

# WEB BUSINESS AND DEVELOPMENT OPPORTUNITIES

## *Learning from Community Networked Services*

Juhana Peltonen<sup>†</sup>, David G. Messerschmitt<sup>‡†</sup> and Mikko O. J. Laine<sup>†</sup>

<sup>†</sup> *BIT Research Centre, Helsinki University of Technology, Espoo, Finland*

<sup>‡</sup> *Department of Electrical Engineering and Computer Sciences, University of California, Berkeley, U.S.A.*

**Keywords:** Web 2.0, Virtual community, Networked service system, IS development, Business development.

**Abstract:** In this position paper we analyze a category of internet service firms providing what we call “community networked services” (CNS), a concept often discussed under the broad umbrella of “Web 2.0”. In a CNS, members of a virtual community co-create value amongst themselves with the explicit facilitation of a service provider, often manifested by a continuously accumulating and usually open information repository capturing user-generated content. We discuss these characteristics and their operational and managerial implications to CNS firms, which include a smaller reliance on human workforces, a community-oriented innovation model, a stronger disconnect between revenue and recipients of value, and greater network externalities among users. Drawing on these observations, we argue that there is an opportunity for academic research that both understands and improves upon the processes used for the integration of business development, IS development, and user support in CNS firms. Not only can such research help improve the performance of CNS firms, but given the high risk tolerance and experimental nature of these consumer applications, it can also capture innovations and best practices applicable to incumbent service firms in e-commerce and enterprise software applications.

## 1 INTRODUCTION

In the context of emerging internet services both the service and software industries are headed in a distinctly new direction, and in the process their fates are becoming more intricately interlinked. That is the basic thesis of this position paper, building on research reported elsewhere (Messerschmitt et al., 2008)<sup>1</sup>. A key distinguishing characteristic of CNS’s is a focus on loosely-coupled virtual communities whose members co-create value internally as facilitated by a service provider (SP)<sup>2</sup>. Examining these services identifies new opportunities and challenges in the management and operations of SP’s, particularly in the integration of the business development, software and IS development, and the customer support functions

<sup>1</sup>This work was funded by the Finnish Funding Agency for Technology and Innovation and several industry partners.

<sup>2</sup>CNS SP’s are organizations (e.g. firms, non-profit foundations) that strongly base their business models on one or more CNS’s.

of a software/service firm. There is an opportunity for both theory-building and applied research that spreads emerging innovations and best practices and contributes to greater effectiveness and efficiencies in such firms, and also to carry the most meritorious of these insights to incumbent service firms.

## 2 WHAT IS CNS?

In (Messerschmitt et al., 2008) a class of emerging “virtual community service systems” called *community networked services* (CNS) are defined and studied. CNS’s involve a technical platform with functionality that explicitly facilitates interaction among members of the user community. CNS’s are a special category of service systems<sup>3</sup> where value

<sup>3</sup>This is defined in (Spohrer et al., 2008) as: “A service system is a dynamic value co-creation configuration of resources, including people, organizations, shared information (language, laws, measures, methods), and technology,

is co-created<sup>4</sup> among community members (compared to co-creation of value between users and the SP). CNS's serve business-to-consumer (B2C) and consumer-to-consumer (C2C) markets, and have some distinguishing characteristics. The most fundamental include:

- **Community Orientation.** CNS's emphasize a membership forming one or more user communities on a virtual communication medium. In contrast to formal *organizations*, these virtual *communities* are typically transparent, pursue loose and open-ended goals, and are loosely governed.

- **Value Creation.** In a CNS users derive considerable value through interactions with other users within some particular service context. Unlike in typical e-services, the role of the SP is merely to facilitate these community activities while encouraging (rather than precluding) direct user-created value.

- **Information Visibility.** An information repository is continuously accumulated as a result of user activity and widely accessible to all users. It yields increasing value (for both users and the SP) over time through large quantities of public information (as opposed to more limited quantities of business and trade secrets stored in corporate IS's).

When operational and technological practicalities are considered, other noteworthy characteristics include:

- **Innovation Model.** More so than incumbent services, many SP's appear to actively involve users in the ongoing evolution and enhancement of services. Exploiting the openness of the Web technologies, innovative capability can also be created by encouraging third-parties extensions and compositions.

- **Smaller Reliance on Human Workforces.** The technical platform supports direct service functionality and necessary support functions (e.g. billing and user service), and customer-facing human workforces can, to a large extent, be "crowdsourced" to the community (for instance in governance functions).

- **Operational Models.** Operations require data centers managed by the SP, though third parties can also host infrastructure pieces. The data centers realize service-specific functions and the burden of maintaining user-facing service-specific software following the software as a service (SaaS) model<sup>5</sup>.

