SIM Advanced Practices Council (APC)

The Society for Information Management's (SIM) Advanced Practices Council (APC) is an exclusive forum for senior IT executives who value directing and applying pragmatic research; exploring emerging IT issues in-depth; and hearing different, global perspectives from colleagues in other industries.

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Executive Summary

Enterprise crowdsourcing (ECS) is based on the flexible approach of “pay for what you use." Like cloud services, where enterprises have moved hosting to the cloud, crowdsourcing taps into vast pools of labor that are outside the enterprise and tapped only when needed.

ECS has three key components. The first is the enterprise buyer, which requests the work. The second is the crowdsourcing platform (CSP). The third is the crowd, which is comprised of individuals who generally work as independent contractors from their homes and offices all over the world. The size of this labor pool is staggering. Upwork has 2.5 million registered freelancers. Microtasking, the fastest growing segment of ECS, is a special type of labor that is new in crowdsourcing. It allows the buyer to engage the crowd to complete extremely small tasks in a matter of minutes, or even seconds, at a cost of 10 to 50 cents each.

A key driver of ECS is an identified imbalance between business needs and internal resources to meet these needs. ECS offers enterprises the benefit of elasticity, thereby facilitating ramping up and down.

We classified most firms we studied as stages 1 or 2 in leveraging ECS. In stage 1, governance is ad-hoc. In stage 2, the firm has created a center of excellence to manage ECS. In stage 3, ECS has become an integral part of the business. Stage 4 is collaborative economy pure-play.

Although most IT managers are not familiar with the power and potential of ECS, it is well diffused in the very largest US companies as well as government units. In 2014 employers worldwide spent between $2.8bn and $3.7bn. In all cases in the study, the ECS initiative was initiated and funded by low-level or mid-level champions.

Labor and legal challenges are substantial because ECS relies on flexible, ad hoc crowds – a labor force that is not comprised of full-time employees. The U.S. classifies workers as W2 or 1099. The ECS model for low level tasks depends on the flexibility of the crowd being 1099. As a result of the labor issues, firms are a bit secretive, probably out of concern for bad press.

Managing the crowd presents significant challenges related to assembling appropriate crowd participants, managing them, and addressing labor compliance issues. Not surprisingly ECS vendors resemble outsourcing vendors.

We also uncovered ECS failures. In one notable case, ECS resulted in a firm regressing from agile development back into a waterfall model.

Finally, we make several predictions for ECS for the 2020s:

1. ECS will expand beyond online into offline work, such as merchandising and deliveries.
2. Microtasking will evolve from ECS to automated microtasking.
3. Both internal and external ECS will grow and merge as enterprises connect internal teams to external talent through CSPs.

4. The collaborative economy will trigger greater adoption of ECS. Like Uber, enterprises will increasingly be driven to engage the crowd into a particular aspect of their business to reap the benefits of elasticity and on-demand talent access.
5. ECS will become a part of the digital transformation agenda inside the enterprise.

Introduction

Enterprise crowdsourcing (ECS) is based on the flexible approach of "pay for what you use." Like cloud services, where enterprises have moved hosting to the cloud, crowdsourcing taps into vast pools of labor in the global cloud only when needed.

Crowdsourcing, which is one of the innovations driving labor markets to become more specialized, modular, measurable, and flexible, has these attributes:

- Service-based: project, subscription, pay for what you use.
- Scalable and elastic: vast, on demand 24/7.
- Shared: no one owns the crowd, multiple clients can utilize the same subset of the crowd.
- Metered: individuals are paid for work that is measured for quality and turnaround.

The future enterprise of 2025 will be more disaggregated due to the combination of outsourcing, cloud, offshoring, and crowdsourcing. Crowdsourcing 2.0 is upon us already. This is the vision that one can “toss" work to the crowd effortlessly and get it done quickly and effectively. Enterprises will be able to capture ever refined slices of the labor market. For example, workers who want to moonlight already find it easier and less stressful. Companies that want to capture the expertise of retiring boomers can buy this labor via ECS. Employers who want to reach specific slices of the labor market, can easily do so, sometimes within hours or even immediately.

