BUILDING MARKET KNOWLEDGE TOGETHER: A NETNOGRAPHIC STUDY OF ONLINE OCCUPATIONAL COMMUNITIES

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Abstract

In this paper, we report findings from a netnographic investigation of a virtual community dedicated to the woodworking trade. Our findings show that by providing user-generated market-related knowledge, virtual occupational communities may play an important role in industrial buying behavior and contribute to the diffusion of positive and negative electronic word-of-mouth about products, suppliers and brands. Our paper thus contributes to research on the information sources employed during the industrial buying process, by highlighting the intense social exchanges among "colleagues in other companies" which are almost neglected by extant research. Moreover, we contribute to the literature on the role of the Internet in industrial marketing and purchasing by shedding light on the relevance and functioning of virtual communities of industrial buyers. Finally, we also contribute to research on the buying center, which has focused on internal dynamics within the buying center without examining patterns of external influence.

Keywords
Occupational communities
Virtual communities
Informal interactions, relationships and networks
Information sources
The buying center

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Introduction

Formal interactions and relationships among organizations in business markets are just the tip of the iceberg when compared to the multitude of informal collaborations among a company's human resources and colleagues from other organizations (Powell, Koput and Smith-Doerr, 1996). Within this sea of interactions and relationships, a sub-set of interest for industrial marketers is constituted by those maintained by members of buying centers involved in industrial buying behavior (Johnston and Bonoma, 1981; Jackson, Keith and Burdick, 1984; Lilien and Wong, 1984; Kohli, 1989). In this context, research on information sources employed by organizational buyers has long addressed the relevance of non-commercial and personal sources, among which feature prominently subjects which are variously identified as "outside company's contacts" (Brossard, 1998) or "colleagues in other companies" (Moriarty and Spekman, 1984). Previous research (Rinallo, Borghini and Golfetto, 2007) has proposed to study these informal personal networks through the theoretical lenses of literature on occupational communities (e.g., Van Maanen and Barley, 1984, Bechky, 2003), which are sometimes referred to as communities of practice (e.g., Brown and Duguid, 1991). Scholars in this perspective have long highlighted the processes of social construction of work-related knowledge and solutions to common problems that occur within communities of workers. However, such literature has not explicitly dealt with the mechanisms through which workers who are members of buying centers develop market-related knowledge and solutions to organizational buying problems. The recent development of web-enhanced solutions for knowledge exchanges among professionals (Andersen, 2005) has only increased occasions for social interactions among these individuals, that complement live interaction situations like those enabled by trade shows and other marketing events (Borghini, Golfetto and Rinallo, 2006; Rinallo and Golfetto, 2006).

In this paper, we extend previous research with an empirical study of an online community of professionals that, we found, is a locus of creative market knowledge co-creation. To make sense of

this virtual context, we employed a method termed netnography, which is ethnography adapted to the study of online communities (Kozinets, 2002). To this aim, we collected posts generated by online community users, and analyzed them with interpretive procedures. Our findings show that through processes of online interaction and knowledge exchange virtual occupational communities may play an important role in industrial buying behavior thus influencing perceptions and opinions about products, suppliers and brands. We also found that by seeking help, giving help and engaging in collective cognition, members of virtual communities collectively develop new technical and market-related knowledge, that result in a collective memory of freely accessible information for future users. Our results suggest that also marketers can become good citizens of customer-managed virtual communities, even though in ways different from supplier-hosted forums.

Our paper is relevant for several issues related to industrial marketing and purchasing. Firstly, it contributes to extant research on the information sources employed during industrial buying processes by highlighting the relevant role of horizontal relations among employees of different companies. Secondly, it enriches the literature on the impact of the Internet on industrial marketing and purchasing. Thirdly, it adds new knowledge to the IMP research tradition on interactions and relationships among organizations by unpacking the role of occupational communities, which strengthen the web of social and informal bonds of a given industry. Fourthly, the paper discloses a pervasive altruistic attitude of members of online communities who are willing to help each other in knowledge sharing and competence building. Finally, our study shows that workers are less likely than consumers to attach themselves to brands from a symbolic perspective. However, they establish bonds with those products that extend physical performances and enable identification within the occupation.

The structure of the present paper is as follows. Firstly, we review literature on the impact of the Internet in contemporary business markets and the role of online communities in consumers' markets. Comparing these two domains, a need to investigate virtual occupational communities emerges. Secondly, we familiarize readers with our empirical context and the procedures we employed to gather and analyze data. Thirdly, we report our main findings. We conclude by discussing our findings and their theoretical and managerial implications.

Literature Review

The Internet revolution has deeply affected industrial marketing and purchasing and, not surprisingly, a number of studies have analyzed web-based business-to-business marketing strategies. This research stream has mostly focused on web sites (e.g., Evans and King, 1999; Perry and Bodkin, 2002; Murphy et al, 2003), which are often conceived as a means through which industrial marketers can develop closer customer relationships (Honeycutt, Flaherty and Benassi, 1998; Bauer, Grether and Leach, 2002; Long, Tellefsen and Lichtenthal, 2007). While web sites are an important part of industrial marketer web presence, recent studies show that the Internet offers several other typologies of information sources to industrial buyer. According to Moriarty and Spekman's (1984) well-known taxonomy of information sources, typical web sites – often designed as "cyber-brochures (Perry and Bodkin, 2002) – are impersonal commercial communication tools, whose influence is relatively low because of the well-known problems in establishing trust in online environments (e.g., Luo, 2002).

