of terms from one Skild Challenge.*

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

Skild is a high profile, sophisticated challenge hosting and management platform with complementary advisory services. Clients can use the basic platform, a white label version or can access the Skild API to integrate challenge hosting and management features into their own websites. Several years ago, Skild launched a lower cost, self-service version of its challenge-hosting platform called OpenSkild, but that service appears to be no longer available. Over the past 12 years, Skild has run over 400 challenges. Rather than maintain a network of experts for their challenges, as InnoCentive does, Skild works with customers to build DIY crowds.

COST OF SERVICES

Skild prices are based on client's desire feature sets: the more complex the challenge, the higher the cost. The basic package starts at $7500 per challenge; an advanced package is $9K per challenge; and the professional package is $15.5K per challenge. To run multiple challenges, the starting rate is $25K (agency package), which includes an annual license plus an additional cost of ~$5K per challenge.

KNOWN BUSINESS IN CANADA

Canada Health Infoway.

STEVE GLASS
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San Francisco, California

Spigit

GENERAL DESCRIPTION AND DIFFERENTIATORS

Spigit is a major provider of innovation management software that also permits customers to host prizes and competitions. Spigit aims to provide customers with cloud-based software to facilitate engagement and collaboration between employees, partners, and customers to build a culture of innovation.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Science/Technology	■
Case Studies	■
ECCC Relevant	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×
White Label	■

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

Spigit offers full-service innovation management software for large enterprises. While customers can use the Spigit platform to host and manage incentive prizes, that is not its primary (or even secondary) purpose. Rather, Spigit provides tools and analytics to support wholesale cultural change in large organizations that are heavily invested in open innovation and crowdsourcing with partners and customers.

COST OF SERVICES

The base price is $60K for access to the Spigit platform. The company distinguishes between "internal" use cases (i.e., accessed by employees) versus external uses cases (i.e., accessed by customers and partners). All uses cases are served by Spigit's cloud-based SaaS platform. Spigit also works with many partners, such as Booz Allen Hamilton and IBM, who white label parts of the Spigit platform in the service of their own customers.

KNOWN BUSINESS IN CANADA

None, though Spigit partners with CGI Group.

info@wazoku.com
London, United Kingdom

Wazoku

GENERAL DESCRIPTION AND DIFFERENTIATORS

Wazoku describes itself as an idea management company. It features a core product called Idea Spotlight, a platform that helps customers to collect, evaluate, and share ideas as well as facilitate the collaboration, workflows, and social tools needed to implement them. Customers can host grand challenges on Idea Spotlight.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Case Studies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

Like many other idea and innovation management companies, Wazoku focuses primarily on enterprise-level innovation processes and cultural change by combining its Idea Spotlight platform with diagnostics (called Innovation Pulse) and advisory services. Spotlight facilitates the hosting of grand challenges, but that it is not its main purpose. Rather, it helps customers to conduct internal and external crowdsourcing of ideas.

COST OF SERVICES

Unknown.

KNOWN BUSINESS IN CANADA

None.

Notes: Unable to reach Wazuko to conduct interview.

service@wethinq.com
Frankfurt, Germany

We Thinq

GENERAL DESCRIPTION AND DIFFERENTIATORS

We Thinq offers an innovation management platform designed to help clients launch and sustain campaigns that involve broad collaboration. Unlike other such platforms on the market, We Thinq is oriented toward organizations, including corporations, which aim to solve social and environmental problems with input from diverse constituencies.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	■
External	■
Works with OECD Public Agencies	■
Science/Technology	■
Case Studies	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
SaaS	■
On-Prem	×

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

We Thinq's platform is a process-oriented collaboration tool that focuses on what We Thinq founders call "social innovation," defined vaguely as "creating a new idea for positive impact." In addition to the platform, We Thinq offers clients consulting services as well as a variety of resources related to open innovation, crowdsourcing, and citizen participation. The We Thinq platform hosts contests for idea generation, but doesn't appear to have more sophisticated functionality.

COST OF SERVICES

Starting price is $129/month for basic functionality. Customized pricing unavailable.

KNOWN BUSINESS IN CANADA

Unknown.

Notes: Unable to reach We Thinq to conduct interview.

