Crowdsourced translation for rapid internationalization in cyberspace: A learning perspective

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ABSTRACT

This paper explores how Facebook effectively used crowdsourced translation to accelerate its rapid internationalization. We apply the learning perspective of internationalization theory to unpack what the firm learned in order to mobilize crowd-based knowledge to facilitate internationalization in the virtual context, and how it did so. Increasingly, global activities are conducted in virtual space and virtual markets and thus the paper offers insights into successful expansion in this new terrain. The findings highlight two key points: (1) the firm used cognitive/explicit learning to acquire external and codified knowledge, rather than the experiential knowledge traditionally suggested in the literature on the process of internationalization, and (2) the firm's success rested on its ability to use virtual learning tools and incentive systems to acquire, articulate and integrate knowledge from communities of internationally dispersed users – the "crowd" – to accelerate its internationalization in cyberspace. This empirical study extends internationalization theory regarding knowledge and organizational learning.

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1. Introduction

In the last decade, Facebook has emerged as the most popular and most highly trafficked social networking website on the Internet. It has also exhibited a notably high speed of international expansion—the network had 1.49 billion users as of July 2015, 83% of which were located outside its home country (Facebook, 2015). To accomplish this significant internationalization, Facebook has engaged over 300,000 volunteers in numerous communities to continuously translate its dynamically evolving web content from English into more than 70 languages. For these translation activities, which are referred to as "crowdsourced translation", Facebook relies on its network of users to handle the translation of its continuously evolving websites (Facebook, 2008). As such, translation is key for Facebook when entering and penetrating a new international market, and it lies at the core of Facebook's rapid international-expansion strategy.

2. Objective, focus and contributions

In this study, we use a study of Facebook's rapid internationalization process to explore the process of crowd-based learning.

More specifically, we investigate how a firm can organize its learning in cyberspace to enable rapid internationalization through crowd-based translation. The case study also allows us to identify several key mechanisms through which learning occurs in virtual space, as well as the types of learning and knowledge involved in this context. Moreover, we show that rapid internationalization, especially in cybermarkets, makes it possible to gain a first-mover advantage, build name recognition, optimize network effects and acquire market share.

In examining learning in virtual space, this case-based study builds on prior research on internationalization (Johanson & Vahlne, 1977, 2003, 2009) and international new ventures (Madsen & Servais, 1997; Oviatt & McDougall, 1994, 1999) to suggest that firms need to go beyond experiential knowledge and take explicit learning into account. We also propose that firms can use virtual technology-aided platforms to acquire, integrate and convert codified knowledge, and thereby accelerate their internationalization.

Research on internationalization stresses the importance of experiential learning in acquiring knowledge for international expansion (Johanson & Vahlne, 1977). Such knowledge, including market-specific knowledge and general knowledge, is accumulated through sequential and incremental steps of international expansion (Vahlne & Nordstrom, 1993). Internationalization has also been viewed as committing to a business relationship

([Johanson & Vahlne, 1990, 2003](#)) or as committing to a network of business relationships ([Johanson & Vahlne, 2009; Jones & Coviello, 2005](#)). This stream of literature has been criticized for not taking into account of other factors such as irregular or non-incremental behaviours ([Chandra, Styles, & Wilkinson, 2012; Hadjikhani, Hadjikhani, & Thilenius, 2013; Vissak & Francioni, 2013](#)) or other unpredictable change in the contexts ([Ghauri & Park, 2012; Hadjikhani et al., 2013](#)). Moreover, prior research primarily examines firms that physically expand their market presence by establishing operations in new geographical markets.

In contrast, internationalization in cyberspace does not always require equity investments in foreign locations or foreign operations, nor does it necessarily require a physical footprint in foreign markets ([Yamin & Sinkovics, 2006](#)). In cyberspace, the creation and use of networks of business relationships may occur in a virtual, rather than a physical, realm. Along these lines, the international new venture literature ([Knight & Cavusgil, 1996; Madsen & Servais, 1997; Oviatt & McDougall, 1994, 1999](#)) acknowledges prior knowledge and experience ([Welch & Luostarinen, 1988](#)), and network relationships ([Coviello & McAuley, 1999](#)) as facilitators of accelerated internationalization. However, similar to the internationalization-process literature, this research stream has not systematically considered the context of cyberspace, in which experiential knowledge from physical operations abroad may be acquired too slowly, such that firms learn to internationalize not through a network of business relationship but through a network of users—known as "the crowd".

Prior research acknowledges cyberspace as an increasingly crucial context for international business (e.g., [Gabrielsson & Gabrielsson, 2011; Petersen & Welch, 2003; Pezderka & Sinkovics, 2011; Tallman & Yip, 2001; Yamin & Sinkovics, 2006](#)). The facts support this focus. For example, the number of Internet users worldwide grew from merely 360 million in 2000 to more than 2 billion in 2011 and surged up to 3 billion in 2015 ([Internet Society, 2015](#)). Research indicates that the Internet may enable early and accelerated internationalization owing to, for example, the digitization of products and production processes ([Petersen, Welch, & Liesch, 2002; Glavas & Mathews, 2013](#)), and to the development of online sales channels ([Gabrielsson & Gabrielsson, 2011](#)). This research also notes that online internationalization is associated with additional risks ([Pezderka & Sinkovics, 2011](#)). However, despite recent progress in understanding the contextual impact, including the possibilities and challenges associated with internationalizing in cyberspace, the question of how a firm learns to accelerate its internationalization process has not been systematically addressed. In particular, learning to mobilize globally dispersed user communities ([Afuah & Tucci, 2012; Jeppesen & Lakhani, 2010](#)) for the benefit of a firm's internationalization has not been addressed in prior empirical research.

