User Communities and Social Software in the Video Game Industry☆

Thierry Burger-Helmchen and Patrick Cohendet

Firms manufacturing video games and player communities enjoying the games are closely related, not only in a producer-user way, but also in co-development, testing and diffusion activities. This paper explores these tight relationships. The interaction between firms and user communities in this industry has drastically increased in intensity and quality with the introduction and development of social software. However, Social software has simultaneously raised new managerial challenges. Based on a theoretical discussion and empirical material we propose a typology of users in the video game industry. These communities have different reactions to incentives coming from firms producing games and therefore have to be approached and harnessed with specific community management practices and social software devices.

Introduction

The video game industry has recently received much attention kin studies of innovation management and organisational architecture (Zackariasson et al., 2006; Tschang, 2007; Arakji and Lang, 2007; Hau and Kim, 2011). This industry has rapidly become a major component of the entertainment and internet-related sectors. It produces influential cultural icons and best-selling products, and already represents a substantial share of the entertainment business (GFK, 2011).

As a cultural product, a video game is a complex mix of technology, art and interactive storytelling. Thus, managers in the video game industry must harness expression of artistic values, creative

contents and technological virtuosity to meet the constraints of the economics of mass entertainment (Cohendet and Simon, 2007). For these reasons, the video game industry is at the forefront of activities that challenge several commonly-held ideas about the way firms should manage their intellectual capital, property rights, production and organisational structure.

One of the main characteristics of video game firms underlined in the recent literature is the fact that they tend to delegate a significant part of their competencies − production, accumulation and circulation of competitive knowledge − to diverse communities (Schulz and Wagner, 2008; Haefliger et al., 2010). These communities can be classified into two broad categories:

First, the video game industry hires creators belonging to very diverse *production* communities or "communities of specialists" (Cohendet and Simon, 2007): scriptwriters, game designers, 2D and 3D graphic artists, sound designers and software programmers. These groups do not correspond to well-defined professions or jobs. Rather, they comprise young professionals generally working part-time, who are bound by emerging and weakly formalised bodies of knowledge. One of the main challenges for the managers of the firm is to align the functioning of these rather informal groups with the hierarchical structures of the organisation. To solve this problem, Wenger et al. (2002) suggest new managerial practices focused on the idea of "cultivating" communities and promoting "a kind of managerial intervention that encourages natural developments, that orients rather than orders, that provides nourishment rather than blueprints" (Prusak and Cohen, 2001).

Second, another recent and fast-growing concern is the increasing role played by large *communities of users* (in particular virtual communities of gamers). As underlined by Jäger et al. (2010), virtual communities of consumption, such as brand communities, create value for firms in different ways: they support a product or service, promote a brand and spread loyalty to a product or firm, or act as a resource for ideas (Carlson et al., 2008; Kozinets et al., 2010; McAlexander et al., 2002; Nambisan and Sawhney, 2007). The video game industry is shifting towards online content, player interactions and social gaming, where the joint effort of firms and communities creates the value for the consumer. Sales of online games in 2010 exceeded $10bn (GFK, 2011). Firms thus try explicitly to utilise these communities of users to create and appropriate value for themselves. Consequently, the relationship between the firms and these communities has become an important part of the industry's business model The industry even witnessed the emergence of firms that essentially base the value of their products on the interaction between users.

One of the most striking features of the video game industry is that a significant part of the value is created by cognitive resources (the communities), which are not directly controlled by the firm. The organisation of these firms can be seen as a nucleus of communities, whether internal to the firm (communities of production or of specialists) or external to the firm (communities of consumption or communities of users.) While the organisational, creative and innovative capacities of communities of production have been explored for more than a decade now, the way firms try to steer the communities of users has received less attention. In particular, the literature has neglected the nature of the communities of users, for example, identifying whether the video game firm deals with a large community of users (the "crowd") composed of diverse individuals (some heavily involved in the "kernel" of the community, others less dedicated), or with specialised communities, each one focusing on a specific domain of knowledge.

A community is a "unit of competence" (Wenger et al., 2002) that attracts passionate people willing to focus their cognitive work on the specific domain of knowledge of the community. As a video game firm increasingly delegates parts of its competencies to communities of users, a progressive "division of knowledge" comes into play: the firm has to manage its relationships with increasingly specialised communities, each of them focusing on a given domain of competence (testing, developing, etc.). Consequently, each specialised community requires a specific mode of management from the firm to "harness" the community to serve the functioning of the firm. Following Dahlander and Magnusson (2008), by harnessing, we mean the firm's ability to access, align and assimilate the production of the communities. If many different modes for harnessing could be designed (prizes, rewards, etc.), the main one inherent to the wide development of users communities is social software. Social software encompasses a range of software systems that allow users to

interact and share data. In line with the above developments, one of the main challenges for a video game firm that wishes to harness a given specialised community of users is to "fine tune" the type and usage of social software designed to interact with a given community.

This leads us to the overall aim of this article, which is to analyse the approaches used by video game firms to "harness" their communities of users through specific social software, and to explore the related managerial challenges. To illustrate the division of knowledge within communities of users, we have identified three main types of communities (tester, developer and player communities) corresponding to three main domains of knowledge. From this typology, we carried out interviews in video game firms to answer this research question: Do user communities in the video game industry influence the way firms use social software to harness communities?

This paper is structured as follows. In Section two, we discuss the literature on firm and community relationships, followed by general research questions. Section three presents a typology of communities in the video game industry. Section four explains the methodology used. The interview results are presented in Section five. In Section six, we discuss the relation between our findings and previous knowledge and opinions in the literature on how to motivate and harness communities with or without social software. The final statements are about the limits of this work and further research directions.

On communities: main issues covered and neglected aspects

The recognition of the importance for firms of the cognitive work of *communities* has been growing since the beginning of the 1990s. A *community* can be broadly defined as a "gathering of individuals who accept to exchange voluntarily and on a regular basis about a common interest or objective in a given field of knowledge" (Amin and Cohendet, 2004). Members of a given community share knowledge on an informal basis, and respect the social norms of their community that drive their behaviour and beliefs.

The literature has progressively identified many variants of cognitive communities such as *communities of practice* (Lave and Wenger, 1991), *epistemic communities* (Cowan et al., 2000), *communities of creation* (Sawhney and Prandelli, 2000), *communities of innovation* (Lynn et al., 1997), *open source communities* (von Hippel and von Krogh, 2003), diverse *virtual cognitive communities* (Bogenrieder and Nooteboom, 2004), *etc.* The forms of communities differ regarding the type of the specialised activities of knowledge on which they focus. Most often, the accumulation of knowledge by a given community is shaped by the dominant mode of learning (such as "circulation of best practices") it adopts. For instance, epistemic communities are more concerned with the production of new knowledge (exploration), while communities of practice are centred on the circulation of best practices in a given domain of knowledge (exploitation).

All cognitive communities share similar characteristics: communities are repositories of useful knowledge, part of which is embedded in their daily practices and habits. The local daily interactions constitute an infrastructure that supports an organisationally instituted learning process that drives the generation and accumulation of knowledge by the community. As Wenger (2000) asserts, a community drawing on interaction and participation to act, interpret and innovate, acts "as a locally negotiated regime of competence". Communities also play a key role in the genuine processes and contexts of creation and diffusion of knowledge (how such knowledge is used, how it acquires meaning and how to interpret its role, etc.). In this perspective, the generic value of communities includes their ability to absorb a significant proportion of the unavoidable sunk costs associated with building and exchanging knowledge (Amin and Cohendet, 2004). These sunk costs (and, more generally, fixed costs) correspond, for instance, to the progressive construction of languages and models of action and interpretation that are required for the implementation of new knowledge that cannot be covered through the classical efforts of hierarchies (or markets).

Historically, the academic literature on communities concentrates on the following three successive domains: 1) communities within a specific organisation (in particular, communities of

practice); 2) virtual communities and open source communities; 3) user communities and the organisation:

The firm and its "internal" communities

In line with the first works on communities of practice (e.g. the reps at Xerox, Orr, 1996), a series of academic papers in the 1990s concentrated on the identification and explanation of the role of communities *within* a given organisation (Wenger, 2000; Brown and Duguid, 2001). Communities are viewed as suppliers of sense and collective beliefs for agents (mostly employees of the firm) and are considered to play a central role of co-ordination in the firm. The academic works in this perspective have been inspired by the vision developed by Kogut and Zander (1993) who consider that "firms are social communities that serve as efficient mechanisms for the creation and transformation of knowledge into economically rewarded products and services".

However, despite this positive perspective, difficulties in matching communities and hierarchies quickly arose. Such difficulties originate from one of the main characteristics of communities, "the absence of a visible hierarchy and the fact that unlike other institutions, communities do not need alternatives of bundles of contracts understood as mechanisms for creating and realigning incentives" (Langlois and Foss, 1999). The governance of the firm viewed as a community of communities seeks to bridge the hierarchical top-down vision, where managers use extrinsic incentives mechanisms (e.g. financial incentives) to align the knowledge activities of employees with the vision they seek to promote, with a bottom-up vision of the firm, where managers permanently enact new forms of organisational devices suggested by the social dynamics of communities. Incentive mechanisms used in such a context are essentially *intrinsic* (e.g. reputational motive).

The main challenge for the hierarchy, which is aware of the potential of knowledge formation and enhancement of the different communities, is that, by definition, a direct action in the functioning of a community (monitoring by intrusion) is likely to fail. Evidently, any hierarchy would like to create communities from scratch, or transform hierarchical teams or project teams into a community: by definition, this is not possible. Consequently, the hierarchy has limited options for benefiting from the potential of communities: either it takes indirect measures to nurture and favour the emergence and growth of communities in the organisation (Wenger et al., 2002), or it takes more direct measures to favour the interactions among communities, for instance, through the design of cognitive platforms (Argyres, 1999). Among the devices that could favour the functioning of these communities, the literature underlines the role of various IT tools (intranet, shared platforms, etc.) that the hierarchy can implement.

