Scalable Social Software Services: Towards a Shopping Community Model
Based on Analyses of Established Web Service Components and Functions

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Abstract
The common use and variety of social software services has rapidly increased over the past years. The big success of established services like Facebook, Twitter or YouTube accelerates the transformation of the whole web. Next generation services are characterized by strong social interaction and collaboration tools. Significantly affected by this movement, conventional commerce platforms and online shops are gradually substituted by social shopping communities. Social commerce allows consumers to collaborate online, to exchange information about products and to get advice from trusted individuals. This paper introduces a scalable social software service model for an online shopping community built under consideration of existing best practice services. The model combines features of social networking, online shopping and social commerce sites. We present comparative analyses of these three service categories, significant showcases as well as the creation process of the model itself. The designed framework serves as basis for both service developers and researchers.

1. Introduction
Recent years have witnessed the remarkable popularity of social web services, in which millions of users interact, collaborate and communicate. Driven by new concepts, technologies and features the web has become more social and interconnected. Social networks like Facebook or MySpace, social media sites like Flickr or YouTube and micro blogging services like Pownce or Twitter are only some web applications which strongly changed internet. O’Reilly [1] summed it up by the buzzword “Web 2.0” and many other wrote about the phenomenon of social web and the wisdom of crowds [2-4]. Nowadays the web is not a one way street anymore. Every user is an active part of the whole sphere and can easily become an author, publisher or media distributor. The fast growth of social web can be demonstrated by creating some traffic charts for leading social networking sites with the popular traffic ranking engine Alexa.com. For example the daily reach, expressed as the percentage of all internet users who visit a given site, of the leading social network Facebook tripled within the last two years. Actual data, gathered on established sites like Quantcast.com, comScore.com or Crunchbase.com, show that Facebook has about 110 million active users, with more than 6 million user groups and more than 30 million photos uploaded daily. Over 24,000 applications have been built for Facebook by third party developers and nearly 1400 new applications are added every day.

This current evolution has also a strong influence on B2C and C2C e-commerce [5, 6]. In consequence of social networks’ market power and their mass of potential customers, new shopping concepts are being developed. Social commerce is the synonym for the next generation online commerce and is significantly affected by a fast preceding social networking. The rise of consumer communities [7] on the web started a few years ago. Such services have a strong community character and could be run as collaboration networks or in combination with e-shops, where products can be bought directly. The request of the web community and consumers for more participation and transparency is a driving factor of social shopping services. User surveys clearly showed that potential customers of a product attach more importance to recommendations and ratings of other users, than to classical product descriptions and advertisements [8, 9]. Innovative concepts and developments announce a new age of online commerce, whereas crowdsourcing [2] and consumer generated content are exemplarily figured out as distinctive milestones of these new developments. Consumers generate content like reviews, ratings, product photos or video instructions for other consumers [10-13]. The convergence of media lightens the borders of content, advertisement,
distribution and consumer. As a consequence, the time of monotony in online retail is a thing of the past. Currently, social shopping communities are positioned mainly in niche markets [4] beside well known big players like Amazon and eBay. But more and more merchants and service developers are launching such new shopping models, and social web features will become a must-have for every shop owner in near future [14-16]. To enable next generation shopping new social software service models are necessary to meet the demands of modern consumers [8].

This paper presents a scalable social software model for such an innovative shopping community. Under consideration of analyzed best practice web services regarding their components, functions and interactions, we constructed our generic model. The following section provides related work, mostly concentrating on academic research and basic literature. Section 3 briefly outlines the methodological approach we defined for our work. In section 4 we present the results and selected showcases of our analyses. Section 6 shows our scalable social software service model. We finally present a summary and outline future directions of research in section 7.

2. Related Work

Extensive research on social web, its concepts and user behavior has a rich history. Literature of Web 2.0 [1-3, 17] and social web services [18] provides an overview on that field. Especially Surowiecki [3] analyzed the wisdom of crowds, an aggregation of information in groups, resulting in decisions that are often better than any decision of a single member of the group. The book presents numerous case studies and anecdotes to illustrate this argument and touches on several fields, primarily economics and psychology. Crowdsourcing is a neologism, which was coined by Jeff Howe [2] and describes, contrary to outsourcing, not the outsourcing from business tasks and –structures to third party companies, but the outsourcing to the intelligence and the manpower of a mass of voluntary staff on the internet.

