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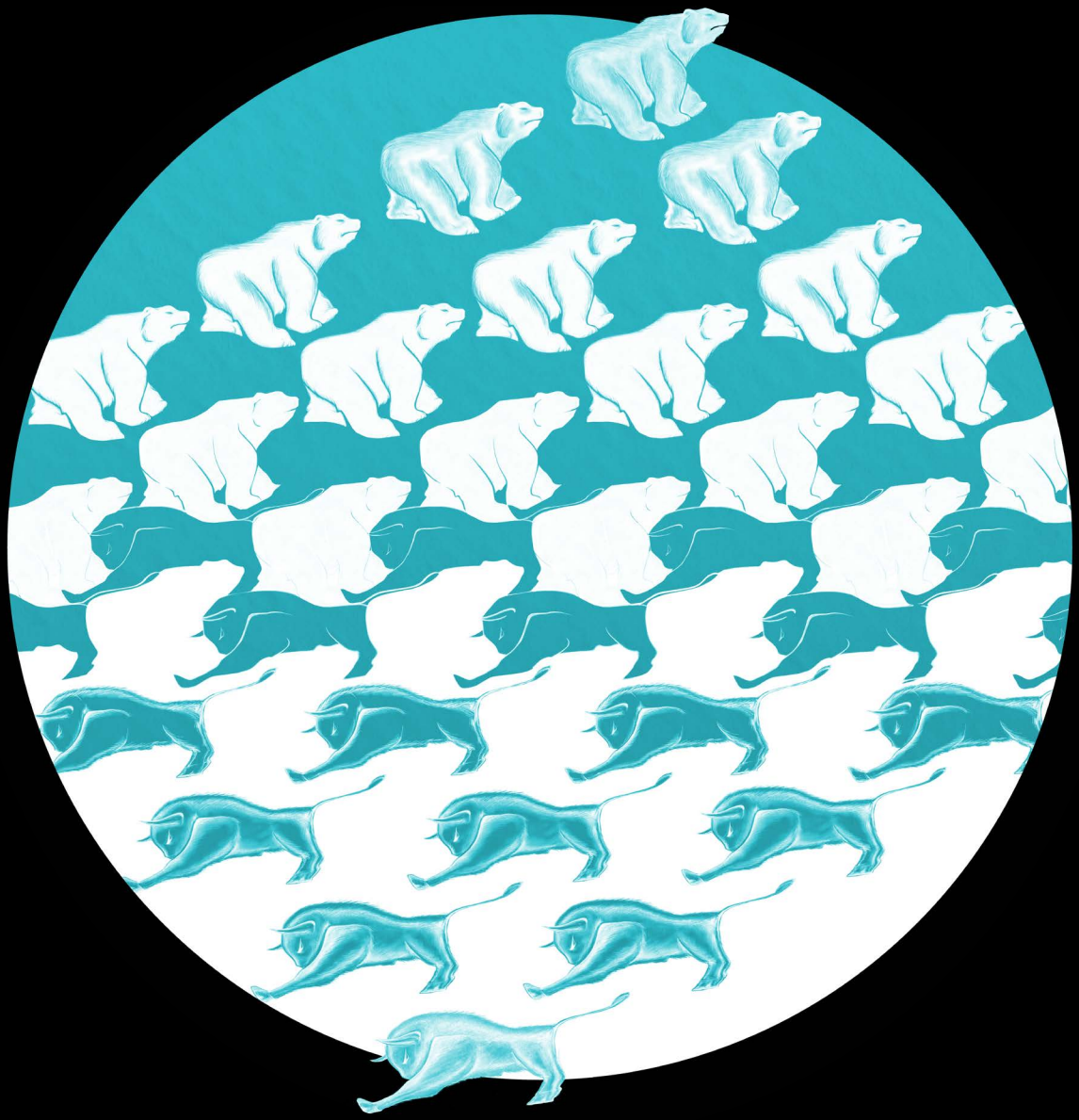

Collective intelligence investing

Alpha generation via alternative data brings new risks

Deloitte Center *for* Financial Services

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Warming up to collective intelligence investing

In the early 1700s, the South Sea Company stock was part of a stock market bubble. One investor who lost a fortune in the stock later remarked:

> "I can calculate the movement of stars, but not the madness of men."
> –Sir Isaac Newton[1]

The scientist and mathematician attributed his investment losses to the failure to understand the wisdom of the crowds. Jumping forward a couple of hundred years, some investment managers have found ways to harness the collective intelligence of people in the investment process.

