

# Collaborative Shopping with the Crowd

Andreas Mladenow<sup>1</sup>, Christine Bauer<sup>2</sup>, and Christine Strauss<sup>1</sup>

<sup>1</sup> Department of eBusiness, University of Vienna, Vienna, Austria

<sup>2</sup> Department of Information Systems and Operations, Vienna University of Economics and Business, Vienna, Austria

## POSTPRINT VERSION

*Andreas Mladenow, Christine Bauer, & Christine Strauss (2015). Collaborative shopping with the crowd. Proceedings of the 12th International Conference on Cooperative Design, Visualization & Engineering (CDVE 2015) (Lecture Notes in Computer Science (LNCS)). Mallorca, Spain, 20-23 September, pp 162-169. DOI: 10.1007/978-3-319-24132-6\_19*

This version of the article has been accepted for publication, after peer review (when applicable) and is subject to Springer Nature's [AM terms of use](#), but is not the Version of Record and does not reflect post-acceptance improvements, or any corrections. The Version of Record is available online at: [https://doi.org/10.1007/978-3-319-24132-6\\_19](https://doi.org/10.1007/978-3-319-24132-6_19)

## Abstract

The ubiquity of information and communication technologies (ICT) stimulate collaborative shopping and bring together customers with similar interests around the world to perform cooperative and collective online shopping. As a result, various models of collaborative online group buying are emerging. This paper analyses the phases of interaction during the shopping processes and provides a systematic categorization of the online group buying based on the top-down/bottom-up crowd-shopping models. In addition, this paper discusses recent developments and challenges of group buying in order to contribute to future research directions within the field of collaborative online group buying.

## 1 Introduction

When shopping, users increasingly achieve satisfaction in terms of user experience through the entire shopping process [1, 2]. To reach a satisfying user experience, many users carry out the shopping process in groups, either collectively or in assigned roles [3]. This phenomenon is primarily known as “group buying” and “collective buying” and can be observed in business-to-business (B2B) contexts as well as in business-to-consumer (B2C) shopping transactions [4, 5].

The motivations to engage in group shopping are manifold and include financial aspects such as discounts as well as quality and service aspects such as the opportunity to obtain additional services or adapted package solutions [6]. Vendors, in addition to buyers, benefit from group buying [7]. For example, vendors can take advantage of group buying by realizing increased sales figures due to higher demand, generating profits despite lower prices due to higher quantities sold, realizing cost-effective transactions due to lower communication and bargaining costs compared to having to deal with a great many of individual buyers, etc.

The advancement of information and communication technologies (ICT) is an important enabler that significantly supports and improves the entire process of group buying, including group forming, discussion, bargaining with vendors, decision making, post-purchase services, etc. As a result, online group buying has flourished recently and numerous intermediaries have emerged that provide platforms for transactions in the entire business process of group buying (e.g., LivingSocial, Groupon, Dianpin, Meituan). Interestingly, large, renowned companies such as Google [8] and Facebook [9] failed with their online group buying concepts, Google Offer and Facebook Deal, respectively, while new players on the market are very successful. For instance, China's Tuan800.com achieved a turnover of 5.94 billion USD with 71 million group buying customers in 2013 [10].

Beside the use of specific online group buying platforms (intermediaries), which is essentially a top-down approach, ICT also enables users to form and manage a cooperative crowd via various communication channels (bottom-up approach). Interestingly, this top-down type of online group buying, which has existed for a long time before intermediaries for online group buying emerged, is far less researched than bottom-up group buying [4].

These two types of group shopping vary tremendously in communication, coordination, and collaboration. Particularly the interaction and non-interaction phases alternate in varying degrees and compositions throughout the online group shopping processes. Consequently, the required support of ICT in these phases

varies, as well. However, this aspect has not yet been systematically approached in research. Against this background, we will fill this research gap by addressing the interaction challenges and opportunities of online group buying, for which we – as a basis – also provide a systematic typology of the online group buying types based on the top-down/bottom-up crowd-shopping aspect of online group buying.

The remainder of this paper is structured as follows: The next section provides a theoretical background on the group buying phenomenon. In Sect. 3, we identify and differentiate the various types of online group buying with the crowd. Built on this, we identify, visualize and discuss the interaction phases for each of the presented types of online group shopping. In Sect. 4, we discuss our findings with challenges and opportunities and, in Sect. 5, we conclude with a summary of our work and point to future research opportunities.