Drivers of Enterprise Crowdsourcing

Firms explore ECS when they identify significant imbalances between business needs and internal resources to meet these needs. ECS offers enterprises the benefit of elasticity, thereby facilitating ramping up and down.

A representative of a notable CSP captures these benefits:

> *"The other general lesson is that we tend to do well at companies that have a large imbalance. What I mean by that is this – If you are [a large IT vendor] or [a large cable provider], you have a huge appetite for cutting edge solutions that can forward your product services in the market. Your appetite is very big so you're always looking for different ways of getting great skills. We also have a lot of customers that are […] not exactly Facebook and Google in technology. But what they're seeing is that their capacity internally is very low, relatively speaking, but they're demand is going up. They still need an app to connect and service their customers. So again, there's a large imbalance and that makes them more willing to look at something new and different. That imbalance sometimes leads us to high tech companies and sometimes leads us to much lower tech companies. But that imbalance, to me, is one of the key drivers to get people to say that they need to do something different, were more than willing to try this, and approach it with an open mind."*

Time to Market
The ability to engage multiple providers and have them work in parallel enables firms to get to market much faster. Brivo, a small Internet-of-things product company, turned to TopCoder when it needed to meet the deadline of an upcoming tradeshow.

Scale
Many enterprises, whether they are digital companies or giant retailers, must manage very large datasets, such as product catalogs or user generated content. Amazon addressed the challenge by creating the first microtasking website, Amazon Mechanical Turk.

Access to Talent
Enterprises increasingly face business needs for which they lack internal expertise. ECS helps bridge this gap by allowing quick on-demand access to external talent. When the Harvard Medical School needed a software algorithm to reduce the computational time to measure the distance between two DNA strands, it turned to Topcoder and was able to reduce the computation time by 120x at a very small cost.

Can ECS go beyond improving operational efficiency and help the firm generate a competitive advantage? Carl Espoti, an ECS thought leader, described examples of firms doing so. Bloomberg and Thompson Reuters use the crowd to get information faster and cheaper, and also find it is more reliable and accurate. Unlike retail companies cleaning up blemishes in their catalogs, information providers such as Bloomberg compete on the quality and timeliness of their data.

Key Components of Enterprise Crowdsourcing

ECS has three key components:

1. The enterprise buyer, which requests the work.
2. The crowd, comprised of individuals who generally work as independent contractors from their homes and offices all over the world.
3. The crowdsourcing platform (CSP), which serves as the marketplace and middleman, like an Amazon of labor.

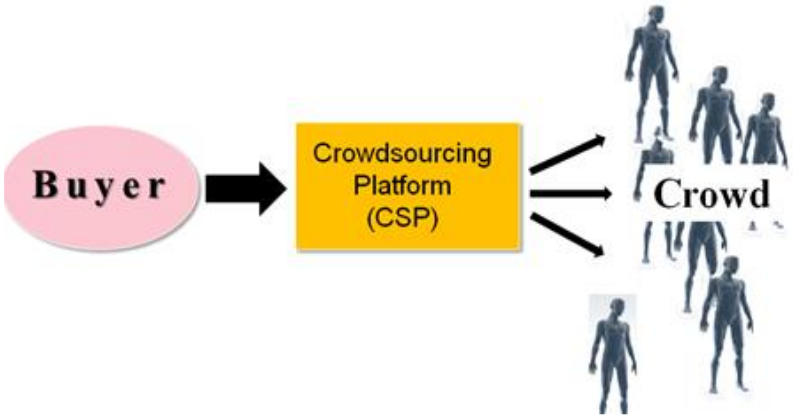


Figure 1: The basic model of enterprise crowdsourcing

The Crowd

Workers who comprise the crowd are scattered around the world. The size of this labor pool is staggering. Upwork has 2.5 million registered freelancers; Uber has 160,000 drivers; Taskrabbit has 25,000 service providers; Freelancer has 8 million workers; and uTest has 175,000 workers. Thirteen million workers are registered on the main Chinese crowdsourcing website Zhubajie, with a turnover of 6.5 billion yuan (US$1.04 billion). It had a $400m funding round of Chinese venture capital in 2015.

