

Paybuyer Whitepaper



CONTENTS

- 1 **INTRODUCTION**
- 2 **VERIFYING PURCHASES IS NECESSARY WHEN PAYING SALES PROSPECTS.**
- 3 **VERIFYING EVERY PURCHASE IS IMPRACTICAL.**
- 4 **PROBABILISTIC VERIFICATION OF PURCHASES IS REQUIRED.**
- 5 **A SOLUTION IS TO USE PROBABILISTIC PAYMENT IN COMBINATION WITH PROBABILISTIC VERIFICATION.**
- 6 **CURRENT TARGETING TECHNIQUES CANNOT BE USED TO PAY PROSPECTS.**
- 7 **WHEN CAN AN ADVERTISER PAY A PERSON A LOT FOR ATTENTION TO A SALES MESSAGE?**
- 8 **WHEN ARE PEOPLE INTERESTED IN RECEIVING ADVERTISING?**
- 9 **VERIFICATION + PAYMENT ENABLES EXTREME TARGETING.**

NOTES

- Expected value (EV) payment amounts
- Efficiency of EV payments
- Verifying purchases is more reliable than predicting them.
- Formula for the maximum amount an advertiser can pay a prospect.

Introduction

In this paper, we explore the problem of how to pay prospects for their attention to sales messages. We give a general method and system for enabling advertisers to pay meaningful amounts of money to prospects. This method has an awkward name: Pay-the-buyer Advertising Using EV Payment and Probabilistic Verification of Purchases. Paybuyer.com itself provides one implementation of the method and system.

Verifying purchases is necessary when paying sales prospects.

Assume you were an advertiser who wanted to pay money to prospects in exchange for their calling your company. Say, for instance, that you sell swimming pools. You could list in a pay directory under "swimming pools." Then when a searcher found your link, she could click on the link and call. A payment from your company to her could then be automatically associated with the call. But, you would want to know that the searchers you paid were prospects who were going to buy the type of product you sell. Otherwise, you would be paying almost all your money to non-buyers.

How could you be sure you were paying only imminent buyers? One way would be to verify that, some time after calling your company, the caller actually purchased the product that you sell. Proof-of-purchase could be required for payment. For example, assume you were Joe's Pools and you wanted to pay \$10 to people for calling you, provided those people were really about to buy a pool. You or the directory operator could verify that any person you paid actually then went on to buy a pool from your company or from one of your competitors, within a specified period of time after calling you.

With \$10 at stake per call, if purchases were not verified in some way, non-buyers would call, waste your time, and take 99+% of the payments. So, some kind of verification of purchases is essential.

Verifying every purchase is impractical.

Yet verification of every purchase - online and offline - would be too time-consuming for the directory operator and for the buyers themselves. For example, assume Mary enters "swimming pool" into a directory and is offered \$10 to call Joe's Pools on the condition that she will submit proof that she purchased a pool within 30 days of calling Joe's. If Mary is like most people she will not care about this offer because she will not want to go to the trouble of submitting proof-of-purchase for only \$10 or some other small amount of money.

Moreover, if normal dollar payments are used, then for every query Mary enters and every corresponding click, the directory would have to ask her, at some point after her search, "Did you buy the type of product you clicked on?" A typical user might click on, say, 10 links per day, 300 a month. Few users would be inclined to answer 300 of these "Did you buy it?" questions a month.

In theory, instead of answering these questions, she could just send in a "notice of purchase" each time she purchased, to collect a payment-for-attention rebate, but then she would somehow have to associate that purchase with all her corresponding search queries and clicks, which, at this point in time, is an impractically time-consuming task.

Probabilistic verification of purchases is required.

Since verifying every purchase, and checking every click, is impractical, some kind of probabilistic verification is necessary. A user-friendly way needs to be found to:

1. Probabilistically inspect searchers - sales message recipients - after they click on links (after they receive sales messages, that is)
2. Pay them if they turn out to be purchasers.

A solution is to use probabilistic payment in combination with probabilistic verification.

