One for All? Managing External and Internal Crowds through a Single Platform - A Case Study

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Abstract

Whereas crowdsourcing as a topic has often been addressed in recent literature, web-based crowdworking platforms that manage the interface between crowdsourcers and crowdworkers have not received much attention so far. Furthermore, most of these platforms focus on either the management of external or internal crowds; platforms that handle both groups are rare. This paper investigates such a provider: the German company Across Systems. It uses a hybrid model, offering an individual "mini crowdworking platform" that enables the simultaneous government of external and internal crowds as well as a more traditional marketplace crowdworking platform (crossMarket) where supply and demand meet. Using a single-case study approach, the main contribution of this paper is to shed light on a model that has the potential to change the current crowdworking platform market. We show that managing both external and internal crowds on one platform can increase the acceptance, quality and speed of task completion.

1. Introduction

In the last years, crowdsourcing has become an alternative way to process work for many institutions [13]. Driven by the increasing digitization of economy and society [3], a new business model evolved - that of an electronic platform that serves as an intermediary between customers and suppliers. Howe [12] was the first to describe this phenomenon where the former seek to get work done by assigning tasks to a crowd and the latter strive to receive such tasks and to generate (monetary or non-monetary) rewards by performing them. The number of such platforms has further increased recently.

However, even though they are a constituent element of the relationship described above, these platforms have not been investigated in information systems (IS) research very intensively so far [27]. Furthermore, most of the current platforms focus either on managing external (i.e., crowds outside the legal borders of a company) or internal (i.e., crowds inside the legal borders of a company/employees) groups. Platforms that enable to manage both groups simultaneously are according to the best of our knowledge rare. The same is true for hybrid models combining individualized "mini crowdworking platforms" with a general marketplace crowdworking platform. This case study aims at shedding light on this issue and at offering first insights.

One motivation for this paper is that the current understanding of crowdworking platforms might have to be re-examined given the recent development of different kinds of models in practice. Since we assume that platforms as the ones described in this case study can offer benefits and have implications with regard to the ideal crowdsourcing platform design, we strive to offer such insights by investigating them. This paper is based on a study with the German platform provider Across, who offers solutions for translation management and translation processes. Using a single-case study approach, we pursue the following research questions:

RQ 1: How does the management of both internal and external crowds by one platform work in practice?

RQ 2: What impact does the processing of tasks on such a platform have on efficiency, the quality of services, the performance of complex tasks, or the speed of task completion?

RQ 3: What requirements for the design of platforms can be derived from the findings of this case?

This paper proceeds as follows: First, a conceptual background is given (section 2). Second, we elaborate on the methodology and case selection (section 3). Third, we introduce the case of Across and its electronic platforms "Across Language Server" and "crossMarket" (section 4). We then present the findings and insights from this case (section 5), discuss them (section 6) and finally derive our conclusions (section 7).

2. Background and Related Work

Whereas the term crowdsourcing was only coined a decade ago, the concept is not entirely new: Outsourcing

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a task to the public in the form of an open call already occurred a long time ago: for example in 1714, when the British government offered a cash prize to anyone who would come up with a way to determine the position of ships in the sea, or when sheriffs in the Wild West crowdsourced elements of crime solving whenever they posted "Most wanted" pictures in public places [1]. When the World Wide Web evolved into a powerful medium for active collaboration among people located around the world [10], this concept received a "boost".

The fundamental idea of crowdsourcing - even though there are examples that differ from this ideal - is that a crowdsourcer (which could be a company, an institution or a non-profit organization) proposes to an undefined group of contributors or crowdsourcees (individuals, formal or informal teams, other companies) the voluntary undertaking of a task presented in an open call [2]. More specifically defined, crowdsourcing is a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task [8]. Crowdsourcing is also sometimes seen as a "human cloud" [25], a counterpart to the machine cloud, so to speak. If the achievements and contributions of the crowdsourcee are financially remunerated, it is labeled crowdwork and the crowdsourcee who performed the task is labeled a crowdworker [6].

Crowdsourcing platforms can be seen as brokers, intermediaries, market places, and in general, the point where the controlling and management of the crowd and of all activities within the crowd take place [14]. If these platforms focus on the performance of paid work (in contrast, for example, to platforms for fundraising, voting, or the like), the authors of this paper will use the term "crowdworking platforms" (as a subset of crowdsourcing platforms). Leimeister et al. [15] identify five archetypes of such platforms: microtask platforms, marketplace platforms, design platforms, testing platforms, and innovation platforms. Furthermore, literature often focuses on either **external** crowdworking platforms hosted by an intermediary, or **internal** platforms mostly hosted by the crowdsourcer [27]. In contradiction to this "traditional" distinction, in this paper, we focus on a platform that does not fit that classification, but instead allows to handle **both** groups.