Crowdsourcing Platforms (CSPs)

There are many ways to categorize the thousands of CSPs. Some operate predominantly through competitions and challenges (e.g., TopCoder and Innocentive), while others are based on pay per task or project.

Several of the most important CSPs for the U.S. enterprise are:

- Upwork – a 2015 fusion and rebranding of oDesk and eLance
- Freelancer.com – a crowdsourcing supermarket that usually does smaller projects
- Topcoder – the software developers' platform
- uTest – crowd-testing's main player
- MTurk – Amazon's Mechanical Turk, the leader in microtasking.

Figure 2: Selected CSPs in 2015

Microtasking, the fastest growing segment of ECS, allows the buyer to engage the crowd to complete extremely small tasks in a matter of minutes or even seconds at a cost of 10 to 50 cents each. The work can be sliced into tiny, well-defined tasks, such as transcribing slices of tax forms and translating a few sentences. Microtasking is essential for tasks in which humans do better than computers. For example, humans can distinguish between two similar but not identical product descriptions better than the current capabilities of artificial intelligence (AI).

Amazon Mechanical Turk (MTurk) is the giant of small tasks. It was launched in 2005 when its parent needed to complete an enormous amount of tiny tasks. MTurk takes 10% of the fee and other CSPs use similar pricing models.

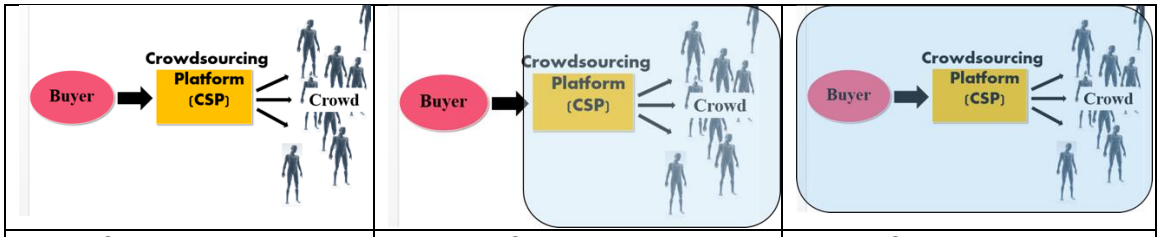
Websites access the crowd for microtasking through several channels. Some access the crowd via business process outsourcing; others curate a crowd on Facebook. Many CSPs use MTurk as a platform by building an interface that connects their processing to MTurk in order to access the huge crowd of workers.

- Crowdflower
- Clickworker
- Serv.io
- Microworker
- Crowdsource.com
- Microtask
- Amazon Mechanical Turk.

Leading microtasking websites

Modes of Engagement

ECS, like cloud and offshoring, offers three key modes of engagement depicted below. In addition, there are other hybrid composites.



Public Crowd	Managed Crowd	Private Crowd

Figure 3: Modes of Engagement

The public cloud is the pure form of crowdsourcing and is transactional, often one-off. The enterprise utilizes the standard feature-set of the CSP platform, usually in a self-service model, and engages the generic pool of workers.

The managed crowd is currently used by large firms that require the crowd workers to be filtered, screened, certified, and tested. Here the CSP cultivates the crowd workers and may even speak of "our crowd." In this mode, the enterprise or the CSP may develop custom functionality for the engagement.

The private crowd, which requires considerable investment, is a less common mode. The enterprise builds its own CSP and curates its own crowd. In addition, it must build the APIs between the CSP and its internal systems, which may be production systems.