The phenomenon of social networking and its driving are topic of related literature [19-27]. Especially Boyd and Ellison [26] are illustrating the global phenomenon and history of social networks.

Despite of considerable interest in academic circles, as represented in various blog posts [28, 29], little academic research has been done in the field of social commerce and shopping communities to date. Work we published recently underlines the importance of social commerce [30, 31] and shows earlier versions of models and concepts [32, 33] for next generation social shopping services.

To create our scalable social software service model we discussed different related work in the field of electronic commerce [34-37], community design [38, 39] and specific social features [40-42].

3. Methodological Approach

After the initial described fundamental review of related literature and work we defined our approach to reach presented goals. For the final creation of the social shopping community model several steps of research (Figure 1) were necessary. Based on a conceptual knowledge of social software services, especially for social commerce, we concretized the main research question to have a strong focus during the different stages of our work. Beside the question on recent components, functionalities and interactions of a modern social shopping community, we were also interested in future trends and used revenue streams in the field of social commerce in general. To cover all aspects and to answer those questions, we designed a multi-stage methodological approach evolved as follows:

3.1. Categorization and Site Selection

To gather information about relevant components, functionalities and interactions for the scalable social shopping community model, we started to categorize related services. Subsequent we identified three basic genres of sites which are significant for the design of our model. As described in the introduction, a social shopping community combines the advantages of social networks and online shops under consideration of interactive social commerce features. Thus, we targeted conventional social networking sites and online shopping sites, as well as social commerce sites to conduct our survey.

For each of the three predefined groups we required 100 sites to start extended analyses. The process of selection was performed in an analogous manner for all of the three categories. We collected sites from all over the world from well known web lists and online resources like Mashable.com, Crunchbase.com or Web2List.com. Criteria for the selection were technological maturity and a minimum of complexity of the services, sorting out sites in an early beta stage from our initial list. Out of the rest we took a random sample of 100 sites. So finally we had 300 different sites separated into three different categories for our research.
3.2. Evaluation and Case Summaries

For the evaluation of the selected sites a structured spreadsheet (Figure 1) for each category was created. Based on a specified metric every site was analyzed, rated and described. Beside some standardized meta data each category (e.g. year of foundation, location, market orientation, multilingualism etc.) there were some individual qualitative assessment criteria (e.g. design, usability, content, actuality etc.) and several feature-related criteria (e.g. forums, blogs, groups etc.) for each of the three different categories. Qualitative criteria were rated with numbers from 1 to 5, whereas a 5 was the best. Feature-related criteria have been considered with “yes” or “no”. Concrete criteria and results are presented in the analyses section in this paper. After the definition of the metric all sites were screened and evaluated. To give a better presentation we transferred the results of the performed evaluation to a standardized case summary collection, including one page for every analyzed site. Additionally there was included a short written description and two screenshots of every observed site on each page. A case book with 300 pages divided in three categories including all sites was the result of these steps and built the base for future research and development.

3.3. Analysis and Interpretation

After evaluation of all sites and summarization of gathered data in case summaries we started a detailed analysis (Figure 1) by creating rankings and charts. Main goal was the indication of applicable components and functionalities of each different service category and their concrete percentage of usage. Furthermore we analyzed the interactions between the components and external applications or third party services. In a final step we documented all results and interpreted rankings and charts to provide an informative basis for the following stages of development. Especially the frequency of usage in percent of distinct components, functionalities and interactions was a significant source for the design process beside other fundamental research on social software service concepts and functionalities, described in the literature section of this paper.

3.4. Clustering and Model Creation

Before we started with the creation of the scalable social software service model we clustered all identified components and functionalities into three different sections, similar to the aforementioned service categories. Additionally we defined a centric entity (consumer, product, merchant) for each part of our shopping community model. Based on every main entity we started to build sub entities, components and functionalities around it and finally we connected all elements trough interaction paths. The modular design
of our shopping community was an initial condition to assure its scalability and flexibility to integrate it into already existing conventional e-shops or communities.