Besides platform classifications, literature also provides typologies of crowdsourcing regarding the processed activities and operations. Prpić et al. [23] distinguish four types of crowdsourcing: crowd-voting where an organization requests choices between alternatives and then aggregates the votes, idea crowdsourcing where an organization invites opinions for small or big questions and then evaluates the proposed ideas, microtask crowdsourcing where an organization breaks a problem into smaller jobs and then re-assembles the completed tasks, and solution crowdsourcing where an organization invites and tests contributions for specific problems and then adopts the best non-falsifiable solutions. The authors also differentiate between objective content where bare facts matter and subjective content that resolves around judgments, opinions, perceptions and beliefs; furthermore, between aggregated contributions that collectively yield value when combined or filtered contributions that require prior validation [23]. Applying these types and characteristics, the crowdworking platforms in the focus of this case study fall predominantly in the realm of *solution crowdsourcing* with *objective content* and *filtered contributions*. The work processed via Across' platform is rather complex, mostly done in "one piece" by one crowdworker, and often validated since it has to meet several specific company- or country-related as well as legal requirements (more details in section 4).

The aforementioned activities require firms to build crowd capital: organizational resources acquired through crowdsourcing [23]. This capital is gained when the organization develops and follows a top-down process to seek bottom-up resources from a crowd [22]. This process can be divided into three stages: constructing a crowd, developing crowd capabilities, and harnessing crowd capital [23]. Regarding the construction of a crowd, executives, for example, have to decide if crowd members should be derived solely from people outside the organization or from own employees [23], or - as in our single case study - from both. Similarly, they have to determine if the crowd should be accessible to anyone within these different populations or closed to selected types of participants – in our case, both variants are possible, too. After the type of crowdsourcing has been determined and the crowd construction has been completed, organizations need to decide how they can obtain resources dispersed in a crowd (acquisition) and how to align the crowd contributions with its existing internal processes (assimilation) [23] - together, they comprise an organization's crowd capability. With regard to harnessing crowd capital, an organization can construct separate crowds as acquisition and assimilation capabilities, for example a crowd comprised of own employees as the filtering and aggregation mechanism to process the knowledge acquired from an external crowd, or the reverse situation [23].

3. Methodology and Case Selection

According to Eisenhardt [7], the case study is a research strategy that focuses on understanding the dynamics present within single settings. Evidence may be qualitative, quantitative, or both. Case studies can be

used to accomplish various aims: to provide description, test theory, or generate theory [7]. Our interest in this paper focuses on the first aim: to provide description.

Similarly to Eisenhardt, Yin [26] points out that case studies can be done by using either qualitative or quantitative evidence and that evidence can for example come from fieldwork, archival records, verbal reports, observations, or any combination of these. For this paper, we thus strived to use multiple sources. According to the author, the distinguishing characteristic of a case study is that it attempts to examine a contemporary phenomenon in its real-life context, especially when the boundaries between phenomenon and context are not clearly evident. This is the case with regard to the objective of our investigation. Although case studies may often begin with little conceptual framework, Yin (1981) insists that the narrative must nevertheless be organized around specific propositions, questions, or activities. Following this recommendation, we organized our case study around our initial research questions.

According to Eisenhardt [7] and Yin [26], the case study methodology is particularly useful for exploring new phenomena. Relevatory single-case studies can often shed light on and provide a deeper understanding of important issues when the available data are limited (which is the case here). Since crowdsourcing intermediaries have not received appropriate attention in the existing literature yet, the case study approach is suitable for investigating them and their challenges [27].

Eisenhardt [7] also states that in empirical research, investigators should provide information about the data collection procedures. Triangulation made possible by multiple data collection methods provides, according to her, a stronger substantiation of constructs and hypotheses. We used the following sources to collect data for this case study:

- In-depth interview with the Chief Sales Officer (CSO) of Across Systems (in June 2016)
- In-depth interview with a representative of a customer company of that platform (in May 2016)
- Several contacts with and information from the press officer of Across Systems (June 2016)
- Analysis of the publicly available information about Across solutions (in May and June 2016)
- Analysis of several documents provided by the company such as fact sheets, function overviews, marketing material or user manuals (in June 2016)

For the semi-structured interviews, we developed a guideline with questions addressing various issues on different levels – ranging from questions about the company and its crowdworking platform(s) to questions about the simultaneous management of both external and internal crowds and the handling of more complex tasks to questions regarding the impact of performing tasks on this kind of platform on efficiency, quality, and speed. The interviews were recorded and subsequently transcribed. To be able to generate the desired insights, we aimed for a crowdworking platform that:

- enables to manage both external and internal crowds simultaneously,
- is positioned on an international basis, i.e., has customers from all over the world (to ease comparability and the application of the findings on an international level),
- has already been existing for a while and has a stable business record (therefore making it more likely to be able to study its development in the future),
- provides the opportunity to also investigate the issue of processing (more) complex work via that platform (see an important aspect of research question 2).