In a recent paper, Deeter-Schmelz and Kennedy (2002) highlighted that the Internet may offer both personal and impersonal information sources; moreover, the web enables industrial buyers to also access non-commercial sources. Of particular relevance for the purpose of the present paper are web-based industrial buyer-generated sources of information about products, brands and suppliers. The Internet enables industrial buyers from different and geographically distant organizations to interact in virtual environments and share market-related knowledge. Industrial marketing scholars have long highlighted the influence of "outside company's contacts" (Brossard, 1998) and

"colleagues in other companies" (Moriarty and Spekman, 1984) as expert and trustworthy sources of information. Recent contributions have proposed to investigate such external networks of influence through the theoretical lenses of research in occupational communities (Van Maanen and Barley, 1993; Rinallo et al., 2007). As holders of different culturally constituted work identities, members of buying centers make sense of industrial marketers' activities and formulate critical responses to them in specific manners. Previous research has also suggested that live events like trade shows provide a platform for the physical interactions of members of buying centers, reinforce professional identity and a sense of belonging to the same occupational community, and contribute to collective cognition (Borghini et al, 2006). With the advent of the Internet, members of buying centers have acquired new tools to interact that do not require physical co-presence, thus multiplying the occasions for contact and further accelerating flows of information and influence among workers from different organizations.

Virtual occupational communities are highly relevant for industrial marketers as information exchanged by buyers in online contexts is more credible than messages transmitted through supplier web sites. From a social psychological perspective (e.g., Kelman, 1961), expert and trustworthy sources of information are highly credible, and thus more influential (Hovland, Janis and Kelley, 1953; McGuire, 1969; Sternthal, Philips and Dholakia, 1978). Unlike company web sites, whose messages can arguably be perceived as partial and self-interested, members of a virtual occupational community can usually be counted on for providing neutral and unbiased information on a given supplier or product alternative. Similar to the much more studied virtual communities of consumers, also online occupational communities may therefore be important targets of industrial marketing communications. However, unlike corporate web sites, online communities are much more difficult to manage. Consumer researchers have shown that communities of consumers may create several problems to marketers (Catterall and Maclaran, 2001; O'Guinn and Muniz, 2005; Berthon et al., 2007), including the appropriation and resignification of brand meanings, resistance to companies and their strategies, product boycotts, and accelerated diffusion of information that damage company reputation. By facilitating interactions across geographically dispersed consumers, the Internet has intensified these phenomena, and altered as a consequence the relative power of consumers respect to marketers. In industrial markets, similar phenomena are likely occurring.

Despite their relevance for the practice of industrial marketing, virtual communities of industrial buyers have received a scant attention. One of the few exceptions is Andersen's (2005) study of brand involvement of professionals through web-enhanced brand communities. Web-based brand communities are however the tip of the iceberg when speaking of virtual occupational communities. Most virtual communities of consumers do not focus on specific brands, but rather on consumption activities. Moreover, even when these communities are centered on specific brands, they are often not created or managed by the brand itself. In industrial markets, online brand communities similar to those studied by Andersen (2005) are likely less frequent than their equivalents in consumer markets, where community/tribal marketing approaches (Cova and Cova, 2002; Cova, Kozinets and Shankar, 2007) are much more common.

To sum up, in this section we propose that virtual communities of workers, while more difficult to manage than company web sites, are relevant but under-studied phenomena. Arguably, results produced by research on virtual communities of consumers may be, to a certain extent, replicable. However, online occupational communities may have their own specificities. While consumer research may provide a useful benchmark for comparative purposes, we believe that online communities of workers are worth separate investigation by business-to-business marketing scholars.

Methods

This research is based on a qualitative approach and employs netnography, a recent but well-established methodology in marketing research (e.g., Kozinets, 2001; Schau and Gilly, 2003; Muniz

and Schau, 2005; Nelson and Otnes, 2005; Cova and Pace, 2006; Giesler, 2006; Hemetsberger and Reinhardt, 2006). Being practically a form of virtual ethnography or cyber ethnography, this methodology adapts traditional ethnographic research techniques to the study of online cultures and communities created in computer-mediated environments such as chat rooms, message boards, e-mailing lists, dungeons (i.e. themed virtual locations in which interactions are structured by role-playing), and rings of thematically linked web pages (e.g., Rheingold 1993; Hine, 2000; Kozinets, 2002). Like conventional ethnography, netnography is based on observation and/or participation, which let the researcher understand the basic dimensions of a given virtual community. In other words, the ethnographer "learns" the language, the means through which knowledge is developed and transmitted, the shared mental models, and the typical linguistic labels adopted by virtual community members. The main difference between netnography and traditional ethnography concerns the location of the ethnographer in relation to the group under investigation. In netnography, the researcher does not need to see the members of the community face to face, nor has to physically interact with them or participate to their activities. Online communities provide the researcher with almost nothing but text. Behaviors cannot be observed other than through their textual contributions to the virtual space. Interactions are essentially verbal and expressed in the form of text and, sometimes, images. The data collected are typically downloaded files of newsgroup postings, e-mail exchanges, transcripts of MUD (multi-user dungeons) or IRC (Internet relay chat) sessions that can be combined with the researcher's field notes.

Recently, scholars have developed methodological procedures for netnographic studies (e.g. Thomsen, Straubhaar, and Bolyard, 1998; Catterall and Maclaran, 2001; Kozinets, 2002, 2006; Langer and Beckmann, 2005) and suggested specific strategies that can be applied to meet the epistemological and methodological requirements of reliability and validity. The typical recommendation is to follow rigorously the steps of ethnographic research which consist on: i) identification of appropriate research questions; ii) data collection developed applying multi-method approaches; iii) analysis and interpretation based on the operations of classification, codification and contextualization; iv) member checking with the informants by interviewing them and/or soliciting their comments on the research report (e.g., Catterall and Maclaran, 2001; Kozinets, 2002). Traditional methods of content analysis are suggested as effective techniques that can be applied to data classification and codification. In particular, e-mail and message exchanges are considered as discourse (Thomsen, Straubhaar, and Bolyard, 1998) that can be interpreted through the established techniques of discourse analysis. A prolonged commitment to involved participant observation and qualitative interviews with group members are useful to further elicit the meanings ascribed to community membership and participation. Such best practices can enable a multi-source and multi-method triangulation of research findings (Thomsen, Straubhaar, and Bolyard, 1998).

