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New Website Social Network Advertising: What Works and What Doesn't

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Table of Contents

List of Figures

List of Tables

Abstract

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Online Advertising on Social networks has become a very hot topic in both academia and industry, but very few studies have been conducted to examine the effectiveness of the advertising through or on social networks. In this paper, we provide an empirical framework to build advertising campaigns from target audience selections, landing page design, incentive design and advertising channel selections by promoting a new website Goodbuylist.com on Facebook to evaluate the advertising effectiveness and return on investment from the field experiments. Our study shows: (1) A well-defined target audience helps new business to save marketing budget and enhance advertising efficiency; (2) the principle of landing page design is to keep it simple and straightforward; and by introducing a team member introduction page, we were able to build website credibility which largely encouraged further user actions; (3) monetary incentives on average work better than non-monetary incentives to attract users; (4) Facebook Right Column Ads outperformed the other two News Feed ads channels in achieving lower CPA (Cost Per Action) but News Feed ads have much better CTR(Click Through Rate); (5) Females like the social shopping idea more than males and the ads targeting females outperformed in both CPA and CTR.

DEDICATION

I dedicate this thesis to my parents and my husband Tianyi, your love and support make my dream come true!

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1 Introduction

With the development of Internet Industry, the market of online advertising has been growing very rapidly in last decade and has been accelerated in the last few years due to the advent of social networks. In 2012, online advertising revenue in the United States reached $36.57 billion, represented by 15.2% growth over the $31.74 billion in 2011 [25]. According to the latest report, the growth trend continued in the first six months of 2013 with an 18% growth of overall revenue on the year-on-year basis[12]. Among its many forms, social media advertising is today's new trend in advertising market[29]. Social networks such as Facebook, Twitter and LinkedIn are daily destinations for millions of consumers. Social network advertising has its unique strength in targeting desired audiences, maximizing the word-of-mouth effects [30], allowing advertisers to track ads' performance and evaluate the investment return more efficiently[8] . The large companies are spending hundreds of millions of dollars on social network advertising and trying to generalize the more reasonable guiding strategies. Meanwhile, small businesses and start-ups are also increasingly rely on Social Network Advertising. But they face their own challenges such as unclear targeting audiences, lack of reputations, limited marketing budgets and etc.

Before this thesis, most attention and energy were invested on designing effective strategies for email ads, search engine ads and web banner ads. The industry best practices for online advertising are mostly for existing businesses which have already built their brand awareness and have very broad audience; but the joint field of promoting new web site on social media has not been well studied and many questions still remain unanswered[16] [21].

2 Related Work

Target market and marketing mix variables are the two major prerequisites for a successful marketing strategy. The marketing mix is often considered as the guid-

ing tool in marketing strategy design and it has four P building elements: product, price, promotion and place. Once the target customers have been defined, a marketing mix strategy can be built by the business to satisfy the target market[5] [31] [22].

A well-defined target audience is the first element to a marketing strategy. Targeted advertising leads to an increase in consumer-product matches; for the consumers, the ads are more pertinent and make the shopping searching more efficient and less time consuming; for the advertisers, cost in advertising is reduced and makes the company itself more profitable. With the rapid growth of the World Wide Web and the technological advances, the Internet has allowed advertisers to address a targeted audience beyond the reach of traditional media[3]. A lot of research efforts were invested on different online advertising channels, such as sponsored search, contextual ads and Behavioral Targeting[32] [6] [13]. Behavioral Targeting in particular, which refers to the delivery of ads to targeted users based on information collected on each individual user's web search and browsing behaviors, is gaining the spotlight. The general effectiveness of Behavior Targeting is well recognized, such as high correlation of ads clicks and web browsing behaviors, increased CTR and etc. [28]. As a result, websites such as Google, Facebook and Twitter heavily rely on Behavioral Targeting to grow their advertising business. Despite its merits, Behavioral Targeting which is usually done by installing 'cookies' to collect user information, raised serious privacy concerns and its use is very controversial[27] [23]. Most recent researches are devoted to develop privacy-friendly targeting method to extract data without collecting the identities of users [24].

Online social networks like Facebook, Twitter, and LinkedIn have become a popular way for people to share, find and disseminate contents at a massive scale. Their popularities make advertising on social networks a promising business. One of its distinguished features is the "word-of-mouth" effect, information propagating among friends in the social networks, one hop at a time[7] [15]. The marketing literatures suggest that word-of-mouth can play a significant role in increasing product brand

awareness, web traffic, customer loyalty and the success of new product launch[33]. Also previous research examined how widely and how quickly the information propagates in the social network; and the extent to what kind of people are more likely to be affected by decisions of their friends[19]. At the same time, several concerns were raised by public, for example individuals may consider social network ads as an intrusion to their own community space, increased advertising spending can be associated with lower online word-of-mouth products [14] and the word-of-mouth marketing may not be effective while the requisite networks of influence are not present[10].

For website design, how online advertisements attract users' attentions have been widely studied and compared. Early studies mostly focused on advertisement itself, suggesting that magnifying the size, strengthening the visibility and placing the information on the upper part of the web page enhance users' perceptions. [9]. Later studies also tried to compare the effect on users' attention of different information types, such as text, image, videos and their mixtures[17] [4]. Although optimizing above factors leads to more user attentions, the disappointing fact is that ad click-through-rate is declining over the years. The most likely cause is that users have learned to filter out countless advertisements surfing the web and the emergence of ad-blocking software[2] [11].

Along with the expanding online advertising marketplace, there is a growing need to measure its effectiveness and return on investment. In social media examiner's 2012 Social media marketing industry report, 83% of businessmen indicate that social media is important for their business. 40% of all social media marketers want to know how to measure the return on investment of social media which ranked #1 among the top 10 social media questions marketers want to be answered [25]. The Internet Advertising Bureau's (IAB) "Social Media Ad Metrics Definitions" report gives a general framework by which advertisers can gauge ad effectiveness across different social media advertisements. For social media sites in particular, the metrics include

unique visitors, cost per unique visitor, page views, visits, return visits, interaction rate, time spent, video installs and relevant actions taken[18]. Later literature also proposed novel ways to look into ROI by users' engagement with the marketer's brands on social media and long-term payoffs rather than short-term results[18].