CNS represents a convergence of two trends:

all connected internally and externally to other service systems by value propositions."

<sup>4</sup>Value co-creation (Vargo and Lusch, 2004) is contrasted with transactions in which there is a clear distinction between the "sources" and "recipients" of value.

<sup>5</sup>In SaaS, the installation of service-specific software in the users' access devices is avoided by executing software in the data center or by software dynamically downloaded and executed in the user's environment.

- **Service Provider Evolution.** The service industries are moving toward increased online presence and using information systems to displace human workforces in both service and user support functions.

- **Software Industry Evolution.** Software vendors increasingly emphasize social applications that support interaction and collaboration among users, and also "cloud computing" and SaaS as channels for software distribution.

In the context of CNS, the application software vendor and online services industries appear indistinguishable. CNS firms are *both* software vendors (which seek a profit through leveraging a major competency in software) and service firms (which seek a profit providing capabilities to consumers). A major enabler for this industry convergence is the ubiquitous Internet and a software platform based on the Web open standards.

Some informative examples of CNS SP's include:

- **LinkedIn** ([www.linkedin.com](http://www.linkedin.com)) is a free-for-use professional advertising-supported networking service. By making use of user-provided content, subscribers can maintain professional contacts, keep in touch with job opportunities, and seek expert opinion. Subscription-based premium accounts provide extended functionality.

- **eBay** ([www.ebay.com](http://www.ebay.com)) facilitates auctions and supporting community activity for individuals, small businesses, and enterprises. Users can rate sellers and buyers, discuss and chat about topics of interest, form interest groups, and attend online and offline events and workshops. It charges an auction fee plus a percentage of the selling price.

- **Facebook** ([www.facebook.com](http://www.facebook.com)) is a free-for-use social networking service that profits by selling advertising, opinion polls of the membership, and virtual goods. Users can create networks of "friends", maintain personal profiles, create groups and events, share photos, and use add-on applications. Third-parties can deploy extensions utilizing an open API, and host the extensions on their own servers.

- **Wikipedia** ([en.wikipedia.org](http://en.wikipedia.org)) encourages users to collaborate on editing articles, and enables them to view article histories and discuss articles with other users. The result of these collective volunteer efforts is a huge and widely available knowledge repository.

CNS is a hotbed of innovation, leveraging the willingness of consumers (especially young ones) to take risks and to center their lives in new online-oriented ways. The "pure" CNS firms that we observed are entrepreneurial startups, while some incumbent e-commerce firms (like Amazon and eBay) have adopted CNS ideas to enhance their existing services. Similarly there is an opportunity to adapt

the best ideas from CNS in various incumbent organizational and enterprise applications, making the CNS concepts, techniques, opportunities, and challenges a topic of larger interest. Business-to-business (B2B) and enterprise applications are appropriately more conservative and risk adverse, but many successes in CNS can be extended to these domains as they are qualified as valuable and mature.<sup>6</sup>

### 3 OTHER PERSPECTIVES

There is a wealth of pre-existing research that is relevant to the study of CNS firms.

While the “Web 2.0” (O’Reilly, 2007) concept has merit in capturing recent large-scale social and technological developments, its lack of rigorous definitions and overly broad scope limits its applicability to academic research<sup>7</sup>.

The e-commerce literature has a long tradition in studying online businesses. Its starting point is often that e-commerce systems are extensions of firms’ internal information systems into the online medium with an emphasis on transactions and business processes (*cf.* Alter, 2002; Wareham et al., 2005). A shortcoming of this approach for CNS is that the social complexities underlying community activities that are central to CNS are difficult to characterize in terms of processes or financial transactions, and require different analysis techniques<sup>8</sup>. E-services are an extension of e-commerce from goods to services, while the focus remains (in our view) within the scope of B2B and B2C.

Research on virtual communities partially addresses these shortcomings by studying their nature and constructs associated with value (*cf.* Lin and Lee, 2006). However this literature rarely considers broader operational and business issues faced by the SP when their business is predominantly focused on virtual communities. The knowledge management lit-

<sup>6</sup>For instance, features for managing professional networks are increasingly utilized within organizations and reflected in enterprise software functionality.

<sup>7</sup>For instance, the discussion here is generally not applicable to Web 2.0 firms and applications such as Google Search, AdSense, and BitTorrent due to our stronger assumptions about the user community. For instance, Google Search (not a CNS but Web 2.0) identifies central web pages with a Web crawler and data mining approach, whereas Wikipedia (both Web 2.0 and strongly a CNS) requires explicit social interaction among user-authors in its approach to harnessing collective intelligence.