Table 1: Classification of crowdworking platforms regarding certain characteristics

Characteristic	External CW platform	Hybrid CW platform	Internal CW platform
Operator	Intermediary (usually independent organization)	Intermediary or respective organization itself	Respective organization itself*
Participants**	External crowdworkers	External and internal crowdworkers	Internal crowdworkers
(Contractual) Relationship	Direct relationships only between CW platform and crowdsourcer or crowdworker, respectively	Direct and indirect relationships between crowdsourcer and crowdworker possible	Direct relationship between crowdsourcer and crowdworker (+ usually employment contract)

* The platform solution may come from a provider outside the company/organization
** We define internal crowdworkers as direct employees of a respective company/organization who are embedded in the organizational structure and possess an individual employment contract. In contrast, external crowdworkers come from "outside the legal organizational border" of a company and, if at all, have only task-based contractual agreements.

We selected the German crowdworking platform provider "Across" since it offers a platform that, on the one hand, enables the management of both the external and internal crowd and, on the other hand, is not restricted to the use in a specific (big and globally operating) company (which is the case with several proprietary platforms), but open for every company worldwide that wants to use their services. Despite the fact that the area of crowdworking companies is dynamic and many companies that existed years ago do not exist anymore (e.g. because they merged with other companies), Across has already been on the market for several years (more than one decade/since 2005), increased its revenues, and proved to be able to "survive" in the long term. Another important reason why we chose this company is that we are interested in investigating what factors are necessary to allow crowdworking platforms to shift from currently predominantly rather simple (e.g. on Amazon Mechanical Turk) to more complex tasks. The area of language translation services, which this company provides for business purposes, is already today relatively complex given that it is not only necessary to translate difficult terminology in areas such as machine building or medicine, but also to adhere to several law requirements and to adapt the translations to local needs.

4. The case of "Across": Crowdworking platforms for external and internal crowds

Across Systems GmbH is a company headquartered in Karlsbad (near Karlsruhe), Germany, that offers software for translation management and translation process management (see "www.across.net/en" and "www.crossmarket.net/en"). Formerly a department (since 2001) respectively a project (since 1999) within the Nero AG (former Ahead Software AG) which is known for its CD and DVD burning software, Across was founded as an own company in 2005. It has about 70 employees and possesses subsidiaries in Russia and the United States. On the whole, the company serves more than 25,000 customers worldwide. About 50 percent of the companies' customers come from Germany and the German-speaking world (i.e., especially Germany, Austria, and Switzerland), the other 50 percent are comparatively equally distributed across the continents (including important customers in Asia, Europe and Latin America). Similar to Amazon, the company pursues a philosophy of not maximizing profits, but reinvesting them in the development of new ideas, products, and solutions. Chief Sales Officer (CSO) of the company is Christian Weih. He studied English and business economics, joined the predecessor company in 2004, and is one of the interviewees who gave us main insights for this case study.

On the one hand, Across offers a "mini-crowdworking platform": the "Across Language Server" - a translation management solution that integrates all aspects of the linguistic supply chain from source to market. It enables companies to choose any language service provider or work with internal and/or external translators. Across sells this platform software or rents it out to several customers from the corporate area, individual translators, and translation service providers. In addition, Across runs the crowdworking marketplace platform "crossMarket", which was activated in 2015 and is a platform to bring crowdsourcers (e.g., companies) and crowdworkers together (see also table 2). Similar to Apple, Across created an own small "universe" with this platform, which is a network of crowdsourcers (mostly companies) and crowdworkers (freelancers and translation service providers) who use the mini crowdworking platform Across Language Server starting with the latest version 6.3 for their language translations tasks. Currently, there are about 150 companies and about 6,000 crowdworkers on the platform crossMarket. The platform was activated about half a year before the moment of writing this case study; Across plans to further enlarge the number of crowdsourcers and crowdworkers on this platform.

Table 2: Key characteristics of Across' two crowdworking platforms

Across Language Server	CrossMarket
Customizable "mini crowdworking platform"	"Classical" marketplace crowdworking platform
Integrates all aspects of the linguistic supply chain from source to market and enables the handling of external and internal crowds	Brings together crowdsourcers and crowdworkers (place where "supply and demand" meet)
Is sold or rented out to customers, individual translators, and translation service providers	Is a proprietary platform that Across runs (not sold to customers)
About 1,500 mini crowdworking platforms in the market, each integrating crowds consisting of very few to several thousand people	About 150 companies and 6,000 crowdworkers on crossMarket
Revenues are generated by the selling of this platform or from licence fees	Revenues are generated by participation and registration fees for premium access

The mini-crowdworking platform Across Language Server can be configured according to the needs of the customers and allows to assign tasks both to external or internal crowds.

