Re-examining the revival of online group buying mechanisms

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In commercial environments consumers with limited order size can aggregate their demand through a group buying mechanism allowing them to enjoy the benefits of a wholesale deal. In electronic commerce, group buying was first introduced in the late 90s. Researchers in various fields conducted studies showing the business viability of the group buying model and it was even regarded as the shopping method for the 21st century. However, web-based group buying did not live up to its initial expectations and experienced an early fall down. In this paper, we provide an evaluation of some of the work carried out on group buying and an analysis of the group buying business model. Moreover, we examine a number of important trends in e-Commerce from a group buying perspective. Based on this analysis, we derive a set of conclusions regarding the re-introduction of the group buying model to the electronic marketplace.

Key words: Electronic commerce, group buying, customer coalition formation, group management, demand aggregation mechanisms.

INTRODUCTION

Suppliers often are willing to reduce their prices for large quantity orders. As a result there are often two pricing schemes one for the retail and the other for wholesale. A group buying mechanism offers customers a means for aggregating their demand in order to qualify for a wholesale offer. In terms of customer interaction, a group buying business model, in which multiple customers (directly or indirectly) cooperate with one another, can be thought of as the opposite of an auction model where customers compete with one another for the goods offered by the supplier (Van and Gustafsson, 2003; Chen et al., 2009). Group buying was first introduced in the Internet in during late 90s (Kauffman and Wang, 2001). It was thought to be the shopping method for the 21st century and subsequently enjoyed a spectacular initial success during which an increasing number of group buying businesses entered the electronic marketplace (Anand and Aron, 2003; Janko and Hashler, 2004). Some of these group buying companies started with more than $200 million initial investment, won numerous e-Commerce awards and enjoyed a high level of consumer popularity (Kauffman and Wang, 2002). However, starting from 2000 the market conditions started to deteriorate for majority of group buying businesses which led to the closure of many of these companies (SIT, 2001). Since then, apart from a short revival period in 2006 (Areddy, 2006; Montlake, 2006) and reports of some cases in the far east (Kauffman et al., 2010), web-based group buying has had an almost silent period. Considering the previous failure of group buying companies, despite high expectations of analysts and market investors, it is highly important that an up-to-date analysis of current trends in e-Commerce is provided. Such a study can potentially play a crucial role in the future success of group buying models through the identification of important trends in e-Commerce by enabling exploitation of arising
opportunities and adoption of protective mechanisms against possible threats. In this study, we first present an overview of some of the work carried out on group buying, we then provide an analysis of the group buying business model and discuss the incentives motivating group managers to initiate a group buying process, we also identify a set of important trends in e-Commerce that can provide major opportunities or threats to the upcoming and future implementations of a web-based group buying business model and finally, we conclude our discussion.

**LITERATURE REVIEW**

Most of the studies carried out on web-based group buying were conducted prior to the demise of the group buying websites. The viability of a group buying business model has been analysed by various researchers in different fields (Tsvetovat et al., 2000; Chae and Heidhues, 2004; Chen et al., 2007; Chen et al., 2010). Kauffman et al. (2010) undertook the first empirical study of group buying that analysed the dynamics of the arrival of new customers at a group buying market (Kauffman and Wang, 2001). Some have worked on devising group formation schemes in which customers post an order for multiple items within a category, with non-equitable cost sharing between members (Yamamoto and Sycara, 2001).

With regards to the distribution of group buying costs, it has also been argued that a strictly equitable cost sharing, in which all group members have to bear an equal proportion of group costs, is not an efficient method (Li et al., 2003). However, as pointed out by (Anand and Aron, 2003), non-equitable approach to share the costs of a group purchase between members of that group is not practical; in fact all the companies operating group buying models implemented a strictly equivalent cost sharing method. This avoids penalising early bidders and encourages members’ early entry into the market, promoting a “bandwagon effect” (Anand and Aron, 2003). Some work has also analysed the group buying process from suppliers’ perspective addressing issues which include definition of more profitable price-quantity relationships for suppliers (Lee et al. 2002; Anand and Aron, 2003).