In this paper, we adopt the learning perspective from the internationalization-process school, and we make two primary contributions. First, we extend prior empirical research on internationalization in the relatively new context of cyberspace by offering insights into the crowd-based translation process, which the focal firm uses to facilitate its rapid internationalization in the virtual space. These insights include how the firm learns to host the translation activity by engaging the crowd and motivating its members' participation; how the firm promotes coordination and interactive learning among the crowd to capture the best knowledge; and, most importantly, how the firm articulates and converts external knowledge into internal expertise to achieve rapid internationalization Second, by connecting prior literature on internationalization with new insights into learning in cyberspace, we offer a fresh perspective on how firms may enhance their learning capacity by learning from and with users—both before and during international, network-based market

creation. Moreover, in line with recent research efforts in advancing the internationalization process (IP) model, e.g.,: by incorporating irregular behaviours ([Hadjikhani et al., 2013](#)) or integrating the influence of knowledge on international behaviour from organizational learning perspective ([Casillas, Moreno, Acedo, & Gallego, 2009](#)), this study provides an empirical case of irregular behaviour – how a firm learns from the crowd to accelerate internationalization in cyberspace – towards building a comprehensive IP model.

The remainder of this paper proceeds as follows. After this introduction, we outline our research context. Thereafter, we explain our methodological approach, data collection and data-analysis methods. We then present the case study, followed by our findings and interpretations. The findings and interpretation section also offers a visual illustration of crowdsourced translation, a table summarizing our thematic coding, and a model illustrating the internal and external learning processes. A discussion follows, including theoretical propositions, as does an overview of research and managerial implications. We summarize our conclusions and contributions in the final section.

3. Research context

In the following sections, we discuss our research context based on theoretical pre-conceptions as well as prior empirical insights from the internalization model, the international new venture literature, and research related to internationalization in cyberspace.

3.1. The internationalization-process model and the role of experiential learning

Internationalization theory (e.g., [Johanson & Vahlne, 1977, 1990, 2003, 2009](#)) initially painted the process of internationalization as one "in which firms gradually increase their international involvement" ([Johanson & Vahlne, 1977, p. 23](#)). Based on acquired knowledge of the foreign market, this theory originally suggested that firms that perceive opportunities in a market will incrementally invest resources and commit to that market ([Johanson & Vahlne, 1977](#)). In later versions, these theorists viewed internationalization as committing to a business relationship ([Johanson & Vahlne, 1990, 2003](#)) and then to a network of business relationships ([Johanson & Vahlne, 2009](#)). While focal types of commitment change as the context of doing business internationally changes, this theory focuses on "experiential" learning aimed at acquiring internationalization and market knowledge. To the extent that experiential learning is slow, the internationalization processes, which are understood as increasing commitments to locations, specific relationships abroad and international networks, may be incremental. Nonetheless, [Johanson and Vahlne (2009)](#) suggest "that experiential learning can be complemented with other ways of knowledge development" (p. 141). This may be of particular relevance in cyberspace, where internationalization may be pursued without the establishment of physical operations abroad.

3.2. The international new venture literature: Prior knowledge and the use of networks for rapid internationalization

The international new venture, or "born global", literature addresses the phenomenon of companies undertaking accelerated internationalization rather than incremental steps even though they are young and lack significant resources ([Bell, 1995; Coviello & McAuley, 1999; Knight & Cavusgil, 1996; Madsen & Servais, 1997; Oviatt & McDougall, 1994; Welch & Luostarinen, 1988](#)). This research emphasizes a variety of factors that can accelerate the firm's internationalization process: technological developments in

production, transportation, and communication (Madsen & Servais, 1997; Mahnke & Venzin, 2003; Oviatt & McDougall, 1999); innovations that are valuable and unique assets (Oviatt & McDougall, 1999); network relations that allow small companies to overcome the size-related challenges of global expansion (Coviello & McAuley, 1999); industrial conditions in a dynamic global industry, such as the computer-software industry (Bell, 1995); managers' prior knowledge and experience (Madsen & Servais, 1997); experience gained through operations in foreign markets (Welch & Luostarinen, 1988); new market conditions, such as the homogenization of markets (Madsen & Servais, 1997; Oviatt & McDougall, 1994); and, as specialization increases, the emergence of new niche markets with a global span (Madsen & Servais, 1997). However, while research on the born-global firm deepens our understanding of rapid internationalization processes (Weerawardena, Sullivan Mort, Liesch, & Knight, 2007; Chandra et al., 2012; Cannone & Ughetto, 2013; Casillas & Acedo, 2013), little attention has been devoted to the micro-processes through which new ventures learn to accelerate their internationalization processes, especially when crowd-based translation serves a driver of those processes.

3.3. Cyberspace as a specific internationalization context

A small but increasingly prominent stream of literature recognizes cyberspace as a distinct context for international business (e.g., Gabrielsson & Gabrielsson, 2011; Kotha, Rindova, & Rothaermel, 2001; Loane, 2006; Mahnke & Venzin, 2003; Petersen et al., 2002; Pezderka & Sinkovics, 2011; Robles, 2002; Singh & Kundu, 2002; Yamin & Sinkovics, 2006; Tallman & Yip, 2009; Glavas & Mathews, 2013) for a variety of reasons. For example, the Internet offers various possibilities as an information source and as a networking platform (Petersen et al., 2002); it increases the number of available international sales channels (Gabrielsson & Gabrielsson, 2011; Gabrielsson & Kirpilani, 2004); the digitization of products may increase firms' inclination to internationalize early owing to the lower barriers to entry in cyberspace (Mahnke & Venzin, 2003); the Internet offers small firms easy, less costly and immediate access to multinational markets from their inception; the Internet may allow smaller firms to compete with firms all over the world from a very early stage of operations (Singh & Kundu, 2002); and the ability (e.g.,: international innovativeness and proactiveness behaviour (Glavas & Mathews, 2013) to deliver digital services quickly and at a low price might result in accelerated internationalization (Kotha et al., 2001; Forsgren & Hagström, 2007; Loane, 2006; Petersen et al., 2002; Robles, 2002; Johanson & Vahlne, 2003). Moreover, in this context, access to global markets is often instant and competitors are dispersed around the globe. In this regard, accelerated internationalization makes it possible to capture market share quickly and to enjoy first-mover advantages.