4. Analyses, Results and Showcases

Three analyses for the initial identified service categories, social networking, online shopping and social commerce, were done simultaneously in a similar way. The following part of this paper presents the analysis design, the selected sites and results focused on the top ten components and functionalities for each investigated category by their percentage of usage. Additionally, one significant showcase for each genre is described to demonstrate relevant components and functions.

4.1. Analysis of Social Networking Sites

Out of all collected conventional community and social networking services we took a random sample of 100 sites (Figure 2) for the standardized evaluation. Beside selected components and functions presented in the following section, analyzed criteria were basic data like the year of foundation, market orientation, used revenue models, and multilingualism.

![Figure 2. Selected Social Networking Sites](image)

Results show that 33% of all social networks have multilingual sites, 94% have a global orientation and 25% are closed networks, what means that a user needs an invitation from another person to join a social networking service.

4.1.1. Components and Functions

The analysis of 100 conventional social networks and communities (Figure 3) outlines that nearly all sites (99%) are using customizable user profiles followed by photos (85%) and groups (64%). 55% of all sites are using blogs and 52% have integrated forums. 50% of all sites have integrated an event calendar and nearly half video features (46%). About one third of all investigated sites are using widgets (31%).

![Figure 3. Component and Function Usage (n=100)](image)

Music (15%) and application programming interfaces (10%) to integrate external applications are not very commonly used. In general, most of the analyzed sites offer a standard setup with user profiles, photo galleries and forums or groups for communication.

4.1.2. Showcase Ning.com

Ning, as a special white label platform, hopes to compete with large social sites like MySpace or Facebook, by appealing to users who want to create networks around specific interests or have limited technical skills. The unique feature of Ning is that anyone can create an own custom social network for a particular topic or need. Currently more than 420,000 networks have been published on Ning. Users can build features on their own using Ning APIs. Less technologically sophisticated users can set up a social network with point and click setup options. Ning allows developers to have some source level control of their social networks, enabling them to change features and underlying logic. Ning offers a broad variety of social networking features, all infinitely customizable to meet members’ needs. Thus, developers can run OpenSocial gadgets within their networks. Currently, Ning has two primary revenue models. One allows users to create a network for free, in exchange for the network hosting ads that Ning supplies. The other, their “Ning for Business” option, offers users a network where they control the ad content, in exchange for a monthly fee. A few other premium services such as extra storage and non-Ning URLs are also available for additional monthly fees.

4.2. Analysis of Online Shopping Sites

To run an evaluation on conventional online shopping services, we selected 100 sites (Figure 4) by a random sample out of a large list of collected cases.
The selected sites belong to different market segments like fashion, lifestyle, electronics or sports.

Figure 4. Selected Online Shopping Sites

We focused on components as well as functions and found out that 29% of the selected objects have multilingual sites, whereas only 27% have a global market. 21% of all sites are certified online shops.

4.2.1. Components and Functions. Figure 5 shows the distribution of relevant components and functions of all 100 analyzed classic online shopping sites. The analysis of selected online shops and B2C e-commerce platforms (Figure 5) shows that almost all sites (97%) are using photo features, followed by user logins (94%) and onsite search functions (87%).

69% of all sites integrated a newsletter feature. Only a few online shopping services are using modern possibilities for collaboration and syndication. Blogs are integrated on 22% of all sites and 10% have implemented video or multimedia components. Less than 10% of all investigated services are using widgets (7%), application programmable interfaces (6%) and forums (5%) for communication purposes.

4.2.2. Showcase Endless.com. Amazon launched Endless.com in response to customers' desires to shop a destination dedicated to shoes and handbags in the year 2007. The Endless e-shop provides an enhanced browsing experience for consumers. Shop visitors may search by category, color, size, brand, or price and alternative views and innovative zoom technology allow a virtually touch of new shoes and handbags. Consumers can navigate easily and quickly to make their choice. For example, if a shopper navigates to black sandals, and chooses a product within that category, similar shoes are displayed above the product he is looking at. Furthermore a customer is only one click away from details of the product which is a great time saver. An exciting tool is the sliding price chooser. As opposed to selecting shoes from a predetermined price range, consumers can actually set their own price points, by just sliding a bar on the product overview. The modern and light design features are realized with innovative technologies and concepts like AJAX. Services like free overnight shipping, free return shipping, price guarantee, and 365-day returns window are offered for all customers. Another interesting point is that existing Amazon customers can sign-in using their Amazon.com account. Within the web community there were many positive reactions based on the new shopping experience. Many other new online shops were inspired by the core components, functions and views of Endless.com.