Managing Enterprise Crowdsourcing

Although most IT managers are not familiar with its power and potential, ECS is well diffused in such large U.S. companies as Walmart and eBay. We speculate that very large companies may employ ECS because the massive scale of some of their tasks can best be addressed with crowdsourcing.

The Financial Times recently cited a report that estimates that employers spent between $2.8bn and $3.7bn globally in 2014 payments to CSPs and workers. The main Chinese crowdsourcing website Zhubajie, has a turnover of 6.5 billion yuan (US$1.04 billion).

Based on our study, we formulated a four-stage model, noting that most companies are currently in Stage 1.

Figure 4: Four Stage Model

Stage 1. Ad-hoc
In stage 1, ECS is owned by champions, often functional executives such as the head of marketing. They publicize successes and educate their peers. At this stage, ECS tends to be organic and bottom-up. Once ECS demonstrates success, there may be a pooling of resources and sharing of knowledge among several ad-hoc ECS groups.

Stage 2. Center of excellence (CoE)
In Stage 2, the CoE helps internal teams with project design issues such as atomization, the slicing of data and tasks into very small chunks, and integration - both of which require new modes of thinking.

Stage 3: Integrated
Here, ECS is an integral part of the business. Large online players that must manage vast data sets of transactions of user-generated content, such as Google or TripAdvisor, fall into this category. At this stage a company usually leverages either its own or a third party platform to engage the crowd on an ongoing basis.

Stage 4: Collaborative economy pure-play
At this highest stage, the enterprise delivers its core value proposition via the crowd and the crowdsourcing platform. The business cannot exist without the crowdsourcing element. Stage 4 is

aspirational for nearly all enterprises. The most well-known instance of a firm in this category is Uber, which leverages the crowd through a proprietary interface rather than a third party CSP.

Enterprise Crowdsourcing Challenges

We identified six key challenges that companies face when leveraging ECS.

Mindset
Since most senior executives do not seem to be familiar with ECS, securing top management commitment can be challenging. ECS should be positioned as a tool to enhance internal labor rather than a replacement.

Crowd curation, engagement, and development
The curation of far-flung crowds requires patience, networking, and resources. Crowdsource.com, a major CSP, claims that it has 5,000 to 10,000 trusted workers on a typical retail engagement. The invention platform Quirky, at its peak, had 200,000 active members and retained them by offering training courses, such as how to use 3D printing. Uber invests significant resources in on-boarding and developing its drivers. The company provides its workforce with suggestions on which element of service they may want to improve and offers guidance on how to do so.

Workflow design and atomization
For ECS success, internal teams must atomize data and tasks into very small chunks. Codified, detailed, and bullet-proof instructions must be created and well-vetted.

Infrastructure and APIs
Because the enterprise buyer must create proprietary middleware to provide access and ensure security, the CIO should play a central role. Unfortunately, CIOs have not taken on that role at many of the firms studied

Potential loss of agility
We also uncovered failures that vendors are reluctant to divulge. On one TopCoder project intended to support an agile approach to development, the CSP model forced a waterfall approach with thousands of pages of documentation. In other cases, buyers had to accept subpar tasks because they couldn't accept just part of a product.

Intellectual property and privacy risks
Sending data to the crowd incurs potential risks of disclosing intellectual property or personal information. The largest and most competitive American firms, leaders in using ECS, have overcome these risks through atomization. Each crowd-worker sees only a tiny piece of the entire puzzle and never enough to threaten an undesirable disclosure.

Labor classification
Labor and legal challenges are substantial because ECS relies on flexible, ad hoc crowds - a labor force that is not comprised of full-time employees. In the U.S., workers are classified as W2 or 1099. The ECS model with low level tasks depends on the flexibility of the crowd being 1099. As a result of the labor issues, firms are a bit secretive, probably out of concern for bad press.