While there is a general agreement on these suggestions, extant literature provides however alternative perspectives on how to deal with research ethics and the limits inherent in the physical distance between researchers and informants. Kozinets, for instance, advises researchers to fully disclose their presence, affiliations, and intentions to online community members and obtain their permission (informed consent) to use any specific postings that are to be directly quoted in the research (2002: 65). Langer and Beckmann (2005), on the contrary, distinguish between private and public communication. When access to the cyberspace of a given community is restricted and communication is quasi-private, researchers actually disclose their presence and obtain the permission to use their texts of social exchange. When the space is public and everybody can have access to texts, covert research can be instead an appropriate methodology.

In this study, we investigated an online community of Italian wood-workers (*Forum Il Legno*) by studying their interactions on cyberspace (http://forum.il-legno.it/). This virtual space was founded in 2002, and today it the most active online community dedicated to the woodworking trade, with almost 6,000 members. The forum was created to contribute to the development of competence in woodworking, as in Italy there is a dearth of institutionalized learning outlets when the community

can meet and share experiences other than the traditional master-apprentice relationship. While attracting also a number of consumers interested in DIY (do-it-yourself) activities, the majority of the forum is dedicated to professional woodworkers. As the focus of the research is on occupational communities, we concentrated on professionals and their interactions, and excluded from the analysis those sections of the forum where consumers tended to concentrate. Professional community members are predominantly male, come from different Italian regions, and are mostly furniture makers, carpenters and, in a few cases, specialized retailers (e.g., wood, tools, tooling machines). The vast majority of them are craftsmen and small entrepreneurs, even though employees of larger firms are also present.

The first author immersed himself in the community conducting an extended investigation through an unobtrusive observation. The decision to adopt a covert research design was motivated by the fact that a direct interaction by the research team or any of its members would not add any value to the community. A more direct participation could even turn out negatively thus influencing the naturalistic dimension of the cyber space and the behavior of its participants. At the time of data collection, the virtual space of the community was public with a completely free access, and the archive of the exchanges was publicly accessible.

During the time of observation, we downloaded approximately 142,000 messages which resulted in a dataset of more than 300 pages (Word, Times New Roman, 12 pt) that were analyzed over a period of 10 months by the research team according to the methodological procedures on netnography (Kozinets, 1998; 2002, 2006; Thomsen, Straubhaar, and Bolyard, 1998; Catterall and Maclaran, 2001; Langer and Beckmann, 2005). As an initial step of data analysis, the first author developed content analyses aimed at classifying the different categories of community members (Kozinets, 2002). Such procedure permitted to exclude do-it-yourself consumers from subsequent investigation, and allowed the identification of the most active and influential members of the community. As shown in Table 1, the majority of community members are “lurkers”, i.e. they read other users’ comments but do not post messages. Other users only occasionally post messages, totalizing a relatively low number of messages typically motivated by specific information requests. The most active members are less than one hundred and, notably, there are four authors with a number of posts ranging from 6,000 to around 12,000. Active members are all professional wood-workers, and some of them – when geographical distances make it possible – tend to meet also in “real life”, for example at trade shows and community-organized workshops that mix socialization, leisure and learning motivations. In the words of one of these members, “*this community is virtual only to a certain extent, as I had dinner with quite a few of us*”.

--- INSERT TABLE 1 AROUND HERE ---

As a second descriptive step, we categorized messages to outline the most relevant topics and issues discussed within the community. Data were coded comparatively. We read each posted message several times, moving across categories and from the specific to the general. On the basis of the emerging empirical evidence, a more sophisticated and interpretive discourse analysis was conducted to grasp the meanings and effects of the community interactions. The intended goal has been to recognize patterns, rules, practices that occur among participants analyzing complete conversations and the series of several exchanges over time. The co-authors developed the step of member checking discussing and partially revising the coded categories of meanings. As a final phase, the research team developed the interpretation of data grouping and linking categories. In examining the data we employed a bottom-up approach, grounding the analysis and the interpretation on our previous knowledge of the industry of woodworking and its culture. Even though we did not interview directly the members of the online community we could rely on a rich dataset of ethnographic investigation developed among members of this occupational community in different empirical contexts, which we have selectively presented in previous published work (Borghini et al., 2006).

Research findings

In this section, we report selective findings from our netnography. While often employing our own observations and interpretations, we also represent our findings with the help of exemplificative online interactions among community members. In these cases, to protect their anonymity, we use pseudonyms for both nicknames and personal names.

The role of virtual communities on industrial buying processes

Many discussions in the *Forum Il Legno* contain information useful to purchase processes. Arguably, one of the main reasons to consult the forum is to get information about what to buy, where to buy it, and at what price. Participants ask questions and receive answers about issues including the best type of wood to be employed for certain purposes (e.g., furniture making or parquet), the relative strengths and weakness of natural versus artificial colorants, the best brands of tooling machines, the cheaper or more reliable online resellers. Technical and purchasing problems are often difficult to disentangle: for example, new technical solutions may require the selection of new suppliers or the purchase of new products. Virtual communities thus permit industrial buyers to obtain quick and cost-effective pre-purchase information. Consider for example the posts that follow.

> ***Romito****: Hello everybody. I would like to buy a basic set of anant planes from Dick. From the catalog, I think I have identified some planes, and precisely: 703170,703175,703177,703183. May I ask you for advice? Thank you in advance. Bye bye, Romito.*
>
> ***Roby69****: Dear Romito, as I often do to those who are getting to know metal planes, I suggest to buy just a few of them, to start getting familiar with the tool. I always suggest one block plane (9½ or 60½) and one jack plane (a classical n. 5). . . . The reason is that you need to familiarize yourself with these tools. Once you are familiar with them, you get fascinated and you start desiring planes which are increasingly performing, specialized and …expensive (it always happens to me). Moreover, you shouldn't forget that it is possible to buy great used planes at very good prices on ebay. Once they are fixed, they offer good performances. Of course, you have to know what to buy. If, on the other hand, you want to buy immediately a "complete" set of planes, then the thing inevitably extends to a 4, a 4½, a 7, a rabbet. But the list could continue much beyond this. Moreover, don't forget that you need your planers to be perfectly sharpened. If you don't have a set of waterstones, then it is better to buy at least a couple (code 711001 and code 711003).*