Over the past years application of software agent systems to group buying problems has attracted the attention of researchers from multi-agent systems (MAS) field (Ito et al., 2002; Asselin and Chaib-draa, 2006). While this may be highly applicable in the long-term – given ith the developments in web services and other technologies such as web 2.0 – the present condition of electronic markets and the attitude of its participants suggest that it is still early to expect agent-based group buying sites on the Internet.

**The group buying business model**

Deitel et al. (2001) list more than fifteen business models that can be implemented in an e-Commerce environment. Group buying is one of these models that is categorised under dynamic e-business models. Group buying is regarded as a demand-sensitive business model, in which the price has a dynamic nature and is a function of customer demand. This is in contrast to the static pricing models used by many online retailers in which customers are offered a fixed price that does not vary if the order size is lowered or increased.

A fundamental difference between a purely retail market and a group buying market is that in a retail market, customers purchase their desired items directly from one of the suppliers and do not interact with one another (Figure 1a). Whereas, in a market that implements a group buying model, customers in a group are linked with one another through the group, and the group will then engage in a wholesale relationship with the suppliers (Figure 1b).

Moreover, in a retail process it is usually not economical for suppliers to directly approach a particular customer due to the costs involved and the small size of the deal if it is realised. Conversely, in a group buying process a supplier may find it highly economical to approach and communicate with a specific group directly due to the potentially large order size.

Finally, the two models differ in terms of the market players involved. In a retail market there are two fundamental types of players: Customers and suppliers. Whereas, in the group buying market, in addition to customers and suppliers, there are group managers who are responsible for a set of tasks including initiating the group buying process, admitting new members, searching for suppliers and negotiating with them, cost distribution and so on.

**Retail market versus group buying market**

**Incentives for group managers**

Initiation of a group buying process, admission of new members to the group, negotiations with suppliers, and other group management tasks usually require a significant amount of effort that will cost the individual or the business organisation managing a group buying process their time and/or money. Although, in some situations a group manager may decide to provide their services free of charge, usually managers expect a financial incentive that covers costs of their service in addition to providing them with a certain level of profit. In general, the financial profit that a manager obtains from a group buying process of order size $n$ can be expressed as follows:
A group manager capable of fulfilling the above inequalities (that is the profitability and the customer attraction inequalities) has an incentive in initiating a group buying process that is both profitable and sustainable.

**Trends in e-commerce**

There has been important developments in e-Commerce since the 2001 study of (Kauffman and Wang 2001), which identified some of the factors that led to the initial fall down of web-based group buying. Some of the previous trends, which were predicted to be an unavoidable consequence of the electronic markets, have now either been slowed down or reversed. In addition, there have been new developments that are expected to significantly influence e-Commerce and the group buying models in particular. Given the changes that have taken place since 2001, it is important to re-assess major e-Commerce trends in order to examine whether these may lead to an environment in which web-based group buying could be revived or not.

**Intermediation versus disintermediation**

An important trend that was expected to be present in e-Commerce during the early days of its take up was disintermediation in the manufacturer channel structure (Rosenbloom, 2002). Since e-Commerce provides an inexpensive, convenient and highly accessible global platform for communication and connection between
various parties in the channel structure, it was thought that it will facilitate omission or disintermediation of one or more intermediaries in the channel structure (Figure 2) (Margherio et al., 1998).

Traditionally a producer sells their items to a wholesaler who deals with a retailer. A consumer then transacts with the retailer (Case a). E-Commerce was thought to encourage disintermediation by providing a direct link between the producer and the retailer through online B2B (Case b). The retailer can also be omitted if the producer establishes a direct link with consumers by engaging in B2C (Case c); From: (Chaffey, 2004).

In the event of the occurrence of a disintermediation in the channel structure, customers can enjoy a cheaper price and/or producer can obtain an increased profit on their goods. However, considering the developments in e-Commerce since 2000, disintermediation no longer can be assumed as an absolute e-Commerce trend. In contrast to the initial expectation, e-Commerce can even lead to introduction of new intermediaries in the channel structure or re-intermediation. This is mainly due to the global factor of e-Commerce which leads to introduction of many players at each level of the channel structure. In other words, given the rapid expansion of Internet-based commerce nationally and internationally there would be a large number of suppliers, as a result retailers would even be at a greater need for an expert wholesaler who has access to a wide network of global producers. Similarly given the variety and distribution of the consumers in the global electronic marketplace, producers and wholesalers need to interact and cooperate with electronic retailers (e-tailers) that specialize in targeting particular segments of the electronic market. In fact, the rapid expansion of e-Commerce and the large numbers of players at each level in the channel structure can well lead to the establishment of need for further intermediaries – such as group buying managers – in the traditional four tier channel structure model (Figure 3).