> *"The possibility to manage both external and internal crowds is a standard tool of our software: There is a function that for example allows to program "if after two days nobody from the internal crowd takes that task, then automatically route it to the external crowd."* (Christian Weih, CSO)

The management of both internal and external crowds through one single crowdworking platform is a main focus of this case study and is now being investigated in the following sections in more detail.

5. Findings and insights from the case

In this chapter, we present the main findings and insights of this case organized around our three research questions (including sub-questions) from section 1. We start with the management of both internal and external crowds, proceed with findings with regard to efficiency, quality, the performance of complex tasks or speed and finally provide some recommendations for the design of crowdworking platforms.

5.1 Management of both internal and external crowds by one single platform

As already stated, most current literature about crowdworking platforms focuses either on platforms that manage internal (i.e., employees of the company) or external (i.e., employees outside the borders of the company) crowds (see, e.g., [4], [5], [9], [11], [13], [16], [17], [24]). According to Prpić et al. [23], in pursuit of crowd capital, executives should not think of siloed potentialities but rather of hypothetically overlapping tools in an overall crowdsourcing mix. Knowledge contained in any particular crowd is never static either [21]. With this case study, we aim at shedding light on such a mixing of the potential of boths external and internal crowds via one platform.

A first and rather unexpected finding with regard to the management of external as well as internal crowds through one platform emerged from the interview with the chairman of the works council of a multinational company (size: between 5,000 and 10,000 employees worldwide) from the machinery and plant engineering industry that uses the "mini crowdworking platform" from Across to handle its internal and external crowd: Since this company uses the function to first give the task to the internal crowd and only give it to the external crowd if nobody from the internal crowd took that task, the ***acceptance*** of crowdworking among the employees of that company increased:

> *"Our internal employees so far do not perceive the external crowdworkers as a 'threat', but as a useful complement that helps tasks to get done when our internal crowd was not able or does not have the time to do so. At least for now, our employees don't regard the work which is done by those external crowdworkers as a jeopardy for their jobs"* (Chairman of the works council of a customer company of Across).

This could point to the assumption that companies that are able to integrate both crowds through a common platform could not only benefit from advantages such as different knowledge and skill levels of external and internal crowdworkers or a broader base of possible task solvers, but also from a higher acceptance rate for giving tasks to external crowds and for crowdworking in general. This is relevant insofar as we assume that a low acceptance of crowdworking among internal employees of a company could result in reluctant behavior and could therefore indirectly harm the respective company. Integrating external and internal crowds into a process through a common crowdworking platform can therefore probably increase the likelihood that this work is processed smoothly. This would also coincide with the statement by Prpić et al. [23] that the final element in the crowd capital creation process lies in the internal assimilation of crowd contributions.

This example with regard to acceptance brought us to the general assumption of this case study that managing external and internal crowds through one single crowdworking platform could probably be a very attractive model for the future since it might from an organizational perspective allow to use the advantages of "classical" crowdwork and at the same time help to mitigate its disadvantages. In their paper "The Future of Crowd Work", Kittur et al. [13] mention some pros and cons of crowdwork. Looking at the company/organizational perspective of their pros and cons, using a crowdworking platform that manages both external and internal crowds could, on the one hand, enable companies to explore the potential of crowdworkers outside the "borders" of their company and to use their knowledge and skills, and on the other hand, reduce gaming behaviors by such crowds since internal crowds work on that platform simultaneously and therefore increase transparency with regard to the appropriateness of the delivered solutions.

Another, more expectable insight regarding the management of both external and internal crowds through one platform is that it increases the ***flexibility*** of crowdsourcers, especially of organizations. Companies can choose among different variations – using internal crowds, using otherwise defined crowds, using external crowds, or a mixture - without media disruptions:

> *"When a company wants for example to translate an important document into Russian language, then it does not want to approach all possible translators individually. Instead, it has in advance defined a crowd of possible crowdworkers who from its perspective are capable to do that task, a 'named crowd' so to speak, and assigns the task to this group. The first who accepts that task to the respective conditions gets it. The customer can do both – assign it to the crowd or assign it to a defined group of the crowd, but also assign it to an individual."* (Christian Weih, Chief Sales Officer, Across)

With regard to flexibility, there is also an advantage of Across' mini crowdworking platform that cannot be directly derived from the fact that it enables to integrate both external and internal crowds, but from the fact that it can be configured individually according to the needs of the respective crowdsourcer company. Traditional external crowdworking platforms are designed by an intermediary who has to fulfill several requirements and usually cannot take care of specific requirements made by crowdsourcers. The customized mini crowdworking platform from Across allows the respective company to administer the platform very closely according to its needs, for example according to its internal IT security guidelines or the requirements of procurement departments which often have regulations with regard to procurements from outside (here: for tasks delivered by external crowdsourcers). This advantage holds true in comparison to crowdworking platforms focusing on external crowds; crowdworking platforms that are operated for an internal crowd are naturally also adapted to the needs of the respective company. Nevertheless, the latter usually do not command over a user interface to an external platform and often only enable the management of internal, not external, crowds.

