A Framework for Virtual Community Business Success: The Case of the Internet Chess Club

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Abstract

Prior work has identified, in piecemeal fashion, desirable characteristics of Virtual Community businesses (VCBs) such as inimitable information assets, persistent handles fomenting trust, and an economic infrastructure. The present work develops a framework for the success of a subscription-based VCB by taking into account the above elements and considering as well an interplay of the membership (both regular members and volunteers), technical features of the interface, and an evolutionary business model that supports member subgroups as they form.

Our framework is applied by an in-depth survey of use and attitude of regular members and volunteers in the Internet Chess Club (ICC), a popular subscription-based VCB.. The survey results reveal that key features of the model are supported in the ICC case: member subgroups follow customized communication pathways; a corps of volunteers is supported and recognized, and the custom interface presents clear navigation pathways to the ICC's key large-scale information asset, a multi-million game database contributed by real-world chess Grandmasters who enjoy complimentary ICC membership.

We conclude by discussing VCBs in general and how the framework might apply to other domains.

1. Introduction: Virtual Communities as a Business

Advances in Internet bandwidth, software engineering, and general public awareness have greatly lowered the barriers to entry for businesses who wish to offer Virtual Communities (VCs) as a promotion vehicle or as the chief source of revenue. The strategy is clear: to leverage the ubiquitous reach and range of the Internet to locate and gather birds-of-a-feather interest groups, to provide these groups with convenient visual interface tools supporting asynchronous and synchronous group interaction, and to sit back and watch as the nascent groups commingle in a virtual melting pot and bootstrap themselves to a critical mass. Early strategy papers [1] touted the vast potential of this new face a virtual community business (VCB) can present to its customers.

One of the domains enabled by increasing bandwidth and graphics sophistication is online gaming. Numerous prescriptive design papers have been set forth to assist in the planning of a VC offering, with varying degrees of business focus. Kollock [2] stressed the importance of trust via persistent VC identities; this trust can facilitate another recommended feature of a VC business, an economic infrastructure that can carry out transactions. The importance of a recognized ID was supported by a recent empirical study on eBay vendors [3] . Millen [4] and Marshall et al. [5] stressed the importance of designing the VC user base's software tools with their needs in mind. Williams and Cothrel [6] reiterated that the users should have "a critical mass of functionality" at their disposal and that managers should delegate authority as much as possible down the ranks to the members so that they have discernible power to shape the rules of conduct in the VC. They also mentioned the common sense principles of providing user feedback channels, recruiting actively for new members, and the importance of the equity holders to acknowledge the "discretionary energy" (the volunteerism) of the many participants who spend time and effort to keep the community going with timely help for newcomers, and guidance to help members locate internal and external information assets of interest.

1.1. Volunteerism in a VCB

Utilizing volunteers effectively has long been recognized as import in VC-based businesses, since the cadre of owners may be quite small yet the Internet reach and range means the VC offering will be global in scope. Volunteers can, for example, provide timely multi-lingual help or they can assist in more core duties, such as

maintaining the infrastructure of an online chat group [7].

What sorts of members can the owners attract into the volunteer workforce? Prior work shows that volunteerism, to some degree, is "prosocial" – an altruistic desire to do good. On the other hand, there is also some degree of selfish motives --- personal gain via the volunteer activity, be it recognition from superiors, a possible stepping stone toward a promotion, or some other non-altruistic rationale [8-10].

1.2 Virtual Community Business: Design with an Eye to Revenue

A VC business offering should identify and design itself for the capture of potential revenue streams. Some of the major possibilities are: subscription-based, where members enroll due to the attraction of differentiated content and functionality; ad-hoc based, where visitors can elect at irregular intervals to make a purchase (for example, a pay-per-premium-article news discussion forum), or advertisement-based, where visitors at a VC site, in order to use the functionality, must also view product placements. An example of the latter model is the Yahoo Gaming network. Bughin and Hagel and Bughin and Zeisser [11, 12] support VC operational performance in a set of limited studies with the caveat that cost-savings is paramount to ensure long-term viability**.**

In the subscription case, the business owners must plan a VC offering which offers dynamic content and functionality that will attract new members and entice existing members to renew. In the members' interaction in the VC, there should be delegation of governance to further the sense of self-construction of the community's members. This effort can be off-loaded, to some degree, to the volunteer force.