The group members in each of the afore-mentioned group buying process may be different, for example, Process I involves group members who are wholesalers whereas Process II has retailers as its group members. A group buying mechanism can offer one or more of the above group buying processes depending on its target market.

**Internet growth**

Internet access is a fundamental requirement for e-Commerce in general and web-based group buying in particular; the pervasiveness of the Internet and the significant increase in its speed have a direct effect on the size of electronic marketplace, especially those that target the individual consumers such as many of the web-based group buying sites.

According to the United Nations e-Commerce and Development Report (UN, 2004), 2004 at the end of 2003, nearly 676 million people (or 11.8% of the total population of the world) had access to the Internet, which represented an increase of 7.8% compared with the figures at the end of 2002. However, the situation has changed dramatically since then. In another more recent report by the Internet World Stats (IWS) website reference (InternetWorldStats 2010), it was mentioned that globally around 2 billion individuals have access to internet. This gives a 28.7% Internet penetration percentage (IPP), which corresponds to the percentage of Internet users in the given population (Table 1).

North America, which has the highest IPP of 77.4%, constitutes only around 14% of world users. It should also be pointed out that there is a notable gap between Europe and North America in terms of internet usage (IPP for Europe is 58.4%). Specifically in the UK,
According to the most recent report produced by the Office for National Statistics, more than 70% of households in the UK had access to the Internet (Offshore Northern Seas, 2010). Their data also showed a steady growth of the number of adults using the Internet everyday (Figure 4).

### Adults using the Internet every day

Another key trend here is the rapid growth of mobile phone networks. According to the International Telecommunications Union (ITU), the total number of mobile subscriptions is estimated to reach 76% of the world’s population, which is more than twice the figure for Internet Penetration globally (estimated at 28.7%). In the UK, according to the Office for National Statistics, 45% of Internet users access the Internet using mobile devices (Offshore Northern Seas, 2010). Given the fact that many mobile network providers currently offer Internet access—though at a reduced speed compared to fixed-line ADSL connections—this provides even further opportunities for consumer-centered B2C e-Commerce mechanisms such as web-based group buying.

In conclusion, it can be said that internationally Internet access with a global IPP of 28.7% is not at a highly satisfactory level. However, based on the current global growth trends, of both fixed-line connections and mobile subscriptions, the potential customer market for e-Commerce and web-based group buying in particular, is going to see an increasing growth in the coming years.

### Online security and e-payment

While a large proportion of transactions are still carried out using traditional methods such as cash and check (Shaw, 1999; Weiner, 1999), the benefits of processing payments online through e-payment mechanisms is attracting an increasing number of businesses and governments. The cost of electronic payment is regarded to be from one-half to one-third of its paper-based
alternative, which at a national level can allow a country to save more than 1 percent of its GDP (Gross Domestic Product) annually by switching from a paper-based system to an electronic payments system (Humphrey et al., 2003).

There are various e-payment mechanisms such as credit cards, wire transfer and debit cards. Out of these, credit cards have been traditionally regarded as the most convenient and popular method for online transactions (Shaw, 1999). However, users (consumers and suppliers) had not been seeing e-payment systems to be adequate in terms of aspects such as security, ease of use, and reliability (Abrazhevich, 2001).

The most important challenge concerning e-payment mechanisms has so far been their security weaknesses (Ghosh, 1998; Hinde, 1998). In fact, privacy and security reasons are the number one reason that web users had been avoiding making purchases online (Udo, 2001). Surprisingly, not all barriers facing the development of more secure mechanisms are technological, for example the US government places restrictions on certain security technologies such as encryption that can endanger its eavesdropping operations on the web traffic (Shaw, 1999).