3 Proposed Research

In this research, we focus on advertising Goodbuylist.com on one social network website and try to generalize what strategies could work and what would not from our field study. Our general framework maps to the 4 Ps' principle and covers target audience selection, landing page design (Product), incentive design (Price and Promotion) and advertising channel design (Place) [1]. In pilot experiment phase, we design advertisement experiments to determine our target audience, make our landing page user friendly, compare monetary vs. non-monetary incentives and preliminarily look into different types of ads on Facebook. In the formal experiment phase, we leverage our findings from previous phase and follow experiment design principles to create controlled experiments. The formal experiments focus on comparing different ads channels Facebook provides and evaluating their effectiveness by measuring click-through rate or cost per action; and also we compare ads performances between male and female users .

4 Methods

4.1 Project

Goodbuylist.com is an e-commerce research project funded by National Science Foundation and created by IRKM research lab from University of California Santa Cruz. It presents a unique platform which allows users to recommend products and share shopping advices among the social network. Goodbuylist.com is in its start-up phase and the goal is to get real users to contribute.

Starting from pilot experiment 3, we launched a continuous Deal Hunter Contest on the website and offered a reward to the champion. In the contest, users were encouraged to create their favorite deal lists and share with their social network to increase their chance of winning. A leaderboard was created on Goodbuylist.com landing page to show the real-time progress. The ranking score was computed by a combination of a list's number of Facebook likes and the quality of the list itself(here we use number of items in the lists). It is worth noting that the actual ranking rule was hidden from the users because we did not want users to take advantage by only building Facebook likes without creating high quality deal lists.

4.2 Facebook Ads

Facebook is the largest social network website with approximately 250 million unique visitors each month. Facebook ads allow advertisers to target a specific group of people based on demographic information, personal interests and more. Also, Facebook ads provide flexible budget control which is very important for small business like us to be engaged. Moreover, Facebook offers a variety of ads formats and channels to encourage different activities based on what kind of results advisers want for.

4.3 Experimental Design Principles

Experimental design is the design of information-gathering exercise where variation is present, whether under the full control of the experimenter or not. It defines the focus variables or treatments, those whose effects we want to understand. Also we need to account for nuisance variables which may also have an effect. The whole point here is to have the effects of focus variables come through sharply without being confounded with the effects of nuisances.
The principles of experimental design were first outlined by Ronald A. Fisher in early 1900s. The basics include:

Comparison: In some fields of study it is not possible to have independent measurements evaluated to a traceable standard. Comparisons between treatments are much more valuable and are usually preferable.

Randomization: Some variables are difficult or impossible to control, but assigning individuals at random to groups or to different groups in an experiment provides indirect control of uncontrolled variables by ensuring their eventual independence of treatment variables.

Replication: Measurements are usually subject to variation and uncertainty. Measurements are repeated and full experiments are replicated to help identify the sources of variation, to better estimate the true effects of treatments, to further strengthen the experiment's reliability and validity, and to add to the existing knowledge of the topic.

Blocking: Blocking is the arrangement of experimental units into groups (blocks/lots) consisting of units that are similar to one another. Blocking reduces known but irrelevant sources of variation between units and thus allows greater precision in the estimation of the source of variation under study.

Orthogonality: Orthogonally concerns the forms of comparison (contrasts) that can be legitimately and efficiently carried out.

Factorial experiments: Use of factorial experiments instead of the one-factor-at-a-time method. These are efficient at evaluating the effects and possible interactions of several factors (independent variables).

To make reliable inferences and make the results generalizable, we will follow the experimental design principles for the field study on social media advertising.

4.4 Evaluation Metrics

To evaluate the effectiveness of advertising on Facebook, we adopt two sets of evaluation metrics, CPA (Cost Per Action) and CTR (Click-Through Rate). CPA measures how much advertiser pays for each specified action, for example, an impression, click, form submit or sale. Because CPA fits best to measure advertisers ROI (Return on Investment), we use it as our primary experiment metric in the research. And the action tracked down in our case is registration, users signing up to Goodbuylist.com after seeing our ads on Facebook.

$$Cost\ Per\ Action = \frac{Total\ Spending}{Number\ of\ Registrations\ after\ Seeing\ Ads}$$

The purpose of click-through rate is to capture customers' initial response to websites before taking further actions. We use CTR as our secondary metric to support CPA evaluation results and to measure ads performance in the absence of user registrations. The click-through rate is the number of times a click is made on the advertisement divided by the total number of impression (the times an advertisement was shown to customer).

$$Click\ Through\ Rate = \frac{Number\ of\ Clicks}{Number\ of\ Ads\ Impressions}$$

4.5 Conversion Tracking

Facebook ads manager provides its native conversion tracking capability to help business measure the return on investment by reporting the actions people take after viewing those ads. In our case to track user registration, we create the tracking pixels on Facebook and add them to the web page where registration occurs. The tracking results are then recorded in our ads campaign reports.

5 Pilot Experiments

In the early stage of running Facebook campaign, there were several outstanding questions we were trying to figure out, for example, which group of users to target at, how to design the landing page user experience, what kind of reward can best engage users to join our website and how to choose appropriate advertising format from Facebook advertising options to maximize our advertising ROI. The general pilot experiments setting are as below,

Advertising Goal: External website clicks to Goodbuylist.com.

Ads Channels: Facebook provides two major types of ads formats, Right Column Ads and News Feed Ads. The Right Column Ads are displayed on the right hand side column of users desktop home page. The New Feed Ads are shown to users among their feed streams; and New Feed Ads are available on both desktop and mobile devices.

Bidding: Bid for clicks. For each ad, Facebook provides a bidding range.In the study we always bid a bit higher than the lower bound of the suggested range to ensure reaching targeted users and user clicks.

Pilot Experiments Design: These pilot experiments were designed to explore the options and did not exactly follow experimental principles. They mainly help us to gain insights to design formal experiments in later phase. The pilot experiments were carried out by four phases. And the design details are reported in Table 1 - 4.