To avoid confusing the members, there should be segmentation of the communication channels to combat information overload [13]; what this means in practice is that the members are offered a chance to self-elect themselves into sub-groups and to "tune in" to various sub-group channels. To allow the members the chance to form persistent friendships and elevate trust, persistent IDs should be supported to further a sense of belonging [14] [2]; this belonging adds to the switching cost of leaving this VC and joining a competitor, thus assisting in member retention. The provision of the infrastructure to conduct economic transactions means the owners can act as middlemen, making a market between VC buyers and sellers (in an online gaming world, this means a market in chess lessons and virtual exhibitions). Finally, the owners should acknowledge and reward volunteers.

We are now ready to develop a simple framework that will help subscription-based virtual community businesses plan for success.

1.3 A Framework for Subscription-Based Virtual Community Business Success

The operational cost of running a VCB based on a certain domain, for example gaming, is low compared to a brick-and-mortar gaming establishment. However, a viable business must generate profit: revenues must exceed costs. To ensure revenue in the case of a subscription-based VCB, the owners must focus on new member attraction and existing member retention. In both cases, the value added by the VCB must be made clear (in comparison with its free or fee-based competitors) and, if possible, the owners should build in an opportunity cost for switching. The greater the value perceived by the member, the greater the chance of establishing and maintaining a revenue stream from that member. There are two positive and one negative source for value. The positive aspects are the sum of the useful features for a particular member and the ease of interface navigation to reach those features. The negative component of value is the avoidance of switching opportunity costs by retaining the current business provider. Assuming the owners have made available the basic elements described in Section 1, we have a VCB scenario as pictured in Figure 1.

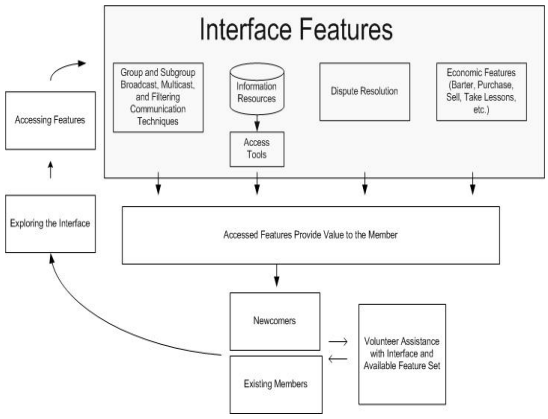

Figure 1. Volunteers Increase the Perceived Value of the VC Business

As Figure 1 shows, the members explore their environment with a client interface. During their session, they are guided to important resources such as internal databases, communication and filter techniques, dispute resolution guidelines, and economic transaction how-to's and fulfillment with the help of a global volunteer corps. As the membership roster increases, the delegation of this facilitation by the owners to the volunteers becomes even more important.

The implication is that the most successful VCB would be one that actively encourages new volunteers to join the corps and recognizes existing volunteers with an explicit reward model.

1.4 Applying the Framework: The Internet Chess Club

The Internet Chess Club (ICC) offers a flexible testbed to check the framework we developed in Section 1.3. It is a highly successful subscription-based VC chess and related-game enterprise with an active international volunteer corps that currently has over 21,000 paid members and over 5,000 trial members with a low daily operational overhead. We exploit the fact that researchers can embed software participant/observers in this environment and gather data using conventional survey-based means and also via automated means, using an embedded software agent. We have taken advantage of this platform in prior work [15-17]; the current paper extends this work with an expanded analysis of member and volunteer attitudes and use (activity) analyses.