Contact
Culver City, California

XPrize

GENERAL DESCRIPTION AND DIFFERENTIATORS

XPrize is a non-profit organization that designs and manages public competitions to encourage technological development that could benefit mankind. The highest-profile XPrize was the Ansari X Prize relating to spacecraft development awarded in 2004. XPrize doesn't feature a challenge platform; its prizes are all uniquely customized.

PLATFORM CHARACTERISTICS

COLLABORATION FUNCTIONALITY	
Internal	×
External	■
Works with OECD Public Agencies	■
Science/Technology	■
Case Studies	■
ECCC Relevant	■
Privacy	■
Terms and Conditions	■

PLATFORM TYPE	
Custom Website	■

TYPE OF PLATFORM AND ASSOCIATED COMPETITIVE ADVANTAGE

XPrize was one of the first organizations to popularize challenges in the early 2000s. Because XPrize is a non-profit foundation that works only with clients who seek breakthrough technological innovations, they do not maintain a commercial platform per se. Rather, they design and launch highly customized challenges and prizes that rely heavily on branding and marketing to attract external capital investment. Such investments are a key feature of XPrize's value proposition, because they enhance the overall impact of the challenge, allowing teams that are competing to win the challenge to independently finance their efforts.

COST OF SERVICES

Pricing is highly variable, depending upon the challenge complexity and requirements for design, management, and execution.

KNOWN BUSINESS IN CANADA

Canada Oil Sands Innovation Alliance (COSIA).

6 Industry Assessment

Crowdsourcing in general and challenge platforms in particular have a bright future. Competitive forces and mission-driven priorities will continue to compel private companies and public organizations to seek new and better ways to access and engage crowds. Using technology to access the crowd's ideas and expertise with as much scale and as little friction as possible will remain a major aspiration for the platforms themselves that comprise the challenge-focused crowdsourcing industry. It appears likely that this industry will remain fragmented and diverse, a reflection of the multiplicity of customers who demand these services. Indeed, a business model that focuses on providing customers with access to early career millennials (e.g., MindSumo) will tend to operate differently than one that connects customers to highly specialized scientists (e.g., Yet2). The high likelihood that this diverse platform ecosystem will continue to meet both generalized innovation and specific expertise needs means that the GoC will continue to have platform choices in the foreseeable future. This implies that there is need for a clear strategy for working with different platforms to achieve specific departmental objectives.

The open innovation and crowdsourcing industry has grown dramatically in the last 10 years, but remains, with a few notable exceptions, relatively young and small. Although XPrize was founded in 1995 and InnoCentive in 2001, they are outliers. Most of the platforms featured in this study were founded in the last ten years and many in the last five. In addition to being relatively new, these platforms are also typically small businesses that take advantage of procurement policies, such as in the United States, where the government frequently puts contracts out to only small businesses for bid. Yet small businesses can complicate the delivery of high quality services as their size can make it hard to weather the inevitably ebb and flow of business cycles. It is also noteworthy that there appears to be little merger and acquisition (M&A) activity in the crowdsourcing industry relative to other technology subsectors. This may be due to the fact that crowdsourcing platforms do not scale nearly as quickly or easily as other technology businesses, thus dampening their market valuation. Taken together, the relative youth, small size, and lower valuations of these platforms suggest that the crowdsourcing industry will continue evolve incrementally, both with respect to overall growth as well as individual platform failure.

Although platforms will remain diverse, their businesses will cluster around three basic models. First, platforms such as InnoCentive, Skild, and Spigit, will remain heavily focused on self-service software, which enables a large customer base to design and launch relatively straightforward challenges with low (i.e., <$10K) prize purses that appeal to diverse crowds. From a platform perspective, this business model has the lowest cost and greatest ability to scale. These platforms will offer standalone services and will also seek to embed their features in complementary software offered by their partners. Second, platforms such as Luminary Labs and XPrize, will remain heavily service oriented, offering customers sophisticated advice for the design and implementation of complex, large-purse challenges that require meaningful resources to scope and execute. These platforms will feature software that complements their advisory services, typically for challenge hosting and/or crowd management. This second business model is essentially a form of boutique consulting that also provides access to complementary technology. Third, given the fundamental importance of technology for innovation across industry segments, there will always be opportunities for highly specialized platforms such as GrabCAD

and Kaggle to focus on distinct market niches. Today, those particular markets include an array of specializations, such as data science, coding, and CAD design as well as patent research and R&D. In the future, these business models will expand to newer but equally specialized technical domains that are amenable to crowdsourcing and challenges, such as artificial intelligence, deep learning, nanotechnology, biotechnology, and robotics.