<sup>8</sup>Indeed, the only identifiable business process in some CNS firms is display advertising and related revenue collection.

erature identifies organizational knowledge as a potential source of competitive advantage (see the review by Metaxiotis et al., 2005), and this perspective is relevant to CNS firms. Nonetheless, CNS users reside on the vast internet scale rather than within organizational boundaries and operate on open information that has few policies governing its distribution. Research that accommodates these differences has begun to emerge (*cf.* Koh and Kim, 2004).

Literature with a technological orientation (e.g. software as a service and web information systems) is highly relevant to CNS, as these technologies form the foundation of community interaction and information access and capture. However in most CNS’s, fairly generic Web technologies are used<sup>9</sup>.

Nearly all aspects of CNS have either been studied separately to some extent or fall within the domain of existing disciplines and research tracks. However it is the combination of community orientation, value creation models, and information visibility that together have operational and business implications worthy of further inquiry. The remainder of this paper supports this premise.

### 4 STAKEHOLDERS AND VALUE

The business environment of a CNS is a particularly complex one involving numerous stakeholders and intricate relationships between value (from whom and to whom?) and revenues (from whom, and why?). This section outlines some of these complexities, and the following section relates them to specific management challenges. Some important stakeholders in a CNS include:

- **Service Provider.** The SP is the designer and major investor, and defines the functionality of the service in the process of software and information systems development and operates a technology platform that supports the service<sup>10</sup>. The SP underwrites most of the development and operational costs, and expects a return on investment.

- **Users.** The users are direct beneficiaries of the CNS, making use of the functionality and capabilities of the SP and engaging in cooperative activities with other users. The users typically also provision

<sup>9</sup>There are exceptions like Second Life, There, and World of Warcraft that use other technologies with richer user interfaces than afforded by the Web, although they pay a price in target market size by requiring users to install special software and to obtain sufficiently powerful hardware.

<sup>10</sup>This may also include outsourcing infrastructure to third parties provisioning and operating “cloud” infrastructure and performing systems integration.

and administer access devices<sup>11</sup> that are also a critical part of the technological infrastructure for the service.

- **Virtual Communities.** Assume their own stakeholder identity in the sense that some actions and outcomes can be ascribed to the community rather than individual users<sup>12</sup>.

- **Third Parties.** Include advertisers and outside developers who develop and support service extensions.

As mentioned earlier, a strong distinguishing characteristic of a CNS is a greater disconnect between how value is co-created by the various stakeholders and the sources of revenue. Even though users are major recipients of value, they typically use the service for free<sup>13</sup>. The value they derive is exploited by the CNS firm to retain these users and attract new ones and to encourage them to actively use the service. To increase this value, the CNS firm may explicitly encourage extensions or compositions with complementary services, and may share revenues with developers and/or providers<sup>14</sup>.

The business model of a CNS firm seeks to convert the various sources of value into revenue. This is complicated (in comparison to e-commerce, for example) in several important respects. While users are a primary target in the design of the service, they are often *not* the major source of revenue. That accrues to third parties such as advertisers. The effectiveness of display advertising is enhanced as more information is available about the user's context and interests. Many CNS's can provide a considerable amount of such information to aid the targeting of ads originating from user profiles, user behavior, and user-generated content<sup>15</sup>.

A primary focus of the service design is attracting

<sup>11</sup>These may include personal computers, smart phones, game consoles, etc.

<sup>12</sup>An example is a poll or a discussion that arrives at a consensus position representing the conclusion of the community as a whole rather than individual members.

<sup>13</sup>Arguably community orientation has some role in this: pieces of user-provided content are rarely something users would pay for, even if they high quality and ample. CNS's also often serve non-professional activities, as content creation is not mandated by an organization.

<sup>14</sup>An extension adds capabilities to the CNS, and can be hosted by the CNS firm or by a third-party provider (Messerschmitt et al., 2008). A composition occurs when the extension is itself a fully functioning stand-alone service, and often requires extensions to achieve integration of the two applications. An example extension is a user-developed application in Facebook and an example composition is the integration of the interactive globe of Google Earth that links to other sources of content like Wikipedia (articles) and Picasa (images).

<sup>15</sup>This raises considerable privacy concerns which should be addressed in the governance policies.

and retaining users, because their activities are usually at least an indirect source of revenue, and without the users the service would be pointless. The importance of community to users introduces strong network externalities (a success-breeds-success phenomenon) and switching costs that discourage users from moving to competing services<sup>16</sup>. The lack of formal organizational boards and information openness act to magnify these effects.