Notably, however, developing foreign business opportunities through the Internet also carries certain risks (Pezderka & Sinkovics, 2011). For example, firms may mistakenly think that learning generated through the Internet eliminates the need for learning about the target market through non-virtual means (Yamin & Sinkovics, 2006). In addition, the limited IT infrastructure in some markets may constrain the speed of internationalization (Forsgren & Hagström, 2007; Mahnke & Venzin, 2003). Moreover, a number of scholars (Kotha et al., 2001; Loane, 2006; Reuber and Fischer, 2011) stress reputational risk as a key managerial concern for firms seeking to attract international users in cyberspace.

In summary, recent research suggests that cyberspace as a unique and specific context may not only reduce transaction costs, but also influence production costs for digital goods and the processes through which they are delivered. However, many challenges remain for firms internationalizing in cyberspace. In the following, therefore, we seek to improve our understanding of the processes associated with successful, rapid internationalization in cyberspace.

4. Research methods

4.1. Research setting

In the following, we present a longitudinal study of Facebook with the aim of exploring how firms learn to accelerate their internationalization process in cyberspace. Our objective is to use Facebook case study to provide insight and as a specific context for theory extension rather than to comprehensively describe the company (Eisenhardt, 1989; Ghauri, 2004; Ghauri & Gronhaug, 2005). Thus, we are selective in that we stress empirical facts that are relevant to our theoretical arguments. As such, we present only a partial picture of this company's vast and complex operations.

In particular, in building on the internationalization-process model developed by Johanson and Vahlne (2009), we seek to unpack the learning process and explore how firms learn to build their "network" position in international markets, particularly through a high speed of internationalization and multiple entries. Our Facebook case explores a novel phenomenon – crowdsourced translation – which allowed for a unique process of engaging international user communities to enable rapid expansion in cyberspace (Patton, 1990). It is important to stress that translation is key for Internet-based companies not only in terms of entering a new market but also in terms of penetrating a new language market. The study of internationalization is best accomplished through process research rather than variance research (Welch and Paavilainen-Mäntymäki, 2014). Therefore, we proceed by organizing the data in a historical sequence, as such a process research design is particularly well suited for the study of processes over time.

Facebook is known for its phenomenal, rapid global expansion. Its business model, which is similar to that seen in many other service companies operating in cyberspace, relies on the user community to expand the company's market and develop business activities. The foreign-market entries of such companies take place in the virtual, rather than the physical, domain (Yamin & Sinkovics, 2006), and their business activities are carried out on the virtual marketplace of their websites. Therefore, gaining access to the international virtual markets means getting local users to access the websites. Such localization occurs through the translation of the websites, which is the initial stage of the online internationalization of service companies operating in cyberspace.

We chose Facebook for our case study because much of its initial stage of rapid internationalization was enabled by a specific group of the social network's users—a global community of over 300,000 volunteers who translated the site from English into 72 languages. This process was enabled by an innovative tool and processes developed by the company. Therefore, this study unpacks the different levels and elements of the learning processes involved in accelerating the online internationalization of the firm.

4.2. Data collection

Data covering the process of Facebook's internationalization from 2008 to 2012 was collected from informant statements (different groups and within groups) via interviews as well as secondary sources. The latter included: (1) archival documentation (e.g., case studies, industrial news, written reports and announcements from the company's website such as Facebook's newsroom and the industry, and user-group discussions), (2) observations of its interaction with users, interactive blogs written by Facebook

engineers, and user-generated content in the Facebook community, and (3) semi-structured interviews with selected users who assisted in the translation process, random users as well as interviews with international managers, internationalization engineers and Facebook linguists (Table 1). These informants were directly involved in the crowdsourced translation process.

We developed a user-interview guide that enabled us to search for multiple viewpoints and supplement our data. We asked open-ended questions related to the firm's internationalization strategy and, in particular, the process of crowdsourced translation. Typical open questions for volunteered translators are "What motivate you to contribute to the translation process? How does the process work? What were the results of the process?" Typical questions we asked internationalization engineers are "What was the process of aligning, adjusting the translation tools with new language or across different languages? How to make it easy for the translators to make the best contributions and voting?". We were particularly interested in asking linguists such questions as "How did you integrate translation results from users and approve the translation?" Interviews lasted one hour, and occurred either in one sitting or over the time when certain issues arose or the interviewee was available. Most of the interviews were held via chat fora, Facebook Messenger, email and Skype. Facebook internationalization engineers were interviewed by phone and Facebook Messenger, while two international managers based in headquarter and who were responsible for internationalization activities were interviewed in person in 2008 and 2009. The latter interviews were followed up with emails. Together, these sources of data provided us with insights into the processes associated with Facebook's early stage of internationalization and its evolution.

4.3. Data analysis

We used different strategies to analyse the data following the guided research question "How did Facebook accelerate its internationalization via crowd-based translation processes?". Our purpose was to map out the process that Facebook used to rapidly internationalize in cyberspace. In order to avoid spurious interpretations, all data sources were triangulated (Miles & Huberman, 1994). Facebook's internationalization and crowd-sourced translation process were framed using documentation,

which was supplemented with detailed information obtained from our observations and the interviews. In Section 6, each stage of the crowdsourced translation process is described in detail to provide insights into the learning process as Facebook engaged the user community, as well as the related processes of mobilizing and reconfiguring knowledge and capabilities.

Our analysis covered several steps. Initially, the data from different sources, including secondary sources, observation and interviews, were sorted and synthesized, after which the detailed story and chronology was constructed from several perspectives following a narrative strategy (Langley, 1999). The constructed story was then used as a means of communicating our interpretations with informants at different stages for the purpose of validation (Eisenhardt, 1989). We recorded time along the chronology of events in order to orient and guide us through the sequences of the crowd-based translation process in question. The data were then subjected to a qualitative content analysis using inductive categorization and thematic coding in which categories, themes and patterns emerged out of the data and were generalized from coding level 1 (open coding), coding level 2 (thematic coding) and coding level 3 (conceptualized constructs emerged from saturated categories and themes) (see Table 2).