2. A Short History of the Internet Chess Club

In 1993 and 1994, Daniel Sleator, a Professor of Computer Science at Carnegie Mellon University, was an administrator and systems programmer on a public code base, the Internet Chess Server (ICS). He fundamentally reworked the code base and implemented useful chat features such as "shout" (a broadcast mechanism to shout to all logged on), "whisper" (where observers of a game can talk among themselves, discussing the game in progress, without disturbing the players), and "kibitz" (where observers' comments are also heard by the players). In 1995, Sleator made the decision to privatize his altered code base, and named the new offering Internet Chess Club (ICC). He established ICC on a subscription basis in early 1995 and in the first quarter of 1995, had 223 paying members (at $49/year/adult; $29/year/student). The ICC now boasts more than 21,000 paid members, with an additional 25,000 free week-long trial accounts (a percentage of which it hopes to convert to paid status). In addition, about 5,000 free accounts are accorded the computer programs and titled players such as Grandmasters. In its short lifetime, ICC has accumulated over 100,000 paid and trial handles in its internal database. Currently, ICC is active with live broadcasts of chess events all over the world, and it has expanded its offering by acquiring Chess.FM, a chess radio web site. Thus ICC members can now follow games using a visual interface (cf. Section 2.1) while they follow the Chess.FM audio.

2.1. ICC from the Member's Perspective

ICC makes use of a rich visual client to play and study chess, to chat, to take lessons, and to seek individual games and tournaments. Figure 2 shows a screenshot of the Blitzin software client, which is freely downloadable from http://www.chessclub.com/. In Figure 2, notice our research chatbot, "Aslak" presenting a game lecture in one window and talking to the member in another; proposing the user visit a webpage and fill out a survey form. This solicitation technique is discussed in our discussion on the survey methodology in Section 3. Members logged on to ICC have a set of synchronous and asynchronous communication choices. They can communicate by private tells to one another, or by shouts (broadcast messages) or by directed comments to 'channels'. They can also leave asynchronous messages to individual members or to a general 'suggestion' account. Guests (unregistered players) can logon but they can only communicate to the Help Channel.

According to Jones and Rafaeli [13], communication segmentation strategies are critical to combat information overload. The ICC supports Communities of Interest - users who interact intensively with one another, but only on limited topics [1] by the use of "Channels". For example, there is a politics channel, a non-chess programming channel, a religion channel, a sports channel, many language channels, and much more. If members offend one another, ICC offers the censor command to stop receiving indefinitely any communication from an offending party. The channels on ICC are not only limited to general

chat. Sometimes new channels are introduced to support specific member-contributed innovation which increases the feature set of ICC as a whole. Related worlds, not part of the original ICC, are glued onto the ICC code base and new channels are dedicated to the related worlds. Channels are analogous to tuning into a certain radio frequency; some are moderated, and others are not.

Related to Channels are ICC "Groups", introduced in January 2001. ICC delegates authority from owners to administrators, to police the groups, and from the administrators to the group-operators, for further sub-policing. This notion of distributed delegation is consistent with [6] [2]. Groups and Channels help segment the population and lower the "background chatter" to help members focus on chats and announcements of interest, consistent with [13].

tied to particular individuals – i.e., they are not known in advance by ICC members. Explicit volunteers are those individuals who are known by ICC members, and whose efforts are tied directly to them.

The ICC membership roster includes professional players, whose real world accomplishments correlated with virtual identities. The World Chess Federation awards titles at annual real-world congresses to recognize chess accomplishments. Titled chess players – male Grandmasters (GM) and International Masters (IM), and female Grandmasters (WGM) and International Masters (WIM) – are the first type of implicit ICC volunteer. They form a core set of vendors who can make use of the ICC economic system by offering lessons or simultaneous exhibitions for a fee. In addition, having a large proportion of the

