Reaching the Unreachable

A Method for Early Stage Software Startups to Reach Inaccessible Stakeholders within Large Corporations

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Abstract—**Bridging the gap in software development from idea to need remains a difficult task for startups, especially when users are unreachable within the black boxes of large corporations. The lack of customer collaboration results in the failure of requirements elicitation and subsequently the failure of software products. In this work, we describe a simple but effective method to enable startups to reach relevant hidden stakeholders within large corporations and elicit requirements from them. AdvisorNet leverages professional networks and social media to find senior domain experts. These carefully selected advisors bridge the gap from the outside world to the hidden corporate structure and social networks in the target corporation and enable highly successful elicitation from stakeholders. We demonstrate AdvisorNet with a real-world case study in which a London-based startup successfully connected with multiple advisors who then introduced previously unreachable users for requirements elicitation and decision-makers to achieve their goal of trialing their product within the large corporations. Finally, we provide suggestions for future research to formalize the method further and enable it to become rigorous and repeatable.**

Index Terms—**startup, B2B, stakeholder, social network, requirements elicitation, advisors, users, decision-makers.**

I. INTRODUCTION

Software startups are difficult. Although success stories may appear frequently in the media, failure is much more common. Armed with limited resources, significant time pressure, uncertainty in product needs and market, most software startups fail within the first two years [1].

Many startups choose to create Business-to-Business (B2B) enterprise solutions. Examples of successful B2B startups valued over $1 billion include Alibaba, Box, Stripe, and Workday. As organizations make logical process-driven purchasing decisions compared to individuals, selling to organizations can be more straightforward. But startups begin with little or no operating history [2], as a result, they do not have the connections with large organizations nor reputation to be taken seriously and their sales pitches will be ignored. (In this sense, other large organizations have some advantage in this area due to prior experience and connections with existing customers [3].) Although large corporations from the tech industry are increasingly open to innovation initiatives by means of partnerships with startups [4], individual employees and other industries are still largely conservative, hence creating roadblocks for startups

wishing to engage with such organizations. Unless a founder has prior connections, creating solutions for users who are hidden within an organization is nontrivial. For many startups, a large corporation is a black box. A startup with an idea for a new human resource (HR) management solution, for example, may not know the decision-makers, purchasers, or users in the organization, and the roles they play within the organization. In one organization the decision-makers might be senior managers, purchasers might be IT managers, and users might be staffers, but in another organization the decision-makers might be directors, the purchaser might be the HR manager and users might be project managers. Even when users have been identified, requirements elicitation by early startups is hampered by the lack of accessibility [5], with difficulties reaching users [6] due to their lack of time or motivation to be involved, or simply that the users do not like to be cold-called. Even finding the right sample of customers and convincing them to invest time in collaboration is challenging [7].

The problem is serious. In a recent study, 100% of the startups that failed and 29% of startups that were still active reported difficulties establishing contact with their potential customers and involving them in product work [7], with a common shortcoming of involving customers too late (i.e., after the product is developed and released into the market). As a result, the most common mistake made by startups is to develop something that users do not want [5]. This problem is only becoming worse in our increasingly digitized world, and ever-expanding number of software startups, many trying to disrupt existing industries with their B2B products.

Any proposed solution to this problem must involve early stages of startups, which require constant interaction with users in order to elicit requirements [1]. While an innovation in algorithm design, or by a perceived need for a new combination of technologies, might often seem sufficient to justify the creation of a product, developing a deep customer collaboration process early on is more important [8], as it helps move startups towards testing the problem and understanding if the solution fits real needs before the product is even developed [1].

Our work focusses on B2B startups at this early stage and provides a practical solution to the problem of reaching inaccessible stakeholders within large corporations in order to elicit requirements. We investigate the research question:

How can a startup systematically leverage their social network to reach inaccessible stakeholders in large corporations in order to elicit relevant information?

where relevant information includes:

1. Identification of stakeholders and their relationships, and the organizational structure relevant to the startup idea or product.
2. Identification of social networks relevant to the startup idea or product, such as highly connected individuals who have links to many categories of stakeholders.
3. Elicitation of requirements from users, collaboration agreements and possible business models from managers, and integration requirements from technical staff.

