Towards successful Virtual Communities

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Abstract. With the multiplication of communication medium, the increasing multi-partner global organizations, the remote working tendencies, dynamic teams, pervasive or ubiquitous computing Virtual Communities (VCs) are playing an increasing role in social organizations currently and will probably change profoundly the way people interact in the future. In this paper, we present our position on the key characteristics that are imperative to provide a successful VC as well as the future directions in terms of research, development and implementation. We identify three main aspects (business, techniques and social) and analyze for each of them the different components and their relationships.

Key words: Virtual Communities, VCs, guidelines, characteristics, business model, techniques, social dimension.

1 INTRODUCTION

In the 1990's and due to the internet phenomena, a particular kind of communities was born: the Online Community, also known as Virtual Communities (VCs). VCs have been the subject of particular attention; it has been defined and classified in different ways (Preece, 2000; Weissman, 2000; ElMorr and Kawash, 2007).

VCs varied in the technologies they use (e.g., email lists, forums, chat rooms), the wide domain of applications (e.g. tourism, health, sociability, leisure). In the 1990's mobility emerged in the telecommunication industry and had a remarkable impact of VC research; particularly on design, infrastructures to use (Kaji et al., 2002; Sousa and Garlan, 2002), services to offer(Li and Leung, 1997), the user interface(Keranen et al., 2003; Cole and Stanton, 2003), the security (Abdul-Rahman and Hailes, 2000) and the privacy of users.

With the multiplication of communication medium, the increasing multi-partner global organizations, the remote working tendencies, the dynamic teams, the pervasive and wearable computing, VCs are meant to play an central role in social organizations and will profoundly change the way people interact. On the other hand, the emergence of the information society depends in a great part on the way information is exchanged between collaborating groups. In this context, VCs appear to be one of the pillars of the

information society. The concept of community appears as a key feature for the development of tomorrows' applications in the information society. Nevertheless, there is a need to define the technologies, methodologies, and tools for the collection, management, exchange and use of information within communities as well as for the engineering of VC applications, in this regard practical engineering challenges are to be met. In this paper, we present our position on the key imperative characteristics to provide a successful VC, and on the future directions in terms of research, development and implementation. Researchers consider VCs from different aspects depending on their background and research prospects. Business professionals look into a profitable viable business model, while engineers search for the most efficient way to maintain connectivity, performance, the way information is organized and communicated; knowledge in VC is an attraction for engineers as well as information systems researchers. The ease of use of the VC through appropriate interface is another aspect of research and development. Decision making and social characteristics are important too. In the myriad of possible VC applications, finding the right set of characteristics that make a VC "work" is a challenge. In the following, we categorize the different characteristics that we believe are central for a successful VC. We identify three main aspects: business, technical and social dimensions. For each of these aspects, we will analyze the different components and their relationships.

2 BUSINESS DIMENSION

2.1 Startup cost

Starting a VC does not necessarily require large investment in the early stage. The famous Facebook started as a hobby project and then expanded thanks to venture capital investors.. In the traditional curve of traffic in a successful community, there is a critical point where the traffic explodes very quickly. To be able to manage the traffic increase, the company should be able to answer the expectations of users while quickly installing new servers and keeping (or increasing) the quality of service in terms of response time. This is a critical phase because these investments are linked to periods of unavailability of the community, where users may be discourage if the unavailability is too long compared to the visible new advances. At this time most of the communities are not able to support such a heavy investment with their own funds. The examples of MySpace and Facebook show that the successful expansion was only possible trough external capital (Facebook example: $500,000 in the first round, and $12.8 Million one year later). In May 2008, Facebook took out $100 million in debt to invest in servers and increase headcount.

2.2 The Media Factor

The role of the media in the success of a community is also important. In the early stage of a community's lifecycle, the word of mouth, buzz, and the internet presence are the most success factors. To get the needed attention, we identified three key success factors:(1)Propose innovative and high usable features for users,(2) Open your community

to developers,(3) Promote the current technological standards, like RSS, web 2.0, usability rules.

In terms of media strategy, it is important to open a blog to promote your company, to keep the media/blogger communities aware of the latest news and advances of your community, and communicate often about the increasing number of members. Getting the attention of the mainstream media actors, like newspaper or television, is a sign of the success of a community. Recent examples of MySpace and Facebook showed that those networks reached their maximum of popularity just after the mainstream media shed the light on them. Traditional media have a low influence on the success of VCs since they will discover them once they are already successful, but they will give the last momentum to reach the peak. Viral marketing is a key factor of success on the internet. Successful projects like hi5, linkedIn, Facebook have reached their current dominant position without advertising and big marketing communication, and they then switched to traditional communication methods like news releases, interviews, conferences and advertising in mainstream media.