Experiment 1: Baseline Campaign	
Targeting	We target four groups of people: including moms, young ladies, college student and those who like discounts and deals.
Landing Page	Goodbuylist.com home page with service descriptions.
Ads Incentives	Social shopping with friends vs. getting purchase rebate through Goodbuylist.com
Ads Channel	Right Column Ads

Table 1: Experiment 1

Experiment 2: Halloween Campaign	
Targeting	We target two groups of people: moms or who like discounts and deals for Halloween theme costumes and gifts.
Landing Page	Halloween landing page with featured product lists of Halloween Costumes and gifts. The first four items in a product lists are shown in the leaderboard.
Ads Incentives	Halloween shopping vs. getting purchase rebate through Goodbuylist.com
Ads Channel	Right Column Ads

Table 2: Experiment 2

Experiment 3: Black Friday Deal Hunter Contest Campaign	
Targeting	We targeted Facebook users who expressed explicit interests on Deals, sales and etc., because we figure these groups of people might be more interested in participating in a contest about great deals.
Landing Page	Deal Hunter Contest introduces a new landing page with a leaderboard of showcase product lists. The first five items in a product lists are shown in the leaderboard. Also starting from experiment 3, we simplified the registration process by showing Facebook and email sign up buttons on the landing page.
Ads Incentives	Award an iPad Air or Deal Hunter Contest champion
Ads Channel	Right Column Ads

Table 3: Experiment 3

Experiment 4: Holiday Deal Hunter Contest Campaigns	
Targeting	We continued to target Facebook users who expressed explicit interests on Deals, sales and etc.
Landing Page	Deal Hunter Contest landing page with a leaderboard of participating product lists. The first five items in a product lists are shown in the leaderboard. The difference from phase 3 landing page is that we added a team introduction page to add credibility to our website. Also starting from experiment 3, we simplified the registration process by showing Facebook and email sign up buttons on the landing page.
Ads Incentives	We designed three ad campaigns of different rewards including: Experiment 4.1 Win Deal Hunter Contest Champion Experiment 4.2 $200 Amazon gift card Experiment 4.3 iPad Air
Ads Channel	Right Column Ads vs. News Feed Ads

Table 4: Experiment 4

Question 1: Determining the targeting audience

Based on our previous analysis, we proposed four groups of users that are likely to be interested in Goodbuylist.com. They are moms, young ladies, college students and those who expressed explicit interest in discounts and deals. We created the same ads targeting those groups separately to compare the advertisement CTR. Refer to experiment 1 & 2 results in Table 5 and Table 6.

Experiment 1 Targeting	CTR
Moms	0.054%
Young Ladies	0.030%
College Student	0.029%
Discount Persons	0.058%

Table 5: Experiment 1 Results

Experiment 2 Targeting	CTR
Moms	0.039%
Discount Persons	0.050%

Table 6: Experiment 2 Results

Among the four targeting groups in experiment, discount persons showed most interests in Goodbuylist.com's idea of sharing shopping lists and followed by moms. We used to believe that college students and young ladies were the major forces of online shopping, but the experiment results showed the opposite. In experiment 2, we continued to compare moms and discount persons for Halloween theme products; again, the discount person group performed better.

Question 2: Design a good landing page

The landing page is the single web page that appears in response to an online advertisement click and it gives visitors first impression of our website and our service. It is normally considered as a logical extension of the advertisement with its contents consistent with the advertisement. Once a user clicks to our website, he or she has already expressed interest in the specific topic. Thus how well the landing page is designed can largely determine if we will be able to covert site visit into further leads.

Make core value straightforward: The objective of a landing pages is to grab target users by keeping their interests and cutting out distractions. We found it very useful to give visitors a taste of our service on the landing page before asking them to sign up. In phase 1 experiment, the landing pages focused on telling who we are and how good our website is. It turned out that the information distracts and confuses visitors; visitors simply dropped off. In phase 2, we decided to directly show

a few product lists created by real users on the landing page. In order to evaluate the difference, we enabled Facebook conversion tracking to record the leads people takes after coming to the new landing page. Here we define the leads as users click on landing page product lists to discover more.

	Clicks	**Leads**
Experiment 1 (Before)	106	N/A
Experiment 2 (After)	119	17

Table 7: Adding Featured Product Lists to Landing Page

Table 7 shows that making our core values/services straightforward encouraged users to take further actions on our website. The good showcases helped people to quickly figure out what the website is about and encouraged them to stay and explore more. Therefore we will proceed with the idea in future experiments.

Make Registration Simple: Sign up is required for users to join Goodbuylist.com. Initially, we created a "Sign up to see more" link next to showcase product lists on the landing page; once a user clicks to that page, he/she will be directed to a registration page where the user is presented with two sign up options, using Facebook account or signing up with email address. The registration steps seemed lengthy, so starting from experiment 3 we decided to make it easier. Inspired by popular websites like Pinterest and Polyvore, we placed a "Sign up with Facebook" button and a "Sign up with email" button at the middle of the landing page right below the Deal Hunter Contest title. For Facebook sign up, the users would be prompted to grant Goodbuylist.com access to their Facebook profiles and by using email sign up, they will need to fill out a short form of required information to have the account created. The registration results from experiment 2 and experiment 3 are compared in Table 8.

	Clicks	**Registrations**
Experiment 2 (Before)	119	0
Experiment 3 (After)	164	8

Table 8: Moving Sign-Up Buttons to Landing Page

Although making sign up buttons salient on the landing page was not the sole change we made from phase 2 to phase, we still believe to some extent the one-step registration process boosts potential customers willingness to sign up.

Building Credibility: Credibility is a major issue with most websites in their startup phase[20]. The more users trust the website, the more likely that they will stay and take further actions. We create a team page with the link placed on the top right corner before experiment 4; the page lists the key players from the Goodbuylist.com team with their backgrounds and roles in the project. We want it to speak for ourselves as a serious website and to assure users that the website and its promotions are not associated with any cyber scamming or fraudulent intentions.

	Cost($)	**Registrations**	CPA($)
Experiment 3	71.88	8	8.99
Experiment 4.3 (Right Column Ads Only)	50	23	2.17

Table 9: Adding a Team Page Link to Landing Page

Surprisingly, such optimization made a significant difference with regards to CPA from previous experiments and it proved that building trust is a worthy practice of landing page design.

Question 3: Non-Monetary vs. Monetary Rewards

The idea of Deal Hunter Contest was first inspired by the fact we learned from Question 1 that discount person was a good targeting candidate. In addition, we proposed to create a competition that offers explicit incentives. In experiment 4, we designed three campaigns to see how users respond to different incentives in our ads and would choose the most efficient reward for future campaigns. Experiment 4.1 themed the Deal Hunter Contest itself, experiment 4.2 offers a $200 Amazon Gift Card and experiment 4.3 rewards an iPad Air.