In this paper, we describe AdvisorNet, a simple but effective method to address the research question. The method is light-weight, easy to learn, quick to show results, cost effective, replicable across different industries, does not require experience in business, sales or requirements elicitation, and does not rely on pre-existing contacts. We describe the application of AdvisorNet in a real-world case study, following a London-based startup as they used the method, successfully reaching previously unreachable stakeholders in large corporations of more than 5000 employees and 50 offices worldwide.

II. Background

Agile practices, which are designed to stimulate customer feedback are often used by startups [9], with some startups using custom-made lighter versions of existing methods that are modified according to needs, such as "thinner" Scrum [5]. Ad-hoc requirements elicitation methods are often used [7]. However, all such methods can only be applied after customers are identified.

In the absence of actual customers, alternative strategies for requirements elicitation include the use of personas and scenarios [2, 7], to secondary information sources such as analysis of similar products, extracting requirements from standards, laws and regulatory documents, observing market trends, and mining competitors forums and social media [3, 9]. User stories are also used, although the information they provide to developers have been found to be insufficient [9]. Although startups are aware of the importance of early customer feedback and dangers of not involving their input in the requirements engineering process [10], many still resort to using friends and family, who are often not the target customers. When possible, some rely on their own previous experience in the domain, which may comprise anecdotal evidence insufficient to prove the need [7]. One of the most common sources of requirements is internal – requirements are invented by the startup team, with the result that success is dependent on the domain knowledge of the team and there is a risk of building the wrong product [3].

Existing startups also use mentorship, in the form of experts, acquaintances, other entrepreneurs, or companies developing products in a similar domain, in order to provide direction in terms of choosing suitable people or sources for requirements elicitation [7].

Lim and Finkelstein proposed the use of a social network to identify stakeholders of large-scale software projects [11, 12].

The method has been found to be effective where consent has been provided for the project. When the method was applied in industry, they found that stakeholders can lack motivation to make recommendations about other stakeholders [13].

Guzman, Alkadhi and Seyff proposed a method that uses machine learning to gather requirements from different stakeholder groups via Tweets [14]. Lim and Bentley proposed an automated tool that establishes a Twitter presence in the area of interest of the target users, identifies those that are open to connect, engages with them, and elicits requirements from them [15]. Such methods can be effective at reaching a wide range of users, although Twitter as a platform is better suited for consumer-based products rather than B2B as many enterprise problems are not interesting enough for Twitter or may not be suitable to make public.

To summarize, existing methods used in startups are often ad-hoc. There is a lack of repeatable mechanisms to identify and reach out successfully to potential customers and elicit requirements from them. Examples of stakeholders and categories of stakeholders provide little help in identifying stakeholders for a specific context [11]. Reaching and involving stakeholders or users who are not within organizational reach is not supported by existing requirements elicitation methods [6].

III. AdvisorNet: The Social Network Advisory Method

We present AdvisorNet to address the research question. AdvisorNet can be summarized in Fig. 1.

1. Formulate need (e.g., we need feedback from potential users of concept product).

2. Hypothesize target person specification (e.g., human resource manager of large organization X, Y or Z).

3. Create desired advisor profile (e.g., ex-partner of X, Y or Z).

4. Search social media for matching profiles.

5. Choose advisors and invite them for one-hour video calls for a fee.

6. Refine questions, get new advisors. Repeat until connection with target people achieved.

7. Reach targeted stakeholders or if hypothesis in (2) is found to be incorrect, make new hypothesis and repeat.
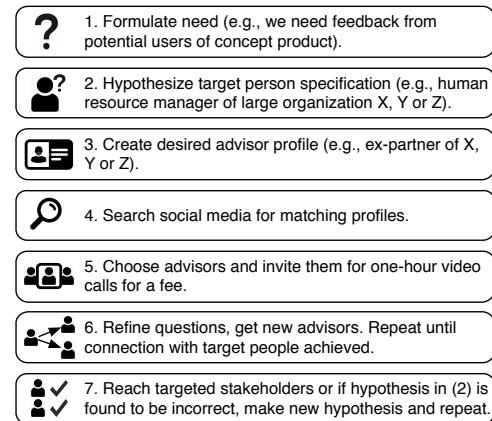
Fig. 1. The seven steps of AdvisorNet.