## 2 Theoretical Background

In this section, we first provide details on group buying, then continue with outlining how the Internet is currently leveraged to improve this phenomenon.

### 2.1 Group Buying

Group buying, also referred to as collective buying, is a shopping strategy in which individuals form a collective to obtain better conditions for purchases than they would obtain as individuals [5]. Benefits achieved from collective bargaining include, for instance, volume discounts, better product quality, additional services, or customized package solutions [4, 5].

The main motivation to participate in a group-buying collective is the financial aspect [11]. When a group buys higher quantities of items, volume discounts can be agreed upon during the negotiation process between the collective and the vendor [5]. Furthermore, when a large group is willing to buy the same product or service, the collective may obtain additional services or customized package solutions under better conditions due to the group's increased bargaining power [5]. In addition, there is an incentive for uninformed customers to cooperate with intermediaries that often have a better understanding of the market and thus use their skills for the benefit of the customer [12].

One advantage for the vendor lies in the potentially increased sales figures, which may be realized, and in the resulting financial flexibility. Cash flow and, thus, liquidity may increase significantly. Therefore, the vendor may generate profits despite lower prices compared to traditional retailing strategies [13]. Furthermore, a deal with a group buying collective may be a tremendously cost-effective business transaction: On average, the marketing costs, as well as those costs incurring from allocation of sales staff, are lower than in transactions with individual customers. In the latter case, the purchase intention is never as extensive as in the case with group buying participants. This means that in transactions with individual customers, higher communication costs and personnel costs are needed to ultimately convince the prospective customer to purchase a product or service.

Group buying incorporates two main elements: the generic process of shopping [14], and the socializing effects in the social network [15]. Over the Internet, however, group buying offers manifold design possibilities and a broader scope: while the traditional prospective customer is limited to his/her friends, family, and acquaintances, the online collaborative shopper has access to a large group, i.e. his/her social web network.

### 2.2 Fostering the Crowd for Collaboration Online

Due to the evolution of social aspects of online shopping in recent years, many new social web services have popped up in the last years, allowing users to participate in the web sphere [15, 16]. Online retail and e-commerce environments are also affected by this trend. Nowadays, a user may recommend products, leave comments, rate vendors or publish a wish list. This is often called *social shopping* or *social commerce*. Customers may participate and interact online with other users. New shopping concepts are constantly emerging as the mass of potential customers grows.

The online group buying concept uses the capabilities of the Internet by bringing many people together to compare prices and negotiate jointly with suppliers. The participants search jointly for a suitable vendor, a fitting product, as well as an accurate model, and they assess processes in the pre-acquisition phase jointly. Thereby, each individual may contribute in the provided forums or chat rooms. In this respect, group buying embodies a form of cooperative teamwork among the participants.

## 3 Online Group-Buying Models Using the Crowd

### 3.1 Online Group-Buying Models Based on Initiation of the Process

Early online group-buying business models were launched in the 1990s. Mercata.com, LetsBuyIt.com, Mobshop.com, and other Websites brought together users with similar product interests to receive sales

discounts. The rationale behind these vendor-based models offering specific “deals” is the following: the more users who are willing to buy a specific product or service, the lower the price. In this dynamic price-level model, the purchase is not initiated by potential customers, but by the companies or suppliers themselves. The customer therefore receives a prepackaged offer, which he or she may either accept or decline within a certain period of time. Thus, the vendors provide no possibility for negotiation.

In contrast, examples such as Jasmere demonstrate that so-called group buying discounts, i.e. quantity discounts, are granted by allowing consumers to pool their demand to increase the purchase volume. In this model, pricing is based on the number of participating customers throughout the entire offer period. The more customers who are willing to accept the current price, the faster the next lower price level is reached. This bottom-up model enables a better price for the entire group of participating customers. Furthermore, this model may offer a useful extra service for customers who do not yet agree with the current price offered since there is an option to accept the offer at a lower price level and pre-register one’s interest.

Beginning in 2008, a novel group-buying model evolved: Groupon.com offers mainly location-based deals such as restaurant menus, tickets, and training lessons. The offered special discounts have a fixed price; there is a minimum number of required customers that has to be exceeded per day in order to obtain the discounts, which may be redeemed after payment [17, 18].