The user *Romito* is looking for planes, which are a basic carpentry tool. After an initial search based on commercial sources, he has identified an online reseller (*Dick Fine Tools*), a brand (*Anant*), and selected what he believes is a "basic" set of products of varying blade width and body length, whose total price amounts to less than €120. He seeks advice from more experienced users arguably to reduce the cognitive dissonance and perceived risk of his purchase. The user *Roby69* soon replies by implicitly criticizing the choice of buying a "complete" set of planes. For novice users, he argues, a better solution is to order just a couple of planes to "*start getting familiar with the tool*", and defer the purchase of more performing and expensive products to the future. Rather than buying brand new products, *Roby69* also suggest to cut prices by buying "*great used planes*" from *Ebay*. Additionally, *Romito* is reminded the need to perfectly sharpen plane blades, and recommended waterstones as appropriate sharpening tools. As a matter of fact, *Roby69* proposes different criteria to evaluate purchase alternatives and, at the same time, broadens the selection set. To the extent that *Romito* follows the advice received, he may eventually order different brands and products, in different quantities, from a different reseller.

Roby69's reply also sheds light on the different reasons why community member share their expertise to help seekers. As in online communities of consumers, one of these reasons may be pure

benevolence, i.e. the sincere desire to help others. At the same time, however, by offering advice *Roby69* asserts his expertise and increases his status within the online community. Consumer researchers have often noted the hierarchical patterning of communities of consumers (e.g., Schouten and McAlexander, 1995), which reproduce themselves also in online communities (DeValck, 2007). Occupational communities are similarly patterned and characterized by opinion leadership phenomena (Leonard-Barton, 1985; Rinallo et al., 2007). By asserting their expertise and offering their time and attention to help others, web forum members acquire status. It is interesting to observe the rhetorical strategies employed by *Roby69* to represent himself as a benevolent expert. First, technical competence is expressed in the way he describes what (not) to do and how to do it. Second, he calls upon his longtime personal experience and involvement ("fascination") with more performing, specialized and expensive planers. Within the virtual community, there is a minority of very active experts (see again Table 1), who are often willing to help others solve their technical and purchasing problems. Whether motivated by benevolence or prestige, these influential individuals are relatively easy to identity, thus constituting a privileged target group for industrial marketers.

Pre-purchase information is also provided by some users through highly visible product reviews. Sometimes, such reviews are the result of actual product comparisons by groups of users that meet offline for that purpose. However, the usefulness of virtual communities for industrial buyers extends beyond pre-purchase information search to include actual purchase activities. *Forum Il Legno* includes a section where community members may sell used products. More importantly, users often use the virtual community as a platform to form buying pools. Take for example the following online exchange.

> ***Dan39****: On Sunday, I'll send an order to Fine Tools. If anybody wants to take advantage from this, please let me know before it's too late* 😀
>
> ***GT:*** *Hi Dan39, . . . Would you send also to Milan? Thank you.*
>
> ***Dan39****: Yes, of course, I'd send also to Milan.*
>
> ***GT:*** *Dan39, I enclose below the list of what I would like to buy . . . in case you, or somebody, have suggestions for additions/cancellations/substitutions. Thank you.*
>
> *1 St 309351 Japanese Waterstone 1000 Size 207x66x34mm*
> [A list of other products follows]
>
> ***Giuseppe****: Dan39, as I'm in Milan every day, Antonio and I agreed that you might send all the stuff at my workshop (so to reduce all the stress to make up parcels and send them and to have the additional expenses from Rome to us). We'll take care of dividing each other's material ourselves. Best, Giuseppe.*
>
> ***Dan39****: Ok, thank you very much for the kind thought* 😀*. I contacted Schmid and there's no way to obtain more than a 4% discount (which is however the norm for orders beyond 400 euros). Apart from GT's list (which arrived today), all the material ordered by Duilio, Silvio1955, and Giuseppe is in stock. What should have been my birthday gift (a low angle jack plane) of course wasn't available* 😈*, but they told me it should arrive within next week…. Shipping costs should be between 16 and 20 euros (they were 16 without the addition of Antonio) + the insurance (which is free for orders of 500 euros or lower, but in this case we are more than double that amount). The order will be sent on Monday, I'll keep you updated.*

The user *Dan39* informs the forum of his intention to place an order to the German online reseller *Dieter Schmid Fine Tools* and offer fellow community members the possibility to join him for a cumulative order. Apparently, the offer is motivated by economic inducements linked to the sharing of shipping costs across different buyers. However, these savings are more than compensated by additional expenses (insurance, shipping from Rome to Milan) and transaction costs. Collective purchase may thus be an excuse for establishing relationships among community members beyond the more usual information exchanges. Admittedly, collective purchases and related negotiation of

better conditions with suppliers are relatively infrequent. In the community we investigated, we did not find evidence of other forms of collective endeavors (e.g., product boycotts). However, the fact that virtual communities may be employed by members as a platform for collective action is a relevant fact for industrial marketers. Customer socialization, whether beneficial or adverse to marketers, may give rise to both opportunities and threats.

Besides pre-purchase information search and actual purchases, virtual occupational communities also affect post-purchase behavior – most notably, word-of-mouth by (dis)satisfied customers. Empirical studies show that word-of-mouth is mostly negative, as dissatisfied customers are much more likely to report negative news than their positive counterparts (e.g., Singh, 1990). The Internet has provided new instruments for virtual buzz and word-of-mouth (Brown, Broderick and Lee, 2007). In the empirical context we studied, we found very similar phenomena. After purchases, industrial buyers share with fellow community members opinions about products and suppliers based on direct experience.