The incentives that platforms use to motivate crowds are unlikely to experience significant change because they have been well tested in the crowdsourcing industry. Platforms will continue to use direct or indirect cash payments to incent crowds. Mindsumo illustrates one version of indirect cash payments by helping members of its crowd find jobs among the corporate customers who post challenges. Platforms will leverage community membership and a sense of belonging by connecting individuals with similar backgrounds and expertise to each other. Platforms will continue to tap into many individuals' philanthropic or altruistic impulses by asking crowds to solve hard social and environmental challenges. Platforms will certainly continue to offer various types of resources to their crowds, including free software and training. Finally, and perhaps most importantly, platforms will remain firmly committed to "coopetition," as illustrated by virtual leaderboards, horse-race dynamics, and team building which are techniques that motivate both collaboration and competition in the solving of difficult problems.

Platform will continue their migration to cloud servers, which drive SaaS-based offers. Among the platforms interviewed for this study that offered on-prem installations, few did so with any enthusiasm or price commitment. Large platforms will continue to provide on-prem installations because some of their customers - especially governments - will buy them to meet security and compliance requirements. The complexity of these types of installations and the systems integration work required to make them successful are unlikely to get less intensive or expensive anytime soon. Furthermore, the master service agreement contract negotiations required to initiate on-prem installations will continue to increase the time and effort needed to begin work. With the possible exception of highly regulated industries, such as financial services and health, most private sector customers will not think twice about working with SaaS-based platforms and will benefit from their lower costs.

Finally, despite the tremendous appeal of crowdsourcing and the value that many organizations get by soliciting solutions from large groups of insiders or outsiders, the open innovation and crowdsourcing industry will almost certainly continue to improve upon its methods to address three primary crowdsourcing management issues. The first is how time-consuming and complex it is to design challenges for hard technical problems. The second is how difficult it is to motivate crowds to solve complex problems, especially when the solutions require real commitments of time, money and effort. The third is how tough it is to incent the sustained engagement of a crowd in ongoing open innovation efforts. Some platforms are addressing these difficulties by reducing challenge complexity and broadening the benefits of engagement. Other platforms, especially those that are services based, deploy consultants and marketing experts to translate enthusiasm for and participation in crowdsourcing into lasting cultural change. For these reasons, organizations that wish to engage in open innovation often undertake multiple, simultaneous crowdsourcing experiments, a strategy that benefits from mutual reinforcement and significantly lowers the risk of failure.

7 Strategic Considerations

Given the diversity of crowdsourcing industry platforms, the GoC may wish to develop a platform portfolio strategy to support scaled open innovation. Few organizations will find one platform to meet all of their crowdsourcing and innovation needs. For example, NASA is one of the US government's open innovation leaders and currently works with 10 platforms [1]. This portfolio strategy can be effective, especially if Departments do not necessarily know what kind of crowdsourcing they wish to do in the future. However, like any strategy, a crowdsourcing strategy requires making choices. One way of considering such choices is to consider what are the Departmental goals:

IN-HOUSE CROWDSOURCING VS **MEDIATED CROWDSOURCING**

Government departments are unlikely to have the internal expertise needed to manage and execute open innovation programs such as platform-based challenges right out of the gate. As such GoC can execute the option of engaging platforms that offer mediated crowdsourcing thereby allowing vendors to manage challenge execution and crowd engagement. This has the added benefit of creating learning and training opportunities for select GoC employees who can then later offer their in-house expertise to others for future challenges while allowing departments to build direct relationships with external challenge solvers. This was the approach in the United States for agencies such as NASA and DARPA, which now each have sizable innovation offices staffed by experienced individuals.

FOCUSED CROWDSOURCING VS **GENERAL CROWDSOURCING**

As departments initiate open innovation, they can choose to focus on meeting the needs of certain areas along the innovation chain - such as engineering, research, or data science - as opposed to allowing all areas within the Department to avail themselves to crowdsourcing platforms during a pilot phase.