Virtual communities (outside firms)

In the late 1990s, a vast body of literature investigated the emergence of *virtual communities*, in particular *open source*. As defined by Rheingold (1993), a "virtual community is a social network of individuals who interact through specific media, potentially crossing geographical and political boundaries in order to pursue mutual interests or goals".

Virtual communities are usually dispersed geographically, and therefore are not communities from the initial intraorganisational perspective. The analysis of the development of these virtual communities is thus somewhat "detached" from hierarchical and managerial considerations. The explosive diffusion of the internet since the mid-1990s has accelerated the proliferation of virtual communities in the form of social networking and online communities. The focus is on the type of social software that connects members of a given community, and shapes social interaction and exchange between users online (Hagel and Armstrong, 1997).

Social software encompasses a range of software systems that allow users to interact and share data. Social software applications include communication tools and interactive tools. Communication tools typically capture, store and present communication, usually written but increasingly including audio and video. Interactive tools mediate interactions between a pair or group of users. They focus on establishing and maintaining a connection among users, facilitating the mechanics of conversation and talk.

Therefore, social software putatively facilitates "bottom-up" community development. The system is classless and promotes those with abilities. Membership is voluntary, reputations are earned by winning the trust of other members and the community's missions and governance are defined by the members themselves (Allen, 2004).

The case of Open Source Software provides the most spectacular and successful use of IT and internet to manage a cognitive complex task (von Hippel and von Krogh, 2003; Raymond, 1998). In many cases (e.g. the Open Source software), the internet forum is an essential tool for collaborative work and organisational learning.

Communities of users: rethinking the relationships between the firm and communities

Increasingly, the literature is analysing the role of virtual online user communities in the development of innovative products and in value creation. Early works on lead user innovation (von Hippel, 1986; Urban and von Hippel, 1988) addressed the relationship between firm creation and product development. These studies assert that the strategy of the firm should incorporate communities because they contribute to the firm's performance. As Jäger et al. (2010) underline, a fundamental distinction in the literature was progressively introduced in the production versus consumption orientation of these communities. This distinction mirrors the interest in such communities among innovation and marketing researchers, respectively. Online communities that produce software or ideas for new product development have received attention from innovation scholars (Bilgram et al., 2008), whereas communities that consume physical or virtual products have been described extensively by marketing scholars (Kozinets, 2002; Algesheimer et al., 2005).

This growing emphasis on the role of user communities, including crowdsourcing aspects, (Noveck, 2009) warrants the combination of the two previous streams of literature that have been largely considered separate (the firm with its internal communities and virtual communities) and to revisit the firm as a constellation of communities, where significant domains of knowledge production and accumulation are delegated by the firm to diverse communities, in particular communities of users. In the context of video games, some users are now able to develop and extend products or technologies, and the distinction between user and producer, or user and doer may disappear, especially with the development of the internet.

One of the neglected aspects of the literature is the nature of the relationships between firms and communities. Research on communities has long focused on the development of ideas and capabilities without the hierarchical control of a specific firm. There are two main weaknesses in the current literature: i) the domains of knowledge and cognitive activities that firms should delegate to communities, in particular, user communities, are ill defined; ii) once the domains of knowledge are delegated, little research addresses the question of how firms can harness or direct communities and turn it into profit. When this topic is addressed, it is often limited to open source software.

In the next section, we address these issues in the context of communities of users in video game firms.

Users communities and the video game firm

Users, video game players or *gamers* can be considered genuine experts in this field; as such they are an important source of knowledge, which circulates through informal channels that lead to the firm. In a cultural industry such as the video game industry where managers must "analyse and address existing demand while at the same time using their imagination to extend and transform the market" (Lampel et al., 2000), this relationship with the users is a key success factor.

The reference to a sole large community of users is highly questionable. In line with the theoretical definition of a community, and with the practical observation of many video game firms, we consider that communities of users, as specialised units of competencies, are very diverse. Different types of communities bring the firm different advantages and require different types and amount of resources to maintain these advantages. Rather than distinguishing a large community of users, we examine the diversity of communities and their place and role in the division of specialised domains of knowledge of video game firms, and analyse their concrete actions linked to a firm's production.

Designing a typology of communities of users

To produce a sound typology of the main types of communities of users, we explored several criteria to distinguish communities observed in the video game industry and their possible links with the firms. Notably, we explored the dimensions linked to value created (for the firm or the community):

 i) Are the strategy and objectives of the firm strongly/weakly related to the strategy of the community?
 ii) Is the game a standalone without a community interface?
 iii) How is the game developed, and what is the status or link between the communities and the firm?
 iv) The orientation of the communities, and thereby the type of output of the community members related to the development of the game;
 v) The degree of specialised work done by the community.

   Finally, we selected the two last dimensions as the basis of our typology, based on the literature analysis summarised in Section two. These two main dimensions seem the most relevant for the following analysis on social software and firm strategy approach without jeopardising other concrete aspects.

   Figure 1 represents the taxonomy of communities we identified with respect to those dimensions. Each of these communities is again subdivided into different categories depending on the dimension:

- The *orientation of the community* (horizontal dimension) refers to the links between what is researched or expected by the users and what is provided by the firm. Whether the user community has an initial aim orientated towards the content of the game or the technical functionalities of the games. Nevertheless, a user can be attracted by a product/or community for technological or gaming-orientated activities.
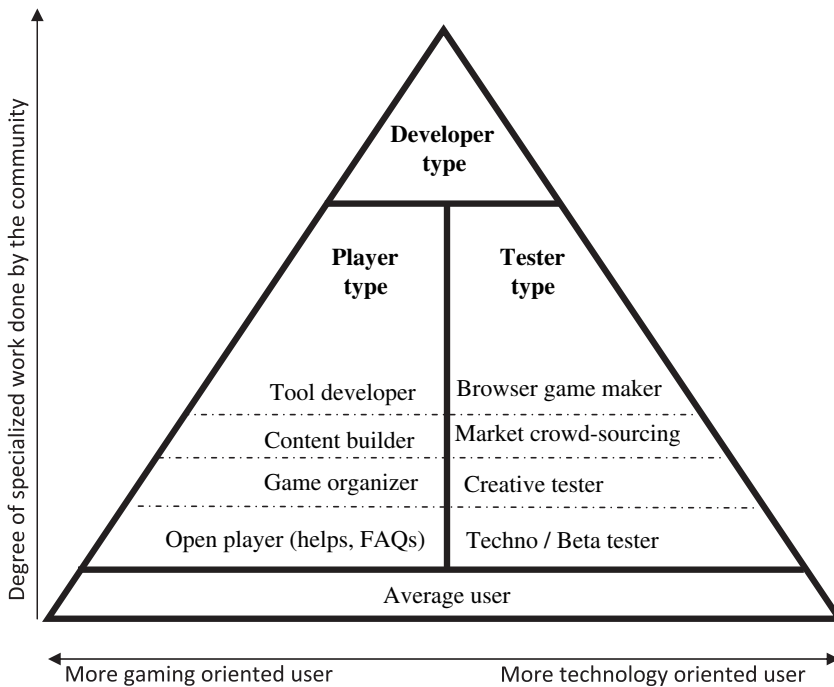

Figure 1. Types of communities in the video game industry

- The *degree of specialisation of the work done by the community* (vertical dimension). The higher the community type in the pyramid, the smaller the community and the more specialised the work it does. Further, the more specialised the community, the more autonomous it can be towards the firm. On the ground floor, regardless of the type of community, the game is developed by the firm, without consulting or needing the communities. Nevertheless, communities can help reduce the firm's production costs or add elements to the game after its release. In the latter case, the firm does not necessarily recognise the work of the communities. A more democratic form of game development happens when the firm develops a game to match specific demands of the gamer communities. In this case, reducing the costs is not the main objective of the firm that enlists the participation of communities. Rather, the firm seeks to benefit from the creativity of the users and from the diffusion and self-regulation of them. Lastly, the firm can co-develop the game with the communities or turn at least some users into developers (the top of the pyramid). This dimension reflects the firm's ability to catch the attention of communities and understand their motivations.

Figure 1 divides video game users into four categories:

- At the bottom of the figure is the average user of a video game, whose only interest is to have fun with the product, but who is not willing to improve or modify it or exchange with others. Such users can be seen as a community with brand loyalty, but not as a cognitive community bringing competencies to the firm.
- The other three communities are cognitive ones, which do contribute to the competence of the firm. The right-hand column corresponds to the "Tester type" community. The left-hand column of the figure corresponds to the "Player type" community. At the top of the figure is the "Developer type" community. The characteristics of each of these cognitive communities are detailed in the next section (Table 1).

The three main types of communities of users (testers, players, developers)

Tester communities (right-hand column) correspond to users whose main cognitive activity is to test games at different phases of development. According to Burger-Helmchen and Guittard (2008), and Llerena et al. (2009), in the early phases of the development of a video game, the firm uses tester communities for beta testing, mainly to search for errors, bugs or misspecifications in the program. As the development of the product matures, the firm tends to employ the community as a creative complement: for instance, the testers give advice on features to be included or excluded.

Player communities (left-hand column) use specific technological artefacts to enhance or fine-tune the game or produce additional content, authorising other users to try their creation or help the community to work better based on this fine-tuning. Player communities correspond to communities where the relation with the firm is not necessarily direct (as opposed to Tester communities, where there is a direct interaction with the firm). Player communities are primarily related to a specific game, and only through their admiration for the game do they become interested in the firm and eventually in its other products. The extent of their involvement with the game, its development, culture and fashion, varies.