Apart from these vendor-initiated group-buying models, there are demander-initiated models involving the crowd. These models, which originated in Asia [19, 20], bring together consumers who plan to buy a specific product or service. The crowd participants may enjoy discounted pricing through collective bargaining. They have the opportunity to meet on an online forum or on specific websites, which might speed up the process of crowd formation. TeamBuy.com.cn is the current market leader in this segment, bringing merchants and customers together. Another prominent example of consumer-to-consumer group-buying platform is [Jiazhang100.com](http://Jiazhang100.com). Table 1 illustrates different types of shopping with the crowd models covering both, vendor-initiated as well as demander-initiated group buying.

**Table 1.** Shopping with the crowd models

	Traditional group-buying exchange (top-down approach)	Collaborative crowd-shopping experience (bottom-up approach)
Exchange is...	<ul style="list-style-type: none"> <li>▪ Vendor-initiated</li> </ul>	<ul style="list-style-type: none"> <li>▪ Demander-initiated</li> </ul>
Deals are...	<ul style="list-style-type: none"> <li>▪ Pre-defined</li> <li>▪ Voucher based</li> </ul>	<ul style="list-style-type: none"> <li>▪ Initiated by the crowd for the purchase of specific products</li> </ul>
Interaction is...	<ul style="list-style-type: none"> <li>▪ Organized by intermediaries to make profits and/or companies to promote brands</li> </ul>	<ul style="list-style-type: none"> <li>▪ Formed by the crowd in order to increase the benefit for participating customers</li> </ul>
Occurrence of Collaboration	<ul style="list-style-type: none"> <li>▪ Collaborative decision making during few phases of shopping process only</li> </ul>	<ul style="list-style-type: none"> <li>▪ Collaborative information seeking and decision making during whole shopping process</li> </ul>
Products are...	<ul style="list-style-type: none"> <li>▪ Mainly location-based</li> <li>▪ “Daily deals”</li> </ul>	<ul style="list-style-type: none"> <li>▪ Determined by the crowd with no restriction</li> </ul>
Group Buying is based on...	<ul style="list-style-type: none"> <li>▪ Time-limited “grouponing” with fixed prices (coupons) or</li> <li>▪ Dynamic price mechanism model</li> </ul>	<ul style="list-style-type: none"> <li>▪ Collaboration between group buyers and time-limited negotiations/ dialogue with vendor</li> </ul>

### 2.1 Phases of Interaction and Non-Interaction

In the following section, we outline in detail and compare the processes of the traditional, vendor-initiated model of group buying and the processes involved in the collaborative crowd-shopping experience. The phases of interaction and non-interaction of the crowd vary between these two online group-buying models and demonstrate two variations for each model.

Figure 1(a) illustrates the simplified process of the traditional vendor-initiated model of group buying. The user accesses the platform, optionally pays an admission fee or subscription rate (step 1), evaluates the offer such as “daily deals” in the Groupon model [21] (step 2) and, in case the user wants to purchase the item, accepts the deal (steps 3). Cooperation between the crowd participants occurs only by accepting the offered deal. No further interaction of the crowd participants is necessary.

Figure 1(b) illustrates the process for vendor-initiated group buying with dynamic offers (e.g., dynamic pricing where the price drops the more customers buy the product or services). A user accesses the platform; (step 1), evaluates the deals (step 2), and accepts the offer if interested (step 3). Some platforms offer the possibility to restrict the acceptance of the offer to a “maximum price level”. The user is notified about the purchase if within the set price restriction on the determined point in time (step 4). Similar to version 1(a), interaction is reduced to the joint acceptance of an offer and the potential of recommending an offer to other users.

Figure 1(c) illustrates the first version of a simplified demander-initiated group buying process. A “crowd” is formed by the users (e.g., parents with similar interests; e.g., [Jiazhang100.com](http://Jiazhang100.com).) (step 1). This step includes the online-search for potential group members on an online forum or directly on an online group-shopping platform. The user evaluates the offers (with fixed pricing) at the platform provider (step 2). Finally, an offer is accepted, if it is of interest to a user (step 3).

Figure 1(d) illustrates the second version of simplified demander-initiated group-buying process, which is the most interactive one. The process begins with crowd formation; the crowd may access an online platform or forum (step 1). The crowd then searches interactively for potential group members, potential merchants, and/or deals on the open market (step 2). The crowd can communicate and discuss with other potential buyers online, and can jointly assess different brands. Next, a group representative (or several group representatives) is typically interactively selected for negotiations (step 3). This representative or representatives negotiate(s) with the selected merchant on the group’s behalf; this phase of the process may also take place offline in the merchant’s premises (step 4) [22]. Then the group discusses the available deals so that the group representatives may agree to accept or to decline the offer that has been negotiated (step 5). Finally the merchant’s offer is accepted to the agreed conditions if convenient (step 6).