How are investment managers able to derive market insights from the theories and thoughts of anonymous online users? What has made this possible? Two key phenomena seem to be the key enablers behind this movement:

- **Content-creation Web 2.0 technologies**
- **Advanced computing power**

Web 2.0 has enabled any online user to generate and share content—including investment-related information—on a diverse array of platforms, such as message boards, chat rooms, online communities, and crowdsourcing platforms. Additionally, advanced computing and analytics capabilities have allowed investment managers and information support vendors to generate real-time market insights from vast quantities of data. We refer to this process of generating market insights from online communities and crowdsourcing platforms as collective intelligence investing (CII) in this report. The myriad of market insights harnessed from CII covers a range of information—from trading signals, investment themes, and investment research to earnings estimates, quantitative algorithms, and asset allocation strategies—with each insight contributing to an investment-decision mosaic.

Getting started with alternative data and CII

Crowdsourced wisdom captured appropriately can form an alternative dataset and fuel effective CII. Automated algorithmic investment strategies have led to quant funds controlling nearly $1 trillion in assets (as of October 2017).[2] These quant strategies are often being complemented with alternative data, including the crowdsourced variant. Additionally, many traditional long-only investment managers are either running CII trials or evaluating adoption benefits. To view how alternative data is being implemented by most investment managers, please refer to Deloitte's *Alternative data for investment decisions* report.

Alternative data in action: Different classes of investment managers have used alternative data in a number of ways:

- **To quickly adopt CII in its investment decision process,** one bank's quant-trading arm utilizes earnings estimates from a crowdsourcing platform. The trading team uses shifts in crowdsourced earnings estimates in earnings time periods to inform trading decisions.[3]
- **A quant fund** uses different alternative datasets to derive unique insights:[4]
  - satellite imagery to track the number of factories under construction in rural China as an indicator of industrial production;
  - sentiment analysis to determine new product perception and brand reputation, thereby estimating future company growth; and
  - real-time ship movements to analyze the health of a company's supply chain and monitor global shipping trends.
- **A family office** looks at a combination of alternative data, including credit card transactions, geolocation, and app downloads, to analyze the performance of a global burger chain.[5]

Considerations for adoption: Traditional investment managers should keep the below points in mind while beginning their adoption of alternative data and CII:

- **Build a well-rounded talent team.** A combination of data scientists, engineers, economists, consumer experts, and finance professionals could help create a competitive edge from alternative data. Consider hiring multiskilled professionals with both data science and security analysis expertise.
- **Have an integrated insights team.** An integrated team of data scientists, engineers, behavioral economists, and financial analysts collaborating with each other would be well positioned to derive new insights. Conduct basic cross-functional trainings to prepare the team for new datasets.
- **Establish a fluid data architecture.** The technology, storage, and computing requirements for alternative data are vastly different. Having a system in place to handle multiple data feeds via API along with scalable processing power could be prerequisites for successfully managing alternative datasets.

Balancing the risks and rewards of CII from different platform types

Can investment managers benefit from information provided by anonymous online users?

Online communities and crowdsourcing platforms that focus on investing and trading-related discussions are typically driven by the hypothesis that there is wisdom in the crowd. This hypothesis is supported by an empirical study by students from UC Santa Barbara and Tsinghua University who found that following select authors from Seeking Alpha, a crowdsourced investment research platform, could lead to market-beating returns.[6] Research also indicates that smaller closed communities (compared to open communities) could be better positioned to provide alpha-generating ideas, as they tend to boast a better signal-to-noise ratio.[7,8]

The challenge for investment managers planning to use CII is to identify and sort the useful and dependable signals from the noise across different platform types. A unique aspect of some forms of crowdsourced data, compared to other alternative data types, is that it may be less susceptible to proliferation decay.

While mature online communities and crowdsourcing platforms offer potential for increased rewards, they also present risks that should be carefully negotiated. The impact and priority of each risk type tends to vary with the investment manager, unique processes, and scale of the online communities, as well as the crowdsourcing platform type. There are four key platform types offering CII, details of which are provided in figure 1.