The emphasis (or lack thereof) on extensions and compositions is a challenging business and design issue involving tradeoffs between the risks of security holes and poor quality and a possible loosening of the relationship with users on the one hand, against the considerable benefits of bringing to bear considerable energy and innovation through complements, economies of scale, and stronger network externalities on the other.

## 5 BUSINESS AND IS

There are numerous challenges in managing a CNS firm. Among the most notable is the difficulty in defining successful business models in a complex and changing environment. There are at least three related issues:

- **Business Development.** focuses on what users actually want, as opposed to what the entrepreneurs may have originally conceived.

- **IS Development.** focuses on realizing the functionality envisioned for the service, maintaining the functionality as problems arise, and evolving and expanding functionality as additional user needs arise.

- **User Support.** focuses on assisting the users as they encounter challenges or problems, as well as removing those challenges or problems as they are identified.

Our position is that these three classes of business challenges are more intricately linked, when compared to incumbent online services bearing limited CNS characteristics. In addition, the very nature of a CNS opens opportunities to do these things better.

Business and IS development are more intricately coupled in a CNS for the following reasons:

- **Connecting Value with Revenue.** As described in Section 4, this connection, which is difficult enough in incumbent services, is considerably complicated

<sup>16</sup>Network externalities (Katz and Shapiro, 1985) refer to the increase in value that users perceive as the community grows larger. Switching costs manifest 'lock-in' (Amit and Zott, 2001), and they include the perceived disadvantages (in money, time, and inconvenience and similar factors) in leaving.

whenever there is community activity and/or third-party developers. Thus the design of the service, which occurs mostly in the course of software requirements setting, must take into account a complex set of priorities (what can we do that will have the biggest payoff?) and tradeoffs (how should we...?). Especially in the facilitation of community activity, it is difficult to anticipate what will be most popular with users; frequently, minor features may turn out to be a big win. For example, selling virtual furniture in Habbo<sup>17</sup> was not an initial feature but has turned out to be popular among users, and also a new source of direct revenue.

- **Capturing User-initiated Innovation.** Many if not most incumbent services are, to a large extent, automations of existing offline service functions. Examples include online retail and financial banking and brokerage. Our observation is that CNS's are more likely to set off in entirely new directions, although this is not universal. Examples include DeviantArt (an art community) and Twitter (a micro-blogging service). A CNS that is most effective in capturing user's ideas is likely to be the most successful. The process of capturing such ideas should actually be an important element of service design<sup>18</sup>.

- **Multi-firm Strategies.** Multiple firms can collaborate in CNS development (independently or through acquisitions) by contributing compositions with their own information repositories and building extensions. Business tradeoffs in make vs. license decisions inherent in extensions and compositions are directly reflected in design choices. Beyond this, standardized vs. proprietary decisions are deeply intertwined with business and technical considerations.

- **Governance.** Governance mechanisms, privacy policies, terms and conditions, etc. influence user acceptance, and hence benefit from user involvement. Generally these choices must be reflected in coordinated design issues, such as what data is captured and how it is protected.

- **Market Dynamics.** Like many incumbent online services, network externalities create an initial obstacle to establishing a critical mass but reward successful services that reach a large market share. These effects are intensified by the community and information openness aspects, and this places more of a premium on strategies for first-mover positioning. On the other hand, the presence of the community tends

to reward successful services with less churning of the user base by creating a substantial community-driven switching cost.

These considerations increase the importance of business and information systems development in the success or failure of a CNS firm. However, we believe they especially place a premium on an integrated strategy for three aspects of the business: business and IS development and user support. This conclusion flows mainly from two factors:

- **Software-mediated User Relationship.** In the CNS's that we observed, the contact between users and CNS firm is almost entirely software-mediated, with (for better or worse) little direct human contact. This software not only supports the domain-specific activities of the users but can also (if so designed) support the capturing of user-initiated innovation and enable the bulk of the user support function<sup>19</sup>. Thus, appropriate software design can give a big boost to the business separately from and in addition to domain-specific functionality, increasing both effectiveness and the productivity of human workers (particularly in the support functions).

- **SaaS User Support.** The SaaS software distribution model enables the user support function to be implemented in a particularly effective and efficient manner. First, the single latest release of the software is presented to all users simultaneously, greatly reducing the support burden relative to distribution strategies that leave multiple versions in the user's hands simultaneously. Second, there is an opportunity (if the software development process is sufficiently agile) to fix shortcomings and defects quickly and roll these fixes out to all users quickly. To the extent this is successful, user support shifts from assisting users in living with problems to one of continuous improvement and a focus on eliminating problems shortly after they are identified.