Experiment 4.1 offering only a Deal Hunter Contest did not seem very attractive to our target users on Facebook, the campaign ended up with 0 registrations and CPA

	Cost($)	Registrations	CPA($)
Experiment 4.1 (Before)	83.34	0	N/A
Experiment 4.2 (After)	128.13	30	4.27
Experiment 4.3 (After)	128.13	35	3.66

Table 10: Adding a Team Page Link to Landing Page

information is not applicable. The other two experiments offering explicit monetary incentives did outperform the one without. The iPad Air reward which worth of $499 (Experiment 4.3) did achieve a better CPA of $3.66 than the $200 Amazon gift card campaigns (Experiment 4.2) CPA of $4.27. Though the differences between the two experiments seem not significant, we still found that our targeted users respond more to higher value rewards. Therefore, we are able to conclude that offering monetary incentives in advertisement is an easy and efficient way for new websites to attract first time users. But as for how to keep users coming back to new websites, it is a separate topic and is out this thesis's scope.

Question 4: News Feed Ads vs. Right Column Ads, a quick look

Regarding ads channel, we want to compare the performance of the two types of ads. And this question is also answered by experiment 4. News Feed ads by nature provides larger sized images and allows additional descriptions for the contents, and the bid price is normally higher. Facebook is actively promoting News Feed ads which helped the company to grow quickly in the online advertising market. The placement of Right Column ads does not seem ideal compared with News Feed ads, but its bidding price is usually lower so it worths learning the two channels performance in lowering CPA, in our case. In the experiment, we try to compare both CPA and CTR for the different channels to get a complete picture.

Holiday Deal Hunter Campaign

In the first Holiday Deal Hunter Campaign, neither of the channels leads to success-

Channel	Cost($)	Clicks	CTR	CPC($)	Registrations	CPA($)
Right Column	37.26	81	0.037%	0.40	0	N/A
News Feed	37.26	116	0.796%	0.46	0	N/A

Table 11: Holiday Deal Hunter Campaign Channel Comparison

ful user registration; but News Feed ads achieved a much higher CTR than Right Column Ads despite its slightly higher average CPC(cost per click).

Holiday Amazon Gift Card Campaign

Channel	Cost($)	Clicks	CTR	CPC($)	Registrations	CPA($)
Right Column	50.00	141	0.053%	0.35	26	1.92
News Feed	78.13	216	0.709%	0.36	4	19.53

Table 12: Holiday Amazon Gift Card Campaign Channel Comparison

In the Holiday Amazon Gift Card Campaign, both News Feed and Right Column ads led to successful user registrations. In CPA measurements, Right Column Ads' average CPA is $1.92, which means that every 1.92 dollars we spend on Facebook advertisement, we were able to get one new user to sign up with Goodbuylist.com. Meanwhile the average CPA through News Feed channel is $19.53 which is ten times more expensive in the same campaign. From CTR perspective, News Feed ads beat Right Column ads of 0.709% vs. 0.053%. In this campaign, both channels' average CPC is close.

Holiday iPad Air Campaign

Channel	Cost($)	Clicks	CTR	CPC($)	Registrations	CPA($)
Right Column	50.00	149	0.070%	0.34	23	2.17
News Feed	78.13	207	0.572%	0.38	12	6.51

Table 13: Holiday iPad Campaign Channel Comparison

The third campaign advertising for iPad Air showed similar results as the previous Amazon Gift Card group. Right Column ads were more efficient at achieving lower CPA while News Feed ads made much higher CTR.

From the pilot experiments, we are able to briefly answer the questions proposed at the beginning of the section. First of all, we find out that our best targeting odds lies at those who like discounts and sales. Second, we summarize a few best practices to design a good landing page. Third, we prove that offering monetary incentive is a straightforward way for a new website to build its audience. At last, we are able to quickly compare Right Column ads and News Feed ads; Right Column ads are more efficient in achieving lower cost per action while our goal is getting users signing up. Meanwhile, the News Feed ads have much better performance in terms of CTR meaning that they were able to get more attentions from our targeted users on Facebook than Right Column Ads. The pilot experiments provide us insights to set up the formal experiments

6 Formal Experiments

Following pilot experiment results, we put together our formal experiment to address design issues from previous experiments, answer questions left and to testify whether above preliminary results are replicable. There are two major issues from prior experiments. The first issue is that the treatments and nuisances in the field experiments were not carefully examined and potential biases were not properly accounted for. The second issue is lack of blocking, where different treatments might be shown to the same user at the mean time. Due to budget and time constraints, the focus of formal experiment is which Facebook Ads Channel works best in achieving our performance goal: Right Column Ads vs. News Feed Ads and Desktop Ads vs. Mobile Ads. The issues mentioned before are to be fixed in the light of experimental design principles.

Treatments

In general, Facebook provides two major advertising formats, Right Column and News Feed. Right Column Ads are only available on desktops versus News Feed Ads allow advertisers to choose to publish on desktops and/or mobile devices. In

the formal experiment, we treat Desktop News Feed Ads and Mobile News Feeds Ads as two channels due to the fast growth of mobile advertising. Thanks to the emerging mobile technologies, more and more people visit websites and access Apps from their smart phones and tablet computers. It becomes an interesting research question for us to answer and a new trend that new website advertisers don't want to miss.

Our primary treatment in the experiment is Ads channel including Desktop-Right Column, Desktop-News Feed, and Mobile-News Feed.

Also in order to prevent the same user from seeing different treatments at the same time, we introduce a blocking factor as the secondary treatment to split users into different groups. In our case, we chose gender to make the groups mutually exclusive.

	Treatment	**Values**
Primary	Ads Channel	Desktop - Right Column Desktop - News Feed Mobile - News Feed
Secondary	Gender	Male Female

Table 14: Experiment Treatments

Experiment Design

We have the 3 x 2 design with the primary and secondary treatments combinations. Also we replicate the experiments in reversed order to counterbalance the influence of users seeing different treatment in the previous order.

The total experiments lasted for four weeks, having 12 independent campaigns. The design matrix is as below.

Nuisances and Control

The level of noise in measuring ads is extremely high on mass social media; we need to control the possible causes of variants as much as we can. Facebook Ads consist of a variety of variables and the following examines all the nuisances in our experiment with proper control techniques applied.