Figure 1. Types of online communities and crowdsourcing platforms supporting CII

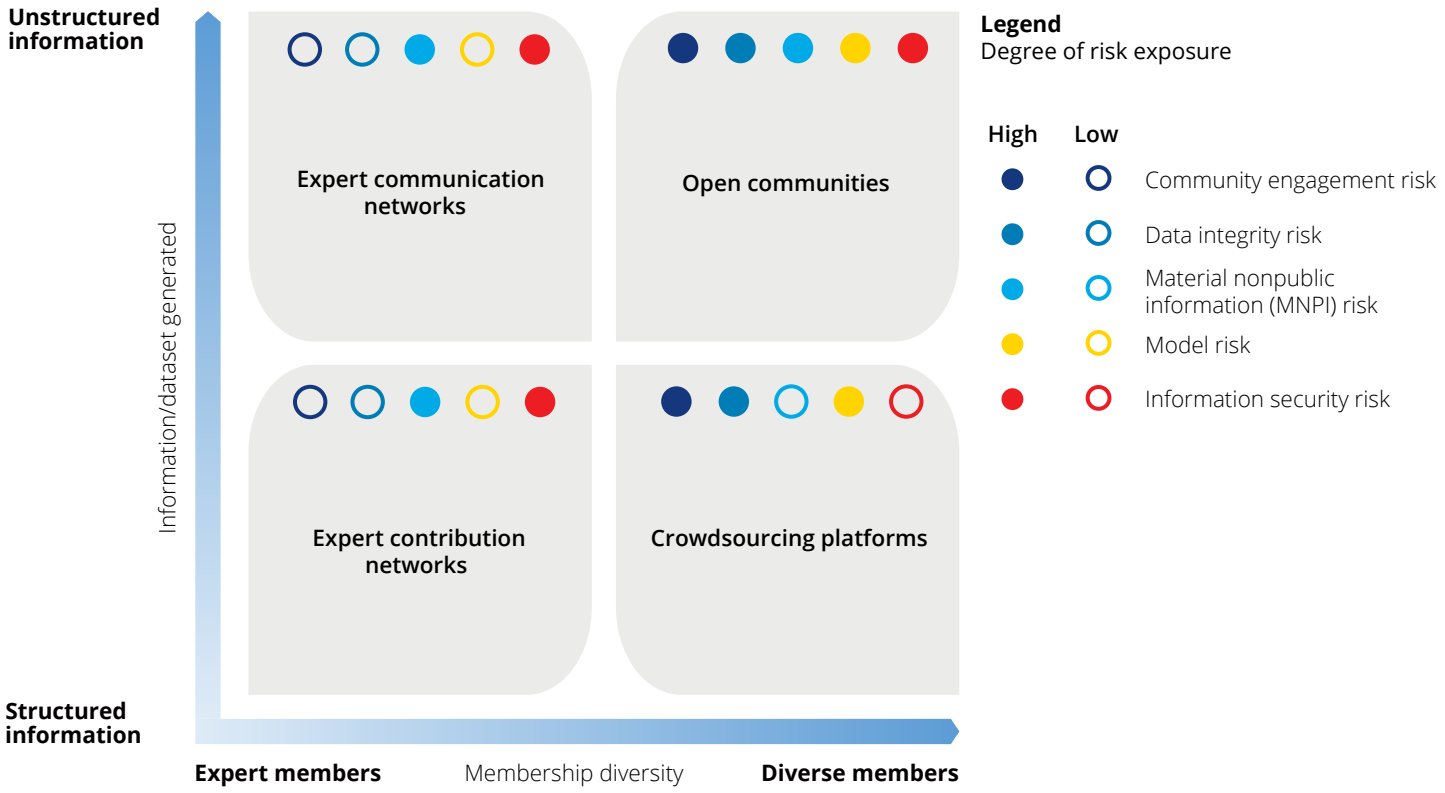
Community type	Description	Investment-related information	Crowdsourced platforms/examples
Open communities	An open network where any member can contribute investment-related content (mostly unstructured), ideas, and experiences	• Stock sentiment • Buy/sell recommendation • Company news • Investment research • Investment strategy/themes	• **Seeking Alpha:** Open community to share investment and stock-related research, call transcripts, and news • **eToro:** Social trading and investment platform offering copy and mirror trading services • **StockTwits:** Social media communication platform for sharing investment and trading ideas, news, and opinions
Digital expert contribution networks	A highly qualified group of experts contributes their research, opinion, or advice on the platform	• Hedge fund research and views	• **Harvest Exchange:** Digital platform for investors, advisors, and individuals to access curated content from investment firms
Digital expert communication networks	A group of experts use a platform for communicating their research and views, either externally or internally	• Opinions of buy-side professionals	• **SumZero:** Expert network of buy-side professionals sharing their investment opinions and views
Crowdsourcing platforms	An open community for gathering specific investment signal inputs to support the investment decision process; the community-generated information pool is analyzed to derive market insights	• Earnings and financial estimates • M&A deals • Algorithmic investment and trading strategies	• **Estimize:** Crowdsourced platform for aggregating earnings and financial estimates • **Quantopian:** Crowdsourced platform for quant analysts to develop, test, and utilize algorithmic trading and investment strategies

In addition to investment, reputational, and cyber risk, investment managers and CII platform providers are exposed to community engagement, data integrity, MNPI, and information risks, among others, that are specific to CII. To help both constituent groups identify, understand, and prepare for these CII-specific risks, we interviewed industry participants and subject matter experts.