INTERNAL CROWDSOURCING VS **EXTERNAL CROWDSOURCING**

Open innovation/crowdsourcing is a completely different paradigm for innovation. As such, acculturation among staff will need to be addressed early to maximize the chances of success. Adopting internal platforms for collaboration may better habituate GoC employees to crowdsourcing and prove its value better than initiating a pilot aimed at external crowds. This, in turn, decreases reputational and management risks.

S&T CROWDSOURCING VS **EDUCATIONAL CROWDSOURCING**

The goal of launching a challenge is not always to solve hard problems. Customers will sometimes work with platforms to build their brands. For instance, the US Environmental Protection Agency launched a small challenge for high school students that asked them to design informative visualizations for water pollution. The GoC can employ these types of challenges to educate Canadian citizens about its mission and the promise of government-sponsored open innovation.

1 See https://www.nasa.gov/press-release/nasa-uses-crowdsourcing-for-open-innovation-contracts (accessed 3/3/17)

A final future consideration is how best to institutionalize crowdsourcing benefits. This will require addressing any policy, administration, legal, and financial barriers that may exist within the current innovation management regime, including institutional voids that are often discovered when initiating new approaches to management. As mentioned, there are also cultural issues that must not be underestimated. Challenge-based crowdsourcing will inevitably generate a mix of enthusiasm and skepticism among internal constituencies. Successful challenges will ideally develop valuable ideas and technologies whose ultimate success will still require champions inside the GoC who are able to operationalize them. Because all innovation involves risk, some challenges will fail, putting pressure on leaders to highlight lessons learned without at the same time punishing the internal innovators who stumbled. To maximize these opportunities and reduce risks, effective open innovation often combines strong support from senior executives, clear and consistent communications plans, transparent and shared program evaluation criteria, and robust strategies for getting different internal constituencies involved. Without these complementary efforts, significant time and money spent on the best platforms and the most ingenious challenges can easily run up against intractable, countervailing cultural forces. The challenge-solving platforms featured in this study can play a critical role in the GoC's open innovation efforts, especially when they are supported by a complementary eco-system of leaders, programs, communications, and cultural change activities.

8 Appendices

8.1 PLATFORMS WITHOUT REWARD-BASED CHALLENGES

Platforms Specializing in Internal Collaboration

1 – BrightIdea
Enterprise innovation management and idea generation software. Facilitates open innovation, but no support for prizes/competitions.

2 – Codigital
London-based enterprise idea generation and open innovation management software platform. Designed for use inside organizations or for engaging pre-determined crowds.

3 – Crowdicity
A robust idea management software platform that provides a suite of collaboration, innovation, engagement and analytic tools. Platform may have prize and competition functionality, though it is by no means a central feature of their service. (Note: unable to get response from Crowdicity to confirm prize functionality.)

4 – Datastation
Belgium-based platform for idea generation, innovation management and project execution. No focus on prizes or competitions and no pre-existing crowd.

5 – Hypeinnovation
Full-service enterprise innovation management platform that supports idea management, process innovation and open innovation. Flexible deployment (on premise, hosted, SaaS). Mix of clients.

6 – IBM Innovation Jam
Conversation and collaboration platform built by IBM that helps large companies foster dialogue about innovation and change management.

7 – Imaginatik
Enterprise innovation management software with focus on idea generation, curation and analytics. Also provides traditional innovation consulting services.

8 – Publivate
A Canadian idea generation and innovation management platform that focuses on getting employees or citizens to collaborate on solving problems. No apparent competition or prize functionality.

9 – Qmarkets
Enterprise innovation management and idea generation software. Facilitates open innovation and prediction markets, but no support for prizes/competitions.

Additional Platforms Reviewed for This Study

1 – 100open
Traditional innovation consultancy, based in London. Offers a tool for managing crowds for open innovation. No explicit support for prizes or competitions.

2 – Amazon Turk
Crowdsource microjob platform that provides customers with access to workers who conduct simple tasks.

3 – Appirio
Technology integrator that uses cloud platform to help clients use third-party products (e.g., Salesforce) more effectively. Includes support for crowdsourcing technology integration projects.

4 – Chaordix
Platform for crowdsourcing brand- and product-oriented questions - via a variety of engagement approaches - to customized groups of people.