Furthermore, in order to produce a comprehensive yet simplified overview of the process, we employed a visual-mapping strategy as a means of data deduction and synthesis. Visual mapping also allows for the succinct presentation of a large quantity of data obtained from multiple sources. It is viewed as a useful tool for the development of theoretical ideas, such as those we aimed to develop regarding the role of crowdsourced translation in accelerating internationalization in cyberspace (Miles & Huberman, 1994). Fig. 1 portrays the resulting process. This mapping served as an intermediary step between the raw data and more abstract conceptualization. In moving towards a generalization of the process, we proceeded to develop it with another level of abstract coding (Fig. 2) in an attempt to generate a crowd-based learning-process model that a firm could utilize when attempting to accelerate its international expansion (Langley, 1999; Miles & Huberman, 1994). The generalization process ended with the development of propositions in combination with prior theoretical knowledge, which can be found in the Discussion session.

Table 1
Interviews and observations (2008–2012).

Informants	Job functions/profile	Interviews		Observations	
		Numbers of interviews	Interview issues	Frequency of observation	Observation issues
International managers	Handle international expansion	2	Internationalization strategy and plan	N/A	N/A
Internationalization engineers	Establish platforms and application tools across all language markets	4	Technical issues, access, scalability, control, security	Frequent	Facebook Engineering page The introduction of new applications and tools Problem solving Interaction among engineers
Linguists	Translate basic website setup Develop glossaries and style guide Handle quality assurance	5	Interactive translation process, handling the complexity of languages, quality assurance	N/A	N/A
Volunteered users/ translators and translator community	Individual translators who are active Facebook users (10 German speaking users, 25 Vietnamese, 20 Hebrew and 10 from other translator communities)	65	Translation tasks, the complexity of verifying and voting on translation work	Frequent	Dialogue and conversation in the translation process Discussion of new terms, possibilities and challenges in dealing with the languages' complexity
User community	Random users	45	The ease of use of the translated website	Frequent	The process of crowdsourced translation, as well as challenges Comments on the process

Table 2
Illustrative quotes and thematic coding.

Coding level 3 (conceptualized constructs)	Coding level 2 (thematic coding)	Coding level 1 (open coding)	Examples of illustrative quotes
Language-market commitment	Initiating a translation project	Choosing a language market to enter Hiring professional linguists to set up basic parts Setting up	"We are based in California, so obviously the second most popular language for us to think of is Spanish." "A lot of people in Slovakia use Facebook on daily basis, I, and probably lot of other users, would be really happy to help translate Facebook into the Slovak language." "We have received requests from thousands of people who want to help translate Facebook into other languages . . . Based on this feedback, we opened 55 new languages this week for translation by the community."
User engagement	Harnessing the user community	Open-call invitation User-community involvement Participation facilitation Incentive provision	"Join our community of translators and make Facebook available in your language." "Add the Translations Application to translate, review and vote on translations in your language." "Today, we are launching an award system for translators in which they will receive special icons as they reach various milestones in the Translations application." "These new awards complement the leader board we previously put in place in the application to publicly spotlight top translators." "I wanted to be rated high." "It is nice to see your name among hundreds and thousands of other people." "The leader board definitely illustrates my contribution and drives me to contribute more." "I wanted to get credit for translations. There was a grading system for translators (you get a higher score the more you translate)."
Interactive knowledge production	Contribution of user community	Translating and interacting with other volunteers Voting: selecting the best translations	"The method Facebook used made it an easy process. The translation was done using a dedicated application that Facebook built, which had two features." "What I translate does not automatically become the official translation, but it competes against other translations, and the one rated the highest wins." "The approval process helps ensure that translations are not wrong and that they are not 'literary'. I think this is the kind of quality we need on the web." "From time to time, I receive messages approving a translation I proposed a few months earlier. The process is slow, but undoubtedly selective and of high quality."
Knowledge integration	Validation and release	Approval of main strings by professional linguists Releasing a version in a new language	"Once the translations for your language are complete and their quality has been verified by the community, your language will be launched for all Facebook users." "After a translation receives a large number of approvals, it is used in the Hebrew interface."

5. Facebook and its rapid internationalization

Founded by Mark Zuckerberg in February 2004 as a forum solely for the use of US university students, Facebook has grown to become the most visited social media website (Facebook, 2009). As of March 2015, Facebook has on average 936 million daily active users, approximately 83% of whom are outside the US and Canada (Facebook, 2015), thanks to its rapid internationalization process.

Facebook made its first significant commitment to international users in February 2008, just four years after it was established (Facebook, 2010a). By June 2008, Facebook had been released in 16 language markets (Facebook, 2010b). It reached 36 language markets by the end of 2008 and added another 12 language markets in 2009. Together with the original Facebook in English, these 48 languages covered 400 million users, or 90% of all Internet users in the world at the time. Facebook's internationalization plan was proudly announced on its community website: "Our goal is to support Facebook in the native language of all our users and people who want to use the site." (Facebook, 2010c).

Facebook's vision to connect the world was reflected in its aggressive strategy for reaching a variety of international markets in a short period of time. Fast internationalization is especially important for social networks, as firms strive to reach a "critical mass" of users as quickly as possible in order to enjoy the network effect. During its IPO process, Facebook declared that connecting all of the world's Internet users (over two billion) was a key element of its strategy (Facebook, 2012). The internationalization effort seemed to have a positive and significant impact on Facebook's revenue. In Facebook's US Securities Registration Statement (Form S-1), the company announced that "international revenue as a percentage of revenue was 33%, 38%, and 44% in 2009,
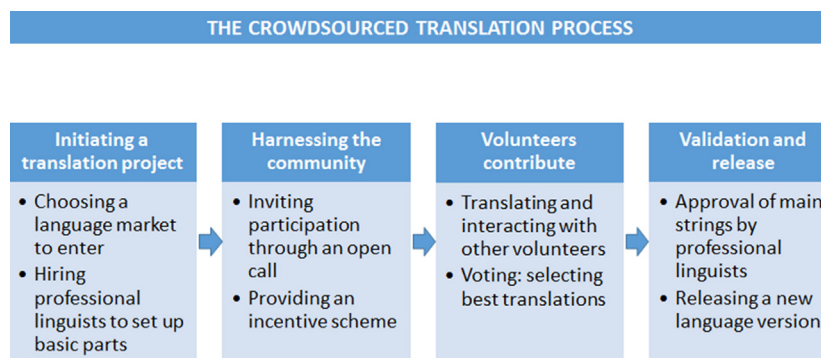