2.3 Only actor or first mover in the market

"The world is too small for both of us". This quote summarizes well the rough battle waged by VCs. The number of internet users increases continuously but there is still no place for two VCs in the same field. Being the first actor to move is a key of success factor or at least helps to maintain a dominant position. A German clone of Facebook, Studivz, starting in 2005 is still maintaining its first position as social network for students in German speaking countries in spite of the rise of Facebook in Europe since 2007. The inertia of community members is very high; they migrate massively to competitor services only if they have substantial advantages that justify it. Nevertheless, if two competing communities cannot survive, each of them can focus on different segments of the market.

2.4 Attracting users and developing loyalty

In the era of the so-called "web2.0" people are invited to contribute to websites and socialize. YouTube and Flickr are two of the most successful VCs that focus more on content sharing and allow to users to publish and consume user-generated content, instead of publisher provided, content. Besides, there are communities, which focus more on the social networking activity; in this domain, two VCs have had outstanding popularity: MySpace and Facebook. MySpace was one of the first social networks on the internet, allowing people and bands to create their own profile page which they can decorate with their favorite images, videos and music. People can also send private messages to each other, but public messages are usually preferred. The most common usage of MySpace is to create a page with as much customized content and friends as possible, in order to increase its visible popularity (i.e. the number of friends). It is a way for youngsters to boost their social ego, and for bands to spread their music virally. Facebook was initially created for students of Harvard College in order to keep in touch, and then attracted a wider population and became even more popular than MySpace. The difference between MySpace and Facebook is that the latter focuses mainly

on current and past real-life relationships brought on-line. Studies have identified that in average its members have a higher level of education than MySpace's. Maybe this is due to the fact that although the main functionality of these sites is similar, the actual experience is different: on Facebook people cannot decorate their own page and they have to add widget-like "applications" to add content on their page. Some applications can leverage the personal profile information and social links, bringing new opportunities to exchange and interact with our friends. For example, the "Movies" application allows one to rate movies; another applications allow friends to compare their movie tastes to evaluate their compatibility, or photos albums tagging (names, descriptions, ranking of friends in several domains, exchange of virtual gifts and small games). An interesting aspect of Facebook is the viral spreading of applications: people who add an application can invite their friends to join the same application so that they can interact with it. Every action is traced to one's public mini-feed, so that his friends can see what she/he is up to and what application she/he is using. The "call-to-action" consists of showing features (brought by an application) on users' profile page so that other users can join (and thus add the application) is an innovative incentive model. Applications can leverage user profile information from the Facebook platform; they can advertise and also charge users for premium features. A downside of this approach is that many applications abuse this model by forcing the user to invite friends before activating the expected feature. Hence most received applications invitations are not genuine and thus they lose impact, by being finally considered as spam. The number of publicly available applications grew exponentially, and there were almost 18,000 of them at the moment this article is being written. We can identify four major factors that can justify the success of MySpace and Facebook social networks:

- **Leverage the need of social ego boost.**
- **Catch the user's attention and gather profile information** by providing fun content and applications. YouTube is a good example in this factor because watching videos becomes an addiction when surfing to proposed "relevant videos". On MySpace this is mostly done by users who decorated their profile page. On Facebook, the fun is brought by the applications.
- **Spread messages in a viral fashion**, as people actions are visible to their friends through the mini-feed.
- **"Call-to-action"**, as people can interact with a friend's application before actually adding it. Adding an application must be straightforward: neither email address nor password to register, such information would have already been collected by the underlying platform (e.g. Facebook).

Overall, it seems that the winning guideline for a successful VC is that people have fun using it; they can keep in touch and interact with the people they know and connect with people they may like.