AdvisorNet is premised on a key factor: bridging individuals (Fig. 2). These are individuals who were previously part of the targeted organization, but have now left (e.g., moved to another organization or retired). They remain linked to the social network of individuals within the target organization. They are able to talk about their experience and problems related to their role, within the limits of their past employment contracts and non-disclosure agreements. From experience, we have found that advisors who are motivated to assist share the same interests as the startup, and the startup is presenting an idea that confirms the advisors' own beliefs – perhaps even giving them an opportunity to improve systems they observed and felt were inadequate. Often, they have recently changed roles making them more open to new opportunities such as consultancy,

have an interest in startups and enjoy understanding the needs of and assisting others. Using a small initial request of one hour of their time paid at their preferred rate prevents the role from being arduous, and many relish the chance to be perceived as an expert.
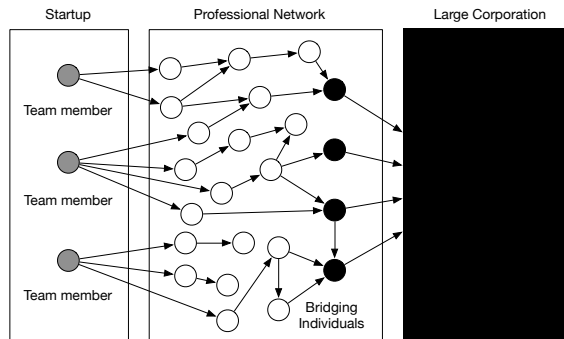

Fig. 2. Using advisors as source of knowledge and bridging individuals into corporations.

We describe each step in AdvisorNet as follows.

A. Formulate Need

Depending on the stage of the startup, the need may be to assess the viability of a product idea, refine the feature set of an existing product, obtain agreement from a manager to conduct a product trial, or even identify and convince the decision-maker to make purchase. This need should be clearly articulated beforehand to prevent ambiguity or confusion.

B. Hypothesize Target Person Specification

The startup must next hypothesize which group of people would be able to meet the need. For example, given the need to check the viability of the use of technology X to provide feature Y for recruitment, we might hypothesize that independent recruiters and recruitment consulting staff within recruitment companies would be able to provide valid information.

C. Create Desired Advisor Profile

We do not contact target people directly – cold calling is likely to damage potential connections instead of forging new links. Instead we contact advisors with the following attributes: (i) seniority, as senior individuals are likely to have better connections and overall visions of problems within the organization; (ii) left targeted organization less than 12 months ago, so that their domain knowledge is current and their social network is intact; (iii) ideally employed by targeted organization more than 12 months, to allow time for their network to build; (iv) mention interests or experience relating to the startup concept, product or market; (v) ideally have multiple connections with people matching the target person specification.

D. Search Social Media for Matching Profiles

AdvisorNet operates on LinkedIn as it is a widely-used social media platform for professionals. Ideal advisors, people who are excited about innovative ideas, are in the minority (2.5% of the population [16]), and as such it is necessary to search from a sufficiently large sample to find them.

E. Choose Advisors for Video Calls

Initially, 10-15 advisors should be selected, with their search taking no more than one week. Due to practical restrictions, only a limited number of potential customers can be involved in elicitation and any requirements are generalized over a larger population [10]. As a result, these initial sources have to be carefully selected to reduce bias. When evaluating the quality of potential advisors, various criteria can be used. Occasionally a partial match to the desired profile can achieve good results. For example, a less senior individual may still be well-connected in the domain of interest and have more current domain knowledge.

A short invitation text to participate in a video call, and potentially a product summary, should be used to contact the advisors, with an offer to compensate them for their time. The text and summary should evolve over time and be modified as necessary to improve response rate. Interviews should be set as quickly as possible, ideally taking no more than one week in total, so that concepts can be verified quickly and if needed, changed.

A set of slides should be used during the interviews to provide structure and guide the process. The content should focus on describing the problem, the proposed solution, and eliciting feedback. To help provoke useful discussion, the final slide should comprise questions such as: "Is this the right solution for the problem?", "How can we improve our product?", "How would you use such a system?" and "What is the best approach to market and pricing?" The slides should be succinct and produced very quickly in order to avoid wasting time on as yet unproven need. (Note that requirements engineering in software startups is closely related to business development, where the business model is a decisive factor in the choice of requirements engineering practices being used [5].) The same set of slides should be used for all the advisors in the same round of interviews to ensure consistency and enable majority opinions to be gathered before feedback is addressed.