THE CROWDSOURCED TRANSLATION PROCESS

Initiating a translation project	Harnessing the community	Volunteers contribute	Validation and release
• Choosing a language market to enter • Hiring professional linguists to set up basic parts	• Inviting participation through an open call • Providing an incentive scheme	• Translating and interacting with other volunteers • Voting: selecting best translations	• Approval of main strings by professional linguists • Releasing a new language version

Fig. 1. The crowdsourced translation process.

Firm   User Community
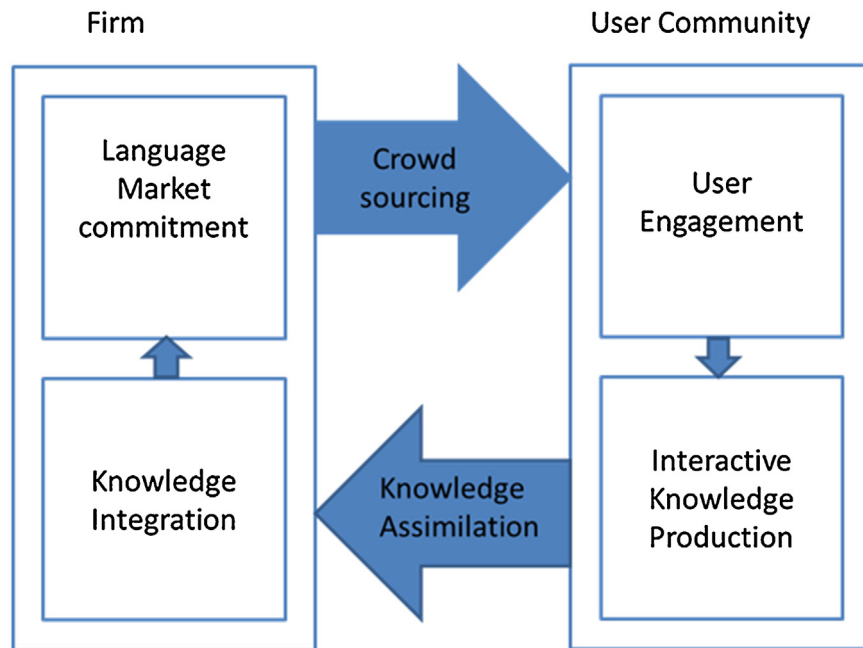

Fig. 2. Interactive learning process for crowdsourced internationalization.

2010, and 2011, respectively." (Securities and Exchange Commission, 2012)

Facebook's business model relies on selling advertisements to be placed on pages viewed by its users. Facebook could therefore compete in many international markets without establishing a physical presence. As one international manager commented during our interviews:

> Many of our advertisers use our self-service advertising platform to establish accounts, and to launch and manage their advertising campaigns. We also have a global sales force that is focused on attracting and retaining advertisers, and supporting them throughout the stages of the advertising-campaign cycle from pre-purchase decision making to real-time optimizations to post-campaign analytics. We currently operate 30 sales offices around the globe.

The translation efforts occurred in the early stages of Facebook's global expansion. After Facebook is translated into a new language and a local user community is well established, Facebook develops business activities with advertisers, marketers and game developers to generate revenue. In an additional stage of internationalization, sales offices are established in some international markets. The translation efforts evolved together with new features of the social network and the introduction of new third-party applications.

6. Findings and interpretation

6.1. The crowdsourced-translation process and rapid international expansion

In order to internationalize, the social-network site needed to be translated into a variety of languages so that it could access international users. As one international manager stated, "in order to enter new international markets, businesses must focus on being discovered by customers or users who should be able to browse or engage in a global online marketplace unconstrained by location, currency or, in most of cases, language".

When Facebook started its internationalization process, it had only 450 employees. The effort needed to translate the site into dozens of languages seemed almost insurmountable because of the site's continuous evolution (e.g., new features, applications and services). Therefore, Facebook decided to rely on the user community for the translation activities. One software engineer pointed out the necessity of relying on local users:

> Authenticity is very important in this context. It makes users comfortable and encourages them to be actively engaged. Naturally, native users are those who have a unique set of vocabulary and know how their local language should be spoken. They are also the people who use the website, so the best plan is to let them 'design' the right language.

A native Vietnamese linguist added: "Cultural sensitivity is a big issue. This is why Facebook hired me as a mother-tongue linguist".

At Facebook, crowdsourced translation was an interactive process involving software engineers, linguists and translators from the user community that ensured the authenticity, accuracy and appropriateness of the language used on the focal site. Crowdsourced translation was enabled by software developers, who developed a translation application. The translation application facilitated a collaborative process that encompassed a variety of Facebook employees (e.g., linguists, engineers) and 300,000 volunteers from setup to launch. Our findings highlight four interactive stages within the overarching website-translation process. As Fig. 1 shows, each of these stages entailed several activities.

6.1.1. Stage 1: Initiating a translation project

Facebook chose the language markets it wished to enter based on the popularity of languages. This strategy enabled it to gain access to those user bases with the largest scale. According to an international manager, "We are based in California, so obviously the second most popular language for us to think of is Spanish." Thousands of users also sent requests to Facebook asking for translations in certain languages and offering to volunteer. After the translation application was developed, Facebook actively

facilitated the translation process by hiring professional linguists to establish the basic parts of the site for each language, and by providing glossaries, style guides, and other supporting materials. Through this process, Facebook could identify and prioritize those markets that were most relevant for its internationalization efforts. The greater the response of the user community in the tested market, the greater Facebook's commitment to that market. The company's investments included setting up more comprehensive platforms and hiring more linguists to develop the website content in that language.