	Male	Female
Desktop - Right Column	W1, W4	W2, W3
Desktop - News Feed	W2, W3	W1, W4
Mobile - News Feed	W1, W4	W2, W3

Table 15: Formal Experiment Design

Campaign Setting: Different ads in a single campaign compete for budget, to rule out the interference we place each experiment in its own campaign. Each ad campaign runs through an entire week and is allocated the same amount of budget in the beginning.

Ads Contents: We keep the same Ads headline, text and image when publishing them through different channels. In the formal experiment, we offer only one reward as the primary incentive. Due to iPad Air campaign worked best in the pilot study, we offer the same reward in this round.

Targeting: We also keep the audience targeting queries consistent across the campaigns. The demographic information we use are location, age range and users interests. The experiments target users that are in United States, among 18 55 years old and expressed interests in one or any of the following categories, #coupons, #daily deals hunter, #Deal of the day, #Sales promotion, #Cyber Monday, #Black Friday(shopping), #free gift, #Living Social, #Groupon.

Bidding: We continue to manually set maximum bid for clicks (CPC). Due to the differences in Ads channel and targeting selection (using gender as blocking factor in particular, all other targeting criteria are the same), their minimum bidding values vary; we will always bid a little bit higher than Facebooks suggested lowest bid price to ensure successful clicks.

Campaign ID	Week	Channel	Gender
1	1	1- Desktop - Right Column	Male
2	1	2- Desktop - News Feed	Female
3	1	3- Mobile - News Feed	Male
4	2	1- Desktop - Right Column	Female
5	2	2- Desktop - News Feed	Male
6	2	3- Mobile - News Feed	Female
7	3	1- Desktop - Right Column	Female
8	3	2- Desktop - News Feed	Male
9	3	3- Mobile - News Feed	Female
10	4	1- Desktop - Right Column	Male
11	4	2- Desktop - News Feed	Female
12	4	3- Mobile - News Feed	Male

Table 16: Formal Experiments Schedule

Schedule

The 12 campaigns are listed in Table 16 with execution schedule.

7 Results

After running the formal experiments for 12 weeks, we obtain the ads campaign results. The most important measurements are summarized in Table 17 and campaign details are contained in the Appendix A.

Channel	Cost($)	Clicks	CTR	CPC($)	Registrations	CPA($)
1 - Desktop - Right Column	79.96	180	0.039%	0.44	28	2.86
2 - Desktop - News Feed	55.96	40	0.166%	1.40	17	3.29
3 - Mobile - News Feed	81.59	151	0.352%	0.54	3	27.2

Table 17: Formal Experiments Result on Channel

Question 5: Right Column Ads vs. News Feed Ads on Desktop

On desktops, Right Column Ads and News Feed Ads are compared. Overall the total spending of 1 - Desktop - Right Column campaign was $79.96; the 2 - Desktop - News Feed campaign did not use up the entire budget assigned and spent a total of $55.96. 1 - Desktop - Right Column ads got 180 website clicks and 2 - Desktop - News Feed ads made 40. On average, cost per website click of 2 - Desktop - News

Feed is much higher than1 - Desktop - Right Column. However, News Feed Ads' relatively higher bid price is not the only cause; Facebook also costs other actions taken on News Feed ads such as, post likes, page likes and share. With regard to CPA, our primary experiment metric here, 1 - Desktop - Right Column's $2.86 per registration cost is better than 2 - Desktop - News Feed's $3.29. As for CTR, News Feed ads on desktop showed its strength again; 2 - Desktop - News Feed's CTR 0.166% is nearly five times higher than that of 1 - Desktop - Right Column's.

Question 6: News Feed Ads on Desktop vs. On Mobile Devices

Mobile technology is the new trend of Internet marketing and attracts huge attentions in both academia and industry[26]. Our question 6 compares News Feed Ads performance on Desktop (2- Desktop - News Feed) and Mobile (3 - Mobile - News Feed) Devices. At high level, 2 - Desktop - News Feed experiments spent $ 55.96 and led to 40 clicks in total; 3 - Mobile - News Feed experiments spent $81.59 and got 151 clicks. To our surprise, the our 3 - Mobile - News Feed Mobile ads only got 3 registrations and resulted in the CPA of $27.2 which is a lot higher than Channel-2 and Channel-1. However, the Channel-3 group achieved a better CTR of 0.352% vs. Channel-2s CTR of 0.166%.

Question 7: Male Ads Audience vs. Female Ads Audience

As for the second set of treatment, gender, we summarized how male and female users responsed after seeing our ads in Table 18. Overall the spending on male and female advertisements were close and the males group made a total of 174 registrations while females made 197. The aggregated experiment data across different channels in Table 18 shows that females' average CPA of $3.95 is lower than males' $5.35 and also females' CTR of 0.076% is slightly better than males' 0.066%. Notably, under each channel treatment, we found similar patterns that female users responded more actively to our advertisements than male. The details can also be found in Appendix A.

Channel	Cost($)	Clicks	CTR	CPC($)	Registrations	CPA($)
Male	107.01	174	0.066%	0.62	20	5.35
Female	110.49	197	0.076%	0.56	28	3.95

Table 18: Formal Experiments Result on Gender

In general, the results from the formal experiments were consistent with our pilot experiments' findings in earlier discussions. For ads channel treatment, on one hand, Right Column Ads on Desktop were better at achieving lower cost per user registration than News Feed ads on Desktop and Mobile devices. On the other hand side, News Feed ads (both 2 - Desktop - News Feed and 3 - Mobile - News Feed) made higher CTR than Right Column Ads. In addition, for the second treatment gender, female users seemed to be more interested in our advertisement than male users.

8 Discussion

First of all, Facebook advertising platform made it possible for us to reach to a broad audience and get people engaged in our campaigns. Otherwise, it would be even more difficult for new websites or small businesses like us to do so with limited budget and resources. Let's take formal experiments as an example, Goodbuylist.com got a total of 524,849 ad reviews and 48 new user registrations. In average, the registration conversion cost is $4.53 and we are very satisfied with the result.

The first factor that makes Goodbuylist.com online campaign successful could be targeting. We were able to compare how a few hypothetical user groups responded to our ads and filtered out a few selections that did not work well. The selection results did help us to save budget and focus our energy on our best audiences.