To maximize effectiveness, the structure of the interviews should be as follows. Start with small talk to build rapport, introduce the company and team, indicate the openness to honest, even harsh, feedback. Then, using slides as discussion prompts, the majority of the interview should be used for verifying the need, eliciting feedback and gathering information. The advisor should do most of the talking. Each interview should be recorded and notes taken.

F. Refine Questions, Get New Advisors

Following the initial round of interviews, three advisors should be selected to iterate the pitch. In the ideal scenario, all advisors will have similar feedback about the product and the need, hence the task here would be to select advisors that have the best potential network and best advice. However, this is rarely the case, so in this stage, we summarize each advisor's feedback into high-level requirements. Here we also introduce an element of priority: we weight the requirements by the advisor's expertise in the area. This involves judgment, and so caution must be taken to refrain from weighting an advisor higher because they confirm our existing beliefs.

The selected advisors should share similar ideas about the product and the need, in order to enable the pitch to converge. Their product ideas should also match the startup's capabilities, in order for it to be built. When a startup uses AdvisorNet to validate a product idea, it is very likely that the outcome is not the product originally proposed or is a variation of it. The user of AdvisorNet must accept that the market wants what it wants, and flexibility is needed when searching for product market fit.

Slides should be updated solely based on advisor feedback. The same set of slides is used on all three advisors. The final slide should clarify the aim of the interview and ask specific questions, for example "our aim is to get a trial with company X – who do we talk to?" This helps the advisors to think in the right way and give actionable feedback on what is needed before they will exercise their network. If the advisor is not the user of the product, they are likely to suggest introductions to target users. As this process iterates and the advisors are given multiple opportunities to provide feedback until introductions are made, a software prototype can be produced to be used as a demonstration. Given that the concept will evolve over time, this should be a quick and simple prototype, implementing only the minimal features required to proceed.

AdvisorNet aims to lead to introductions to the target people in an organization after a few iterations with the advisors. In order to reach more organizations or more target people, this step is repeated with new advisors, using the latest version of the invitation text, product summary, and slides.

G. Reach Targeted Stakeholders

AdvisorNet has now resulted in introductions to the target people by friendly intermediaries. By iterating several times with appropriate advisors, their active collaboration results in them becoming integrated into the startup team and becoming advocates for the team. The final stage involves preparing a new set of slides for each set of target audience, with the advisor making the introduction. The target people are then asked to participate in hour-long interviews, ideally with an advisor present. Even if the startup began the process with little more than a hazy idea, AdvisorNet will enable the idea to be iteratively refined through deep customer collaboration, until the startup achieves working prototypes, trials, and sales agreements with decision-makers.

IV. CASE STUDY

We now present the use of AdvisorNet in a real-world case study (details anonymized). In this case study, the need was for a software startup to determine how best to use a technology arising from academic research (an agent-based simulation of how people with different personalities would work in a team) for a product. The founder was unable to gain interest or even understand who the users were. Existing methods such as mentorship via other entrepreneurs and exhibitions at conferences were used without success. There was also a pressing need: the investor had predicated the next round of investment on the founder proving demand within a limited timeframe.

We hypothesized that people in large consulting companies might be interested in such a tool, as consultants work in teams that are assembled for short-term high-value projects. These people are especially hard to reach as they have a high workload, do not respond to cold calls and are uncomfortable talking to strangers about their internal processes.

We specified the advisors to be ex-partners or associate partners of targeted large consulting firms. In total, 6,000 LinkedIn profiles were automatically parsed to find 95 profiles that matched our criteria (ex-partners who had left a year ago are rare). An invitation text and two-page product summary were used to contact potential advisors.

A total of twelve ex-partners from various firms agreed to be advisors, and a one-hour call was conducted with each: ten with Zoom, one with Google Hangouts, one in person. Three advisors were selected from the initial twelve to iterate the pitch. The advisors were selected because they were knowledgeable in the area, have similar ideas about the problem and requested product features that the startup could develop (Fig. 3). The slides were refined focusing on the feedback from these three advisors with a new product concept of optimizing teams across multiple factors on top of personality fit, and the final slide now ended with the aim of implementing a pilot project with the organization, and the questions: "What do we need to do next?", "Who do we need to talk to?", "What should the pricing be?"
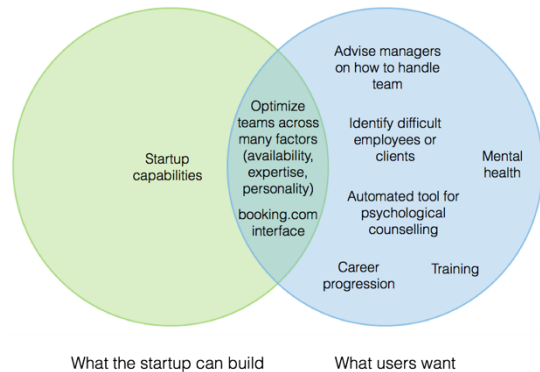

Fig. 3. Venn diagram showing advisor high-level requirements and their overlap with what the startup can offer (features that are too small, e.g., calendar plugin, are not included).