Modifying products to alter their performance characteristics is a long-established tradition for video game users. "Modding" is a term used to describe the modification of a product to perform a function not intended or authorised by the manufacturers. In the context of computer programs, modding is used for changes in the software. There is a long history of developers inserting hidden features in commercial games (Kent, 2001). Those modifications (or "mods") are creations that have become a significant source of innovation within the gaming community, and firms have reorientated the way in which they develop and publish games to harness this source of creativity. For a review of modding from an economic and managerial perspective, see Jeppesens (2009) and Flowers (2008).

In the early 1990s, some users developed mods that were completely new levels for games, or new ways to dress the characters of the game or change the sounds and other features. Around that time, the games did not have any features allowing those modifications: the user community

Table 1. Types of communities in the video game industry and goals of firms toward the communities

Type		Output/examples	Goal of the firm/position toward the communities
Player	Open player	Produces help to a specific game on blogs, website, FAQs for other players that encounter difficulties to win in a game. The average users read those help tools when he is offline of the game, or watch videos demonstrating what to do.	- The firm tries to attract the attention of the users - The game is developed without the community of users
	Organizer	Produces help directly in the game to the other players. Such kinds of player are commonly found in MMORPG and other online games where players interact. Typical examples are the so-called guild master.	- The firm tries mainly to assimilate communities output - The firm tries to develop the product for a community
	Content builder	Produces additional content for a game. Typical example is modding, when players create supplementary game levels, clothes, sound … that other players can install and utilise. Initially developed on the PC such features are now standardised in many games.	- The firm tries mainly to assimilate communities output - The firm tries to develop the product for a community
	Tool	Produces tools to develop additional content, modding, map editors, tweaking devices …	- The firm tries to align its goals with the communities - The firm tries to attract the attention of the users
Tester	Techno/beta	Tries to discover technical errors (bugs) in the game that make the game impossible to play or uninteresting.	- The firm tries to draw the attention of the users - The game is developed without the community of users
	Creative	Proposes small modifications in the general "look and feel" of the game, making the product more attractive to the other users. Some ideas, if they are not implemented in the current game, can be used for future versions of the product.	- The firm tries mainly to assimilate communities output - The firm tries to develop the product for a community
	Market crowd-sourcing	Determination of the taste and appreciation of the actual product and orientation for future product forecasting of user appreciation, adhesion towards some ideas during the game development or accurate estimate of the sales before the launch of the game.	- The firm tries to align its goals with the communities - The firm tries to develop the product for a community
	Browser	The building of simple games made by a tester type, based on his own ideas and appreciation of the market.	- The firm tries to develop the game with the community - The firm tries to align its goals with the communities
Developer		Production of a game, open source or not, free or not, entire game or a specific element of the game	- The firm try to harness the whole production of the community

consequently developed its own tools to create mods. A key stage in the development of this relationship dates back to 1993 with the commercialisation of games that included tools for the user to make mods. This led to the development of the mod culture by the user communities. These mods helped to sell games, and by the mid-1990s a vast number of PC games included dedicated tools that consumers could utilise to modify aspects of the game, develop new content and share it through the internet. Nowadays, it is almost a requirement for some types of game to include such features.

Some firms did not propose any modding possibilities early on, but later offered toolkits. The toolkits were first offered with the game or sold separately. They then became accessible through the internet and were finally integrated in some games, allowing constant modification of the product by the user communities. The creation of computer game modders also finds parallels in earlier research (von Hippel, 2006), as does the development and use of a toolkit.

Another subtype of player communities uses the game more actively. Originally designed to be played on single computer, video games have evolved into multi-player products in which thousands of players can compete simultaneously (Castronova, 2006). In this second subtype, "Game Organiser", some members of the community step forward to help all the users better utilise the game. They thus self-organise the user communities. Many examples of Game Organisers (or guild master) exist, especially with the emergence of massively multiplayer online games. The most famous example is probably *World of Warcraft*, (Peters and Malesky, 2008; Chien-Hsun Chen, 2008; Bessière et al., 2007). The Game Organiser promotes protocol, moderates the action of other users and guides users to higher achievements in the game. Some firms rely heavily on guild masters, whereas other users take up those responsibilities without any backing from the firm. Cohesion in the community results from a sense of obligation to support the community by contributing to it, investment in events, monitoring of activities and the gaining of recognition from the other members in the community (Fredberg, 2009). On a practical level, the community is formed when its members share similar experiences regarding the brand/product/service and talk about them in virtual or physical meetings, which is eased by social software.

As was the case with the tester community, the establishment of a player community and its relation to the firm offers several advantages that may enhance the performance of the firm. For example, player communities allow firms to take advantage of market opportunities that are at the frontier of their core market by exploiting current resources and capabilities. These player communities may enable firms to achieve cost benefits by developing new content for the game at zero marginal cost. In addition, such communities may be more driven by competition between communities than by competition between firms. Further, the advantages that player communities provide may limit the entry of rival firms (by extending their costs, because they must also nurture a community).

Scholars argue that early efforts by the firm to exchange with player communities produce experience that leads to economies for the firm (Jeppesen, 2009). However, as player communities gain in production, performance benefits decrease with increasing monitoring, co-ordination and integration requirements and can, in extreme cases, turn out to be negative (which is not a real problem for the firms, because they do not store the production of the communities on their servers). Other scholars find a different time link between the cost/benefits of player communities and firm performance (Burger-Helmchen and Guittard, 2008). They suggest that player communities in the early phase of their relation with the firm have a negative effect on performance. Later, performance improves as experience provides opportunities for learning by doing, potentially allowing firms to develop the knowledge and capabilities required for their next product and for the successful joint management of operations with player communities.

Finally, there is ample evidence in the strategic management literature that a firm's current stock of resources can influence the success of the relationship with player communities. Intangible resources, such as technological knowhow, brands and management skills may be especially influential. For example, firms with an advanced stock of knowledge-intensive resources may have the absorptive capacity to capitalise on exploration opportunities with Player communities. Similarly,

Player communities provide opportunities for firms to exploit resources that would otherwise only be seldom utilised (e.g. market resources). Given the costs of developing intangible resources, a better return on exploitation of these resources is most likely when they are deployed in relationships with Player communities.

Developer communities (at the top) are users who have computer skills allowing them to produce programs or to record some parts of the product, and to regularly exchange their creation with others. In some cases, firms develop parts of games with the help of users or user communities. Co-development between firm and communities (Neale and Corkindale, 1998) can be found on social software-enhanced websites or games proposed by social gaming or casual gaming companies, such as *gameforge*, *Zinga*, *BigFish* etc. By co-development, we mean a process where the firm and the communities work together to obtain a new product. In co-development, the customers play a very active role as team members in a joint development process: their involvement starts at the earliest stages of the project. The fact that the co-development occurs in the context of both demand-pull and supply-push market situations is often overlooked. We found these aspects in social gaming.

Social gaming firms offer features, tools that user communities can employ to easily create their own game and attract, through social software, people with whom to play these games. The popularity of the game and the ability of user groups to catch the attention of others, proposing an original design that becomes a dominant design, are easily measured and eventually transformed into financial rewards. Therefore, it is simultaneously the demand of users for the new game that pushes user communities to supply those games; they, in return, demand new tools that the firms must supply. The use of social software as a means of interaction with the user communities allows the firm to fine tune the product to market needs.

Combining a variety of communities and products exposes the firm to intense demands related to resources and challenges, particularly to the co-ordination of the firm's activities. Managers may therefore find it difficult to develop and maintain the absorptive capacity to understand and adapt the requirements of all the customers and communities. When the simultaneous maintenance of different types of communities involves unrelated product development and institutionally and culturally distant communities, firms encounter additional complexity and costs and may compensate by underinvesting either in management skills or in innovation. Because only a few firms have the resources and capabilities to manage large quantities of new products and communities, it is in the interest of the firm to link communities and product development, in order to save resources and leverage all available capabilities.

Accordingly, the theory and empirical evidence suggest that the integrated pursuit of product development and community diversification can enhance firm performance. One possibility is that a community allows the product to be used by a wide base of consumers and that any new service has a sufficient scale of employment necessary to drive down costs. This product and community co-development may provide valuable learning experiences that the firm can use in the process of creativity and marketing for upcoming products.

Methodology

From a methodological point of view, the video game industry has received little attention in the academic literature. There are very few reports or detailed studies on the ways video game firms interact with their communities. The economic and social organisation of activities and the particular organisational issues and dilemmas prevailing in this industry remain vague and largely unexplored.

For these reasons, the comprehensive objective of this contribution calls for inductive design and case study research that can foster theory development. We used qualitative data collection, analysis and reasoning methods inspired by the literature (Yin, 2008; Edmondson, and McManus, 2007; Eisenhardt, 1989; Glaser and Strauss, 1964).

To examine the main issues of this contribution within the video game industry thoroughly, we began by collecting secondary data about the industry structure and actors' behaviour. We

conducted two in-depth case studies and a series of exploratory interviews with experts, well-known practitioners and senior managers within the industry to validate the typology of communities.

Second, to compare our point of view with those of practitioners, we attended several professional meetings and industry conventions in France, Canada and Germany (especially GDC Cologne 2009). In Cologne, we conducted additional interviews, specifically focused on social software and harnessing endeavours of the firm. In addition, we collected secondary data on actual and future projects of firms involved in social software for video game users.

To summarise, we carried out two broad steps: i) identification and validation of the typology of user communities (tester, developer and player communities); and ii) interviews to assess the use of social software. Below, we describe the methodology used in each of these steps. Interviews directly orientated towards social software are emphasised.

First step: identification and validation of the typology of user communities (tester, developer and player)

The typology of communities (tester, developer and player) that resulted from our analytical grid presented in Section three was validated empirically. The main issues at stake at this stage were: to validate the existence and importance of the three main types of communities of users, to validate the fact that these communities are perceived by all video game firms as useful units of competence, and to analyse in depth, through case studies, the ways the firm and the communities of users interact, to prepare the second phase of the study (the interviews on the use of social software).