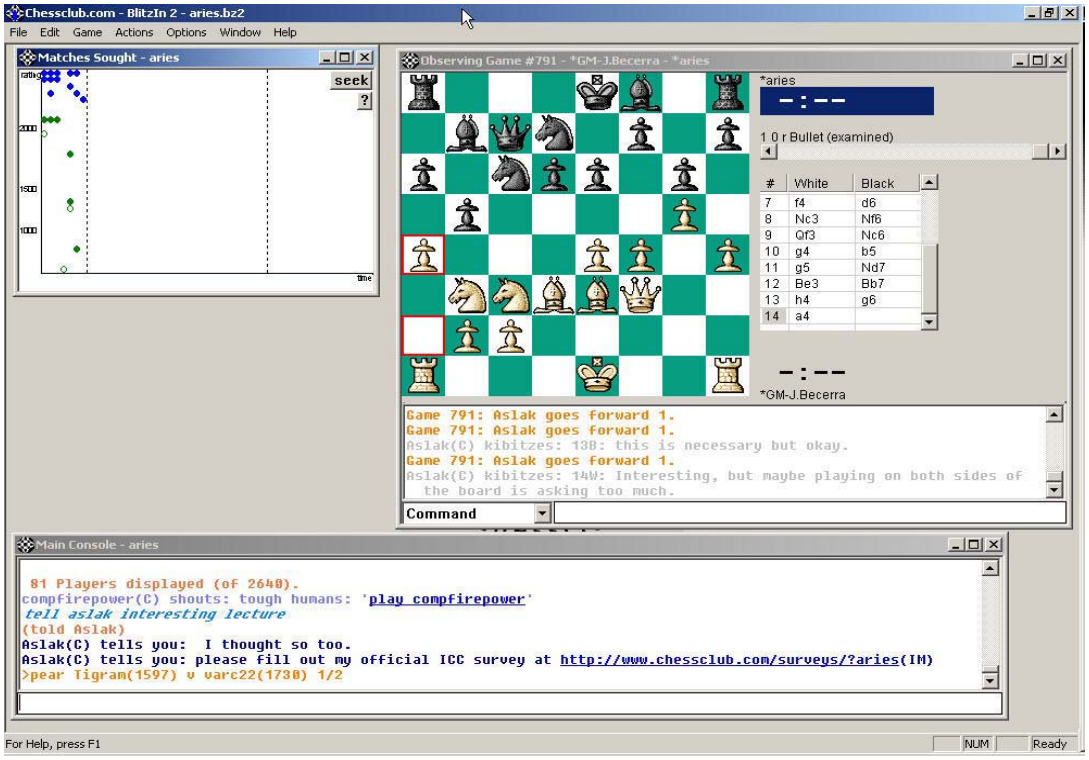

Figure 2. Member Exploration of the ICC Environment Using a Custom Client Interface, `Blitzin`

2.2. ICC Members: Grandmasters, Volunteers and Other Subgroups

Both implicit and explicit volunteers contribute effort to ICC. Implicit volunteers are those individuals whose efforts are not usually

real-world titled players as members is a good promotional benefit that the ICC can use for marketing purposes. As of February 2002, ICC has 318 Grandmaster members, (out of a real world total of 786, or 60%, and 646 International Master members out of a real world total of 2,185, or 27%). All of the chess games played by

the titled players flow directly into an internal ICC games database. The database is a structured and proprietary information archive of high value to the members who wish to improve their game by allowing members to search the results of games and place them in their private databases for replay and study. It is not possible to log onto ICC, export the database en masse, and use it outside which would weaken its benefit [2] . There are currently over 1.3 million chess games in this database and it, coupled with the Blitzin visual tool, serves the players' community of practice [4, 18] well. Because of their importance to the core activity of the community, and to encourage their use of the ICC software and database, ICC offers free membership to titled players.

Explicit volunteers help ICC members interested in playing and learning chess. "Helpers" are identified with an "H" suffix after their ICC identity, or "handle". Thus the suffix after the handle is a form of artificial status. Members must take a test, which is administered by a testing software agent, to become a Helper. They are not paid, however. Their reward is a private chat channel, Channel 100, where they can discuss ICC issues and socialize among themselves, much like the About.com "virtual water cooler" [6]. The members' questions to the Helpers, and their responses, occur in the main channel, Channel 1. "Administrators" or "Admins" are also able to respond to Channel 1 questions. Admins also have a higher degree of authority and status than the Helpers. For example, Admins can look up members' data such as their email address, their current dues status, and their most recent IP numbers in their logon history. They can ban people who are behaving in their view offensively from the server, or, in extreme cases, they can delete accounts permanently. They can also create complimentary accounts for Grandmasters and serve in addition as watchful guardians over the group of relatively less experienced Helpers. Most of the Admins are also unpaid volunteers, however some of them are paid consultants, and a few of them are equity holders in the privately held ICC.