4.3. Analysis of Social Commerce Sites

Comparable to the other analyses, we took a random sample of 100 social commerce sites (Figure 6) for our third evaluation. Beside core components and functions, we investigated the year of foundation, market orientation, used revenue streams, and multilingualism.

Results show that 10% of all social commerce sites are multilingual, and 33% have a international orientation.
4.3.1. Components and Functions. The investigation of 100 innovative social commerce services (Figure 7) outlines that the most used components are member profiles (92%), photos (66%) and blogs (64%). Tags are used in 31% of all analyzed services.

Figure 7. Component and Function Usage (n=100)

Social commerce services have a similar distribution of used components and functions like social networking services, resulting from similar concepts and platforms.

4.3.2. Showcase Threadless.com. Threadless is an online clothing store where community members can submit and provide t-shirt motives to produce their own designs. The basic idea of Threadless is crowdsourcing, as it counters on the increasing heterogeneity of needs by putting the consumers actively into the value added chain. Because of the user driven model, there is no need for trend scouts or a cost-intensive marketing department. Consumers place advertisements, pose as models or take photos for the product catalogues. Hobby designers generate revenue for themselves in form of a flat rate. Thus, Threadless provides the platform and manages the production and distribution of the t-shirts. The designs are rated by the community, and the top-voted designs are chosen by Threadless for production and sale. On average, around 700 designs compete in any given week. Many social commerce features are implemented on the platform. Users can vote for designs, blog in an area, publish news and exchange opinions. After buying a shirt the user can submit a photo wearing the shirt to his profile. The user gets one credit point for the submission. If Threadless uses the picture on the product page as a full size product photo, the owner will get ten points. One credit point is equal to $ 1.50 which can be used to buy more shirts. Most of the revenue is generated through direct product sales. In May 2008, Threadless announced a new service, called Threadless Prints, printing selected designs on high quality paper.

5. Scalable Social Software Service Model

The scalable social software model (Figure 8) for an online shopping community is a result of our research on components, functions and interactions of existing web services presented in the section before. Scalable in relation to our model means that it should be regarded as a generic framework to build new services in the context of social commerce. The model can be either used to build completely new fully integrated services or to expand already existing projects, like conventional social networks or online shops. Service developers should choose their combination of components, functions and interactions with different complexity and granularity based on case-specific requirements. Furthermore the model can be used as a fundament to generate derivates or as an inspiration for new design approaches.

Describing the main business process of an online shopping community – a consumer buys a product of a merchant – we defined the following three different main entities for our model:

**Consumer:** The consumer is the centric entity of the social network section. It is similar to a user in a conventional social network or community. After joining an online shopping community, the main consumer goals are to interact and collaborate with others in a social way. That means to get advice from trusted individuals, discuss about products, provide related media and probably find new friends online. Beside social interaction, consumers use these platforms to find and finally purchase appropriate products.

**Merchant:** Main goals of a merchant within a social shopping community are to address potential consumers with marketing campaigns and finally sell his products. The merchant, being the central entity of the online shop section, is also responsible for delivering informative content about products and to set them into the right context. To be successful, the vendor has to integrate himself within the whole community like a conventional member. In an optimal way the merchant should collaborate and interact continuously with other consumers to be an active participant.