The empirical materials used in this first part of the study, the majority of which came from secondary data, serve to refine the theory. Given our aim to differentiate communities from the point of view of the firms that wish to harness them, it was important to perform several case studies to cover as many different types of communities and relations between firms and communities as possible. Such an approach, which relies on a set of different, yet complementary studies, adds breadth to the phenomenon (Eisenhardt, 1989; Glaser and Strauss, 1964; Eisenhardt and Greabner, 2007). The observations from the secondary data and existing literature on the subject indicated that each of the three types of user communities has been identified in previous works, but with the following restrictions: 1) there are fragmented pieces of work that have never been analysed in a global and integrated strategy of the firm, and 2) the focus on each type of community has been extremely variable. The player type is by far the most studied type of community; many relationships with open source communities and user communities are possible, in particular through a series of works on game piracy and modding, while the analytical works on the other types of communities are very limited (see Table 2 for references corresponding to each of these categories). For these reasons, we conducted two longitudinal case studies: one on the tester community and one on the developer community.

The tester communities were investigated by one of the authors in a longitudinal case study (five years) of a small French video game company. During the study period, he participated in beta testing with users, interviewed the entrepreneurs who had launched the company and consulted a variety of data (accounts, press information, etc.). Over these five years, he witnessed the evolution of the techno/beta user community into a creative tester community and the failed attempt to make it a market crowd-sourcing community. We gathered additional information on market crowd-sourcing and web browser communities from the literature and interviews. Information and insights on developer communities, inside and outside the firm, were obtained through a long-term research project, including an ethnographic study of developers in a major video game company. Research exchanges with this company have been conducted for more than 10 years.

The developer community was studied by a longitudinal case study (three years) of one of the top 10 video game companies in the world. The firm permitted one of the authors of this contribution to analyse, question and interview its game developers. The company expected feedback from the investigator on how to structure the group of internal developers and cope with external developers (third-party developers, independent developers and the user community of developers).

Table 2. Empirical approaches: this table resumes the different types of studies we use to draw and validate the typology

	Player type	Tester Type	Developer type
Firm studied and/or interviewed by the authors	Bioware, CCP Games, Gameforge, Gaia online, Gogogic, FreeRealms, Ninja Bee, Zynga	- Mighty troglodyte - Electronic Arts	- Ubi Soft
Main Methodology	Interviews	Case study/longitudinal approach	Case Study/Ethnography
Literature	Jeppesen (2009), Jeppesen and Molin (2003).	Burger-Helmchen and Guittrard (2008), Burger-Helmchen (2010).	Cohendet and Simon (2007), Tschang (2007, 2005).

To confirm the pertinence of distinguishing the three categories of communities of users, we also conducted exploratory interviews with experts, practitioners and senior managers within the video game industry. In total, eight interviews were done, each corresponding to 30 minutes of face-to-face interaction.

Second step: interviews to assess the use of social software

Once this typology of communities of users was identified and validated, we conducted interviews in video game firms to answer the main research question: Do user communities in the video game industry influence the way firms use social software for harnessing communities?

To demonstrate the usefulness of our proposed typology for conceiving social software and harnessing techniques, we rely on Ram et al. (2004), who suggest evaluation methods relevant for the video game industry and the social software context. Therefore, in this second step, following Yin (2008), we adopt an exploratory approach: our work does not move from theory to reality, but uses reality to explore the possibilities of harnessing the different communities. We do not aim to establish irrefutable harnessing techniques based on social software but rather to outline important features and managerial insights. We follow the steps of Jeppesen and Molin (2003) and trade off several concerns about external validity against the opportunity to gain insights into a largely undocumented phenomenon.

During the interviews, our aim was to understand the point of view of leading firms, how they saw their relations with communities of users and the features they implemented in their social software. We are aware that one of the limits of the research is that we have looked at the relationship between firms and communities of users exclusively from the point of view of the firm. We did not interview members of the diverse user communities.

Firm selection and data collection

We limited our interviews to firms with high interaction with communities, typically firms producing MMO (massively multiplayer online) games and web browser games for online communities and social networks. This choice reflects the motivation of the paper, to adopt the point of view of firms and see how to design social software to best harness a specific community of video game users.

The firms selected varied in size and age. Not all were producing the game entirely on their own but all are responsible for the interaction tools (design, programming and operating) of the social software or user interacting web platform.

We conducted eight interviews (see Table 2, player type column, for the names of the firms). All interviews were done during GDC 2009 (Game Developer Conference), the worldwide video game developer conference, and all the interviewees were involved in the technical development and management of social software for interacting with users. The discussion was eased by all the interviewed persons being participants in a sub-seminar on social software (from a technical point of

view) and user involvement. Each interview was relatively short (maximum 30 minutes). The main objectives were to present our typology of communities, collect information on what the firm offers online to its communities and determine how the relation evolves.

Question coverage

Questions were designed to identify the multiple facets of social software, the place of social software in the general strategy of the firm, the efforts by the firm (human and financial resources dedicated to the development of social software), the features they already have developed, the features they intend to develop and the importance they place on different types of communities. This dimension was helpful for eventually eliminating firms that are not orientated toward social software development or online gaming. It prevents sampling errors, but there was none in our set of interviews.

We invited the informants to describe their activities related to social software, to describe how they hope to achieve or improve the "harnessing" of communities.

By describing their strategy and objectives, activities and relationships with communities, the informants confirmed the importance of those actors for all studios independently of their size, form, location and activities. What is really striking is that the stakes, the importance of this growing phenomenon for the future competitiveness of the firms, is emphasised by all the interviewees. However, the underlying challenges and the ways firms try to harness communities differ considerably from one firm to another.

Coding

Our unit of analysis is the firm/community relationship that is putatively eased and developed through social software. The two main actors are the firm that develops and markets the video game with internet application and social software features and the community types based on our typology.

As mentioned, all informants have technological knowledge and a commercial orientation in the use of this knowledge. Thus, we asked questions concerning strategy, products and customers (i.e. what type of games are produced, targeted types of consumers), about social software and general internet applications (i.e. describe the relationship you try to build with the customers, describe the tools you want to provide to video game users, describe the role of users in the definition of your games).

To guide our coding and understanding of the relationships between firms and the different types of communities and the harnessing endeavours of the firms, we referred to the user innovation, IT management and open source community literature (Slaughter et al., 2006; Adomavicius et al., 2008) to develop rules and procedures for coding each piece of information to the relevant dimension.

We identify the *general firm strategy* toward video game users by applying the coding rules to the interview statements and publicly available information about the firm. A *social software strategy* was coded to see if the firms want to shape the relation with the video game users and a *general and differentiated harnessing strategy* was coded for firms that try to harness one, several or all types of video game communities. The harnessing strategies differ from social software strategies in that they are not limited to internet application but also encompass real world events, to develop brand loyalty.

In our coding, we considered the potential for differences in the stated versus actual general firm strategy, social software strategy and harnessing strategy, and therefore compared interviews with information available on the firm website, annual reports and press documents.

The interviews are also the primary material for determining what features social software must have to satisfy different types of consumers and harness user communities. We developed the coding rules on the basis of the literature mentioned in Sections two and three and adapted them to social software for video games and internet applications for gamers. For example, in the social software strategy, we first included all information related to internet-based applications. We subsequently distinguished between internet applications that involve exchanges between members, direct interaction and indirect interaction (for example on blogs or commenting sites, people

respond to comments of others by posting comments, but the interaction is not in real time, whereas on some community sites it is).

Table 3 shows the coding rules for the *general and differentiated harnessing strategy* and provides examples of *access*, *alignment* and *assimilation* components. In coding each firm's harnessing strategy, we considered that such a strategy is often not a simple, one-dimensional definition.

Data Analysis

The analysis of the data led us to clarify our initial typology and add elements to the features social software require to harness communities. The situation was eased by the relative unanimity of the people interviewed, which limited misinterpretation (Eisenhardt, 1989). We aimed to develop

Table 3. Coding example for general and differentiated harnessing strategy

Definition	The extent to which a firm is able to access communities to extend its resource base, align the firm strategy with that of the community and assimilate the work developed within communities.
Coding rules for determining if the strategy is relative to the access, alignment or assimilation	*Access*: the firm is able to identify and collect the production and/or competence of a community. *Alignment*: The firm in terms of ambition and objectives has common points with the activity of the community. *Assimilation*: The firm can use works done by the members of a community.
Coding rules for determining if the strategy is general or differentiated	*General*: The firm uses the same techniques, methods, ways of communication, social software features for all types of communities. *Differentiated*: The firm uses several techniques for harnessing the communities, adapting the method to the characteristics of each type of community.
Some examples of coded statements	"We are a video game company specialised in casual games. We have a software that allows you to create your own video game and easily implement them in social utilities like Facebook. Our aim is to attract as many people as possible by providing them with easy to use tools that each user can adapt to his own website and elaborate its own basic games. All features are proposed to all players, they can choose between everything. Usually they start with the most basic, and following their interests move to the most advanced gaming tools. " Coding → *Alignment/General* "Our games are based on two main features: social interaction and customisation. We provide tools for modifying many of the aspects of the game: colours, clothes, sounds and to create additional maps. We also provide storage space so that what you have created can be shared with others. (…) Of course, all categories of customisation do not have the same success. There are many people proposing their own clothes and colours, but not many downloading them, and only a few that created their own level maps but many who download them. The skills and time necessary for contributing in those categories are obviously not the same. Mastering the map creator is much more complicated. " Coding → *Assimilation/Differentiated*

cohesion through a systematic linking between our findings and the existing concepts and frameworks in the literature.