Another type of explicit volunteer is the Manager. The Manager may also be an Admin or a Helper, but this is not required. The Manager fulfills the important role of running chess tournaments on demand. So, while Helpers and Admins assist and socialize new ICC members to the rules, norms and obligations of the community, Managers assist by creating the analog of a real-world chess tournament in this virtual environment.

In sum, ICC makes use of a volunteer base to provide around-the-clock service, seven days a week. Volunteer groups are recruited from around the world to serve its global community of members. The volunteers are recruited to address the observation that "online communities can connect narrow, targeted segments while leveraging the ubiquity of the web to generate sufficient reach." [11]. The ICC relies on volunteers to assist in member acquisition and retention. While there is no financial incentive to volunteer, there is status, and the opportunity to move up the volunteer chain.

3. ICC Member Attitudes and Activities Survey

We conducted a web-based survey in the time frame January 2003 to March 2003. To conduct the online survey, we used research assistants who logged on to ICC and we also made use of a software chatbot which functions in the ICC environment. This chatbot has been described previously [15, 16, 19]; it is a participant and observer in this community. It can give chess lectures at prearranged intervals (reading from a canned script), or it can chat in a human like manner. The interactive portion of the ICC Robot is built around program "D", a Java 2 implementation of the ALICE platform written by Jon Baer. Richard S. Wallace is the ALICE project originator (http://www.alicebot.org). To promote our survey, we modified this chat interaction to have the chatbot, at intervals, solicit members to go to the Web questionnaire. The member's ID is passed to the survey as ap parameter. To view the survey, visit the Web page http://www.chessclub.com/surveys? The questionnaire consists of basic demographic questions and set of attitudinal and use (activity) statements on a Likert 1 to 7 scale. There is also a section meant only for the volunteers. The net result of the combined chatbot and research assistant promotion was 124 respondents, with 29 of those being volunteers (Helpers or Administrators).

4. Results

We investigated how volunteers in the ICC community (24%) felt about ICC, as compared to non-volunteers (76%). Table 1A describes the demographic data collected from 127 ICC members.

Table 1A. Demographic Variables.

Variables	Value	N (%)
Age	11 to 20 yrs	38 (30%)
	21 to 30 yrs	30 (24%)
	31 to 40 yrs	33 (27%)
	41 to 50 yrs	14 (11%)
	Over 50 yrs	9 (7%)
Education	Less than H.S.	27 (21%)
	H.S.	35 (28%)
	Undergrad	33 (26%)
	Masters	22 (18%)
	PhD	9 (7%)
Gender	Male	116 (94%)
	Female	7 (6%)
Volunteers	Regular members	94 (76%)
	Helpers/Admins	29 (24%)
Years as ICC Member	< 1 year	36 (29%)
	1 to 2 years	16 (13%)
	> 2 years	74 (58%)

Table 1B shows the chess skill level of the ICC members and how many ICC members the respondents are acquainted with in real life. The letter grades correspond to 200 rating point increments. The rating fluctuates after each game played depending on the result (win, lose or draw) and the opponent's rating. A Senior Master is rated 2400 and above; a master is 2200-2399, an expert is 2000-2199, and so on down to the letter F, which is less than 1000. The histogram of the rating distribution is similar to the real world United Chess Federation with n = approximately 55,000.

Most of the members who answered the survey were males (94%), with at least a college degree (72%) and a wide range of age groups . A majority have been members of ICC for more than 2 years (59%), and the range of chess skill levels is normally distributed. Most ICC members spend over 20 hours per week online (42%), with 49 members (44%) knowing at least 5 members in real life.