Recently a number of collaborative economy pure-plays, such as BlueCrew in New York City, have chosen to classify its workers as full-time employees to avoid legal complications and improve

employee commitment and motivation. We have seen these examples, however, only among CSPs that operate a crowd of a fairly small size with a relatively advanced skill set.

In most cases, buyers don't have the ability to gather and manage the crowd as well as deal with labor compliance. Unlike the slogans of crowdsourcing, it is more than just paying an anonymous machine thru Paypal. Therefore, most buyers outsource managing the crowd to the CSP. The CSP, in turn, curates the crowd, trains the crowd, but usually wants to keep the crowd as contractors.

Enterprises should exhibit caution when dealing with low-paid crowd workers by engaging them with thoughtfulness and paying them in a way that will not appear as exploitative. U.S. workers must be able to string together microtasks that are greater than minimum wage.

Conclusions

Even though crowdsourcing has not yet had a profound impact on either enterprises or society, we believe that it will be a key factor in changing or even transforming labor markets in the next ten years.

Our predictions for the 2020s include:

ECS will expand beyond online into offline work
Traditionally ECS focused on work that can be done online (e.g., programming and data management). With the rise of mobile and the Internet of Things, ECS is beginning to be leveraged for such offline work as merchandising and deliveries.

Microtasking will evolve quickly
Companies will automate microtasking (robotic process automation), rather than use ECS.

ECS will be applied where automation falls short
Although automating mundane tasks and processes offers a better solution in some cases, many tasks currently either cannot be easily automated or require significant human input at the early stages. Hence, companies will balance the pros and cons of automation and ECS as well as use them more in combination. We will likely continue to see blending of the computer and human clouds, particularly with microtasks.

Internal and external ECS will grow
Enterprises will employ a balance of internal ECS to capture internal talent while working with CSPs and external crowds for other tasks. They will also connect internal teams to the external talent through CSPs.

The collaborative economy will trigger greater adoption of ECS
The rise of the collaborative economy, exemplified by Uber, suggests that in the future more enterprises will engage the crowd into a particular aspect of their business to mine the benefits of elasticity and on-demand talent access. An example of such blending is a supermarket-based system that asks customers to notify the enterprise when their desired products are out of stock. When a shelf is empty, the consumer scans the shelf's QR code and receives loyalty points for the extra effort.

ECS will become part of the digital transformation agenda inside the enterprise
As this occurs, ownership of ECS will shift to the executive sponsor of digital transformation.

Recommendations

Given our predictions, we recommend that enterprises seed experimental ECS projects and, over time, capture learning to move to Stage 2, where ECS is institutionalized in a CoE. Projects that leverage ECS should cover multiple functions, including data science, invention, operational business process, software development, software QA, and graphic design.

Appendix: Research Methodology

We conducted more than 30 hours of interviews with all members of the ECS business model: enterprise buyers, CSPs/intermediaries, and the crowd. We also relied on years of studying crowdsourcing, including speaking to dozens of crowdsourcing people in industry, government, and at many conferences.

Enterprise buyers
We interviewed ECS managers at a variety of firms, beginning with the larger ones. We conducted interviews with managers at three well-known large (more than $1 billion in sales) firms. In addition, we received rich cases on three enterprise buyers from a CSP or a vendor that we interviewed. We did this by deliberately probing in those interviews for rich cases. We conducted interviews with managers at two medium-sized (up to $1 billion) firms. And we added one small firm (with less than 200 employees) that was outside our target size, but had useful case lessons. Only two of the six enterprises we studied allowed us to use their names: Brivo, the small firm mentioned above, and Buscape, a Brazilian firm.

Crowd members
Opportunistically, we interviewed several employees in the crowd both in the U.S.A. and abroad. In particular, we spoke to crowd testers.

Middlemen and experts
We interviewed many managers at CSPs, consultants, experts, and vendors. We thank Carl Esposti, leading consultant on crowdsourcing, as well as many CSPs, including Crowdsource.com, Workfusion (previously Crowdcomputing Systems), uTest, and Lionbridge.

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