Second, a good product is the foundation of any successful marketing campaign. We learned from the course of improving Goodbuylist.com and the landing page that simplicity is the new sophistication. We were confused or say overwhelmed by the

ideas at the early marketing phase about how to present our website. We added every detail on the landing page trying to convince people how good we are and how different our website is; but that did not work out until the team decided to show featured product lists on the landing page directly and simplified the registration process. Credibility issue is what every new website faces and building trust is critical for marketing. In our case, a simple approach to add a team introduction page helped to make a difference.

The next question is about incentive. Since everyday our potential users are inundated with mass information from media and todays social networks, how can our websites ads draw their attentions immediately? From our experience, we find out that it is worthwhile to offer some explicit reward to involve users first and let them to explore more about our website later. After introducing Deal Hunter Contest and offering a champion gift, users started to sign up and became more engaged. Surprisingly, our experiments showed at Facebook Right Column Ads have lower CPA than News Feed ads. Both the pilot and the formal experiments support the same result. However it is widely believed that News Feed ad is a preferred channel and according to an industry report the former have 21 times higher CTR than the latter. The most likely cause of this phenomenon is that those who clicked on Right Column ads have indicated their stronger interests in the ads contents than those who clicked News Feed ads. In addition, another important aspect of News Feed Ads is that they are likeable, shareable and commentable. Their best use might be building brand awareness on the social network and encouraging users to like or share the posts. Here we collect some additional data of "Likes" News Feed ads received in our formal experiments in Table 19.

Moreover, mobile New Feed Ads did not work as well as expected. In total, we got only 3 mobile registrations which uplift the CPA to $27.20. One plausible explanation is that Goodbuylist.com's user interface is not ideal on mobile devices likes smart phones and tablets. For example, the contents do not fit well on much smaller

Channel	Page Likes	Post Likes
Desktop - News Feed	10	24
Mobile - News Feed	10	51

Table 19: News Feed Ads Page and Post Likes

screens and it is more difficult for users to perform same operations like fill out registration form on mobiles devices than desktops.

At last, we found that our social network shopping theme appeal to females more than males. This finding is consistent with the general belief that women spend much more money and time shopping online than men. Therefore the female user group is of more value to Goodbuylist.com and for future research we should focus on females to improve our advertising efficiency.

9 Conclusion

Our research generalizes a few lessons for new websites advertising on Social Networks. To begin with, identifying target audience is the first step for new websites to get started on social network ads platforms. Meanwhile, offering monetary incentives is an effective way to attract users and a user-friendly product design greatly increases the chance to keep the users stay. Notably, it is a nice try to start building trust for new websites. Then, with regard to choose the best advertising channel to efficiently advertise our website, we find out that Right Colum Ads have lower CPA than News Feed Ads on Desktop given that News Feed ads have a much higher CTR. For News Feed Ads on Desktop and Mobile, Desktop ads achieved better CPA. Moreover, female users respond better to Goodbuylist.com ads than male users.

At the higher level, the optimal ads setting combinations depend on advertisement goals, products and other factors; but the key to a successful campaign is constant testing and find it out from the ads results.

10 Limitations

The major known limitations of the research are:

- We had to conduct experiments and generate results from only one new website Goodbuylist.com.

- The pilot experiments did not exactly follow experimental design principles by controlling all nuisances.

- Due to limited budget and time, we were not able to compare all different variables, for example, compare how people respond to different rewards in formal experiments.

- As a new website without an audience base, we were not able to best leverage the World-of-Mouth advantage on social networks.

- The website is created by a university research team and several features of the website are still under construction.

11 Future Work

We proposed future research to focus on several areas. First of all, developing a mobile version of Goodbuylist.com that can help us to better compare News Feed Ads' performance on Desktop and Mobile devices (Question 6). Second defining a set of different advertisement goals and studying what works best on Social Networks

like Facebook; for example, we can study how to effectively build audience using Facebook. As a follow up for user registration, we can design tracking mechanisms to measure users' actions after successful sign-up.

12 Implication of Research

Each year, hundreds of new websites goes on line; Google, Facebook and Twitter used to be among them. How to rise from the crowded competitors? The most challenging part is marketing, advertising for the service and getting the right users; after that, things get easier. From our research, we generalize a few lessons from our experiments and hope these will provide other new websites some insights about how to get started with marketing campaigns, and how to do it right from beginning on social media.

A Formal Experiment Statistics

In Table 20 and 21, we include the original advertising statistics from the 12 campaigns.

Campaign ID	Cost ($)	Clicks	Reach	Freq.	Impressions	CTR	CPC ($)	# of Reg.	CPA ($)
1	20.00	50	56727	1.9	107781	0.046%	0.40	8	2.50
2	11.94	15	6086	1.1	6695	0.239%	0.75	3	3.98
3	23.00	41	10811	1.0	10811	0.379%	0.56	0	N/A
4	19.96	46	68274	1.7	116066	0.040%	0.43	9	2.22
5	4.47	2	2273	1.0	2273	0.088%	2.24	2	2.24
6	19.05	35	9673	1.0	9673	0.362%	0.54	0	N/A
7	20.00	44	60628	1.8	109130	0.040%	0.45	6	3.33
8	19.55	10	7570	1.1	8327	0.120%	1.96	5	3.91
9	19.54	44	10721	1.1	11793	0.373%	0.44	3	6.51
10	20.00	40	54307	2.3	124906	0.032%	0.50	5	4.00
11	20.00	12	6201	1.1	6821	0.176%	1.67	7	2.86
12	20.00	31	10573	1.0	10573	0.293%	0.65	0	N/A

Table 20: Formal Experiment Campaign Details

Channel (Male)	Cost($)	Clicks	CTR	CPC($)	Registrations	CPA($)
1 - Desktop - Right Column	40.00	90	0.039%	0.44	13	3.08
2 - Desktop - News Feed	24.02	12	0.113%	2.00	7	3.43
3 - Mobile - News Feed	43.00	72	0.337%	0.60	0	N/A
Total	107.02	174	0.066%	0.62	20	5.35

Table 21: Ads Targeting Males on Different Channels

Channel (Female)	Cost($)	Clicks	CTR	CPC($)	Registrations	CPA($)
1 - Desktop - Right Column	39.96	90	0.040%	0.44	15	2.66
2 - Desktop - News Feed	31.94	28	0.207%	1.14	10	3.19
3 - Mobile - News Feed	38.59	79	0.368%	0.49	3	12.86
Total	110.49	197	0.076%	0.56	28	3.95

Table 22: Ads Targeting Females on Different Channels

B Landing Page Design

In the appendix, we include different versions of landing pages. During baseline phase, Figure 1 landing page mainly focused on discribing the services we offer. There is a Sign Up button at the upper right corner, once clicked on the button the user will be directed to a seperate registration page with two options using Facebook account or creating an email account.