Figure 2 maps out the CII-specific risks—and degree of risk exposure—across the different online communities and crowdsourcing platform types.

Figure 2. CII mapping grid

The key risk exposures for firms varies based on the diversity of community membership and volume of dataset/information being generated



Source: The risk mapping grid was developed based on inputs from industry practitioners and subject matter experts.

Community engagement risk

Ensuring healthy contributions from a thriving and active community can be important for both the platform provider and IM firms utilizing CII support vendors. Platforms reaching a critical mass of members should ensure the retention of existing members and high engagement levels among influential users for continued success. This is often an integral challenge as many social platforms have witnessed drastic declines in their active user bases after gaining early prominence.[9] Investment managers maintaining a proprietary CII platform can monitor key community details (including diversity, influential users, and member attrition) and make decisions. On the other hand, these community details might not be readily accessible for IM firms depending on CII support vendors.

Crowdsourcing platforms possessing a large and diverse membership are typically exposed to a higher degree of engagement risk. In order to mitigate this risk, platforms can introduce a number of features to maintain high user-engagement levels. Some platforms adopt gamification (contests, user ranking, and leaderboards) to recognize and reward influential users and top contributors. Some also use a lock-and-key approach, asking users to share their own opinions before they can access the collective knowledge base.

Material nonpublic information (MNPI) risk

It can be imperative for CII platforms to conduct sufficient due diligence on their data and input origination processes to mitigate MNPI risk.[11] Sharing of MNPI (ranging from proposed transaction and term sheet to nonpublic financial and operational information) on the platform can lead to adverse legal and regulatory consequences. MNPI and associated risk exposures differ based on platform types—from expert networks where users are identified, to open communities with anonymous users.

What should IM firms do to mitigate this risk? Rigorous due diligence of CII platforms is one way to reduce this risk exposure. Expert networks can introduce well-defined registration policies to record affiliated organizations and restricted input options based on each user's profile. For open communities with a large number of anonymous users, additional checks and balances should be conducted if a very small sample of participants are driving a particular market insight. These could include allowing a limited number of inputs per user and closely monitoring user-input patterns.

Model risk

Most crowdsourcing platforms typically utilize proprietary models with supporting algorithms for screening, processing, and deriving market insights from their crowdsourced information pool (referred to as CII model output). These CII model outputs are then incorporated as inputs into an IM firm's investment model. Any error in the CII model or its algorithms can adversely impact the output accuracy. Only those CII models that can withstand changing community diversity, experience, and input freshness would be able to survive and provide market insights over time. This element of risk is new and not present in traditional financial data used to support investment decisions. For example, with CII the rules for input are generally much less structured than corporate financial statements.

Higher membership diversity would increase the variety of inputs on a platform, and as a result, could increase the model complexity and risk exposure. To mitigate this risk, sufficient model testing and sturdiness checks across different scenarios could help avoid negative CII output events.

Information security risk

As the entire business model of online communities or crowdsourcing platforms is online, any security breach, access denial, or improper access attack can adversely impact the platform's operations. It is imperative for these platforms to have in place an advanced and secure technology infrastructure, as the number of computer malware, phishing, and virus attacks is growing every day. This risk exposure generally intensifies for expert networks, where less analysis is typically required to derive market insights.

Data integrity risk

Online communities and crowdsourcing platforms collect a large variety and volume of inputs from their members, leading to the creation of an unstructured dataset. How good are these user-provided inputs? What are their accuracy levels? With a constantly shifting community membership and diverse accuracy levels, maintaining data integrity for these user-generated inputs can become difficult. Some platforms have put in place a system that can screen out the outlier inputs and filter for identifying users that provide more accurate inputs. The degree of risk exposure generally increases in proportion to the scale and spread of inputs provided by community users.