5.2 Influence on efficiency, quality, the performance of complex tasks and speed

Companies using Across' platform software experience significant cuts in time, efforts, and money due to simplified and automated processes. Cuts in ***time and effort*** result both from Across' translation software which already translates much of the text since it uses a translation memory technology and the fact that for the part of the translation that needs "human intelligence", the platform ensures that tasks are processed fast:

> *"Without using the crowd, the crowdsourcer usually had to approach a translator and lost time because for example the latter did not call back, reacted only late due to business trips, vacation, a high workload, or the like. If this person then could not do or refused to do the task, the crowdsourcer had to approach the next translator, and so on and so forth. Meanwhile, a lot of time passed. With the use of the crowdworking platform, the task is done as soon as possible and on the whole faster by a member of the crowd."* (Christian Weih, Chief Sales Officer, Across)

Cost savings in this case can, on the one hand, be traced back to the typical usance on crowdworking platforms, that using the crowd increases competition and therefore leads to decreased prices. Additionally, cost savings result from the automated processes installed:

> *"Our core competence is to allow our customers to automate and optimize their translation processes. The goal is that our customer companies don't need a human who organizes that. That means to automatically engage all parts of the 'supply chain', to connect them, to equip them with the respective data, to incorporate quality ensurance mechanisms, and simply to automate the whole process from A to Z. Because this brings our customers the most advantage and the most cost savings.* (Christian Weih, Chief Sales Officer, Across)

However, we also assume that cost savings can result from the fact that crowdsourcers can now better compare the costs of processing the same task by an internal or an external crowd and therefore would, all other circumstances being equal, choose the less costly version. We also found further evidence for cost savings in the documents about Across' crowdworking platform solutions that we evaluated (especially in the fact sheets): they also resulted from the reduction of administrative efforts and the automation of recurring steps.

With regard to the question if managing both external and internal crowds via one single crowdworking platform can have an impact on the processing of more ***complex tasks***, this case study provides indications that

combining the knowledge of internal processes and requirements from employees with additional specialist knowledge from external crowdworkers can positively influence the handling of such complex tasks:

> *"We are sure that in the future, even more work will be done via crowdworking platforms. This is true at least with regard to the services in our industry. Yes, we think that crowdworking platforms will also be used for more complex tasks. Already today, the differences between competencies of the crowdworkers on our platforms are huge. The work performed on our platforms is already nowadays relatively complex taking into account law or technical requirements or requirements with regard to confidentiality and data protection. Furthermore, it is necessary to adapt language translations to local or industry requirements. Being able to combine internal and external knowledge here is an advantage."* (Christian Weih, Chief Sales Officer, Across)

An aspect of the ***quality*** of services on a crowdworking platform is, according to our assessment, that crowdsourcers can keep sensitive information protected. Companies often fear to reveal confidential information to parties not trustworthy by using crowdworking platforms. For example, translating the user manual of a new product before it is launched bears the risk that competitors could gain information about that product in advance and can therefore react or at least prepare a reaction earlier. In the case of the Across mini crowdworking platform, this risk can be limited, on the one hand, by assigning this task only to the internal crowd (or a part of it). On the other hand, with regard to the external crowd, it can be limited by a) the possibility to define who is allowed to "belong" to this crowd, b) by mechanisms that ensure that only the crowdworker who eventually receives the task obtains or keeps the confidential information, and c) the fact that crowdsourcers and crowdworkers who use the Across mini crowdworking platform software in the version 6.3 are automatically also on the crowdworking platform "crossMarket". The latter increases transparency and makes it likely that misbehavior towards one company becomes known and decreases the likelihood to receive work from other companies in the future. The documents we analyzed also provided clear indications that the possibility to control the whole supply chain via Across' platform solutions has an impact on quality. Furthermore, from these documents, we also gained indications that the seamless connection to a single platform reduces efforts and especially error sources.