Figure 1: Original Landing Page

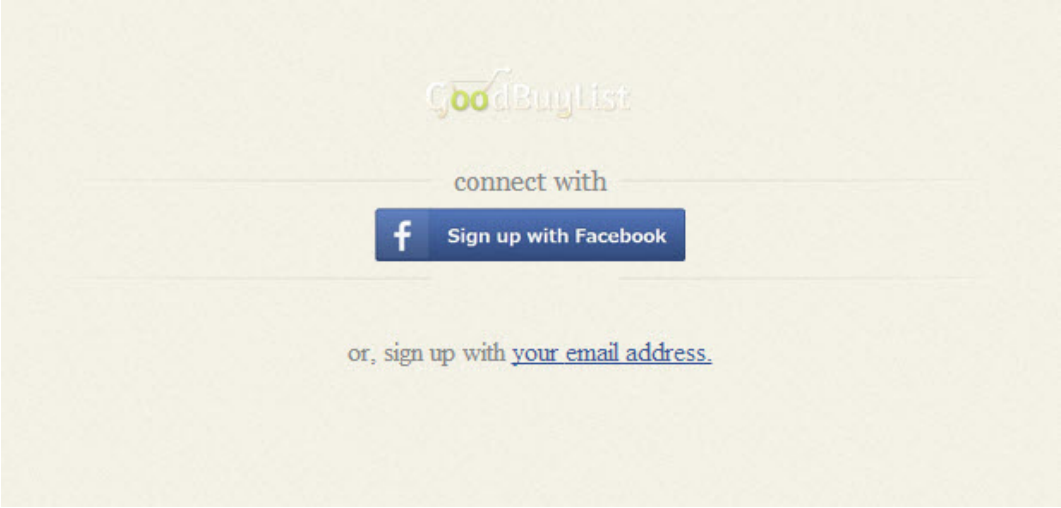

Figure 2: Registration Page

On Halloween campaign landing page, we present two featured product lists.

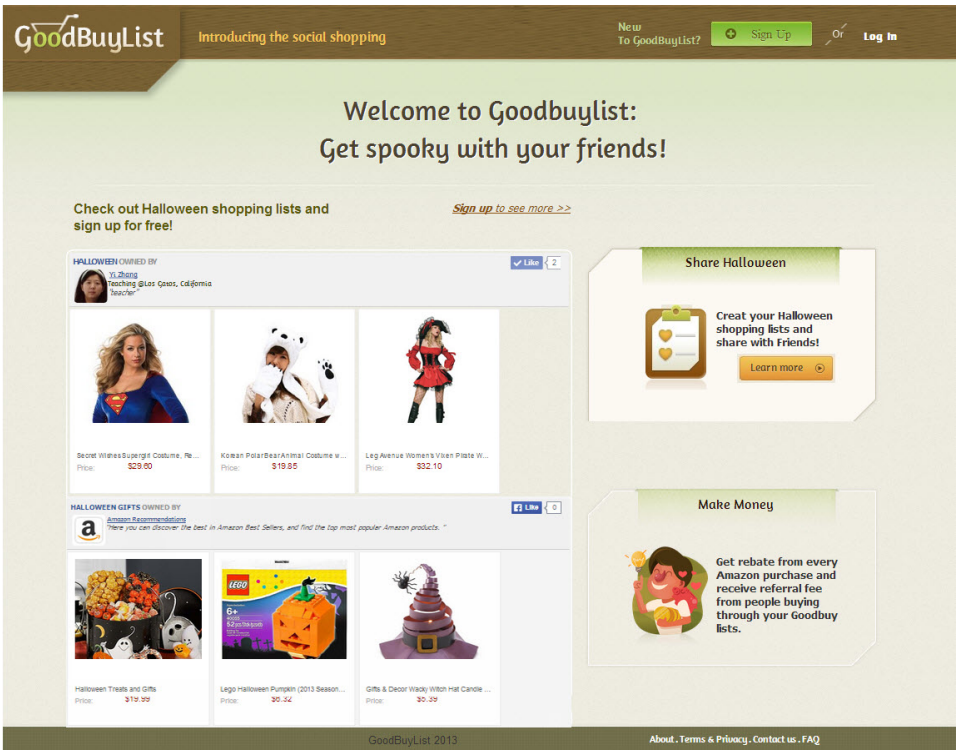

Figure 3: Halloween Landing Page

Table 4 below is the Deal Hunter Contest landing page with a product list leaderboard with real time ranking. Two major changes we made to the landing page are the Sign Up button was moved to the landing page and we added a link to "Team" page at the upper right corner.