As an example, we looked at the process through which Estimize (a crowdsourcing earnings and financial estimates platform) screens and filters estimates for more than 2,000 US stocks from 50,000-plus contributors.[10]

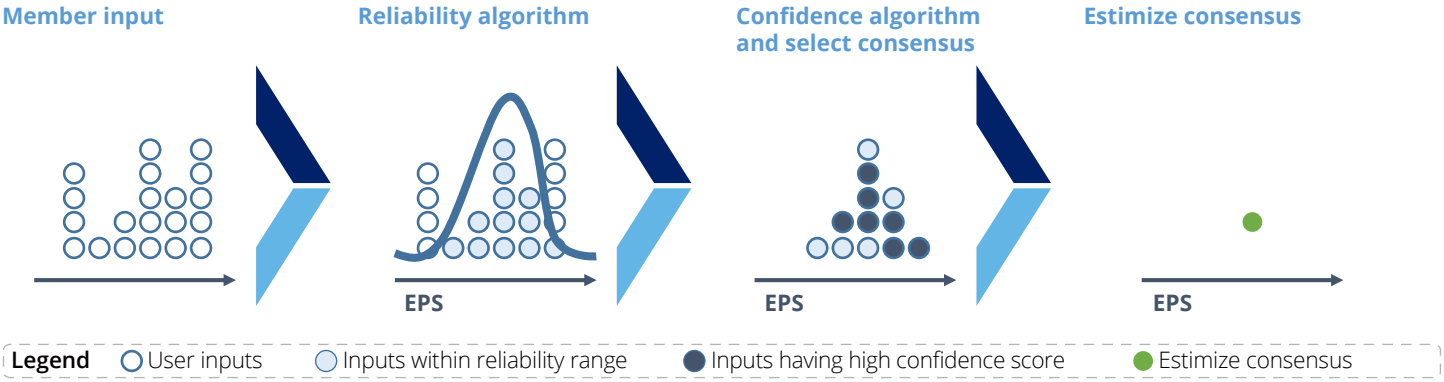
Estimize depends on proprietary machine learning algorithms for screening and filtering estimates provided by members. Dependence on the inputs collected from an open community tends to provide challenges on two fronts: community characteristics and input range.

1. **Community characteristics:** There is continuous flux in the community's membership, background, and experience. The company uses a process that combines machine learning, behavioral heuristics, and human intervention to identify the more influential users for each company and sector.
2. **Input range:** Members provide estimates that need to be screened and filtered to ensure all are within a statistically reliable range.

Estimize has developed a process to address both the community characteristics and input range challenges. Each stage of the process is mapped and described in figure 3.

Figure 3: Crowdsourced input processing and analysis

Estimize uses machine learning algorithms for screening and filtering earnings per share (EPS) estimates



Estimize contributors provide their inputs on the platform, leading to the formation of the input pool for a particular company.

A mean variance model compares user inputs against actual earnings of preceding eight quarters. Superfluous inputs are flagged and excluded from input pool.

Real-time regression models coupled with behavioral psychology aspects are used to provide a confidence score to each user input.

Appropriate weights are allocated to user inputs based on confidence score. Weighted user inputs are then pooled to arrive at an Estimize consensus.

Source: Deloitte Center for Financial Services analysis (based on interview with Leigh Drogen, Estimize founder & CEO).

This approach for handling the entire process—from collecting estimates from members to generating a crowdsourced earnings consensus—is designed to address data integrity risks and convince clients that all user inputs are being closely monitored and curated on the platform.

The road ahead for investment managers

Investment managers are facing a difficult market and operating environment, making alpha generation an essential element to successful organic growth. In their search for differentiation, investment managers are increasingly referring to alternative data sources (including online communities and crowdsourcing platforms) to gain information advantage and make investment decisions.

Improvements in advanced data analytics and the increasing availability of data from online communities have set the stage for investment managers to augment their decision making with CII. To succeed with CII, investment managers should customize these market insights for their current investment decision-making process. For example, a team of buy-side analysts is using earnings estimates from one crowdsourcing platform to develop a broader market view that differentiates it from the typical sell-side-driven estimates of its competitors.[12] IM firms like these may be at the forefront of using CII, but it is likely that many more will follow.

2017 saw the usage and testing of CII among hedge funds rise significantly. CII will likely see increasing usage among traditional long-only managers over the next two years. Many investment managers seeking maximum advantage could adopt a holistic view of CII, driving change through cross-functional teams (analytics, risk, operations, and IT) and the investment life cycle. However, in their quest for better returns, it would be prudent for investment managers to move cautiously and consider incorporating appropriate CII risk mitigation measures for the differences and nuances of each dataset.

Figure 4: Success factors for CII

Before jumping wholeheartedly into CII, IM firms could adopt the following steps for a potentially smoother takeoff:

While all these steps do not guarantee success, investment managers stepping into CII with sound business practices and a holistic risk management framework are more likely to experience sustained positive outcomes.

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