4.1. Self-Reports on Attitudes and Behaviors

We asked 36 questions designed to elicit self-reported attitudes and behaviors of ICC members. Participants responded using a 7-point scale, where 1 was "strongly disagree" and 7 was "strongly agree." Multi-item scales were developed with factor analysis using varimax rotation. Scale items were included if they loaded at 0.45 or higher on the same factor and did not cross-load (at 0.40 or higher) on any other factor. The items that make up all the multi-item scales and the results of the factor analysis are shown in Table 2, in Appendix A.

Table 1B. ICC Variables.

ICC Variables	Value	N (%)
Chess Rating	F (lowest)	5 (4%)
	E	6 (5%)
	D	13 (11%)
	C	23 (19%)
	B	19 (16%)
	A	25 (21%)
	Expert	21 (18%)
	Master	6 (5%)
	Senior Master (highest)	1 (1%)
	None	49 (43%)
ICC members known in real life	Less than 5	14 (13%)
	5 to 9 members	35 (31%)
	> 10 members	14 (13%)

Factor 1 represents the various views of ICC, supporting the community (e.g., helping others, building relationships). The items in Factor 2 represent ICC members who are addicted to ICC (e.g., log on every day, feel at home, lose track of time) Factor 3 represents those members who are focused on learning about and improving their chess game (e.g., constructive use of time, learn about chess) while Factor 4 connotes those members who have more of a social focus (e.g., meeting people, playing nonchess games). Factor 5 are those members seem committed and enjoy their time as ICC members (e.g., plan to renew membership, recommend ICC to real world chess players).

4.2. Self-Reports on Use

Table 3 presents the various types of uses that ICC members reported in their survey. As discussed earlier, there are many software tools available to allow a variety of uses for ICC members.

There are tools to socialize and observe others (e.g., whisper, kibitz, read others' finger notes), tools to learn about chess (e.g., listen to lectures, play simulations), and tools for other types of non-chess playing games (e.g., wild games, non-chess games). Referring back to Figure 1, there

are interface features to support the major use subgroups identified in Table 3.

4.3. Relating the Demographic Variables with the Attitude and Use Factors

Table 4, in Appendix B presents the results of the full correlation table with the demographic, ICC variables, and factor scores from attitude and use data. Age is highly correlated with education ($r = .54$, $p < .01$) and years as an ICC member ($r = .36$, $p < .01$). Males have with higher educational levels than females ($r = -.20$, $p < .05$) and a higher chess skill level ($r = -.25$, $p < .01$) Those who have been ICC members for over two years spend more hours per week online ($r = .19$, $p < .05$), are more likely to be volunteers ($r = .28$, $p < .01$), have higher chess ratings ($r = .28$, $p < .01$), and know more ICC members outside the online community ($r = .31$, $p < .01$). Thus, ICC provides an environment to encourage and grow the volunteer corps, which is the critical facilitation element presented in Figure 1. Note also that the more hours spend on ICC per week, the higher the chess rating ($r = .23$, $p < .05$). This reinforces the idea that there are suitable tools on ICC to generate perceived value from the "chess focus" attitude 3 in Table 2.

The correlation of attitude factor scores with the demographic and ICC variables is revealing. Those who were ICC members longer ($r = .34$, $p < .01$) and volunteers ($r = .25$, $p < .01$) were correlated with supporting ICC (Attitude Factor 1). Not surprisingly, addiction to ICC (Attitude Factor 2) is related spending more time in the community and knowing more members outside the ICC community ($r = .22$, $p < .05$). It also seems that knowing members outside of ICC is also related to a motivation to stay a member ($r = .31$, $p < .01$), but not necessarily to improving their chess game ($r = -.23$, $p < .05$).