> *"With regard to data protection, on our platform, only the crowdworker who gets the job finally gets the necessary document(s). For the others, we delete the document(s) immediately."* (Christian Weih, Chief Sales Officer, Across)

Despite these positive impacts, this model could also bear some challenges in the long run. Even though we did not find direct evidence in this single-case study, we assume that companies can increasingly have difficulties in motivating enough external crowdworkers to join their platform if more and more companies start to run their own crowdworking platform. As Prpić et al. [23] note, in terms of crowd size, larger scale is generally thought to be beneficial. This might not be a problem for big, internationally operating companies with well-known brand names. In addition to their large internal potential crowds, it is very likely that they can also attract many external crowdworkers. Yet, it might be a problem for smaller companies with brand names that are not so well known. In this case, the advantages mentioned above might not come true. For example, quality could suffer if the external crowd is too small and does not include enough specialists for the demanded tasks. Similarly, the speed of task completion could decrease if the available crowd is occupied with other tasks and cannot take additional tasks that might be time sensitive. It might also happen that internal crowds start to demand, or at least expect, additional compensation when processing tasks on such a single platform since they know that the external crowdworkers are paid for the completion of these tasks. This could increase the costs given the fact that companies ususally already have to pay the regular salaries of their internal employees.

5.3 Derived requirements from the findings of this case for the design of platforms

We derived several requirements for the design of crowdworking platforms from this case. These requirements are based on the description of customer needs by the CSO of Across, our exchange with other Across employees and a customer representative, the documents we evaluated and own reasoning. The following example shall illustrate this derivation of requirements using the topic of intellectual property/IP on crowdworking platforms (see table 3). Zogaj et al. [27] state that creating confidentiality and trust between the crowd and the crowdsourcing company is one of the most critical challenges. In the interview, the CSO of Across similarly described that especially customers from the machinery

construction industry have the need to avoid that by giving important documents to the crowd to translate them, unauthorized persons could gain access to confidential information in an early stadium. This is an evidence that this is an important issue in this case, too, and that it is very likely that this can be generalized for the successful design of crowdworking platforms (and thus has been included). For the successful operating of a crowdworking platform, providers should implement the following tools and should take the following needs into account:

- *Intellectual property/IP measures*:

To ensure that the customers trust the respective crowdworking platform providers, the latter should implement measures to foster data protection. One measure could for example be that only the crowdworker who finally "gets" the task obtains confidential information.

- *Profile search tools:*

Crowdworking platforms should offer the possibility of a target-oriented search for profiles among the crowdworkers that fit their needs best since customers often face a huge amount of crowdworkers. This can increase efficiency and can decrease matching effort.

> *"On our platform 'crossMarket', our customers have the possibility to search for certain language competencies among crowdworkers and then select which of these crowdworkers they want to include into their private cloud/private crowd platform."* (Christian Weih, Chief Sales Officer, Across)

- *Procurement requirements:*

One necessity to allow more companies to use crowdworking is to design crowdworking platforms in a manner that enables companies to handle the use of crowdworkers according to the regulations of their procurement departments. Non-compliance of crowdworking platforms with the regulations of the own procurement departments seems to be an obstacle.

> *"The procurement processes of many companies are often not yet accustomed to the processing of tasks via crowdworking."* (Christian Weih, Chief Sales Officer, Across)

- *Revenue generation:*

Crowdworking platforms should ensure by their pricing model that they generate enough revenues in the long run as well. After an initial starting phase, there is – especially with regard to pricing models that ask for fees with every single transaction – the risk that crowdsourcers start to try to circumvent the platform and strive for direct contractual relationsships.

> *"But there is a problem: Platforms that rely solely on transaction-based revenues risk that the crowdsourcer connects with the crowdworker of his choice directly for the next tasks and 'saves' the fees."* (Christian Weih, Chief Sales Officer, Across)

Table 3: Insight from the case and derived requirement for the platform design (own depiction)

Insight from the case study	Derived requirement for CW platform design
Customers from the machinery construction industry fear to give important documents about their products to the crowd for translation services because they assume the documents could be revealed to competitors.	*Intellectual property/IP measures*: Implement measures to secure intellectual property.
The procurement processes of many companies do not fit the processing of tasks via crowdworking platforms since the procurement departments have regulations in place that are not met by the platforms.	*Procurement requirements*: Design crowdworking platforms in a manner that allows companies to handle the use of crowdworkers according to their procurement departments' regulations.
Customers are often overwhelmed by a huge amount of different crowdworkers and need the possibility to specifically search for certain competencies/profiles.	*Profile search tools*: Offer the possibility to search for specific profiles among crowdworkers that fit the company needs best. This can increase efficiency and decrease matching effort.
After an initial phase, there is the risk that the crowdsourcer company directly connects with the crowdworker of their choicse for the next tasks in order to save fees.	*Revenue generation*: Ensure that the pricing model can generate enough revenues also in the long run and that it prevents the circumvention of the platform.