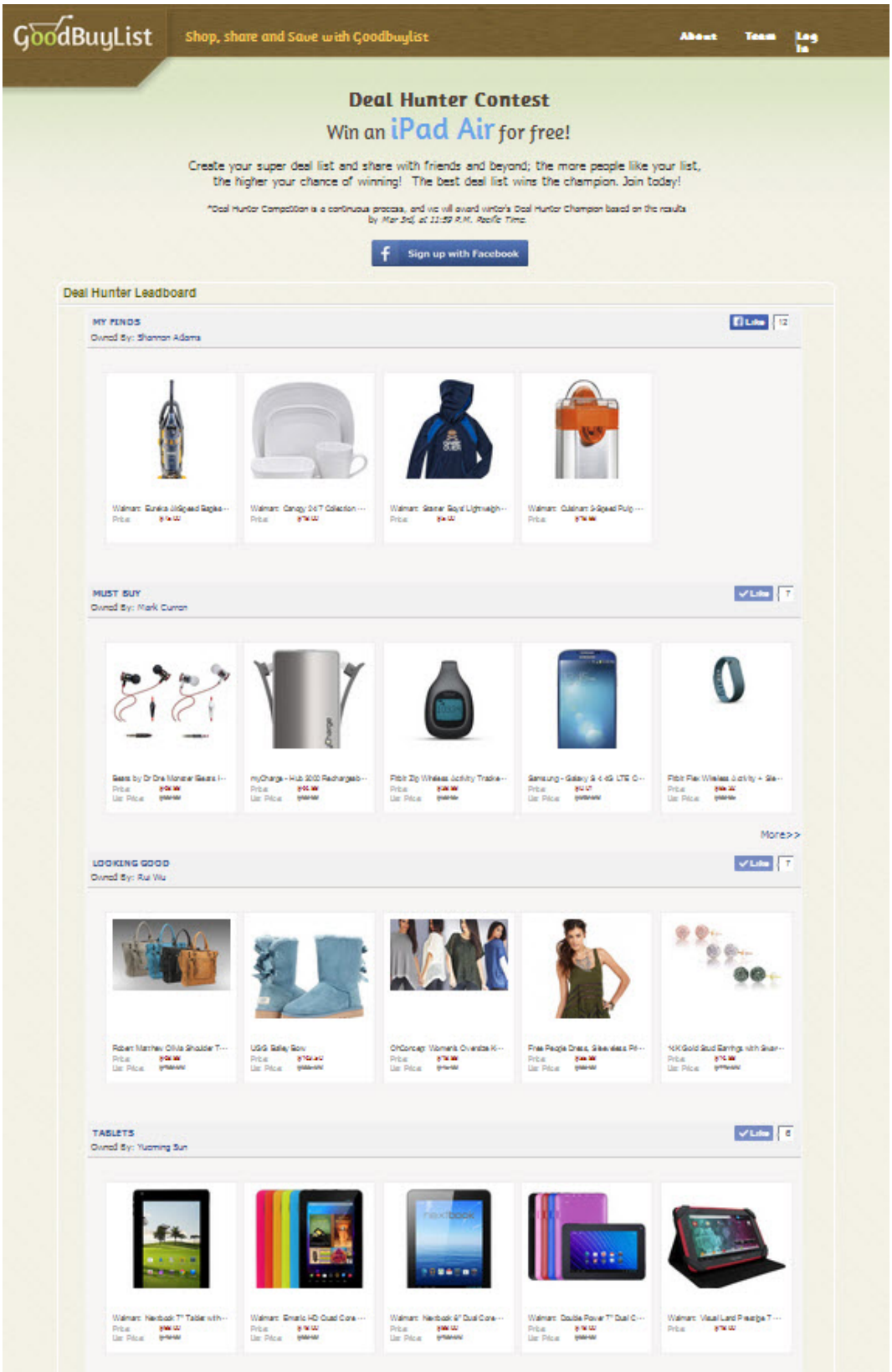

Figure 4: Deal Hunter Contest Landing Page

Below is our team page with detailed introduction of each member's profile and background.

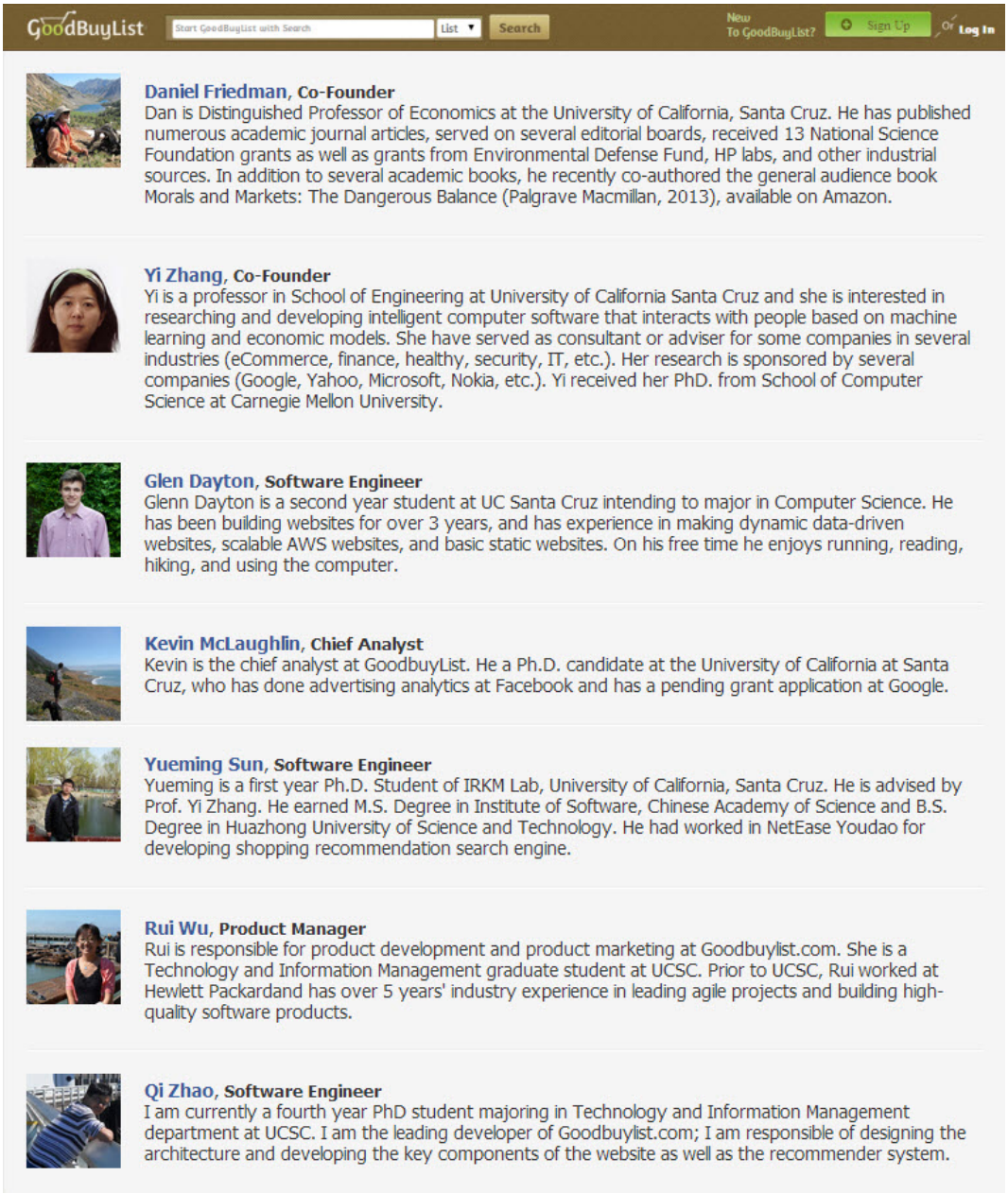

Figure 5: Team Introduction Page

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