Finally, the correlation of use factor scores with the other variables suggests those who support ICC (Attitude Factor 1) use a variety of ICC tools for a variety of reasons. In addition, those who express an attitude about wanting to improve their chess game (Attitude Factor 3) also use more chess tools ($r = .23$, $p < .05$) but not other games ($r = -.22$, $p < .05$). Game players (Use Factor 3) tend to be younger ($r = -.21$, $p < .05$), spend more time on ICC ($r = .25$, $p < .05$), are more likely to volunteer ($r = .25$, $p < .05$), and have lower chess ratings ($r = -.39$, $p < .01$).

Note finally that all of the use factors, chess focus, social, and general games player, all correlate significantly with the "support ICC" attitude – a positive outcome for the ICC management. The interface, with the help of the volunteers, has thus provided enough value for each of the use subgroups.

4.4. Discussion of Results

The factor analyses of attitudes and use of ICC demonstrate a set of personality traits consistent with volunteerism: these include support of the ICC and real-world chess communities, the importance of helping other people, the importance placed on relationships with other ICC members, and the willingness to give feedback to improve ICC. Different kinds of member subgroups are interested in proactively shaping the internal norms and rules of behavior, based on their interests [2]. The results show a high degree of direct communication and interaction [20]. ICC is receiving payoff here from acknowledging its existing corps of volunteers.

Table 3. Principle Components Analysis of Use Variables

Variables	Socializer	Improve Chess	Game Player
whisper	**.80**	.12	.05
kibitz	**.74**	.04	.02
change my finger notes	**.66**	.15	.31
observe games	**.58**	.12	-.29
read ICC members' finger notes	**.55**	-.16	.36
censor	**.53**	-.11	-.01
listen to robot lectures	.22	**.68**	-.18
take chess lessons	.01	**.64**	.07
play in simuls	.16	**.57**	.40
listen to human lectures	.48	**.56**	-.16
standard games	-.09	**.55**	.09
bullet games	.14	**-.50**	.30
shout	.19	**.49**	.40
blitz games	.22	**-.43**	-.31
help other icc members	.26	.14	**.66**
wild games	-.36	-.14	**.62**
play in tourneys	.10	.02	**.55**
chat	.40	-.18	**.50**
play nonchess games	-.15	.07	**.48**

Considering these results in light of the overview framework presented in Figure 1, we see evidence for perceived value accruing from many of the prescriptive VCB elements suggested by the literature: channel communication, filtering, economic barter, and large-scale information assets. We also see the key role of volunteers in facilitating feature

access. ICC has the additional unusual feature of volunteers having the ability to extend the core business model by contributing software to the environment, which supports the general games player subgroup.

We also see members who are positive about ICC and who derive both chess-related benefit and intangible mood-related benefit. This is a payoff from the full-featured Blitzin client, the persistent handles fomenting trust, and the wide range of communication and software support for personal and larger group interaction. In addition, we see ICC members who prefer "non-chess games" and the socializers value the constant influx of newcomers.

5. Concluding Remarks

The analysis lends support to the argument that the ICC, with its dynamic environment, sophisticated interface, and support for both explicit and implicit volunteerism, is able to provide value to each of the member categories we identified in the analyses of their attitudes and their activity preferences.

The classic virtual community considerations of trust, reputation, identity, and economic infrastructure are all apparent in this environment and the linkage between virtual chess ratings and real-world chess ratings offers an unusual tie to strengthen findings regarding chess play in this environment. More generally, we show that volunteerism is a key "glue" component to facilitate and orient members to access the tools best suited for their use patterns and attitudes; a loss of volunteer discretionary energy would be disorienting and harmful to the owners' interests.

Our future plans include a study specifically targeting the ICC member retention decision process.