6. Discussion

Most current literature focuses on crowdworking platforms that are either run by an external intermediary or by the crowdsourcer company itself. This case study broadens and enlarges the perspective on crowdworking platforms: Besides offering a "classical" intermediary crowdworking platform (crossMarket), Across also offers a solution that allows every company to run its own "mini-crowdworking platform" and to integrate and manage both internal and external crowds (Across Language Server). This might, on the one hand, change and enlarge the future perception of the crowdworking platform model, on the other hand, offer stimulation and guidance for other areas of crowdworking to use this approach, too ("crowdworking platforms as a service").

While it could be difficult, at least for smaller companies, to attract enough crowdworkers if a large number of companies would establish their own "mini crowdworking platforms" in the future, the model could work for large international companies that are big enough to attract a sufficient number of external crowdworkers. Because of the gearing of both internal and external crowdworkers, together with their internal crowdworkers, they are likely to be able to gain a critical mass of crowdworkers to get their tasks done in the desired time and with the desired quality. Therefore, the business model of classical crowdworking platforms could come under pressure if more and more companies would establish their own crowdworking platform with solutions that enable to handle both internal and external crowds. The Across approach of offering both – a customizable mini crowdworking platform that is run by the respective company and a more "classical" intermediary crowdworking platform – and of connecting these platforms on a content-, system- and technical level, thereby creating an own small "platform universe", could also serve other providers as a model. It could also particularly serve as a bounding measure to avoid, or at least mitigate, possible attempts by crowdsourcers to circumwent the respective platform.

Even though a single case study can only offer selected hints for this assumption, it can be presumed that the integration of both internal and external crowdworkers can combine advantages and reduce disadvantages compared to more traditional crowdworking platforms that only enable the management of one of these groups. One example is the realm of intellectual property where it can be rewarding to be able to assign a certain task only to an internal crowd or to an indeed external, but selected "private crowd". On the other hand, it is at the same time also imaginable that a task that cannot be solved by the internal crowd due to lacking problem solving skills in this realm is routed to the external crowd which might have that certain skills. And last but not least, hybrid models where internal and external crowd members combine their knowledge and work together to solve certain tasks are imaginable.

Despite the fact that we gained several valuable insights, this paper has limitations: First, the format of a single-case study implies that its external validity has yet to be verified. Second, this case study focuses on a crowdworking platform provider from a certain realm. There are many sorts of crowdworking platform providers that might face different challenges. Third, the company introduced in this case study provides a very special crowdworking platform model that, on the one hand, makes it very interesting for research, on the other hand, does not easily allow to compare the results and apply the derived insights and recommendations to other platforms. While there are first indications that combining both internal and external crowds can have impacts on areas like efficiency, quality, or speed, there is the need to investigate this question more deeply. We plan to address these issues in our future research by conducting additional case studies with other platforms.

7. Conclusion

Using a single-case study, this paper focuses on a crowdworking platform that enables to manage both external and internal crowds simultaneously. A main contribution of this paper is to shed light on this type of platform and to help to fill a gap in an area where, according to the best of our knowledge, little research exists.

Since we assume that connecting and integrating external and internal crowds can have several advantages for an organization (and we explain some of them in this paper), we aim at setting the stage for future research in a promising area that could, on the one hand, lead to a shift of interest of researchers, moving from focusing either on platforms for external or internal crowds to platforms that allow the management of both. On the other hand, it could lead to important implications for practice; for example, crowdworking platform providers could attempt to shift their business models to this more integrative approach. Furthermore, the unique combination of mini crowdworking platforms that are highly customizable to the needs of a company and the simultaneous access to a larger general crowdworking platform that acts as a gateway to connect with additional crowdworkers, thus creating an own small "universe" for the platform provider, can serve as a role model for other providers and is likely to find more followers.

Since processing tasks via crowdworking platforms has become increasingly popular in the last years, we assume that this development will continue and these intermediaries will enhance their importance for economies. In this context, future research might consider the

crowdworking environment also from a service system's perspective ([20], [18]). It is in any case worth putting more research effort in an area where research gaps seem to exist. This is especially true for the evaluation of crowdworking platforms that enable the simultaneous management of external and internal crowds. And the question, what impact the processing of tasks on such platforms has on efficiency, quality, speed and especially the performance of complex work (and to develop corresponding business models [19]). We plan to further deepen our findings in our future research.

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9. References

[1] Afuah, A. and Tucci, C. L. 2012. Crowdsourcing as a Solution to Distant Search. *Academy of Management Review* 37, 3, 355–375.

[2] Blohm, I., Leimeister, J. M., and Krcmar, H. 2013. Crowdsourcing: How to Benefit from (Too) Many Great Ideas. *MIS Quarterly Executive* 12, 4, 199–211.

[3] Brynjolfsson, E. and McAfee, A. 2011. *Race against the machine. How the digital revolution is accelerating innovation, driving productivity, and irreversibly transforming employment and the economy*. Digital Frontier Press, Lexington, Mass.