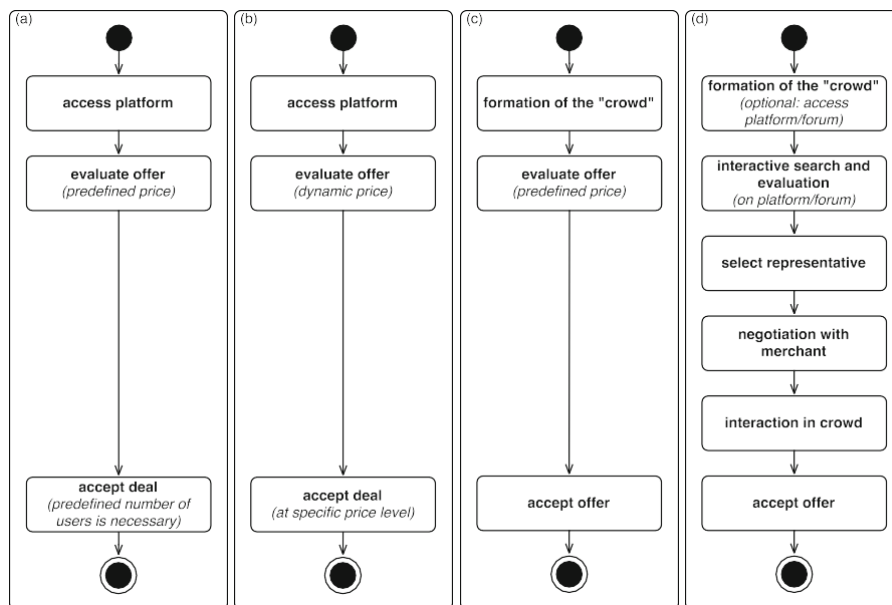


Fig. 1. Traditional group buying (a/b) vs collaborative crowd shopping (c/d)

### 3 Discussion

Group buying allows companies to serve solvent customers in larger quantities and – as a consequence – to generate additional profit margins. A disadvantage for the vendor arises due to the increased influence of

customers on pricing negotiations in a group buying setting. As a result, unit contribution margins may be lowered. After all, suppliers still can set prerequisites in the price negotiations, e.g., a certain price requires a certain number of sales. One difficulty with this approach from the perspective of a supplier might arise in determining the correct group size without deterring potential customers by quoting unrealistic sales volumes in negotiations. Therefore, consumers are motivated to distribute product information to other people if the required number of potential buyers has not been reached [23]. The success for both parties of the group-buying schemes, thus, depends largely on the efficiency of consumers as sales aids.

Small and medium-size enterprises (SMEs) show an increased interest in this type of cooperation with the crowd and often willingly respond to the needs of the consumer groups regarding pricing. Larger companies with an established brand name, however, often appear inflexible in their price expectations, sometimes due to image reasons. For many companies, group buying offers the possibility to attract the attention of a large number of consumers and build a positive reputation. This strategy also suits companies, which are geographically isolated. Despite their remoteness they may build up a base of customers who value good and beneficial business relations more than vicinity. Thus, physical or geographical conditions/restrictions may be leveled out in context of group buying concepts.

Depending on the group-buying model, either the “deal” takes place or the price discount increases if the number of customers has reached a predefined level. Due to the fact that users may not know the price they are expected to pay, vendor-based business models with a dynamic pricing mechanism might turn out as an alternative that is too complex for consumers and therefore might suffer from a lack of consumer acceptance on a broader basis. This process might also include discounts for recommending other users to join a purchase on the platform. The customers interact with merchants by redeeming the “deal”.

## 4 Conclusion

In recent years, there has been an upswing concerning collaborative online group buying. To date, many aspects that could help to understand, explain and operationalize this phenomenon have not been explored through research. Interestingly, while there has been a trend towards pre-defined vendor-initiated “daily deals” in countries such as the USA, in other countries, platforms such as China’s market leader Teambuy, where forum members initiate crowd-shopping activities, have flourished.

These types of group shopping vary tremendously with regard to communication, coordination, and collaboration among participants. This paper focuses on phases of the entire process of group buying including online intermediaries which speed up the process in both directions. The suggested model categorization provides a basis for future research, as a systematic approach is essential to an understudied research field like online group buying. Analyzing different phases of interaction as well as providing a categorization will help to improve the involved shopping process and the underlying notion of the different business models.