The effect of poor online security is also devastating on business organisations that come under attack. A study by (Cavusoglu et al., 2004) revealed that a security breach on average costs major firms 2.1% of their market value within two days of the announcement (an average loss in market capitalisation of $1.65 billion per breach). In the UK, more than half of UK businesses (52%) suffered malicious or premeditated security breach during 2005 (ONS, 2007). In particular, large businesses (with 250 or more employees) were especially likely to be affected, at 84%.

In conclusion, with the increasing popularity of the Internet amongst the general public and business organisations, the need for new well-performing and secure e-Commerce systems that meet the needs of consumers and merchants is clearly evident; and unless serious measures are not taken to ensure the security and reliability of e-payment mechanisms, due to the reluctance of consumers and businesses to take part in online transactions, the full-potential of e-Commerce can not be realised. This is particularly important for e-Commerce business models, such as web-based group buying, whose success heavily relies on a large customer market that trust and use the online payment mechanisms.

**Business-to-business (B2B) versus business to consumer (B2C)**

As mentioned in earlier the group buying business model can facilitate demand aggregation at various points in a channel structure. However, the majority of web-based group buying sites often tend to target individual customers with small demand. As a result, developments in B2C (business-to-consumer) e-Commerce in terms of size and value can have a direct impact on the success of many web-based group buying companies.

Business-to-business (B2B) e-Commerce had traditionally been the predominant type of e-Commerce
over the early days of e-Commerce (Shaw, 1999). In fact, for 2002 online B2C comprised only 1.1% of all B2C commerce in the US (Willis, 2004). This indicates the difficult conditions that group buying sites were operating under during early 2000, where B2C sector had not grown sufficiently. Nevertheless, since then B2C e-Commerce has observed a rapid growth; after the collapse of web-based group buying in the US, e-Commerce B2C growth far outpaced non-e-Commerce B2C by a rate of 25 against 4% (Willis, 2004). In the same period of time, in the Europe based on a report by eMarketer cited by (Chaffey, 2004), it was predicted that by the end of 2004 non-B2B e-Commerce (most important of which is B2C) would amount for 23% of total European e-Commerce of nearly 1 trillion dollars.

One reason that can be attributed to the usually lower value of B2C e-Commerce compared to B2B is the fact that most consumer transactions are of much lower value compared to the transactions that take place between businesses. Furthermore, for an organisation to engage in B2C activity, a large number of other intermediary business organisations such as producers, wholesalers, logistics companies, market researchers etc. are involved that lead to generation of many B2B opportunities to facilitate the B2C activity (Figure 5).

Business-to-business (B2B) versus business to consumer (B2C) transactions

Overall, the fast growth of B2C e-Commerce is providing a more preferred setting for web-based group buying compared to late 90s when the model was first introduced in the electronic markets and the size and value of B2C e-Commerce.

Conclusion

Contrary to various studies conducted by researchers in disciplines such as economics, multi-agent systems and business management, which indicated viability of a group buying business model, group buying sites failed when they were first introduced into the Internet market. This failure emphasises the importance of obtaining an up-to-date picture of the electronic market and the trends present within it prior to re-introduction of this business model.

Based on the analysis in this study, disintermediation can no longer be regarded as a definite trend in e-Commerce. In contrast, e-Commerce can facilitate creation of new intermediaries. These intermediaries may provide a number of services that add value to the supply chain, in particular demand aggregation or group buying. Furthermore, the Internet has seen a phenomenal growth in terms of both speed and pervasiveness since the initial failure of the group buying websites in 2000. This in turn has led to the significant increase in value and size of B2C transactions. This becomes more significant considering that majority of group buying sites operated in B2C. On the other hand, security problems and deficiencies in e-payment mechanisms are still acting as a major barrier to the growth of e-Commerce and B2C sector in particular.

Assuming consumers understand the basics of a group buying business model and will be able to relate to it, current situation of the Internet marketplace suggests an opportunity for the re-introduction of the group buying.
model provided that a number of aspects, most important of which are security and payment mechanisms, are adequately addressed.

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REFERENCES


Yamamoto J, Sycara K (2001). A Stable and Efficient Buyer Coalition Formation Scheme for E-Marketsplaces. The 5th International Conference on Autonomous Agents, Montreal, Quebec, Canada, ACM.