> ***TOPIC: Axminster Panel Clamps***
> ***Romeo****: I'd like to revise the positive opinion I gave in this thread http://forum.il-legno.it/viewtopic.php?t=6004&start=0 about the panel clamps I bought from axminster. I confirm they are excellent from many different points, but … THEY BREAK*
> *Oh, yeah … You only need to tighten them a little more, without using pliers or extensions, just with your bare hands, and they break. Today I used them to glue together the boards for the workbench I'm building. I needed to clamp them tight for a good gluing. I broke two. Please, don't buy them.*

The user *Romeo* is correcting a previous favorable review about a product he bought from English mail order company *Axminster Power Tool Centre*. Panel clamps are relatively inexpensive tools (i.e., usually less than € 10 each) employed to assemble together multi-board panels, and are supposed to last for years – if not for decades. *Romeo* is disappointed by the fact that they broke after what he considers a normal use (i.e., tightening them with just the bare hands). According to *Romeo*, the breaking is neither due to his inexperience with the product nor to a random production defect: the fact that he broke two panel clamps is interpreted as a sign of a systemic product failure. While still considering *Axminster* clamps "*excellent from many points of view*", he now advises other users against purchase. *Romeo*'s negative opinion is arguably very credible as it comes from a peer with no vested interest in other members' purchase decisions and it is supported by direct experience. Whether writing because of benevolence towards other users (e.g., to avoid them a negative experience) or out of a desire of vengeance towards *Axminster* (e.g., to cause them an economic damage), *Romeo*'s words are persuasive. With the advent of the Internet, also industrial marketers are subject to regimes of surveillance that may accelerate the diffusion of both favorable and unfavorable information.

In this section, we proposed that virtual communities may be employed by industrial buyers in different phases of their purchase process. In pre-purchase phases, they act as a quick and cost-effective database of information about what to buy, where to buy, at what price. Previous posts act as a reservoir of information that can be accessed in every moment by new users. When previous posts are not useful, users can in every moment post new requests for advice. More often than not, other users will be happy to help by sharing their expertise. We also found that virtual communities may facilitate social interaction in the web and act as a platform for collective action – including collective purchases. Additionally, user also use virtual communities after purchases, to give voice to spontaneous opinions based on direct experience – notably, dissatisfied users are more likely to share their opinions than their satisfied counterparts.

Creating new knowledge: A process model

In the previous section, we documented flows of information from more to less expert virtual community members. However, in this study we also identified creative moments where new knowledge is collectively developed in response to problems for which no individual user is able to provide ready solution. Collective creativity is based on a set a inter-related activities, as visualized in Figure 1. *Help seeking* refers to situations when individuals facing problematic situations actively seek the assistance of other members of the community by posing specific questions or by describing a problem for which no solution is apparent. Help seeking behaviors are a necessary first step in collective creativity within the virtual community, and result in the mobilization of support by other community members. Any community member may seek help by the community as a whole by posting a message with a request for help, advice, or suggestions.

--- INSERT FIGURE 1 AROUND HERE ---

> ***Colombina****: Hello everybody, . . . I'd like some advice if possible. Which is the best glue to use for wood? Thank you very much, as usual. Colombina*
>
> ***Thor****: Hello. This is a very vague question* 😀 *It depends on what you have to do: a vinyl glue may work for more or less everything (however, I would avoid vinavil) and I'd suggest bindulin. These days, I got titebond, and I think I'll keep using it because it seems great to me. For micro-repairs, also attak is ok (be careful to fasten the pieces together long enough). Bye.*
>
> ***Colombina****: You're right. I need to glue together joints.*
>
> …
>
> ***FabioR****: Dear Francesca, even though you added a detail, "joints" is still very vague. For windows joints I use vinyl d3, whereas for shutter joints I use polyurethane d4. For furniture joints, I use whatever glue is at hand, for furniture doors either b3 or d3, etc. For period furniture joints, for example, animal glue should be used . . .*

The novice user *Colombina* seeks help in an initial phase of her information search process. *Thor* and *FabioR* help her to specify her request by providing details about intended product use. Other users, such as *Romito* in the exchange reported in the previous section, may be in more advanced phases of their information search process, thus asking about alternative solutions, products or suppliers, price ranges, etc. Help seeking behaviors results in *help giving* by individuals who devote time and attention to respond to other users' questions. An individual help request may result in a number of help offer, ranging from almost none to dozens depending on factors including difficulty and help seeker popularity.

> ***Geppetto****: I'm looking for some douglas wood (Rome area) for a shutter I'm renovating. It seems that such wood is disappearing from the market! I searched for it in several large bricolage centers, but to no avail. I just need a little bit of it, 7 cm (width) x 4 m. (length) x 1 cm (thickness). Does anybody have suggestions or news about resellers (also on the Internet)? Thank you.*
>
> ***Roby69****: Nowadays it is less used for the price that went sky-high and for the problems of resin release that went accentuated with the current water-based paints. Rather than from resellers, I'd look for it from some carpenter, as you only need a little bit. Alternatively, you could use hemlock wood, which is rather similar in color and grain.*
>
> ***Zeus****: Wouldn't larch-wood be ok? I've got several planks of in my workshop, of various length and width… If you want, I can send them to you . . . Bye, Alberto.*
>
> ***Pinocchio****: One month ago, while speaking with my dealer . . . he told me that cabinet-makers don't want it [douglas wood] anymore because it went from 900 to 1,300 per cubic meter, and you can't ask a greater price to the end user. For this reason, many are using Swedish pine, which unfortunately has knags but for the rest it has nothing to envy the douglas for . .*
>
> ***Falegname61****: What about trying with Russian larch 1st choice, which is identical?*

> ***FabioR*: *I think, too, that Russian larch is a great compromise, for my next lot of windows I'll use it myself if I don't find red pinewood (the customer doesn't want to spend too much).***
>
> ***Roby69**: Dear Geppetto, a couple of years ago I had to take away from a customer's house all the shutters, which were made in douglas (made by a carpenter 20 years ago and still in great conditions) for security reasons (no comment!), and to mount instead armored shutters. It broke my heart to throw them away, so I kept them in the garden. Once in a while I take one and recover the wood to make something, but I've got plenty of them. If it is ok for you, since you only need a little bit I can give you some, but you have to come to Naples to take it.*

Many users reply to *Geppetto*'s help request. Some shed light on the reasons why it is so difficult to buy douglas wood (i.e., price increases, resin release problem). Others suggest substitute products (e.g., Russian larch, Swedish pine) and channels (other carpenters who may have douglas wood reserves, instead of bricolage centers). Some users even go beyond the simple provision of market-related knowledge. *Zeus* – who has a stock of larch-wood in his workshop – offer to send some to *Geppetto* free of charge. *Roby69* puts an end to the conversation with his offer of recycled douglas wood – again, a gift. Interactions based on help seeking and giving are similar to those reported in the previous section, when individual expertise by one or a few members is sufficient to solve the problem at hand. There are however cases when nobody is able to provide easy solutions. In these circumstances, help giving occurs through a series of interactions among different individuals who build upon previous comments by other users until a more or less satisfactory solution is found. We term this process *collective cognition* to refer to the fact that while different individuals contribute to the problem-solving process, it is through social interaction that solutions are generated.