For each possible type of community, we identified strengths that made them interesting and recognisable by firms. We then assessed the interrelations and opposing and simultaneous nature of these qualities. Thus, we broke the general community of video game players down into subgroups based on these strengths.

Regarding how firms try to harness communities, we sought regularities between the general features they put into social software and the general strategy of the firms. The issue here was to identify regularities between the challenges faced by the firm and the way it meets them. At every stage, we also verified our findings with the existing literature.

Below, we discuss the main results based on the proposed taxonomy, where the relations of firms with some types of communities in the video game industry are realised through social software applications. We also discuss the managerial implications of these harnessing efforts.

Results of the interviews

The main objective of the interviews was to understand how video game firms use strategically social software to harness communities of users, and how these strategies differ depending on the type of community at stake.

To a large extent, responses to the interview questions provided support to our categorisation (in a broad sense the three types of users). The participants indicated the importance of social software for the growth of their activities, the importance for detecting the communities and harnessing them (the word "harnessing" was not necessarily employed to describe the intended actions of the firm). Besides, several key insights came out of the interviews concerning the general strategy.

The majority of participants (seven out of eight) independently noted that, until recently (interviews were done in 2009), the employees of the firm did not have the time to perform the necessary analysis of the social software evolution and that they must sometimes make a choice between outsourcing the social software building or the game programming. The respondents mentioned that social software applications are seen as a major device for differentiating the products and all the companies want to internalise the development of these tools.

Additionally, every participant independently noted the importance of communities and the fact that they bring many ideas and complementary information to the firms. Many participants (six out of eight) also noted that current social software investments and "partnerships" with users play a significant role in future investments, and often social software design and development are a main part of the firm's general strategy.

These insights reinforced the importance of providing new techniques to help practitioners evaluate trends in social software. In general, all the participants found interest in our proposed typology of communities for evaluating the social software and providing aid in predicting future trends in firm/communities relations, rating the potential effectiveness of using our proposed typology of communities.

Several key dimensions about the employability of our proposed typology of communities for building social software and harnessing the users consistently emerged in their opinions regarding the value of our research. These dimensions were identified from the interpretation of points independently made by several interviewed participants. In particular, we found that the proposed typology of communities based on the orientation of the user (more gaming or more technology-orientated and the degree of specificity of the utilisation of the game) helps structure social software-related decisions and provides a representation for trying to harness the communities. We discuss each of these in succession, and provide our respondents' reactions to illustrate our arguments.

Social software: a general or differentiated strategy depending on the community
The general consensus of the experts we interviewed was that the use of social software adds a path of influence and provides a novel and useful way of accessing the communities while extending the

important relationships among gaming technologies and users because a broad part of users seek the technology hype behind the social software. Six out of eight respondents independently made comments to this effect, underlining the fact that firms in that business must have at least a general social software strategy; for example:

> "I can't imagine to launch a game without a dedicated online website and DLC's (note: downloadable additional content) … social software structures the interaction between the firm and the users very well and it's a nice way of trying to understand the needs of gamers." Development Director, Bioware (a division of EA).

The exercise of defining a social software strategy provides two useful insights to the firms. First, social software forces the game company to consider interdependencies among technologies and to realise the complexity of the gamer's environment (number of tools, additional product, mods, DLCs, tech support, forums…) and the interdependencies among the different user types we pinpointed. Second, social software provides a structure to reduce this complexity by linking all the elements together in one place, by assembling all the environments in one portal. Each of these aspects enhances the user's and the firm's ability to understand the nature of relationships between communities and firms through the social software.

These arguments provide a basis for discussing the decision-making process related to social software investments and the layout of the strategy.

> "We have to work on this [the social software strategy and investments] within the organisation. You could present this to the CEO, engineering guys, marketing guys, and they would all know what you were talking about. They may ask different questions, but they would all find social software to be the next challenge for us…and for the different types of users you mention." Project Leader, Gogogic.

Several respondents pinpointed the fact that if they did not yet have a differentiated strategy depending on the consumer type they address, they would need to differentiate in the future. Seven out of the eight respondents mentioned that the proposed methods provided a much-needed formulation for decision trends in user communities and the use of social software. Our interviewees noted that the techniques most commonly used by firms to identify and analyse the communities were informal and ad hoc.

> "Most work on this problem is informal. But for us it doesn't really matter. The user identifies himself as [player, developer, tester]. We simply have to count the number of applications downloaded… The applications for developers are heavy files and not self-extractable. Only developers download them and lots of just curious people… Most strategic social software-related decisions are made using by far less formal types of analysis." Development Director, Bioware (a division of EA).

Through the interviews, we discovered evidence of a lack of structure in how firms analyse the social software and develop a community-orientated strategy. Before 2009, they typically relied on third-party workforces, but this apparently would not be the case in the near future. Six out of the eight respondents noted that our proposed typology provided a possible clustering of the users for generating representations of the social software and associated technology trends that were relevant to the firm's interests and business contexts. Five of the eight participants also noted that the proposed approach was a useful tool for decision-makers across different functional roles in the organisations. The participants felt that senior managers and strategic planners, as well as technical managers and engineers, could all benefit from understanding the social software and technology trends in terms of communities of users. In general, the consensus of the participants was that the proposed methods should

be useful in the social software strategy development process. But they feared that firms could be pushed into feeding only the player community (the biggest community type) and abandon the others which would be an error, because the "productions" of the other types of communities bring value to the users. If developers are rare, they add more value to the other groups.

Harnessing a community

Dahlander and Magnusson (2008) proposed the following definition of "harnessing a community". Harnessing a community means: "(1) accessing communities to extend the resource base; (2) aligning the firm's strategy with that of the community; and (3) assimilating the work developed within communities in order to integrate and share results":

- *Access* corresponds to the capacity for the firm to collect the production and competences held by the community. Therefore, access depends on whether the firm can see the community as a resource or not.
- *Alignment* refers to the existence of common goals between the strategy of the firm and the strategy of the community. It is awkward to speak of strategy from a community's perspective but we can refer to a general goal or ambition. Depending on the community type, it is easy to identify this ambition. For example, for the player type, the modding movement has the ambition to develop the games, to enrich them, which is in line with the strategy of a firm to create extensive content for the product.
- *Assimilation* corresponds to the integration capabilities of the firm, the absorptive capacities, utilisation or reutilisation that can be made by the firm of the outputs or resources of the communities.

Following these three phases, we can underline the following elements out of the interviews.

The Access phase

All participants found the different aspects of harnessing proposed to be useful, and seven out of eight also commented that our identification made it clear that the existing techniques of the firm must be extended by making social software investment.

> "I like games that are the simplest as possible. One of our first games, if we can tell that's a game, was simple about kicking someone else by clicking on the screen… of course now we develop much more complex products and we try to satisfy broader but also more diverse communities of users. That is the true power of social gaming — you address, or access if you prefer, an immense quantity of different types of people, casual gamers to hard core gamers. We have to provide something for each of them." VP Business development, Zynga.

Alignment of the interest of firms and communities

Based on interviews, an interesting finding for us was that, in terms of alignment, the interview participants differentiated between the objectives of different typologies of communities. On the other hand, the majority of the interview participants (seven out of eight) felt that using the proposed approach to actually conduct the analysis of the social software would be most beneficial to firms that either produce social software or produce games to be deployed in social software environments but not for traditional offline game manufacturers.

We also learned where the value of our proposed typology of communities would be highest, which is another important aspect. A young manager offered the following comments:

> "Companies that can benefit most from this are the technology producers and not the technology users. We make content — that is more important than the technical part of social software. We determine the social software we need depending on the games we want to do, not the opposite." Project manager, Gaia Online.

Another relevant industry factor is the time dimension. The time dimension will push firms to delegate part of the work, game polishing and testing to communities even if the firm would rather say that it is postponed for later updates but in fact it is hoping that community members tackle the problem before. Thereby a specific community provides a way to identify, evaluate and pre-select strategic alternatives by addressing the needs of sub groups of users in due time.

Several respondents pinpointed the fact that the communities sometimes aligned themselves with the firm, or that the firm had to follow the direction of the communities. This is especially true with online gaming, where retention of the user is essential. Sometimes the communities do unexpected things:

> "Users grow into communities and develop their own scenarios, sometimes even modifying the code. One of the earliest versions of EVE Online has been cracked by a Russian [player-developer] community who implemented some features and new scenarios. Some ideas have since been integrated in newer versions of the game." VP, CPP.

> "We make free online games… some of our games have been modified, almost co-developed, with communities… sometimes without our permission. For example, a Turkish community made a complete translation of one of our games into the Turkish language. This attracted many new gamers." VP, GameForge.

The interviews also made it clear that there are separate communities and that some of them are true developer types.

Assimilation phase

Understanding the trends in user communities that led to the current state of the social software should prove vital in determining what direction social software development initiatives should follow in the future and facilitating the assimilation. Furthermore, the reality of social software analysis is that many video games firms do not have the time, resources or technology to develop games and social software applications. So, even if the techniques for harnessing the communities improve, social software firms will still rely for a fair amount on communities to do some improvement of games and those communities cannot be assimilated. As a result, new formal approaches for analysing the social software should add value to the firms producing the games as well as the communities consuming and improving them. Our findings, with respect to assimilation, also suggest that firms that continue to outsource their social software conception and management are in fact outsourcing what should become a core competence in the industry.

> "This [approach] should be very useful to help us conceive our relation with gamers. Social software is complementary to other existing approaches for building a relation with our consumers." Project Manager, Ninja Bee.