A further iteration with the advisors resulted in more professional-looking slides, product summary and a prototype that demonstrated the main features that the advisors suggested were important, still making use of the technology developed by the startup. Slightly different versions of slides were produced for each type of target user and decision-maker revealed by the advisors.

This was then sufficient for the advisors to begin introductions to relevant people in one of the targeted large corporations – the final stage of AdvisorNet (Fig. 4). Very quickly, users were providing positive feedback on the product and its features, confirming pain points, and the advisors assisted further by providing access to decision-makers who were able to give the go ahead for a trial of the proposed product. The prototype and materials for the case study are available at: http://www.cs.ucl.ac.uk/staff/S.Lim/advisornet/
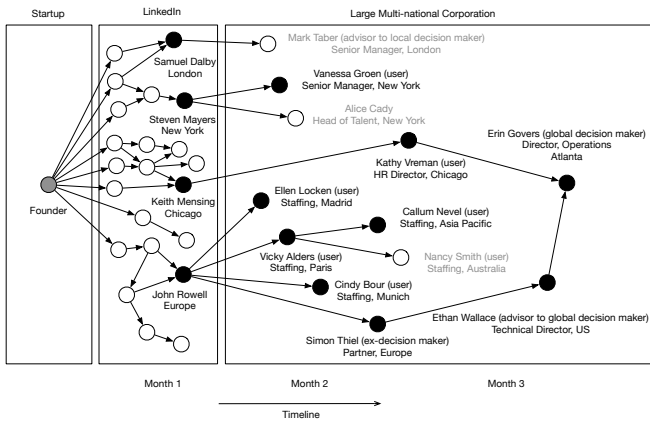
Fig. 4. Advisory network from startup to users to decision-makers for a large multi-national corporation. LinkedIn allows us to contact 1st, 2nd and 3rd level contacts in the network. Arrows indicate direction of introduction. Nodes in black indicate successful introduction resulting in one or more one-hour elicitation calls. Names are anonymized for confidentiality.

The timeframe to iterate from concept to product with feedback from advisors and actual users, finally reaching the decision-maker of the organization, was three months – a rapid and effective result. A total of 18.5 hours of advisory time were required to achieve this. The cost to the startup was £4,500 in advisory fees – a cost-effective solution for the startup.

This process was repeated for different corporations, resulting in a total of 25 introductions into 4 organizations. The response rate was high: 23 introductions agreed to interviews, resulting in 3 companies wanting to trial the product. 47 hours of advisory calls were conducted with 29 advisors. Their hourly rate ranged from £0 to £700, with 11 advisors not charging for their time. The average cost per interview was £210 and the average cost per advisor was £460 (7 advisors were used multiple times). It cost an average of £2,500 to reach each organization, and £400 per introduction. In comparison, presenting at an exhibition costed more with only 1 interest and no follow up; hiring consultancies or advertising agencies would have costed ten times this amount and is unlikely to achieve a result of this magnitude. Quality of feedback was generally high because advisors were experts in the area and apt at providing feedback. Advisors became increasingly enthusiastic as the product was refined, and two advisors offered to invest.

V. THREATS TO VALIDITY

While good results have been achieved to date with a variety of teams and experiences, the success of AdvisorNet is dependent on several factors described in this section.

Although requirements elicitation experience is not a prerequisite for AdvisorNet, interviewers with limited interviewing or presenting experience may elicit worse quality information or require more rounds of interviews before advisors are comfortable to make introductions. Similarly, the quality of the invitation text, product summary, slides, and prototype will affect the success of the method.

The method relies on topics suitable for large organizations that are also clear and interesting enough to capture a potential advisor's attention via the short invitation text. As such, some ideas may struggle to gain interest and hence have difficulty finding advisors, although lack of interest might indicate lack of product market fit, which in itself is useful information.