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Appendix A. Table 2. Results of Factor Analysis of Perceived Benefits and Uses

Variables	Factor 1 Support ICC	Factor 2 Addiction	Factor 3 Chess Focus	Factor 4 Social	Factor 5 Motivated to Stay
Help other people	**.813**	.146	-.190	.035	.078
I support the ICC community	**.811**	.114	-.017	-.048	.132
Become known to ICC members	**.777**	.086	.109	.188	-.152
Build relationships with ICC members	**.730**	.165	.065	.308	.145
Support real world chess community	**.677**	.199	.106	.067	.085
Tempted to participate as a helper	**.624**	.054	.177	.077	.243
Get my questions answered	**.621**	-.048	.164	-.211	-.116
Career advancement or professional visibility	**.598**	.086	.212	.168	-.099
I promote ICC to people I know	**.589**	.172	-.034	-.011	.218
Often provide feedback to improve ICC	**.577**	.310	.062	.114	.186
Easy to lose track of time on ICC	.138	**.789**	-.022	-.029	.095
I am addicted to ICC	.128	**.658**	.141	-.068	.077
Feel at home when I log on to ICC	.231	**.647**	.115	.219	.237
ICC does not interfere with real life relationships (reverse)	.179	**-.555**	.165	.023	.244
Log on almost every day	.243	**.520**	.200	-.059	-.162
People interfere with enjoyment	.153	**.473**	-.064	.077	.030
Don't care if I improve (reverse)	.052	.197	**-.754**	-.024	.114
Improved in chess since joining	.126	.094	**.676**	.011	.231
ICC is a constructive use of my time	.226	.208	**.671**	-.027	.124
Learn about chess	.271	.068	**.445**	-.392	.207
Would not want to socialize (reverse)	-.026	.052	-.282	**-.615**	.239
Nothing wrong with people meeting first	.025	.156	-.055	**.603**	.187
Met people on ICC that are good friends	.441	.015	-.039	**.565**	.174
Non-chess channels are entertaining	.310	-.302	-.267	**.536**	-.092
Real sense of community in my channels	.399	.160	-.180	**.451**	.354
ICC is an easy virtual space to navigate	.140	-.065	.091	.107	**.652**
I plan to renew membership	-.056	.139	.334	.013	**.625**
ICC help atmosphere policy works well	.172	-.247	.030	-.322	**.535**
I would recommend ICC to real world chess players	-.065	.324	.319	.210	**.473**
Knowing a member determines trust in post	.238	.190	-.222	.386	**.449**

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Appendix B. Table 4. Correlation statistics among demographic and ICC variables and factor scores

	1	2	3	4	5	6	7	8	9	10	11	12	13
Demographic Variables													
1. Age	1.00												
2. Gender	-.05	1.00											
3. Education	.54**	-.20*	1.00										
ICC Variables													
4. Years as ICC Member	.36**	-.09	.28*	1.00									
5. Hours Spent on ICC	.08	-.16+	-.07	.19*	1.00								
6. Volunteer (Helper)	-.05	-.05	-.02	.28**	.13	1.00							
7. Chess Rating Class	-.05	-.25**	.11	.27**	.23*	.06	1.00						
8. ICC Members Known in Real Life	-.01	.15	-.07	.31**	.06	.12	.48**	1.00					
Attitude Factor Scores													
9. Support ICC	-.02	.18+	-.13	.14	.34**	.25**	-.05	.05	1.00				
10. Addiction	.27**	-.12	.21*	.28**	.38**	.09	.14	.22*	----	1.00			
11. Improve Chess	-.21*	-.11	-.28**	-.32**	.12	-.22*	-.04	-.23*	----	----	1.00		
12. Motivation to Stay	-.09	.20*	-.13	.27**	.09	.12	.17+	.31**	----	----	----	1.00	
13. Social	.15	.04	-.05	.17+	.04	.11	-.14	-.11	----	----	----	----	1.00
ICC Use Factor Scores													
14. Social Uses	-.11	.09	.01	.12	.17	-.12	.22*	.17	.21*	.14	.07	.23*	.05
15. Chess Focus	.16	-.04	.10	-.25*	-.11	-.09	-.29*	-.39**	.29**	-.16	.23*	-.07	.00
16. Game Player	-.17	.14	-.21*	.15	.25*	.32*	-.39**	.03	.48**	.05	-.22*	.22*	-.02

Note. Correlations within factors scores are not reported since they are orthogonal, with a correlation of zero between them because they all have a mean of 0 and a standard deviation of 1.
**$p < .01$, *$p < .05$, +$p < .10$

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