An additional aspect of harnessing suggested by most of the interviewees (six out of eight) was that assimilation through social software will complement existing harnessing methods. To delve deeper into the potential complementarity, we evaluate the strengths and weaknesses of many common approaches for harnessing communities. Table 4 provides an outline of common harnessing techniques. Although specific methods could be seen as exclusive, some firms use a combination of these techniques to generate a better harnessing. In contrast, a social software approach utilises elements that lower the costs and allow a mapping of the historical relationship between the communities and the firm and could provide useful insights into the next possible evolutionary step of a specific community. In particular, social software may complement existing harnessing methods.

Thus, to increase their resource base and accelerate their technological development, firms are encouraged to develop specific tactics along these three dimensions (access, alignment and

Table 4. Harnessing communities: set of theoretical and practical studies

Authors	Case setting — industry studied	Nature of the community	Action of the community	Tools used to harness the community
Käser and Miles	Inside multinational consumer good companies	Different groups with different knowledge	Helps identifying knowledge gaps and potential threats to the company	Workshop, face to face meeting
Jeppesen and Frederiksen (2006)	Computer controlled music instruments	Hobbyist and professional user communities	Help developing the product	Web interfaces, recognition by the company of the work done
Dahlander and Magnusson (2008)	Firms involved with open source software	Different groups with different knowledge	Develop, test and share resource codes	Web interfaces
Harrison and Waluszewski (2008)	Bio sensor products	Different sub groups	Re-launch a product	Web interfaces and user-to-user interaction
Miller et al. (2009)	None, theoretical work	Different degrees of variety in the group	Promote the product of the firm	Marketing efforts
Fredberg (2009)	Reality TV show Big Brother	One group	Guide the development of the show	Different channels (web, newspaper, TV, chat)
Jäger et al. (2010)	A machinima company	One group	Provide comments and specialized feedback to improve the product	Social software

assimilation) in order to benefit from their involvement with user communities. Adequate resource management should facilitate the integration of firm capabilities and the communities as a resource. By harnessing different types of communities, or helping their establishment, firms structure a portfolio of resources. The integration of those resources by means of dedicated interaction software can be a source of competitive advantage and value creation. The global strategy of firms should incorporate the definition of product lines and a support/learning process through dedicated tools like social software to operate the consumer communities. Such firms must have a strategy to "manage" the large audience of consumers grouped in communities.

Discussion and managerial insights

To be able to harness a community, the firm must first attract the attention of the communities to access them before aligning and assimilating their works. Following Ocasio (Ocasio, 1997) and the advice of Fredberg (2009) and those gathered during our interviews, we can pinpoint the following insights on community attention building and motivation so that firms can harness them.

To create attention and cultivate motivation

To be able to harness a community, firms must catch their attention and cultivate their motivations. Many firms may not realise the crucial role that trust and motivation play in knowledge utilisation and thus do not see the need to provide the opportunity for these to emerge in a voluntary, self-guiding setting. Similarly, management, knowledge brokers or social activists may be under pressure to force results and therefore neglect those elements as noted by Käser and Miles (2002). Moreover, a major reason why firms devote limited attention and resources to the harnessing of communities is that management are in fact only seeking a limited amount of creativity driven outside of the firm. For example, in typical firms today, the focus on efficiency limits the

willingness to create the "slack" necessary for voluntary community building; unfortunately, slack is necessary to the emergence of attention. Different means exist for firms to influence communities, with more or less subtle monetary implications.

West and O'Mahony (2008) explored one of those means of influence. They studied the role of participation architecture in growing sponsored open source communities and showed that firm-sponsored online communities or open source online communities initiated by a firm differ from organically grown open source communities. This influence can also be found on the community's collective process of development and the accessibility for participants to contribute to code development. Clearly, our observations in the different cases we provide show that this effect is surely also present when firms sponsor not open source communities but communities that use the commercial firm tools or social software. The sponsorship can take several aspects, such as the organisation of events, prizes, storage on official web servers, and not necessarily a direct payment in money.

The drivers behind creation and production in such communities depend primarily on their motivations. Integrating the dynamics of motivation is a step towards a better understanding of the relationship between commercial firms and communities. Firms can try to harness communities, to see them as a part of their strategy. Running the communities as sets of internal resources means rewarding them like employees according to their marginal productivity, which implies relying on extrinsic rather than intrinsic motivation mechanisms.

Motivation can be subdivided into two groups: extrinsic and intrinsic. Extrinsically motivated co-ordination in firms, communities and between firms and communities is achieved by linking individuals or communities' monetary motives to the goals of the firm (Prendergast, 1999). Motivation is intrinsic if an activity is undertaken for the immediate satisfaction of one's need, but it is different from the monetary value.

Any managerial decision must take into consideration the marginal benefits and the marginal cost of the two types of motivation (external and internal) when applied to communities (Osterloh and Frey, 2000). If the two types of motivation were independent and additive, intrinsic and extrinsic motivations could be managed by firms according to their relative advantages and would also correspond to a useful division of labour between psychology (focusing on intrinsic motivation) and economics (focusing on extrinsic motivation). The use of both types of motivation gives rise to strange behaviours by the employees. These behaviours are known in the economic literature as crowding effects and are applied here to the relationships between communities and firms. By doing this, we discuss the impact of the dynamics of motivation on the organisational relationship between the community types and the firm and try to identify the conditions under which motivation artefacts (like social software) are best suited to forge value-creating linkages between these communities and the firm (Osterloh et al., 2002). Introducing the dynamics between extrinsic and intrinsic motivation helps to determine which factors influence the intensity and quality of production of intangible firm-specific resources creating crowding effects in favour of the firm.

Each external intervention, like rewards, has two aspects: a controlling and an information aspect. The controlling aspect strengthens the perceived external control and the feeling of being stressed from the outside. The informing aspect influences one's perceived competences and strengthens the feeling of internal control. Depending on which aspect is predominant, intrinsic motivation is reduced or raised (Milgrom and Roberts, 1992). Motivation has to be managed so that the required intrinsic and extrinsic motivations are sufficient. In particular, strong monitoring, pressure of sanction, high-powered incentives such as piece rates, bonuses or other forms of variable pay for performance, undermine the work ethics of a firm's members. This holds in particular for complex jobs, where intrinsic motivation is necessary to contribute to intangible form-specific pool resources.

Social software, for harnessing communities, has to incorporate these elements of motivation and the crowding effects risk the firm is exposed to by trying to align the community with the firm.

Design of social software

We have seen that different communities require different types of attention and motivation. Therefore, there is not a unique and universal tool for harnessing all types of communities. But

we think that social software, if its design is adapted to each type of community, can be an effective tool for firms trying to harness communities because the most important characteristics behind all the attention and motivation discourse is the fact that the processes the firm wishes to harness are social processes.

As pointed by Chesbrough (2005): "Firms can and should use external ideas as well as internal ideas and internal and external paths to market". Community types meet both requests; they offer new ideas and paths to the market. Online communities therefore constitute an important source of innovation for those firms able to implement a constructive relationship with them. But for firms there are not only potential benefits; there is also a variety of challenges to be met. This is particularly obvious when managing online communities as individuals participating in these communities are out of the firm's hierarchical hands. Individuals can decide to do work, to choose partners freely and what they like to do. Therefore, in online communities the social processes behind members' participation are intrinsically dissipative because such self-organised processes have to be mobile to harness the communities and bring value to both communities and firms (Dahlander et al., 2008; Dahlander and Magnusson, 2005).

Social software is not only socially-orientated, it also incorporates all advantages of online feedback mechanisms and has common features with knowledge portals (Dellarocas, 2003). Online feedbacks are an essential feature of social software. Online feedback, as pointed out by Dellarocas, is a mechanism that harnesses the bidirectional communication capabilities of the internet to engineer large-scale word-of-mouth networks. They are powerful tools to build trust and foster co-operation among online communities. Through such mechanisms, firms cannot only reach audiences of unprecedented scale at low cost. These mechanisms have emerged as a viable modus for fostering co-operation among strangers in online communities. Firms can use social software to intensify the interdependencies between the firms and the customers.

Likewise, social software exhibits some characteristics of knowledge portals (Van Baalen et al., 2005). Literature on knowledge management and communities suggests the pre-existence of shared knowledge or a shared belief system as a prerequisite for networks to emerge. The central question then is how a knowledge portal facilitates the diffusion of knowledge among rather loosely coupled and often disconnected communities. This is particularly the case when we deal with the video game behaviour in the mid-1990s, when tools were not designed by the firms, but some communities tried to build their own tools to improve some games. Social software facilitates the emergence of a network of practice. It also gives some governance and organisation aspects to the social interaction. We suggest that when social software is utilised, communities and networks of users are particular forms of the same phenomenon. The network is probably the starting point; social networks can be defined as a patterned organisation of a collection of actors and their relationships (Jones et al., 1997). This implies that even when people are only connected through a computer network, they should be conceived as a social network. To be a community, the individuals in the network must pursue repeated, enduring exchange relationships with one another. If exchanges are not enduring but occasional, there is no community and it is merely a loose network or a market relationship. Also, the social networks lack a legitimate organisational authority to arbitrate and resolve disputes that may arise during exchange (Podolny and Page, 1998).

Wenger et al. (2002) made a first attempt at sketching the evolution of communities by identifying five stages of development. Later, O'Mahony and Ferraro (2007) extended this approach with a governance perspective and Llerena et al. (2009) made a first attempt at matching this development with the video game industry. According to those authors, communities start as loose networks that have the potential to become more connected and develop toward a tightly-knit community. However, loose connectedness presumes the existence of particular ties between the members of potential networks. It is the role of firms to create such ties, based on their images, and to develop the attention of the individuals, from network to communities to better harness their creativity. Clearly social software is the adequate tool for this.