> ***Mercurio**: For a little thing I'm making (I'll tell you later) I need to use non-toxic glue. I searched the Internet, but I stranded and so I'm seeking help. Titebond II should be what I need, perhaps. By reading its composition, I find "Cross-linking polyvinyl acetate". Could it be substituted with vinavil? In chemistry, at the university, I wasn't a genius. An alternative could be the ELMER'S GLUE-ALL, which is "PVAC based adhesive". Thank you.*
>
> ***Alfiere**: Vinavil is PVA (polyvinyl-acetate), I don't know what that means… But as a kid I used to eat vinavil and I grew up well – ehm, perhaps – and surely robust. Titebond II is cross-linking, which means water-resistant . . . If you look on databases, if I'm not wrong, it is not among the most toxic . . . Seriously, if you want non-toxic glue, I'd use animal glue . . . It's more difficult to handle, but it's worth taking the trouble if you really want a non toxic glue. The only problem is that it is not water-resistant . . ..*
>
> ***Mercurio**: . . . I'm interested if it is toxic by inhalation rather than ingestion, i.e. whether it releases potentially poisonous vapors. It will be employed for exteriors. Regarding animal glues, it could work but for provisioning and costs I'd prefer something else (if vinavil is ok, that would be perfect).*
>
> ***Silvio1955**: If it is for exteriors, the most important thing is that it is classified as D4 . . .*
>
> ***Bimbo**: I wouldn't like to meddle in your own business, but what do you have to glue? . . . If I'm not wrong, the majority of glues, once dried up, cease being toxic, at least by inhalation. Moreover, if it is going to be used for exteriors, I don't see the problem. Bye.*
>
> *…*
>
> ***Alfiere**: If it is for exteriors, animal glues are not ok . . . However, their costs are much lower than other glues . . .*
>
> ***Falco79**: . . . I think I read somewhere that some types of vinavil are used as thickener in the food industry… So, I wouldn't worry about vinavil, neither if you want to eat it nor if you want to sniff it* 😀 *Regards!*
>
> ***Chimico53**: As a chemist, I'd suggest you to take more than 5 seconds to read the instructions on the label, particularly when they say very irritant. Almost all glues with two components that polymerize*

contain an organic peroxide (the catalyzer) that produces long-term problems (= from allergies to cancer!!!) . . . So, guys, look out at the label, use gloves and air the rooms!!!

PS: do you want to know what you are using? Ask your supplier to give you SAFETY INFORMATION. Moreover, visit the sites www.dbsp.iss.it, http://www.toxnet.nlm.nih.gov/ they are very technical, but you find everything about almost all substances.

In these cases, a solution, when it emerges, results from online interactions by different members. In term of Nonaka and Konno's (1998) well-known model of knowledge creation in organizations, different phases of the collective cognition process may be identified (see Figure 2). To respond to help requests, help givers have to externalize their knowledge. Web forums permit to post user-generated content, which is mostly in written form. By articulating their knowledge in writing, users convert their tacit knowledge into explicit knowledge. In collective cognition processes, no user has all the knowledge required to find a solution. One user may have a better understanding of the problematic situation while others may have potentially relevant information to contribute. By combining the explicit knowledge made available by individual users with their own, other users move forward the problem solving process. The locus of creativity thus moves to the collective level when individual contributions shape subsequent contributions. During the process, all parties involved are exposed to new knowledge and thus learn. To the extent they are able to internalize such knowledge, they may be able to convert the explicit knowledge produced together into individual tacit knowledge.

--- INSERT FIGURE 2 AROUND HERE ---

Virtual communities thus act as platforms for knowledge creation that enable collective cognition and creativity among individuals belonging to different organizations. However, virtual communities have their intrinsic features that affect knowledge creation processes. Processes of knowledge socialization when individuals share their tacit knowledge directly with each other are hardly possible. Online environment do not permit direct learning through observation, imitation and practice – even though users occasionally post pictures or video that permit to a certain extent to go beyond the limits of the written word. Moreover, *Forum Il Legno* members occasionally organize "real life" workshops and study groups where more experiences users show actual woodworking techniques. However, while constraining knowledge exchange processes, web forums permit to have access to the contribution of a virtual community of geographically dispersed users belonging to different organizations who are motivated by benevolence rather than contractual obligations. The result of these processes is the creation of a reservoir of knowledge – a *collective memory* – easily accessible through web-based archives, to which new members are referred to when seeking help for problems whose solutions were successfully found in the past.

Supplier-customer relationships in virtual occupational community

Unlike the web-based communities studied by Andersen (2005), which are centered on an individual brand, we found that virtual communities centered upon occupations do not attribute a central role to brands and marketers. Mostly, these virtual contexts enable the constitution of horizontal relationships and networks among users. Industrial brands and resellers (both online and traditional) are however often discussed, and the relative benefits and costs of each of them form the content of a large number of online conversations.