2.5 Monetizing the community

VCs, as the rest of the Web 2.0 applications, suffer from a lack of good business model. For example, Facebook, with more than 120 million active users has projected earnings before interest, taxes, depreciation and amortization (EBITDA) of $50 million for 2008

and a projected negative cash flow of $150 million for 2009. In the traditional economy, there are not many companies having such a large number of clients and such a critical financial situation. The lack of revenue is the biggest issue for VCs. Turning a community website into a money machine is not an easy task, therefore finding good revenue sources is a key issue. There are four main revenue sources for VCs:

– **Advertisement**
– **Subscription fees**
– **Paid features**
– **Selling user generated content**

Advertising is currently the most common revenue sources, since it can be applied for almost every VC. Specialized communities have a higher profitability, since it's easier to target the consumer, advertiser are ready to pay higher CPM for those sites. Some other VCs require paying some fees at registration or monthly. Restricting features is also very common, for example users who want to increase their storage space on Flickr or Picasa have to pay a small monthly fee. Finally, for valuable user generated content, and if the VC is owner of the content, the content can be edited and sold in forms of books, videos, printings, t-shirts. An example is UrbanDictionary who recently published a book containing the best definition given by users. The terms of service leave the ownership to the submitter of the content but grant the company a non exclusive license to copy and sell the user generated content

3 TECHNICAL DIMENSION

3.1 Centralization vs. decentralization

In current VCs the management model consists of a central entity taking care of all the low-level functionalities. However, the existence of a central server raises some significant issues related to privacy, censorship, and independence. Decentralized communities, based on the principles of peer-to-peer (P2P) systems, would attract users that value much these aspects. However, the fact that end-users are required to contribute a significant amount of resources for supporting core system functionality would be detrimental to the efficiency of the system and raises important incentive issues (e.g., free riding). We believe that web-based and self-organized communities should not be treated as substitutes to centralized communities but rather as their complement. Web-based communities are probably the only way to manage global scale online communities of millions of users, while self-organized communities would be a good alternative for more medium sized communities with a sufficient number of pre-existing trust relationships. One way to bootstrap decentralized virtual communities is to rely on existing social networks (such as Facebook and MySpace) in order to benefit both from the social ties developed between members of large virtual communities.

3.2 Incremental deployment

Deployment of the infrastructure should be made according to traffic expectations. An early overinvestment in the hardware or in the software development can lead to dis-

astrous consequences. Even if the explosion of traffic is hard to forecast, indicators of internet presence, popularity in Technorati, and existing traffic analysis provide an interesting way for forecast. Concerning the software deployment, the first set of features should also not be excessive. Providing a bountiful set of features can lose the user in never-ending menus and pages. Before deploying or even implementing new features, it is important to get user's feedback. Recent announcement of the Beacon advertisement system in Facebook spawned a long controversy about the use of private data for advertising purpose.

3.3 Downtime, availability, performance

Interruption of service for a community is synonym of death. For most of the communities, users connect every day and expect a permanent availability of the service. Short interruptions (few hours) will disturb the users and spread an image of non trustworthiness, whereas longer interruptions will lead users to migrate to competitor services. Performance is also a key factor for successful communities; the amount of exchanged data can quickly become very large, especially in picture or video sharing. A slow response time is off-putting for new users and can become a reason for members to switch to another community.

3.4 Context Awareness

Most social communications today deal with contexts, people informs their friends what they are doing on their blog, share their pictures of last trips using emails, send SMS to ask friends where they are. But all these communications remain manual so far. Getting rid of these communications means and focusing on real conversations instead would be a step forward. Context awareness is an answer to the automation of these contextual rituals. The idea of "context awareness" is to sample every possible piece of context information, in order to infer the current situation of the user, such as location, current activity, surrounding people and devices. With the growing popularity of mobile phones with advanced capabilities such as Blue-tooth, broadband internet access, cameras and GPS receiver, the possibilities of leveraging "real world" context information increase. In the scope of VCs, context awareness enables the implementation of:

- A social radar which would visualize interesting information about surrounding peers. This information may include status information that can improve communication.
- A social network that automatically gives updates to friends about location, encounters, and activity, according to user's privacy preferences.
- A collaborative map on which users give some contextual information in exchange of useful services. As an example, a company could buy contextual information as an implicit way of gathering feedback and statistics on usage of their products and services, in order to improve them.
- A world of social recommendations that helps a person on the move decide where to eat or what movie to watch based on the recommendations of other community members. This is also a business opportunity for targeted advertising.

These opportunities can be met by inferring actual situations from sampled context data using the mobile phone (e.g. Bluetooth to discover surrounding phones and devices, GSM or WiFi positioning), the user profile, social graphs, and inference rules for reasoning pro-actively with all this knowledge. We think that context awareness is an opportunity to enrich VCs experience.

3.5 Integrating User experience

The feedback of user experience within a VC can be gathered implicitly or explicitly. Indeed, on a platform with many applications like Facebook, the user experience with applications has significant impact on their spreading and active use. It is easy to gather implicit statistics due to the viral spreading of applications using invitations. Users can also provide explicit feedback by commenting, rating and reporting applications according to their expectations. With all this collaborative data, users can already evaluate the popularity, quality and usefulness of applications before actually adding them.