Employees who have left the target organization may still have constraints on confidentiality, limiting their ability to help as advisors. In addition, potential advisors can also be constrained by their current employment contract rather than past employment contract. Constraints and conflicts of interests are usually uncovered on initial contact, and as a result such individuals are not engaged as advisors. But this does reveal that highly secretive industries may be less suitable for AdvisorNet as there will be fewer available advisors.

Finally, startups using AdvisorNet have to be open to sharing ideas in order to gain traction. As such, a startup operating in "stealth mode" would be unsuitable, or may need to use non-disclosure agreements to prevent advisors from disclosing confidential information, but in general it is better practice to be open – the most difficult part of a startup is finding product market fit and gaining customers, not developing ideas.

VI. FUTURE DIRECTIONS

There are many ways in which AdvisorNet can be further improved and developed. So far AdvisorNet has limited automation which enables searching of social media profiles automatically. However, there is much more we can automate and analyze to enhance its effectiveness.

A. Automated Analysis of Advisor Quality

Advisors are evaluated based on their ability to give good requirements (relevant expertise and experience in the area), and ability to give good introductions (either to potential users or decision-makers). We currently select advisors based on their position, assuming that seniority provides higher betweenness centrality. Social network analysis can be applied to their professional network to know their connection and provide objective metrics to evaluate advisors. Visualization and analysis tools could be used to help understand how the social networks interact with corporate structure as it is learned from the interviews, and help startups make strategic decisions about which people in the large organizations are best placed to help.

B. Conversion of Interviews into Requirements

AdvisorNet can generate many hours of advisor, user and decision-maker interviews, many of which have similar structure. At the moment, startups that have used this method have to allocate resources to convert those interviews into minutes manually and then into requirements. A tool can be developed to convert videos into requirements with links to the source video and interviewee for traceability purposes.

Given that many of the users of AdvisorNet would not be experienced in requirements elicitation, and the interviews are digital and recorded, there is scope to develop methods that can improve requirements elicitation skills [17]. For example, a simple measure of speaking time ratios between interviewer and interviewee would be very helpful, as startup founders tend to spend too much time talking about their product than eliciting requirements from users. Such a tool could also give suggestions or reminders on what to do, for example, keeping time and what to say at the start and at the end of the interviews.

C. Tool Support for Workflow

There is a substantial workflow involved in the identification, tracking, management and maintenance of the advisory network, especially as it scales. AdvisorNet uses automated scripts to speed up the search process, but once the advisor is identified, it is necessary to send a message to them, add their details to a database, gain approval for their hourly rate, arrange a meeting time with them, produce slides that are tailored to them, remind team members about the call with details about the advisor, conduct the call, document the call, process the invoice from the advisor, follow-up and so on, much of which are administrative tasks that can be automated. Although the startups who have applied the method were able to use AdvisorNet as is, the scalability of the method would be improved if we automate and provide tool support to most of the steps, with integrations to the tools used in the process, such as calendar, email, LinkedIn, Zoom, Google Hangouts and Slack.

D. Method Evaluation

Finally, we need more rigorous measures to evaluate the effectiveness of the method. AdvisorNet has so far been used to evaluate several startup ideas by different teams. We need more understanding on the areas and industries for which the method is suited. Understanding the broader success rate of the method will also enable its further improvement.

VII. CONCLUSIONS

One of the main challenges faced by startups is the inability to access potential users for requirements elicitation. It is crucial at the start to talk to users, because it is the only way to verify whether or not there is a need for a product. This is particularly difficult for startups that wish to provide B2B solutions to large organizations because users are either unknown or inaccessible. For most successful startups, the bulk of their initial activities involve talking to users and understanding their needs, or to co-develop with the organizations that need the tool. Being constrained on funds and resources, cost efficient methods are much needed by startups.

AdvisorNet is a method to address these issues. It makes use of a hypothesis-driven social media search to find advisors. These carefully selected advisors bridge the gap from the outside world to the hidden corporate structure and social networks in the target corporation and enable highly successful elicitation from stakeholders. AdvisorNet enables a deep customer collaboration process for software startups, and has much potential for improvement with further research.

The benefit of the AdvisorNet is that it is field agnostic. To change industry simply means changing advisors. It is useful for technologies, fundamental scientific discoveries, or concepts with a wide range of potential uses, where the need is to find the most receptive application.

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