**Product:** The product is the third main entity of the scalable model. In a fully integrated social shopping community it connects the two other main entities by using modern social commerce components and functions. Products have to be clearly categorized and sorted to allow fast access from both directions. The application of tagging, rating and ranking concepts allows user-driven categorization and includes the power of the whole community within one platform.
After definition of the three main entities we clustered all identified components and functions of the three analyses done before and positioned relevant ones as sub entities around the three main entities. Besides integrating our own results, we tried to consider important research and aspects presented in the related work section of this paper. The outcome of this was a simplistic model structure (Figure 8) with three main sections. Around the consumer we built a social networking section, because of its similarity to classic social networks. The online shopping section around the merchant includes main e-shop components.
and functions. And finally the connecting part between the two other parts is the social commerce section, which is the most innovative part of the model because of an integration of many social web features. Finally we connected all elements with interaction paths to demonstrate their relation. This interaction model clearly shows the complexity of a fully integrated social shopping community. Fundamental components, functions and interactions of each section are described below.

5.1. Social Networking Section

Consumers will join an online shopping service due to campaigns, the invitation of a friend, a search result of a price comparison engine. After joining the consumer can customize his own profile, run a blog or create his own product wish lists, which are shared with other members within the community. Users of a social shopping service arrange themselves in different groups and find friends or other users with similar interests. All members of a group have the possibility to discuss on products or other related topics. Most of the components and functions are similar to a conventional social network. It is also possible to include premium features for special user groups.

5.2. Online Shopping Section

The components and functions of the online shopping section allow merchants to start marketing campaigns to target potential customers, use specific promotion tools and communicate newsletters. All products of a vendor are part of his repository which can be managed and categorized over the backend. Furthermore a merchant has a direct interface for his suppliers to update relevant product information and to provide a direct link between a product and a supplier for consumers. A merchant may have a corporate blog to inform consumers about relevant things.

5.3. Social Commerce Section

The social commerce section, connecting the social network and the online shopping part, has the most innovative components and functions of all sections. Consumers and merchants can use these product-related features to collaborate and interact in a new way. Products can be tagged by members of the shopping community to allow a user generated categorization. Consumers write recommendations or comments on products, rate them and create rankings to show others their preferred products. Social media like interactive photos or videos can be included by consumers or merchants. Question and answers about products or shopping-related topics can be run consecutively between consumers and merchants. The whole collaborative interaction cycle should be seen as a continuous process. After buying a specific product, the user will recommend it within the community, share information with other users, and perhaps they will put it on their wish list.

An external connection with the system can be established via several interfaces. Thus, the framework can be opened for third party applications and as a consequence, communication within the global web sphere is possible. For example, integrated Feeds which are driven by RSS or Atom can be tracked in real time, or interactive product lists can be searched over product search engines over the internet.

6. Conclusion

Accelerated by innovative developments and new concepts the web is moving to an interactive space, where all users participate and collaborate online. Established social software services like Facebook, Twitter or YouTube demonstrate the variety of a fresh genre of web applications. Strongly influenced by this trend, B2C and C2C electronic commerce is changing rapidly. As outlined in the introduction of this paper, consumers demand recommendations by other users and a direct conversation and interaction with others. Online shopping communities are combining many of these new demands in one place, allowing consumers to collaborate online, get advice from trusted individuals, find products and then purchase them. Building a successful shopping community requires an ideal combination of different components, functions and interactions to motivate users for active participation.

The presented scalable social software service model in this paper was created under consideration of best practice elements of already existing social web services. Structured analyses of social networking, online shopping and social commerce sites built a fundamental framework for the design process of our model. For each of the three categories we took a random sample of 100 sites to gather significant information on the usage of distinct components, functions and interactions. The results of each analysis led us to an illuminative ranking of all relevant elements. By clustering components and functionalities around three identified core entities (consumer, product and merchant) the scalable model was built in three parts. Finally we connected all entities, sub entities and components through interaction paths. Our model can be used to build an online shopping community in
different stages from different directions and in a different granularity. Besides building a completely new social commerce service up from scratch, already existing conventional social networks or online shops can be upgraded by including the complementary parts. As already mentioned, little academic research has been done on social commerce services and its usage. Especially user experience tests on specific features and mass user behavior would be interesting to gather further insights. As forms of online shopping sociality continue to spread and diversify, we also anticipate the need for further design approaches balancing functions and utility. We hope that our generic framework can serve as basis for researchers and service developers of online social shopping communities.

7. References