6.1.2. Stage 2: Harnessing the user community

Facebook invited all users to take part in its internationalization process through an open call along the lines of:

Join our community of translators and make Facebook available in your language. Add the Translations Application to translate, review, and vote on translations in your language. Once the translations for your language are complete and their quality has been verified by the community, your language will be launched for all Facebook users (Facebook, 2010d).

Any Facebook user could download the translation application, and suggest ways to translate the words and phrases on the site. A software engineer commented that "since launching our Translations application two years ago, more than 300,000 users have answered the call to contribute translations and make Facebook available in more than 70 different languages".

In addition, Facebook offered an incentive scheme, which one translator highlighted: "Facebook is launching an award system for translators in which translators will receive special icons as they reach various milestones in the Translations application". The awards varied based on the frequency and accuracy of translators' contributions, and they complemented the "leader board", which spotlighted top translators. According to a linguist, "many translators are motivated by the impact of their contribution to making the site available to millions who speak their language". Via this social-visibility incentive system, Facebook learned to kick start and grow an active crowd of users who voluntarily contributed their creative translation input to Facebook. The system also helped the company to better understand and build trust with users to ensure continued future participation and contributions.

6.1.3. Stage 3: Contribution of user community

Facebook's translation tool allowed users to click on a phrase as they browsed the site, see the original text, and vote on translations suggested by their peers or offer their own. This enabled both the initial translation of the site, and the updating of translations as more text or features were added. The community approved all translations through a voting system. According to a volunteer translator "The fact that Facebook added a mechanism for rating and voting made it better than just 'crowdsourcing translation'". This system ensured that what users translated did not automatically become the official translation. Instead, each translation competed against other translations, and the one with the highest rating was chosen. As a result, Facebook could achieve the best result, as another volunteered translator indicated: "I think crowdsourcing creates a more natural interface language. While a professional may use a 'standard' language, users will translate into a more 'everyday' language. I think this is the kind of quality we need on the web. The language should be the kind that is used by the common people". The crowd rating and voting system helped to facilitate and promote collaboration among members of the online user community for sharing knowledge and best practices. Individuals were motivated to share with the community, as they could learn from feedback and thereby improve their performance, leading to more recognition.

6.1.4. Stage 4: Validation and release

To ensure quality, the professional linguists hired by Facebook checked and approved the most commonly viewed strings. The crowdsourced translation setup ensured a balance between the company's controls (e.g., glossaries, rules) and the crowd's input of authentic language, allowing Facebook to capture the best translations. A linguist commented: "The approval process helps make sure that a translation is not wrong and is not 'literary'". A translator agreed: "It is important that the translators have some freedom of expression while the company still maintains a certain level of control". In this stage, Facebook demonstrated its abilities in acquiring, selecting and integrating the input from users with its own knowledge to achieve the most naturally translated language for the website in the chosen language market.

6.2. Integrating external knowledge from the user community: An interactive learning process for internationalization

In this section, we conceptualize the different stages of the crowd-based translation processes on the basis of what and how the firm learned from the crowd of users. We illustrate this *interactive learning process* in Fig. 2.

The interactive learning process that occurred in translating the site was the initial stage of Facebook's internationalization. The process was characterized by intense interactions between the firm ("*Firm*") and the volunteer community ("*Users*"). Fig. 2 depicts four learning stages, which correspond to the four crowdsourced-translation stages (Fig. 1): (1) language-market commitment, (2) user engagement, (3) collaborative knowledge production and (4) knowledge integration. These four stages illustrate how the firm learned to: identify a language market for entry commitment; delegate the translation tasks to the community of users; motivate users to participate, and to share and co-produce the best translation knowledge; and acquire, select, integrate and blend the users' knowledge to produce the best-possible translated site in the shortest time.

At the *language-market commitment stage*, the firm relied on the popularity of the language and on users' requests to gain an understanding of which language markets were most relevant for its initial internationalization. The technological translation platform, including the Translation application, standardized language and other features, played an important role in facilitating the link between the firm and the user community, and in the hosting of all interactive translation activities.

At the *user engagement stage*, users began to engage in the translation process. Volunteers were asked to take on the task of choosing and translating whatever work they found suitable, or the task was delegated to them by the firm ("crowdsourcing"). The incentive system, which gave them recognition for frequency of participation and the amount of work, motivated them to participate more. In this way, the firm learned to not only motivate users but also to provide suitable tasks and support.

In the *interactive knowledge-production stage*, the firm utilized a social visibility incentive system to facilitate collaboration among members of the user community. Users had opportunities to rate and vote for translations proposed by other users. Through this feedback and voting platform, knowledge was co-created, filtered and selected to ensure the best end result with minimum effort from the firm. With the publically recognized reward scheme, the firm learned to extrinsically motivate volunteers to actively contribute and share their translation knowledge with the community. The feedback process also intrinsically motivated users, as they started learning the best knowledge and best way to translate, and were therefore driven by self-interest to perform the task better. In these two stages, the technology-aided reward scheme, which aimed at promoting both extrinsic and intrinsic

motivation, helped the firm to better understand the users and acquire the best possible knowledge from their contributions.

After the most acceptable translation was selected, it went back to firm for approval at *knowledge-integration* stage through a process of *knowledge assimilation*. At this stage, all translation work was systematically organized through an integration process that ensured a balance between management control and the creative input of voluntary translators. In this stage, before launching the site, the firm demonstrated its abilities in selecting, articulating and integrating translations with its extant knowledge.

The process of learning is repetitive, as languages continuously evolve and knowledge is continuously updated by users, who can contribute to and update the firm's knowledge stock. The right or "natural" translations are not only assimilated by linguists; this knowledge is also integrated into the firm's knowledge base, as it is kept and analysed on Facebook's massive IT infrastructure. Consequently, knowledge of new, trendy and "natural" words and phrases is integrated with the existing knowledge base as the process is repeated over time. As the site continuously evolves, the firm may decide to increase its commitment (i.e., translate a new page/product/feature), such that the interactive process of engagement, learning, assimilation, and integration continues. In this regard, the crowd-based translation process continuously reconfigures the language knowledge of both Facebook and the volunteer community. Learning, therefore, improves with repetition and over time.