These factors yield an opportunity to "get it right" in terms of a close coupling of the business development and user support functions in information systems development. The complex of considerations described in Section 4 are among those that need to be taken into account in terms of business development. Beyond the factors in incumbent online services, the community aspects of the application are similar to collaboration technologies, albeit in a more specific and customized service context. Considerations like the choice of standardized vs proprietary solutions and the delegation to extensions and compositions also mix technical and business issues.

<sup>19</sup>For instance, both members of the user community and SP employees can post solutions to problems on the service's blogs and discussion boards.

<sup>17</sup>Habbo Hotel (<http://www.habbo.com>) is a virtual world targeted at a teenage audience.

<sup>18</sup>An example of a service that is particularly effective at this is World of Warcraft. Close monitoring and interaction with the community helps to tune the game to a balanced world with innovative user-driven features.

The potential for integrating software development with customer support, as well as agile characteristics in the context of a complex functionality and large user community are also a challenge to the IS development processes.

Regardless of the extent to which the opportunities identified here are realized in present CNS firms, the challenges and opportunities loom large.

## 6 RESEARCH OPPORTUNITIES

As concluded in Section 3, research on the various facets of CNS suffer from fragmentation and loosely defined terminology, and thus fails to holistically address this subset of the “Web 2.0” phenomenon. Therefore, topics related to CNS are a ripe and promising opportunity for academic research from which existing and emerging CNS firms could benefit through improved processes and methodologies. Specifically, the following are some promising lines of research:

- **Empirical Research into CNS Firms.** The goal is to capture and categorize innovations and best practices from existing CNS firms in areas such as business development, software development, and customer service, and how they are integrated. The goal of this research is to better understand these phenomena, to identify opportunities to improve the performance of these firms, and to capture best practices which can be adopted by emerging CNS firms and non-CNS firms.

- **IS Development.** CNS offers an opportunity to advance the state of the art methodologies in agile processes for software development and coupling this to SaaS software distribution models. The user communities for these applications are, relatively speaking, risk tolerant and amenable to experimentation. There is also an opportunity to observe and improve processes for requirements setting and design decisions that are tied to business issues in an environment of strong coupling between business and design<sup>20</sup>.

- **Incumbent Services.** A major issue for research is the extent to which ideas and methodologies from CNS can be transferred to a broad range of incumbent services. This requires expanding our understanding of how value is created and exploited in CNS.

<sup>20</sup>For instance, close collaboration in feature development with the most active content contributors can facilitate expansion of the shared information repository, and this serves business purposes by contributing value to other stakeholders.

## 7 CONCLUSIONS

Not only are CNS firms at the forefront of innovation in online services, they are an exciting development because of the new territory that they explore in functionality and business and information systems methodology. An important opportunity presents itself to the information systems, software engineering, and management fields to understand these recent developments and promulgate them to the broader universe of online services and web information systems.

## REFERENCES

- Alter, S. (2002). *Information Systems: The Foundation of E-Business*. Prentice Hall.
- Amit, R. and Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, 22(6/7):493–520.
- Katz, M. L. and Shapiro, C. (Jun 1985). Network externalities, competition, and compatibility. *The American Economic Review*, 75(3):424–440.
- Koh, J. and Kim, Y. G. (2004). Knowledge sharing in virtual communities: an e-business perspective. *Expert Systems with Applications*, 26(2):155–166.
- Lin, H. F. and Lee, G. G. (2006). Determinants of success for online communities: an empirical study. *Behaviour & Information Technology*, 25(6):479–488.
- Messerschmitt, D. G., Peltonen, J., Laine, M. O. J., and Oza, N. (2008). Community networked services: Learning from Web 2.0. Technical report. Dec. 30, 2008. ISBN: 978-951-22-9734-4. <http://ssrn.com/abstract=1320947>.
- Metaxiotis, K., Ergazakis, K., and Psarras, J. (2005). Exploring the world of knowledge management: agreements and disagreements in the academic/practitioner community. *Journal of Knowledge Management*, 9(2):6–18.
- O’Reilly, T. (2007). What is web 2.0: Design patterns and business models for the next generation of software. *Communications and Strategies*, No. 65, First quarter:17–37.
- Spohrer, J., Vargo, S. L., Caswell, N., and Maglio, P. P. (2008). The service system is the basic abstraction of service science. *Proceedings of the 41st Hawaii International Conference on System Sciences (HICSS)*.
- Vargo, S. L. and Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1):1–17.
- Wareham, J., Zheng, J., and Straub, D. (2005). Critical themes in electronic commerce research: a meta-analysis. *Journal of Information Technology*, 20:1–19.