## References

1. Kauffman, R.J., Lai, H., Ho, C.T.: Incentive mechanisms, fairness and participation in online group-buying auctions. *Electron. Commer. Res. Appl.* 9(3), 249–262 (2010)
2. Cho, N., Park, S.: Development of electronic commerce user-consumer satisfaction index for internet shopping. *Ind. Manage. Data Syst.* 101(8), 400–406 (2001)
3. Shin, D.H.: User experience in social commerce: in friends we trust. *Behav. Inf. Technol.* 32(1), 52–67 (2013)
4. Liu, Y., Sutanto, J.: Online group-buying: literature review and directions for future research. *ACM SIGMIS Database* 46(1), 39–59 (2015)
5. Wang, J.J., Zhao, X., Li, J.J.: Group buying: a strategic form of consumer collective. *J. Retail.* 89(3), 338–351 (2013)
6. Chen, W.Y., Wu, P.H.: Factors affecting consumers’ motivation in online group buyers. In: 2010 6th International Conference on IEEE Intelligent Information Hiding and Multimedia Signal Processing (IIH-MSP), pp. 708–711 (2010)
7. Yu, M., Lang, K., Pelaez, A.: Evaluating electronic market designs: the effects of competitive arousal and social facilitation on electronic group buying. In: 47th Hawaii International Conference on System Science, pp. 4148–4157 (2014)
8. Blumenthals. <http://blumenthals.com/blog/2014/03/05/google-shuts-down-self-serve-offers-product/>
9. Forbes. <http://www.forbes.com/sites/tomiogeron/2011/08/26/facebook-shutting-down-deals-service/>
10. Lee, E.: 2013 China’s Group-buying Turnover Rockets 67.7 % YOY to 35.88 Billion Yuan. <http://technode.com/2014/01/15/2013-group-buying-turnover-rockets-68-percent-yoy-in-china/>

11. Sharif-Paghaleh, H.: Analysis of the waiting time effects on the financial return and the order fulfillment in web-based group buying mechanisms. In: Proceedings of the 2009 IEEE/WIC/ACM International Joint Conference on Web Intelligence and Intelligent Agent Technology, Vol. 1, pp. 663–666. IEEE Computer Society (2009)
12. Jing, X., Xie, J.: Group buying: A new mechanism for selling through social interactions. *Manage. Sci.* 57(8), 1354–1372 (2011)
13. Leitner, P., Grechenig, T.: Collaborative shopping networks: sharing the wisdom of crowds in E-commerce environments. In: BLED 2008 Proceedings, p. 21 (2008)
14. Hu, M., Shi, M., Wu, J.: Simultaneous vs. sequential group-buying mechanisms. *Manage.Sci.* 59(12), 2805–2822 (2013)
15. Mladenow, A., Bauer, C., Strauss, C.: Social crowd integration in new product development: crowdsourcing communities nourish the open innovation paradigm. *Glob. J. Flex. Syst. Manage.* 15(1), 77–86 (2014)
16. Bauer, C., Mladenow, A., Strauss, C.: Fostering collaboration by location-based crowdsourcing. In: Luo, Y. (ed.) CDVE 2014. LNCS, vol. 8683, pp. 88–95. Springer, Heidelberg (2014)
17. Edelman, B., Jaffe, S., Kominers, S.D.: To Groupon or not to Groupon: The Profitability of Deep Discounts, Harvard Business School. NOM Unit Working Paper 11–063 (2011)
18. Dickinger, A., Kleijnen, M.: Coupons going wireless: determinants of consumer intentions to redeem mobile coupons. *J. Interact. Mark.* 22(3), 23–39 (2008)
19. Chung, W., Chen, L.: Group-buying e-commerce in China. *IT Prof.* 14(4), 24–30 (2012)
20. Zhang, J.J., Tsai, W.H.S.: United we shop! Chinese consumers' online group buying. *J. Int. Consum. Mark.* 27(1), 54–68 (2015)
21. Luo, X., Andrews, M., Song, Y., Aspara, J.: Group-buying deal popularity. *J. Mark.* 78(2), 20–33 (2014)
22. Tan, W.K., Tan, Y.J.: Online or offline group buying? In: 2010 Seventh International Conference on Fuzzy Systems and Knowledge Discovery, vol. 6, pp. 2853–2857 (2010)
23. Xie, G., Zhu, J., Lu, Q., Xu, S.: Influencing factors of consumer intention towards web group buying. In: 2011 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM), pp. 1397–1401. IEEE (2011)