Our findings show that Facebook's rapid internationalization process was enabled by the crowd's competence. We also show that crowdsourced translation is an interactive learning process that consists of four stages: *language-market commitment, user engagement, knowledge production* and *knowledge integration*. Throughout this process, the firm demonstrated its abilities to setup a technological platform for delegating the translation activities to users, to setup an incentive scheme for motivating user contributions and the co-creation of knowledge, and to integrate acquired knowledge while achieving a good balance between control and user contribution. The crowdsourced translation focused on bottom-up, open and creative input from the community of users, and it required little effort or resources from Facebook. We also find that electronically mediated relationships with user communities helped the firm to acquire, articulate and integrate external knowledge with internal learning, thereby enhancing Facebook's learning capacity and enabling rapid internationalization. The continuous process led to additional commitments to those particular markets.

7. Discussion and contributions

This study explores how Facebook used the crowdsourced-translation process to rapidly internationalize its operations in cyberspace. We extend the internationalization literature by connecting our findings with past research on learning during internationalization. Consistent with recent internationalization research (Johansen & Vahlne, 2009), we find that internationalization in cyberspace may be best understood as the creation and use of networks of (virtual) relationships to pursue business interactions on an international scale. Our case shows that Facebook relied on explicit and codified knowledge that was organized and accumulated along the translation process to facilitate its access to a new language market. This suggests that firms internationalizing in cyberspace must move beyond experiential learning and consider explicit learning with codified knowledge.

Johanson and Vahlne (1977) initially identified a lack of tacit market knowledge as the main obstacle to international operations, the acquisition of which requires experience-based learning in foreign markets (Johanson & Vahlne, 1990). In contrast, our findings suggest that a firm's learning in cyberspace centres more on explicit, codified knowledge acquired through virtual, rather than physical, operations. This improves our understanding of a variety of learning mechanisms that firms internationalizing in cyberspace use either in isolation or in combination. While our findings on crowdsourced learning mechanisms emphasize the interaction of knowledge and learning in a firm's internationalization process, and although they are consistent with prior theory on firm internationalization (Autio, Sapienza, & Almeida, 2000), they also suggest that firms need to move beyond experiential learning from foreign operations to embrace different learning mechanisms. Firms engaged in internationalization in cyberspace may not be restricted to learning while they "build new business networks and connect them to each other" (Johanson & Vahlne, 2003, p. 93)—they may be able to engage in learning before they build such networks. Despite the threat of a virtuality trap (Yamin & Sinkovics, 2006), virtual learning might serve as a substitute for learning in physical proximity.

Our findings also indicate that explicit learning may be enhanced by the introduction of electronic aids (e.g., software-based translation systems, virtual encounters, electronic show-rooms, business intelligence, and click-stream analyses) that support and complement human learning during internationalization. This issue is of practical relevance and clearly deserves more research attention. Our findings show that the technology platforms used by Facebook – the translation framework, the translation application, the application dashboard and the self-hosted open-graph objects used to facilitate translations – play vital roles in acquiring, selecting, articulating and integrating knowledge from the crowd of users. These observations lead us to the following propositions:

Proposition 1a. To accelerate internationalization in cyberspace, firms have to engage in explicit learning.

Proposition 1b. To accelerate internationalization in cyberspace, firms benefit from the use of electronic learning tools.

The international new venture literature (Dimitratos & Jones, 2005; Oviatt & MacDougall, 1994; Zahra, 2005) suggests that accelerated internationalization depends on the business-network access firms acquire prior to internationalization. Our paper's findings support such propositions, but we also suggest that internationalization speed in cyberspace is highly dependent on the firm's ability to integrate external knowledge and competences from the network (e.g., those held by user groups).

In their study of how new venture firms learn to expand during their international expansion, Zahra, Ireland, and Hitt (2000) stress the effect of knowledge integration on technological learning. Knowledge integration is understood as "a process for coordinating the specialized knowledge of individuals" (Grant, 1996). This implies that knowledge combination, which is the process of acquiring, transferring/sharing and using knowledge across organizational boundaries (Brown & Duguid, 1991; Kogut & Zander, 1996), serves as an enabler of problem solving (Nickerson & Zenger, 2004). With regards to learning, "(knowledge) integration is the process by which managers determine what has been learned, evaluate its potential importance, and explore ways in which the new knowledge can be used" (Zahra et al., 2000, p. 926). At the core of Facebook's rapid internationalization, our findings highlight a learning process determined by the firm that facilitates the coordination of the user community in terms of voting and co-creating the best translation work. The firm also handles the evaluation, integration and approval of the final knowledge. In particular, knowledge that Facebook acquired from the most accepted work by the community was absorbed, articulated and blended into its operations. Overall, this process

was replicated in different markets and facilitated the rapid expansion of the service into more than 70 languages covering over 90% of Internet users worldwide.

This process of knowledge integration is a key foundation for developing a capability that allows firms to conceive of and develop new products and services for internationalization. In particular, consistent with previous studies of the impact of learning during international expansion (Grant, 1996; Nonaka & Takeuchi, 1995; Zahra et al., 2000), our study indicates that a knowledge-integration capability helps firms achieve greater, deeper and faster international expansion than their competitors. In our case, Facebook held first-mover status among the digital-service providers. Moreover, it achieved the largest international Internet user base (20% of the world's population).

Therefore, we submit that our understanding of the nexus between learning and internationalization speed is enhanced when external users' knowledge and competences are well integrated by the firm for the development of a global digital-service offering. As a consequence, we propose that:

Proposition 2a. The higher the integration of external knowledge acquired from the crowd, the faster the firm can achieve internationalization in cyberspace.

Proposition 2b. The deeper the integration of knowledge external knowledge acquired from the crowd, the greater a firm's ability to penetrate foreign markets in cyberspace.