4 SOCIAL DIMENSION

4.1 Profiles management

The usual way of taking part in a VC is to create a profile which stands as a personal avatar with a chosen name (a ”nickname” or ”pseudonym”) and possibly fictitious personal information. Entering multiple communities implies creating many profiles that are independent and not necessarily containing the same information. This approach is relevant when joining communities that are focused on specific domains, so that the user professional information will not be part of her/his leisure profile and vice versa. However, at the era of the social networks there is an emerging need to federate our identities. Indeed, this need is justified for many reasons:

1. The user has to remember her/his authentication credentials for every community. If he/she decides to use the same credentials on every platform, then one security breach will have considerable impact.
2. The change of a piece of information (e.g. current status, e-mail address or location) each profile of every community must be updated separately. Otherwise, inconsistencies between profiles will occur.
3. Communities usually provide internal messaging capabilities which are not interoperable. Keeping up to date with messages implies logging on all my communities.

Microsoft, Facebook and Google have been proposing their own unified account to federate one’s identity on various communities. Their unified accounts allow single-sign-on and consistent profile information but one account maps to one identity which is shared across communities as a same basic profile. This approach prevents the user from having separate identities, especially on Facebook where the user profile is richer than elsewhere. OpenID is an interesting alternative to identity federation because it is decentralized and not affiliated with any big player of the IT industry, and thus seen as ”not evil” concerning the usage of your personal data. A ”persona” (identity) can be

hosted on any OpenID container website, and this website will be used to authenticate the user on any third party OpenID-compliant website. The identify management is thus delegated to the OpenID container instead of the community website itself.

4.2 Privacy and anonymity

The part of the user activity revealed to the interested parties and/or made public (e.g., visits, when a user is online, profile information, etc.) could affect the way people behave in VCs. Increased visibility strengthens the personal responsibility and the opportunities for social interactions. However, increased transparency raises privacy issues; besides, private information (identity and/or content) is being stored in central databases which could be exploited for commercial purposes, or could be exposed through security breaches (Rosenblum, 2007). A VC should take care of privacy concerns seriously and be transparent about its privacy policies during the subscription; besides, as VC can leave for members to decide what is private and what is not. Some third-party applications, such as in Facebook, lead to malicious data harvesting, current protocol often forces users to give application access to non required data (Felt and Evans, 2008).This is a very crucial issue; for instance, Facebook having more than 110 million active users, a popular application developed by a malicious company can gather huge amount of private data.(Felt and Evans, 2008) proposed a simple privacy-by-proxy approach to help keeping privacy while providing required information to third-party applications.

Notice also that the professional networking website LinkedIn keeps profiles anonymous until the user is recognized as a part of the social graph.

4.3 Acceptance

One of the key questions in VC research is why some systems are accepted and some are rejected by users. The factors and processes affecting to users adoption and use, have received a lot of interest form IT researchers. Scholars have developed several general acceptance models which link individual reactions and intentions to actual use of the system (Venkatesh et al., 2003). Probably the most popular acceptance framework is Technology Acceptance Model (TAM) (Davis, 1989). According to TAM perceived Ease Of Use (EOU) and usefulness are the sole determinants of attitudes towards an innovation, which in turn predicts the behavioral intention that is a solid predictor of actual behaviour. Information systems researchers have developed many extensions to the original TAM, and new intention determinants to the original model were added to cover the special features of the analyzed context. Examples of extensions include perceived credibility ()(Wang et al. 2003), trust (Dennis and Alsajjan, 2006), playfulness (Moon and Kim, 2001; Cheong and Park, 2005), self-expresiveness (Pedersen and Nysveen, 2003) and enjoyment (Phuangthong and Malisawan, 2005). This rises a question what are the special characteristics of virtual communities that affect their success and acceptance?

The factors resulting either in the success or failure of VCs are still unclear. However, one of the critical factors determining the success of a VC is its members' active information sharing and generation (Ardichvili et al., 2003; Bross and Sack, 2007;

Moore and Serva, 2007; Koh et al., 2007). SSuccessful applications have many active users. Based on discussion above we have identified three intention determinants to our extended TAM model: perceived value, perceived ease of use and perceived social enjoyment. Although we base our discussion on TAM we follow the logic of Kaasinen (Kaasinen, 2005) and replace the original determinant of TAM (perceived usefulness) with perceived value. This way we emphasize that instead of implementing a collection of useful features, the designers of VCs should focus on key values provided to the members of the community.