The results of this study have highlighted some important practical managerial issues. First, they confirm that harnessing a specific type of community requires the firm to design specific social

software. Second, the results tend to show that, from a managerial point of view, it is not necessary to invest in overly sophisticated tools. Most communities are more interested in a cheaper, simpler interface than a rich environment with features that no user needs. As mentioned above (Prusak and Cohen, 2001), social software is a powerful tool that enables community members to build enduring relationships among themselves, but also enables firms to harness communities and benefit from their existence, creativity and production. Social software is a key component of the spontaneous or deliberate emergence of referential systems structuring individual and collective beliefs within the decision-making process of the firm. In addition, for firms aiming to capture value from some of their user communities, social software is certainly important, but complementary efforts (for example, organising meetings in virtual and real worlds between the firm and different types of users) could strengthen the global "participation architecture" of the firm.

Conclusions, limitations and future work

The overall aim of this article was to analyse the approaches used by video game firms to "harness" communities of users through specific social software, and to explore the related managerial challenges. From an analytical framework, we have identified three main types of communities (tester, developer and player) corresponding to three main domains of knowledge. In each of these domains, video game firms may delegate part of their creative efforts to a specific community of users. From this typology, we carried out interviews in video game firms to analyse the use of social software for harnessing communities.

The development of the research brought forward a more fundamental issue in terms of management: to a large extent, the video game industry is facing a fast-growing situation where a significant part of the value is now created by cognitive resources (communities) that are not directly controlled by the firm. Such a situation corresponds to the vision of the firm once suggested by Brown and Duguid (2001). They argued that the firm could be viewed "as a collective of communities, not simply of individuals, in which enacting experiments are legitimate, separate community perspectives can be amplified by interchanges among communities. Out of this friction of competing ideas can emerge the sort of improvisational sparks necessary for igniting organisational innovation."

However, while the idea of using communities may be appealing, the transformation of the relationship between firms and communities into profits for the firm is not obvious. Several empirical studies on community/firm relations have shown that community-based strategies do not achieve the performance outcomes expected by the firms (Zackariasson et al., 2006; Hesselbein et al., 2001). As previous scholars have asserted, understanding how to implement these strategies effectively is as important as selecting or planning the strategy. From this point of view, community-based strategies do not differ from more traditional strategies (Mintzberg and Waters, 1982).

We are aware that online interaction through social software is not and should not be the only way the production of video game user communities can be harnessed. Brand fests, exhibits, shows and other organised events support integration with the customer community, especially for people who are not as connected to the community as they were before (Schouten and McAlexander, 1995). In standard products, connection with the brand motivates people to become a member of the community, rather than the attractiveness of the community itself, and customer communities are more useful for retaining customers than a customer acquisition tool is (Algesheimer et al., 2005). We believe that for some communities in the video game industry, this relationship is reversed, especially for communities that are more interested in programming and hacking than playing the games.

Therefore, we propose several avenues of research:

First, the interaction between communities deserves more attention. The above arguments have focused on the relationships between the firm and a given community, without taking into account the potential interaction between communities. The need to ensure effective communication

between various knowledge communities is emphasised by many authors. Nohria and Ghoshal (1997) argue, for example, that in a decentralised organisation "the real leverage lies in creating a shared context and common purpose and in enhancing the communication densities within and across the organization's internal and external boundaries." Interestingly, Nohria and Ghoshal highlight the role of socialisation through the soft infrastructure (for example, via corporate encounters, conferences, recreational clubs), normative integration (via incentives such as access to healthcare or travel concessions, company rituals and inculcation of corporate or brand standards), and effective communication between self-governing units (for example, via both internet and relational or cognitive proximity). Similarly, von Krogh et al. (1998) argue that tacit knowledge does not readily translate beyond its generative context, but can be nudged through the use of "knowledge enablers" (for example, ongoing dialogue with customers, personal exchanges with suppliers, intraorganisational conversations through block conferences, newsletters and interdivisional exchanges of plans). They note that "boundary-spanning" informal networks (for example, associations and clubs that cross-divisional boundaries) and individuals (for example, brokers and intermediaries, employee exchanges between firms) foster linguistic transfer and the introduction of new practices. Similarly, Nooteboom (2000) emphasises the role of third-party "go-betweens" who help build trust, resolve conflicts, highlight mutual advantages and introduce novelty without destabilising established competences within each firm. Brown and Duguid (2001) draw on the work of sociologists Star and Griesemer (1989) to note the role of "translators" such as external mediators and consultants, who "can frame the interests of one community in terms of another community's perspective"; "in-firm knowledge brokers" who work with overlapping communities to loosen internal ties that restrict exploration; and "boundary objects" such as contracts, plans, blueprints and other technologies and techniques that "not only help to clarify the attitudes of other communities, but can also make a community's own presuppositions apparent to itself, encouraging reflection".

Second, the dynamic of interactions between the firm and a given community should be considered. The above discussions largely construe the frame of relationships between the firm and its user communities as overly static. The logic of Figure 1 can be contrasted with the model of resource allocation of Grand et al., (2004) which describes the evolution of the firm's perspective and that of the open source project. They find that at different steps, the commitment changes and the firm and communities respond to each other by gift exchange. As long as they continue to exchange gifts, the relationship can move on to the next level. In our work, we do not yet propose a dynamic between the user communities we describe. However, like Grand et al., we look at which factors a firm must consider when making its resource allocation decisions. These factors change from one community to another. For the relationship between firms and communities to be productive, there must clearly be a gift exchange so that trust can be established. Relying on communities to enhance the creation, economics and social components of firm's activities is therefore difficult. In the relationship, firms must try to rally the communities to the strategic direction of the firm, but the firm's ability to control the communities is very limited, at least with traditional management tools. If firms try to control the communities too directly, there is a great risk that communities feel "employed" against their will and do not perform any of the expected activities, or if they do, they quickly lose the level of involvement, interest and creativity that distinguishes them. Conversely, if control is nonexistent or inadequate, the communities can push the development of the activities in a different direction than the one expected by the firm, or the communities can capture all created value without any benefits for the firm. In particular, there is a clear risk that user communities may be more conservative than the firm, and thus slow the creative processes that the firm wishes to implement. This may happen, for instance, when community members are "fans" of a specific character (Harry Potter) or a type of story (Assassin Creeds), and thus narrow the creative efforts of the firm and concentrate them on the continuation of their favourite stories. In this context, it is probable that the size of the community is a key variable to be taken into account by the firm: the bigger the community, the higher the risk of its narrowing the firm's creative endeavours.

References

Adomavicius, G., Bockstedt, J.C., Gupta, A., Kauffman, R.J., 2008. Making sense of technology trends in the information technology landscape: a design science approach. MIS Quarterly 32, 779—809.

Algesheimer, R., Dholakia, U.M., Herrmann, A., 2005. The social influence of brand community: evidence from European car clubs. Journal of Marketing 69, 19—34.

Allen, C., 2004. Tracing the evolution of social software. Life With Alacrity. http://www.lifewithalacrity.com/2004/10/tracing_the_evo.html.

Amin, A., Cohendet, P., 2004. Architectures of Knowledge: Firms, Capabilities and Communities. Oxford University Press.

Arakji, R., Lang, K., 2007. Digital consumer networks and producer-consumer collaboration: innovation and product development in the video game industry. Journal of Management Information Systems 24, 195—219.

Argyres, N.S., 1999. The Impact of Information Technology on Coordination: Evidence From the B-2 "Stealth" Bomber. Organization Science 10, 162—180.

Bessière, K., Seay, A.F., Kiesler, S., 2007. The ideal elf: identity exploration in world of warcraft. CyberPsychology & Behavior 10, 530—535.

Bilgram, V., Brem, A., Voigt, K.-I., 2008. User-centric innovations in new product development — systematic identification of lead users harnessing interactive and collaborative online-tools. International Journal of Innovation Management 12, 419—458.

Bogenrieder, I., Nooteboom, B., 2004. Learning groups: what types are there? A theoretical analysis and an empirical study in a consultancy firm. Organization Studies 25, 287—313.

Brown, J.S., Duguid, P., 2001. Knowledge and organization: a social-practice perspective. Organization Science 12, 198—213.

Burger-Helmchen, T., 2010. Communities: The gears of war for agile firms. Theory and Practice in the Video-Game Industry.

Burger-Helmchen, T., Guittard, C., 2008. Are users the next entrepreneurs? A case study on the video game industry. International Journal of Entrepreneurship Education 6, 57—74.

Carlson, B.D., Suter, T.A., Brown, T.J., 2008. Social versus psychological brand community: The role of psychological sense of brand community. Journal of Business Research 61, 284—291.

Castronova, E., 2006. Synthetic Worlds: The Business and Culture of Online Games. University Of Chicago Press.

Chesbrough, H.W., 2005. Open Innovation: The New Imperative for Creating And Profiting from Technology. Harvard Business Press.

Chien-Hsun, Chen, 2008. Player guild dynamics and evolution in massively multiplayer online games. CyberPsychology & Behavior 11, 293—301.

Cohendet, P., Simon, L., 2007. Playing across the playground: paradoxes of knowledge creation in the video-game firm. Journal of Organizational Behavior 28, 587—605.

Cowan, R., David, P.A., Foray, D., 2000. The explicit economics of knowledge codification and tacitness. Industrial & Corporate Change 9, 211.

Dahlander, L., Magnusson, M., 2008. How do firms make use of open source communities? Long Range Planning 41, 629—649.

Dahlander, L., Magnusson, M., 2005. Relationships between open source software companies and communities: Observations from nordic firms. Research Policy 34, 481—493.

Dahlander, L., Frederiksen, L., Rullani, F., 2008. Online communities and open innovation: governance and symbolic value creation. Industry & Innovation 15, 115—123.

Dellarocas, C., 2003. The digitization of word of mouth: Promise and challenges of online feedback mechanisms. Management Science 49, 1407—1424.

Edmondson, A.C., McManus, S.E., 2007. Methodological fit in management field research. Academy of Management Review 32, 1155—1179.