***Ronaldo**: Has some of you guys bought something from axminister?*

***Aosta**: Almost everybody has. What do you want to know? In general, I can tell you it's an earnest and qualified supplier, sometimes expensive on shipping costs.*

***Ronaldo**: I just wanted to know if it's a safe supplier, but how much are shipping costs?*

> ***FeliceRM****: Hello, some time ago I had the same doubt and I contacted directly Axminter. Here's the answer:*
>
> *"Thank you for your enquiry, the cost to ship depends of the physical size & weight of each order, but as a general rule:*
>
> *0-1 kgs £5.00 GBP + VAT @ 17.5%"*
>
> [Complete shipping cost information follows]
>
> *I hope this is useful for you. Felice.*
>
> ***Lex42****: When you send your order, they send you back a confirmation email with the shipping costs, then you can choose whether confirming the order or not. I confirm they are very serious, I had a problem with a belt and they sent it to me without letting me pay anything. Bye, Lex42.*
>
> ***Ronaldo****: I see, thank you for all the information, I'll try and order and let's hope for the best.*
>
> ***Roby69****: I confirm the site's goodness. They are very serious and helpful. Once in a while I even telephoned, and I've always received prompt and friendly answers. Shipping packs are not always excellent. Prices are on average a little high, but for some products they are good . . .*

As evident in the online conversation about the UK online retailer *Axminster*, distinct preferences emerge within the community, and the rapid circulation of information by (dis)satisfied users may deeply affect industrial brand image. Positive feedback received from fellow users may contribute to increase trust for foreign web-based suppliers, thus supporting marketers' e-commerce strategies. Despite industrial brands being important parts of the occupational cultural landscape of woodworkers, we did not find evidence of identity brands (Holt, 2002) or the intense phenomena of brand attachment so widespread in consumer culture (Arnould and Thompson, 2005). Some work-related possessions, most notably tools and tooling machines, are instead valued as they are a part of their extended self (Belk, 1988; Tian and Belk, 2005). In other words, such possessions act as prosthesis allowing individuals to do things they would otherwise be incapable of, and are thus instruments of occupational identification. Rather than extending mental capabilities that aid mental performances (as in the case of the knowledge workers in high-tech companies investigated by Tian and Belk, 2005), the tools employed by wood-workers improve physical performances and thus symbolically extend the hand. In sum, *Forum Il Legno* members appear to be involved more in products than in brands.

Despite the preeminence of horizontal relationships among users, we also found that marketers may have a right of citizenship in online customer communities. In the *Forum Il Legno* resellers can advertise their products together with special offers in the context of separate sections where their identity as suppliers is apparent. There are however a few cases where marketers are full-fledged members of the community and openly express their opinion about own products and those of competitors.

> ***MrWood****: I wouldn't buy for any reason a bosch* [jigsaw]. *Once they were the best, but today they are quite poor-quality… At the top-range, there are three fine brands… Festo, Fein, Metabo. For duration, manufacture, reliability they are the best… Of course, I'm speaking of current production. In the past, there were many fine machines, but if the machine lasts forever you don't sell more of them, and then the gnawing of quality and materials starts… More plastic, less metal . . . Many people are missing the fine machines of the past . . . I wouldn't really sell them* [Bosch jigsaws]
>
> ***MrWood****: This brand* [Freud] *has little circulation here, also because of the poverty of their catalog. I would never sell them* [Freud milling machines]. *It's not a total disappointment, but with all the market has to offer, resellers decide to propose that brand just to have a product less common, in order not to have price competition from other resellers . . . Anyhow, the opinions of both users and resellers are different, therefore we find radically different opinions on the same products.*

MrWood is the owner of a small company located in northern Italy that sells, repairs and provide assistance on professional woodworking tools and tooling machines. While he is a member of *Forum Il Legno* only since 2006, he is among the most active contributors to the forum's life: on average, he posts 12 messages a day on different matters related to the woodworking trade. When other users seek help, he is more than willing to help. While not engaging in overt self-promotion, he is very open about his status as a reseller and, no doubt, his company benefits from his presence in *Forum Il Legno.* Other forum members seem to appreciate his timely and sharp comments, supported by an undeniable expertise only strengthened by his privileged access to information from industrial product manufacturers. From a social psychological perspective, we could expect that the credibility of his comments would be lower when he expresses favorable opinions about products and brands he sells. However, this does not appear to be the case. His behavior seems motivated by a genuine desire to help others, rather than commercial opportunism. On occasions, he even organizes, together with other forum members, free one-day technical courses (e.g., use of hand tools). As he somewhat ironically explains to a user asking about the price: "*It's not free… It is absolutely necessary to bring a bottle of something good or some typical food to the landlord who kindly provides the premises and equipment. Besides, it is necessary to arrive full of good will, capability to pay attention, and a small bottle of alcoholic drinks (at least over 30°) for MrWood's private emergency reserve*". By dedicating time and attention to others and acting outside of market mechanisms, *MrWood* has become, in all respects, "one of the guys".

Discussion and Conclusions

In this paper, we report findings from a netnographic investigation of a virtual community dedicated to the woodworking trade. Our findings show that by providing user-generated market-related knowledge, virtual occupational communities may play an important role in industrial buying behavior and contribute to the diffusion of positive and negative electronic word-of-mouth about products, suppliers and brands. Our paper thus contributes to research on the information sources employed during the industrial buying process (Moriarty and Spekman, 1984; Bunn and Clopton, 1993; Brossard, 1998), by highlighting the intense social exchanges among "colleagues in other companies" which are almost neglected by extant research. Moreover, we contribute to the literature on the role of the Internet in industrial marketing and purchasing (e.g., Evans and King, 1998; Deeter-Schmelz and Kennedy, 2002; Perry and Bodkin, 2002) by shedding light on the relevance and functioning of virtual communities of industrial buyers. Finally, we also contribute to research on the buying center (Johnston and Bonoma, 1981; Jackson, Keith and Burdick, 1984; Lilien and Wang, 1984; Kohli, 1989), which has focused on internal dynamics within the buying center without examining patterns of external influence.