5 – Clickworker
Crowdsource microjob platform that provides customers with access to workers who conduct simple text, survey and translation tasks.

6 – Crowdflower
Data enrichment, data mining and crowdsourcing company that offers a SaaS platform which allows users to access an online workforce of millions of people to clean, label and enrich data.

7 – Designhill
Graphic design marketplace that also hosts small prizes for logo design.

8 – DEVPOST
Jobs website for developers that also hosts corporate-sponsored hackathons to engage and test talent. Hackathon winners earn prize money.

9 – Dialogue--app
Platform that enables governments and organizations to crowdsource ideas and feedback for policy issues and problems. Heavily focused on public sector.

10 – Eyeka
Platform for crowdsourcing (exclusively) design and marketing challenges with access to curated crowd. Based in France with offices in other parts of the world. No science or technology focus.

11 – Foldit
Crowdsourced computer game that enables "players" to contribute to scientific research about protein structures.

12 – Freelancer
A large bid-based platform aimed at small businesses that need design and technical talent for relatively straightforward projects.

13 – Greenchallenge
Dutch sustainable business model competition.

14 – Hypermind
Prediction market that rewards predictors with virtual money.

15 – Ibridgenetwork
Foundation-managed platform that facilitates technology transfer among and between academic and research institutions and enables innovation collaboration.

16 – Indiegogo
Platform for crowdfunding entrepreneurs.

17 – Innoget
Open innovation platform, focused on science and technology, where users can submit technical challenges or descriptions of needed technologies. Not designed for prizes and competitions. Claims thousands of members who will work on other people's problems.

18 – Ioby
Crowdsourcing and crowdfunding ideas for neighborhood improvement

19 – One Billion Minds
Amateurish open innovation platform that allows individuals to post projects. Science and technology are just two of several areas of focus.

20 – Quirky
Platform for crowdsourcing product development ideas and talent for rendering and building ideas into actual products.

21 – Startsomegood
Crowdsourcing and crowdfunding social impact projects.

22 – Sustainable Games
Business model competition website operated by Cornerstone Capital Inc.

23 – Tongal
Design and creative content development platform, mainly focused on video, which gamifies idea generation and provides small reward-based incentives for winning ideas.

24 – Uservoice
Platform for crowdsourcing product feedback and integrating helpful feedback into product design and development roadmaps.

25 – Ushahidi
Platform for crowdsourcing data collection and mapping for social good, i.e., crises, elections, advocacy and human rights.

26 – Weather Underground
Platform for crowdsourcing live weather data with 250,000+ weather stations purchased and maintained by individual weather enthusiasts.

27 – Zooniverse
Crowdsourcing platform that enables volunteers to contribute to scientific research across a variety of domains.