Eisenhardt, K.M., 1989. Building theories from case study research. Academy of Management Review 14, 532—550.

Eisenhardt, K.M., Greabner, M.E., 2007. Theory building from cases: Opportunities and challenges. Academy of Management Journal 50, 25—32.

Flowers, S., 2008. Harnessing the hackers: The emergence and exploitation of outlaw innovation. Research Policy 37, 177—193.

Fredberg, T., 2009. Organising customers: Learning from big brother. Long Range Planning 42, 320—340.

GFK, 2011. The video game industry 2010.

Glaser, B.G., Strauss, A.L., 1964. Awareness contexts and social interaction. American Sociological Review 29, 669—679.

Grand, S., von Krogh, G., Leonard, D., Swap, W., 2004. Resource allocation beyond firm boundaries: A multi-level model for open source innovation. Long Range Planning 37, 591–610.

Haefliger, S., Jäger, P., von Krogh, G., 2010. Under the radar: Industry entry by user entrepreneurs. Research Policy 39, 1198–1213.

Hagel, J., Armstrong, A.G., 1997. Net Gain. Expanding markets through virtual communities. McKinsey Quarterly, 140–153.

Harrison, D., Waluszewski, A., 2008. The development of a user network as a way to re-launch an unwanted product. Research Policy 37, 115–130.

Hau, Y.S., Kim, Y.-G., 2011. Why would online gamers share their innovation-conducive knowledge in the online game user community? Integrating individual motivations and social capital perspectives. Computers in Human Behaviour 27, 956–970.

Hesselbein, F., Goldsmith, M., Somerville, I., 2001. Leading Beyond the Walls: How High-performing Organizations Collaborate for Shared Success. Jossey Bass.

Jäger, P., Haefliger, S.,von Krogh, G., 2010. A directing audience: How specialized feedback in a virtual community of consumption stimulates new media production.

Jeppesen, L.B., 2009. Profiting from innovative user communities: How firms organize the production of user modifications in the computer games industry. Copenhagen Business School (Working paper).

Jeppesen, L.B., Frederiksen, L., 2006. Why do users contribute to firm-hosted user communities? The case of computer-controlled music instruments. Organization Science 17, 45–63.

Jeppesen, L.B., Molin, M.J., 2003. Consumers as co-developers: learning and innovation outside the firm. Technology Analysis & Strategic Management 15, 363.

Jones, C., Hesterly, W.S., Borgatti, S.P., 1997. A general theory of network governance: exchange conditions and social mechanisms. Academy of Management Review 22, 911–945.

Käser, P.A.W., Miles, R.E., 2002. Understanding knowledge activists' successes and failures. Long Range Planning 35, 9–28.

Kent, S.L., 2001. The Ultimate History of Video Games: From Pong to Pokemon – The Story Behind the Craze That Touched Our Lives and Changed the World. Three Rivers Press.

Kogut, B., Zander, U., 1993. Knowledge of the firm and the evolutionary theory of the multinational corporation. Journal of International Business Studies 24, 625–645.

Kozinets, R.V., 2002. The field behind the screen: using netnography for marketing research in online communities. Journal of Marketing Research 39, 61–72.

Kozinets, R.V., de Valck, K., Wojnicki, A.C., Wilner, S.J.S., 2010. Networked narratives: understanding word-of-mouth marketing in online communities. Journal of Marketing 74, 71–89.

Lampel, J., Lant, T., Shamsie, J., 2000. Balancing act: learning from organizing practices in cultural industries. Organization Science 11, 263–269.

Langlois, R.N., Foss, N.J., 1999. Capabilities and governance: The rebirth of production in the theory of economic organization. Kyklos 52, 201.

Lave, J., Wenger, E., 1991. Situated Learning: Legitimate Peripheral Participation. Cambridge University Press.

Llerena, P., Burger-Helmchen, T., Cohendet, P., 2009. Division of labor and division of knowledge: A case study of innovation in the video game industry. Schumpeterian Perspectives on Innovation, Competition and Growth, 313–333.

Lynn, L.H., Aram, J.D., Reddy, N.M., 1997. Technology communities and innovation communities. Journal of Engineering & Technology Management 14, 129.

McAlexander, J.H., Schouten, J.W., Koenig, H.F., 2002. . Building brand community. Journal of Marketing 66, 38–54.

Milgrom, P., Roberts, J., 1992. Economics, Organization and Management. Prentice Hall.

Miller, K.D., Fabian, F., Lin, S.-J., 2009. Strategies for online communities. Strategic Management Journal 30, 305–322.

Mintzberg, H., Waters, J.A., 1982. Tracking strategy in an entrepreneurial firm. Academy of Management Journal 25, 465–499.

Nambisan, S., Sawhney, M., 2007. A buyer's guide to the innovation bazaar. Harvard Business Review 85, 109–118.

Neale, M.B., Corkindale, D.B., 1998. Co-developing products: involving customers earlier and more deeply. Long Range Planning 31, 418–425.

Nohria, N., Ghoshal, S., 1997. The Differentiated Network: Organizing Multinational Corporations for Value Creation. Jossey-Bass.

Nooteboom, B., 2000. Learning and Innovation in Organizations and Economies. Oxford University Press.

Noveck, B.S., 2009. Wiki Government: How Technology Can Make Government Better, Democracy Stronger, and Citizens More Powerful. Brookings Institution.

O'Mahony, S., Ferraro, F., 2007. The emergence of governance in an open source community. Academy of Management Journal 50, 1079–1106.

Ocasio, W., 1997. Towards an attention-based view of the firm. Strategic Management Journal 18, 187–206.

Orr, J.E., 1996. Talking About Machines: An Ethnography of a Modern Job. Cornell University Press.

Osterloh, M., Frey, B.S., 2000. Motivation, Knowledge Transfer, and Organizational Forms Source. Organization Science 11 (5), 538–550.

Osterloh, M., Frost, J., Frey, B.S., 2002. The dynamics of motivation in new organizational forms. International Journal of the Economics of Business 9, 61–77.

Peters, C.S., Malesky Jr., L.A.Jr., 2008. Problematic usage among highly-engaged players of massively multiplayer online role playing games. CyberPsychology & Behavior 11, 481–484.

Podolny, J.M., Page, K.L., 1998. Network forms of organizations. Annual Review of Sociology 24, 57.

Prendergast, C., 1999. The Provision of incentives in firms. Journal of Economic Literature 37, 7.

Prusak, L., Cohen, D., 2001. How to invest in social capital. Harvard Business Review 79, 86–93.

Ram, S., Hevner, A.R., March, S.T., 2004. Jinsoo park design science in information systems research. MIS Quarterly 28, 75–105.

Raymond, E., 1998. La cathédrale et le bazar. LinuxFrance. 3.

Rheingold, H., 1993. The Virtual Community: Homesteading on the Electronic Frontier. Perseus Books.

Sawhney, M., Prandelli, E., 2000. Communities of creation: managing distributed innovation in turbulent markets. California Management Review 42, 24–54. Summer.

Schouten, J.W., McAlexander, J.H., 1995. Subcultures of consumption: an ethnography of the new bikers. Journal of Consumer Research 22, 43–61.

Schulz, C., Wagner, S., 2008. Outlaw community innovations. International Journal of Innovation Management 12, 399–418.

Slaughter, S.A., Levine, L., Ramesh, B., Pries-Heje, J., Baskerville, R., 2006. Aligning software processes with strategy. MIS Quarterly 30, 891–918.

Star, S.L., Griesemer, J.R., 1989. Institutional Ecology, "Translations" and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39. Social Studies of Science (Sage) 19, 387–420.

Tschang, T., 2005. Videogames as interactive experiential products and their manner of development. International Journal of Innovation Management 9, 103–131.

Tschang, T., 2007. Balancing the tensions between rationalization and creativity in the video games industry. Organization Science 18, 989–1005.

Urban, G.I., von Hippel, E., 1988. Lead user analyses for the development of new industrial products. Management Science 34, 569–582.

Van Baalen, P., Bloemhof-Ruwaard, J., Van Heck, E., 2005. Knowledge sharing in an emerging network of practice: the role of a knowledge portal. European Management Journal 23, 300–314.

von Hippel, E., 1986. Lead users: a source of novel product concepts. Management Science 32, 791–805.

von Hippel, E., 2006. Democratizing Innovation. The MIT Press.

von Hippel, E., von Krogh, G., 2003. Open Source Software and the "Private-Collective" Innovation Model: Issues for Organization Science. Organization Science 14, 209–223.

von Krogh, G., Roos, J., Kleine, D., 1998. Knowing in Firms: Understanding, Managing and Measuring Knowledge. Sage Publications.

Wenger, E., 2000. Communities of practice and social learning systems. Organization 7, 225.

Wenger, E., McDermott, R.A., Snyder, W., 2002. Cultivating Communities of Practice: A Guide to Managing Knowledge. Harvard Business School Press.

West, J., O'Mahony, S., 2008. The role of participation architecture in growing sponsored open source communities. Industry & Innovation 15, 145–168.

Yin, R.K., 2008. Case Study Research: Design and Methods. Sage Publications.

Zackariasson, P., Walfisz, M., Wilson, T.L., 2006. Management of creativity in video game development: a case study. Services Marketing Quarterly 27, 73–97.

Biographies

Thierry Burger-Helmchen (PhD in Management Science, University of Strasbourg, France), is a researcher at BETA Strasbourg. His research topics are entrepreneurship and innovation management, notably in the video game industry. He teaches Strategy of SMEs and Managerial Economics at EM Strasbourg, University of Strasbourg.

Patrick Cohendet is Professor of Economics and Management at HEC Montreal and the University of Strasbourg. He is a researcher at BETA Strasbourg: his research topics are on economics and management of innovation, creativity and communities. He is the author of several books on economics of innovation and knowledge management.