8. Research implications

While the key constructs and relationships of the internationalization framework (Johanson & Vahlne, 2009) appear to remain intact in the context of cyberspace, our findings suggest a possibility for refining our understanding of how firms learn in cyberspace. One issue that future internationalization research needs to address is how investments in e-learning may enhance a firm's internationalization process. Furthermore, research based on larger samples may build on this study to reveal the extent to which learning differs between firms primarily operating in cyberspace and firms primarily relying on physical operations abroad. In this regard, this study enhances prior internationalization research in general and explanations of accelerated internationalization in particular.

A related issue that future internationalization research should address is how investments in e-learning may enhance a firm's internationalization process. Furthermore, research using larger samples may build on our study to reveal to the extent to which learning differs between firms primarily operating in cyberspace and those primarily relying on physical operations abroad (Mahnke & Venzin, 2003).

Our research highlights the role of the crowd's knowledge integration in accelerating internationalization in cyberspace. However, future research should more closely examine *when* rapid internationalization is important for competitive advantage (Grant, 1996; Nonaka & Takeuchi, 1995). In addition, our study highlights the interactive learning cycle between firm and the community of users, and among members of the community itself. This raises several questions for future research. For example, is this cycle applicable to other industries that do not provide digital services? How do firms ensure that the learning cycle continues as they continue to internationalize?

Moreover, our evidence shows that active user engagement in the internationalization process is essential, and that the firm can use incentive schemes to promote intrinsic and extrinsic motivations for that engagement. Therefore, future research may investigate how a firm can sustain that engagement among the users. Our discussion also highlights the knowledge integration undertaken by a firm using a technology-aided platform to crowdsource a task, facilitate collaboration among users, and combine the acquired knowledge with the firm's standardized knowledge. Future research can benefit from examining additional details of this integration mechanism in other contexts.

9. Managerial implications

This research has several implications for managerial practice, especially for firms that provide digital social service. The case study indicates that website translation relying on the dispersed network of users – the crowd – is key for the early internationalization process of Internet-based firms, and that this crowd-based translation can result in a faster, cheaper, and even better process. Therefore, managers aiming to accelerate their firm's internationalization process should consider establishing organizational and technological mechanisms that facilitate crowd-based translation of their site.

Our findings highlights the following practices for firms using crowd sourced translation to accelerate digital internationalization: (i) building an international community of users, (ii) enabling their contributions through electronic toolkits and incentives, and (iii) utilizing both processes to enhance product development and adaptation in the firm's internationalization process.

Further, managers who decide to engage in crowd sourced translation can consider the four crucial steps of the process which Facebook has effectively employed: initiating a translation project, harnessing the international user community, encouraging contribution of user community, and validation and release of the website. The description of each of these steps includes practical insights, such as Facebook's open call, the award system for translators, the translation and voting processes, etc. These practices underscore the importance of learning to engage international user communities by creating appealing incentives such as building an intrinsic reward system that offered public recognition to users contributing to its translation efforts. User ratings were based on the number of accepted translations submitted by each user. Thus, managers of internationalizing firms in cyberspace need to recognize that users may find personal benefit in interacting with other international users, being part of a global community (social reward), receiving peer recognition (reputation), and expressing themselves as part of an international user network.

In summary, in cyberspace mobilizing and motivating externally available competences may be as important as internal learning for the accelerated process of internationalization. Managers of firms internationalizing in cyberspace need to blend internal and external competences, which require a keen understanding of those processes that enable participation by globally distributed volunteers—the crowd. In networked markets, accelerating the pace of internationalization through technology-enabled and semi-automated learning from codified information may be more beneficial in terms of survival and growth than the acquisition of tacit knowledge from physical operations in foreign markets. The ability of a firm to engage the crowd, and harness its skills and input enables the firm to enjoy faster and cheaper international growth.

10. Conclusions and contribution

This paper used a case study to explore a relatively new phenomenon: crowdsourced translation as an accelerator of the early internationalization process in cyberspace. We focused, in particular, on the learning perspective. Our findings contribute to the literature in several ways.

First, the paper makes an empirical contribution, as it explores a new method for accelerating the firm's early internationalization process—crowdsourced translation. This method can result in a faster, cheaper and better process, as translations are undertaken by volunteers translating into their mother tongue. Second, this research contributes to the network perspective of internationalization by illustrating the importance of the crowd's networks. Facebook's unique tools and processes (especially the translation platform and incentive mechanisms) enabled the establishment of a virtual network that included hundreds of thousands of individuals. This network went far beyond a network of business relationships that included a small number of firms or individuals (e.g., suppliers, customers, business partners). Third, our findings suggest that internationalization in cyberspace can be accelerated if the firm is able to re-configure and integrate external knowledge and capabilities that can be accessed in voluntary communities of internationally dispersed users and external complementors.

In integrating theoretical insights from internationalization theory with phenomenological aspects of Facebook's global expansion process, we: (1) used a detailed micro-level account to enrich our understanding of the relationship between internal and external learning work and the firm's internationalization, and proposed a model illustrating the process, (2) argued that explicit learning may be at least as important as experiential learning, and showed how an electronic learning tool can facilitate such learning, and (3) contributed to the knowledge-integration literature by illustrating how a firm can mobilize and integrate internal and external competences. These learning mechanisms depend on the development of a dedicated software tool and the design of a new organizational process.

Our results advance internationalization theory and related research by connecting past research on learning with research on cyberspace as a specific context for learning and doing business on an international scale. In this regard, our paper enhances our knowledge of the potential for rapid internationalization in cyberspace and the possible ways in which a firm can organize learning to support that internationalization process. The results underscore several issues of managerial relevance, including the role of user networks that complement the firm's learning while simultaneously assisting market entry, and the importance of processes that combine external community-based knowledge sources with internal learning as key drivers of rapid internationalization in cyberspace. Compared to firms operating in physical space, firms internationalizing in cyberspace have a variety of learning possibilities that extend beyond tacit and experiential learning through foreign operations.

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