[4] Colombo, G. and Buganza, T. 2013. Crowdsourcing intermediaries and problem typologies: An explorative study. *International Journal of Innovation Management* 17, 2.

[5] Doan, A., Ramakrishnan, R., and Halevy, A. Y. 2011. Crowdsourcing systems on the World-Wide Web. *Communications of the ACM* 54, 4, 86.

[6] Durward, D., Blohm, I., and Leimeister, J. M. 2016. Crowd Work. *Business & Information Systems Engineering* 58, 4, 281–286.

[7] Eisenhardt, K. M. 1989. Building Theories from Case Study Research. *The Academy of Management Review* 14, 4, 532–550.

[8] Estelles-Arolas, E. and Gonzalez-Ladron-de-Guevara, F. 2012. Towards an integrated crowdsourcing definition. *Journal of Information Science* 38, 2, 189–200.

[9] Feller, J., Finnegan, P., Hayes, J., and O'Reilly, P. 2012. 'Orchestrating' sustainable crowdsourcing. A characterisation of solver brokerages. *The Journal of Strategic Information Systems* 21, 3, 216–232.

[10] Geiger, D., Seedorf, S., Schulze, T., Nickerson, R. C., and Schader, M. 2011. Managing the Crowd: Towards a Taxonomy of Crowdsourcing Processes. *AMCIS 2011 Proceedings*.

[11] Guo, W., Straub, D., and Zhang, P. 2013. The Impact of Formal Controls and Relational Governance on Trust in Crowdsourcing Marketplace: An Empirical Study. *Proceedings of the International Conference on Information Systems (ICIS) 2013*.

[12] Howe, J. 2006. The Rise of Crowdsourcing. *Wired Magazine* 14, 6, 176–183.

[13] Kittur, A., Nickerson, J. V., Bernstein, M. S., Gerber, E. M., Shaw, A., Zimmerman, J., Lease, M., and Horton, J. J., Eds. 2013. *The Future of Crowd Work*. ACM, San Antonio, Texas, USA.

[14] Leimeister, J. M. and Zogaj, S. 2013. *Neue Arbeitsorganisation durch Crowdsourcing. Eine Literaturstudie*. Arbeitspapier 287, Düsseldorf.

[15] Leimeister, J. M., Zogaj, S., Durward, D., and Blohm, I. 2016. *Systematisierung und Analyse von Crowdsourcinganbietern und Crowdworkprojekten*, Düsseldorf.

[16] Moqri, M., Bandyopadhyay, S., and Cheng, H. 2014. A Contract for "Crowds". *Proceedings of the International Conference on Information Systems (ICIS) 2014*.

[17] Moussawi, S. and Koufaris, M. 2013. The Crowd on the Assembly Line: Designing Tasks for a Better Crowdsourcing Experience. *Proceedings of the International Conference on Information Systems 2013*.

[18] Peters, C. 2015. *Modularization of Services – A Modularization Method for the Field of Telemedicine*. Dissertation, University of Kassel.

[19] Peters, C., Blohm, I., and Leimeister, J. M. 2015. Anatomy of Successful Business Models for Complex Services. Insights from the Telemedicine Field. *Journal of Management Information Systems* 32, 3, 75–104.

[20] Peters, Christoph, Maglio, Paul, Badinelli, Ralph, Harmon, R. R., and Maull, R. 2016. Emerging Digital Frontiers for Service Innovation. *Communications of the Association for Information Systems* 39.

[21] Prpić, J. and Shukla, P. Crowd Science: Measurements, Models, and Methods. In *2016 49th Hawaii International Conference on System Sciences (HICSS)*.

[22] Prpić, J. and Shukla, P. The Theory of Crowd Capital. In *2013 46th Hawaii International Conference on System Sciences (HICSS)*, 3505–3514.

[23] Prpić, J., Shukla, P. P., Kietzmann, J. H., and McCarthy, I. P. 2015. How to work a crowd. Developing crowd capital through crowdsourcing. *Business Horizons* 58, 1, 77–85.

[24] Teschner, F. and Gimpel, H. 2013. Crowd labor markets as platform for IS research: First evidence from electronic markets. *Proceedings of the International Conference on Information Systems (ICIS) 2013*.

[25] Tran-Gia, P. 2013. Crowdsourcing: Plattformen für die Organisation von Arbeit. In *Die Zukunft der Arbeit in der digitalen Welt*. Knecht-Dr, München, 59–71.

[26] Yin, R. K. 1981. The Case Study Crisis: Some Answers. *Administrative Science Quarterly* 26, 1, 58–65.

[27] Zogaj, S., Bretschneider, U., and Leimeister, J. M. 2014. Managing crowdsourced software testing. *Journal of Business Economics* 84, 3, 375–405.