We also found that web-based communities may act as virtual platforms enabling collective customer action, such as collective purchases and, most notably, the co-creation of technical and market knowledge. On the basis of our findings, we proposed a process model of collective knowledge creation in virtual communities based on a series of inter-related activities: i) help seeking; ii) help giving; iii) collective cognition; iv) collective memory. Scholars in the IMP research tradition have long investigated formal interactions and relationships among organizations. However, the countless informal interactions and relationships among individual workers have gone mostly unnoticed by extant research. In this paper, we contribute to the understanding of inter-organizational horizontal interactions and relationships among members of the same occupational community. In "mainstream" marketing and consumer behavior, researchers (e.g., Cova and Cova, 2002) have recently highlighted the relevance for theory and practice of variously labeled communities of consumers (Schouten and McAlexander, 1995; Muniz and O'Guinn, 2001; Cova, Kozinets and Shankar, 2007). Communities of workers, in our view, have a similar relevance also for business-to-business marketing – despite the scant attention received by the subject (Rinallo et al., 2007). Previous research has already highlighted the role played by special events like trade shows for the interaction and collective cognition of members of occupational communities (Borghini et al., 2006;

Rinallo and Golfetto, 2006). In this paper, we extend such stream of research by empirically exploring the less exceptional but more frequent online interactions, relation-building and knowledge co-activities of such individuals, whose outcomes result in freely accessible user-generated information.

Finally, our paper showed that workers are less likely than consumers to attach themselves to brands (on this, see also Borghini and Cova, 2006), and often attach themselves to those products that extend their physical performances and enable identification within the occupation (i.e., tools, tooling machines). We also found that industrial marketers may find a place in virtual occupational communities of customers. However, their role is not that of "landlords" as in web-based brand communities (Andersen, 2005) but rather that of good citizens. However, our study is just a first step in this direction, and future research should investigate brand-building activities and the establishment of supplier-customer relationships in occupational communities (both online and offline).

One of the main implications of our study is that industrial marketers may be both advantaged and damaged by web-based customer socialization. Industrial suppliers may thus have mixed stances towards virtual occupational communities, ranging from totally ignoring/tolerating them to active support or, on the contrary, resistance (Berthon et al., 2007). We want however to highlight the many opportunities engendered by virtual communities of industrial users. By being a reservoir of marketing knowledge, virtual communities may be employed for cost-effective market research. By investigating virtual communities of industrial users, marketers may obtain competitive intelligence about own and competing brand, better understand customer behavior, and generate ideas for innovation. Moreover, virtual communities may represent important targets of industrial marketing communications. However, approaches based on mass e-mailing or, worse, suppliers trying to pass as users are hardly advisable, as they would likely annoy the community. It is also worth highlighting that virtual communities are characterized by a hierarchical structure, with a minority of well-connected and expert individuals acting as opinion leaders. Such virtual influencers – who unlike their "real life" counterparts are easily identifiable – are natural targets of industrial marketing communications. However, we concur with Andersen (2005) that one-sided product push approaches would hardly lead to good results, as these experts value their independence and would be skeptical of overtly persuasive messages. However, by acting as competent partners, industrial marketers may build fruitful relationships with virtual opinion leaders, particularly when providing helpful knowledge that may further their status within the community. To conclude, the case of *MrWood* shows that by behaving as good community members, showing relevant expertise and engaging in help giving behaviors without looking at short-term economic benefits, virtual communities may be employed to nurture supplier-customer relationships. Of course, our study can only hint at the various roles virtual communities may play in industrial marketing and purchasing. Online aggregations of industrial users and buyers certainly need further empirical investigation.

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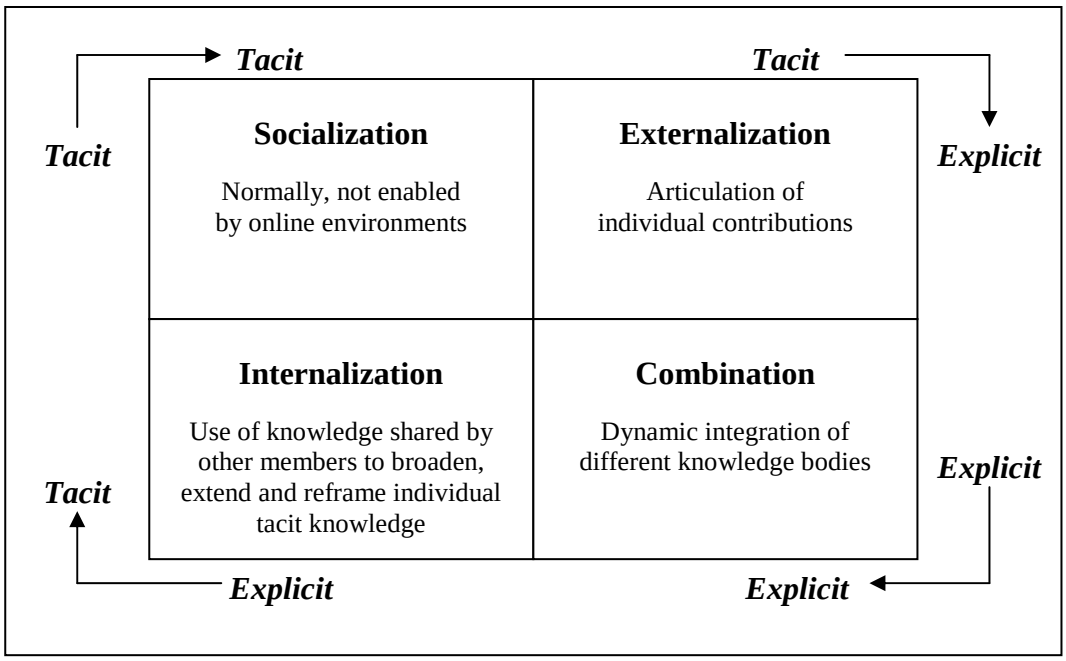
Table 1 – Forum Il Legno:
Distribution of members by levels of activity

Level of activity (n. of messages)	N. of community members
0	2,911
1-10	1,953
11-50	662
51-500	313
501-5,000	81
> 5,001	4
Total Users	**5,924**

Figure 1 – A process model of knowledge co-creation in virtual occupational communities

Figure 2– Modes of knowledge creation in virtual occupational communities



Source: Based on Nonaka & Konno (1998).