8.2 SECURITY AND TECHNICAL ISSUES

INFORMATION RELATED TO SECURITY AND TECHNICAL ISSUES														
PLATFORMS WITH CURATED CROWDS														
	Battle of Concepts	**Grab CAD**	**HeroX**	**Hypios**	**Idea Connection**	**InnoCentive**	**Kaggle**	**MindSumo**	**NineSigma**	**OpenIDEO**	**Patexia**	**Presans**	**Top Coder**	**Yet2**
Type of Platform (External (Saas) / Internal (On-prem) / Both / Neither	External	External	External	External	Both, appears to be provided by Brightidea	Both	Both	Both	Both	External	External	Neither	External	Neither
Is the platform a cloud based, hosted management application (Software-as-a-Service)?			Yes		Yes, and on-prem install also possible	Yes	Yes	Yes, and on-prem install also possible	Yes, and partnered with Hype Innovation for on-prem installation	No	No	N/A		N/A
Is the platform interface fully bilingual (English & French), including support that may be required?			Yes		Yes, supports multiple languages	Yes	Yes	Yes	Yes	No	No	N/A		N/A
Does the platform enable users to access help menus, provide text tips, and short tutorial on commands and features?			Yes		Yes	Yes	Yes	Yes, and can customize	Yes, only for on-prem installs	Yes	Yes	N/A		N/A
Does the platform enable an administrative function to manage (add, approve, remove) user access / accounts?			Yes		Yes	Yes	Yes, for internal competitions and with limited options	Yes	Yes, only for on-prem installs	No	No	N/A		N/A
Must platform software be installed on users' computers and devices other than a compatible web browser, and does it require installation of any browswer plug-ins (e.g., ActiveX, Java, and Flash)?			No		No, for on-prem, software sits only on client's webserver	No	No	No	No	No	No	N/A		N/A
Does the platform function using the following web browsers: Internet Explorer 6.0 and later versions, Firefox 2.0 and later versions, and Mozilla 2.0 and later versions?			Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A		N/A
Is the platform application code and data hosted and maintained by the Application Service Provider (ASP)?			Yes		Yes	Yes	Yes	Yes	Yes	No	No	N/A		N/A
Is the platform accessible from the Internet, on a 24-hour, 7-day-a-week basis?			Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A		N/A
Is the platform universally accessible from the Internet to any user authorized to access and use the platform?			Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A		N/A
Is the platform available at least 99% of the time with a requirement of availability of uptime of 99% during business hours of M-F 8AM - 6PM EST, exclusive of scheduled maintenance			Yes, with longer support planned for global companies		Yes	Yes	Yes	Yes	Yes	No	No	N/A		N/A
Will the platform support and maintain a high availability architecture (e.g., RAID arrays and mirrored servers) capable of satisfying the Solution 99% availability requirements			Yes, redundant servers plus recovery images. Just passed security audit.		Yes, including tape and server mirrors	Yes	Yes	Yes	Yes	N/A	N/A	N/A		N/A
Does the platform work with unicode compliant browsers?			Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A		N/A
Is the platform 100% Internet based used IPv6 protocol?			Yes		Yes	No, but in their development pipeline	Yes	Yes	Yes	Yes	Yes	N/A		N/A

INFORMATION RELATED TO SECURITY AND TECHNICAL ISSUES

PLATFORMS WITH DIY CROWDS

	Common Pool	CMNTY	Idea Drop	Ideaken	Ideascale	Luminary Labs	OI Engine	Skild	Spigit	Wazoku	We Thinq	XPrize
Type of Platform (External (Saas) / Internal (On-prem) / Both / Neither	External	External	Both	Both	External	Neither	External	External	External	External	External	Neither
Is the platform a cloud based, hosted management application (Software-as-a-Service)?	Yes	Yes	Yes, and on-prem install also possible	Yes	Yes	Yes	Yes	Yes, and on-prem install also possible on private cloud	Yes	Yes	Yes	N/A
Is the platform interface fully bilingual (English & French), including support that may be required?	Yes	Yes	No, but may do a European rollout	?	Yes, and real-time translation	Yes	Yes, about to release French	Yes	Yes			N/A
Does the platform enable users to access help menus, provide text tips, and short tutorial on commands and features?	Yes	Yes	Yes	?	Yes	No	Yes	Yes	Yes			N/A
Does the platform enable an administrative function to manage (add, approve, remove) user access / accounts?	Yes	Yes	Yes	?	Yes	No	Yes	Yes	Yes			N/A
Must platform software be installed on users' computers and devices other than a compatible web browser, and does it require installation of any browswer plug-ins (e.g., ActiveX, Java, and Flash)?	No	No	No, but on mobile there is a native app that must be downloaded (iOS and Android)	No	No	No	No	No	No			N/A
Does the platform function using the following web browsers: Internet Explorer 6.0 and later versions, Firefox 2.0 and later versions, and Mozilla 2.0 and later versions?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No			N/A
Is the platform application code and data hosted and maintained by the Application Service Provider (ASP)?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			N/A
Is the platform accessible from the Internet, on a 24-hour, 7-day-a-week basis?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			N/A
Is the platform universally accessible from the Internet to any user authorized to access and use the platform?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			N/A
Is the platform available at least 99% of the time with a requirement of availability of uptime of 99% during business hours of M-F 8AM - 6PM EST, exclusive of scheduled maintenance	Yes	Yes	Yes, with live chat	Yes	Yes	Yes	Yes	Yes	Yes			N/A
Will the platform support and maintain a high availability architecture (e.g., RAID arrays and mirrored servers) capable of satisfying the Solution 99% availability requirements	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			N/A
Does the platform work with unicode compliant browsers?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			N/A
Is the platform 100% Internet based used IPv6 protocol?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			N/A