Perceived Value The value of a VC is a critical aspect for attracting users to be active participants in the VC. New communities should offer a clear added-value to its potential members. In a VC value is generated from the software itself and from the members' contributions (in terms of content, expertise, and presence). Based on the work of (Hassenzahl et al., 2002) we can identify two categories of value: pragmatic and hedonic value. Pragmatic value refers to the VC's usefulness and it includes practical value aspects (e.g. ablility to share information or generate knowledge from the interactions with other members). Hedonic value, on the other hand, addresses human needs for excitement (novelty, change) and pride (social power, status). Pragmatic value refers to the VC's usefulness and it includes practical value aspects (e.g. ability to share information or generate knowledge from the interactions with other members). Practical value could be independent of the existence of other users or dependent on them. To take the example of Flickr, users creating an account in Flickr have immediately the ability to backup their photos and show them to their friends and family, independently of how many more users are members of Flickr. Similarly, Delicious offers the possibility to users to view their bookmarks from any computer connected to the Internet. This type of value is important for the bootstrapping of the system. On the other hand, knowledge, feedback, expertise generated from the interactions with other members or just by "lurking" is another significant value generator of a VC. For example, Flickr offers to members the opportunity to learn photography, improve heir own skills. The opportunities for socialization (even if not the primary objective of the community) and self improvement are strong incentives for users to participate. Hedonic value, on the other hand, addresses human needs for excitement (novelty, change) and pride (social power, status). In VC context the importance of hedonic value is more important than in information systems in general. VCs are not expected to serve only the members' needs for communication and information but also for socialization, emotional connections, entertainment, fun, and pride (Antoniadis and Grand, 2007).

Perceived Ease of Use Perceived ease of use is the second intention determinant of our model. There has been a rich stream of EOU studies in all kinds of information systems during the last decades; their main goal has been to create products that have high usability. Usability increases customer satisfaction and productivity, leads to customer trust and loyalty, and contributes to tangible cost savings and profitability. Thus, a high usability can also lead to the success of a VC. Because information sharing is essential to all VCs, a successful VC must offer easy to use communication tools which help people to understand each other in the on-line community. Today's most popular communication methods in VCs are still text-based although other forms of commu-

nication, such as voice or video conferencing can also be used. Several studies have examined the promotion of mutual understanding in text based communication (Farnham et al., 2000; Vronay et al., 1999; Toth, 1994; DiMicco et al., 2002). The method for promoting mutual understanding can be categorized into two: the enhancement of the text presentation (e.g. adding visual attributes to text such as changing size or color of fonts) and the design of statement database (e.g. add explicit statements or symbols to database like the ”smiley”). In successful VCs the interaction between the user and the system must be entertaining, engaging and effective experience.

Perceived Social Enjoyment The above discussion revealed that in VC both value and ease of use have a strong social dimension. The perceived value of a VC is not limited only to personal values independent of the existence of other users but in includes values related to the community, and to common outcomes of the community that offers satisfaction and pride for the members that took part in its production; such as Wikipedia top contributor, and Flickr's explore page. Clay Shirky calls this the ”promise” of the community (Shirky, 2008); the way this ”promise” is expressed and communicated can play an important role in the users' participation. Similarly ease of use is not limited to simple ability to the use the system; indeed, in successful VCs the interaction between the user and the system offers an entertaining, engaging and effective experience. We believe that VCs must support sociability and enjoyment throughout the activity, and that the perceived social enjoyment is an essential intention determinant and prerequisite of actual use of the system. Although some studies on methods to measure social enjoyment exists (Lindley and Monk, 2008) further studies in this context are still needed.

5 CONCLUSION

We discussed in this paper three main characteristics to enable successful VC projects. For the business part, we stressed the importance of being a first mover on the market or to propose a clear and important added-value in order to be competitive. Good relationships with influent bloggers and specialized web media are keys to good visibility. We also discussed strategies on how to attract users, as well as on the financial dimension. On the technical side, we had few suggestions regarding the design and development and the traffic forecast. Furthermore, we suggested that context-awareness is an opportunity to develop exclusive and powerful added value VCs that can be competitive; besides, we emphasized the importance of users' feedback during the process of development of new features. Moreover, we approached the social dimension from the user's perspective; thus, we've discussed several identification mechanisms that allow users to manage their identity/profiles; then we've overviewed trust, privacy and anonymity needs; finally, we presented an acceptance model that may give insight into what makes a VC successful from a user point of view.

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