One efficient way to choose which clicks to choose for purchase verification is to use a probabilistic payment method called expected value (EV) payment¹. This method can also be called "payment by lottery ticket." As Rivest² has pointed out, "From a bank's point of view, lottery tickets are significantly more efficient than any known micropayment scheme.

Combining probabilistic payment with probabilistic verification works as follows: Instead of a definite payment of \$10 from Joe's Pools, Mary would be offered an EV payment of, say, \$10 EV. This means she would receive a virtual "EV Ticket" which would have, say, a 1/100 chance of being worth \$1,000. This EV Ticket is mathematically equivalent to a definite \$10.

The condition of receiving the payoff on the ticket is that, after calling Joe's, she buys a pool from one of Joe's competitors. Assume, then, that Mary takes the offer and collects the corresponding EV Ticket by clicking on Joe's link in the directory and calling Joe's. Assume, further, that her EV Ticket wins, entitling her \$1,000, if she can prove that she bought the pool that she said she planned to buy when she clicked on Joe's link. Joe, or the

directory providing Joe's pay-ad, would alert Mary that she has provisionally won the \$1,000, if she provides proof-of-purchase. Most people would gladly submit proof for \$1,000. Thus, EV payments - embodied in EV Tickets - enable advertisers to pay prospects for their attention because only winning tickets, with large payoffs, lead to purchase verifications².

That means:

- The searcher only gets notified if her EV Ticket is a winner. Then she can answer, "Did you buy?"
- For a large payoff it's worth her time to prove she was a buyer.
- Given the large payoff, the directory operator can justify the cost of verifying the purchase, and charge a verification fee.

In other words, verification-of-purchase, essential to paying meaningful amounts of money for attention, is made practical by the use of large, random payoffs.

Joe's Pools, meanwhile, is satisfied because they know that they are only paying for calls from people who purchase a pool after talking to their company. Their money is paid out to verified buyers, not in small amounts with each call, but randomly, once every, say, 100 calls, in large amounts.

Naturally, people will have different preferences regarding how much money they require in order to go to the trouble of submitting proof-of-purchase. To fit personal preferences, an advertising system enabling EV payments for attention can let individuals choose the size of their payoffs. A user would set her payoff and the system would automatically adjust her probability of winning to yield the EV payment determined by the advertiser. For instance, if Joe's Pools offers \$10 EV, and Mary chooses a payoff of \$2,000, then her probability of winning would be set at 1/200.

Current targeting techniques cannot be used to pay prospects.

Techniques such as keyword placement, personalization, and context-based placement all increase the probability that a person who receives an ad will be a buyer. However, these techniques cannot work well for offering money to prospects for attention because of two fundamental limitations:

1. They have no way to stop free riders (non-buyers) from taking almost all of the payments
2. They do not yield a high enough probability of a sale³ per ad exposure to justify a meaningful money payment to a prospect (see the payment formula⁴ below).

When can an advertiser pay a person a lot for attention to a sales message?

The only time an advertiser can pay a person a significant amount of money to visit a web site, view a commercial, or call is when the searcher is an imminent buyer of the advertiser's type of product or service. Only at this time is reaching the searcher worth much money, because only at this time is the probability of a sale high. The fact is, you're almost always worthless (or close to worthless) to advertisers. For instance, a local pool builder will almost never be willing to pay you much, if anything, to talk to him on the phone. But there is one time when

you are worth a lot. And that is when you are really in the market for a pool. Then, at that rare time, a local pool builder may well be willing to pay you \$100.00 to talk to him on the phone.

Commentators who have suggested that advertisers should pay people directly for attention to sales messages have missed the central fact that people are almost always worth near zero to advertisers. That's why the amount of money that can be spent per impression, per sales message, delivered to an audience member is generally small (e.g., from .5 cent to 2.0 cents per viewer of a commercial).

It is only during the pivotal ready-to-buy time that a person flips from being Ms. Worth-almost-nothing to Ms. Worth-a-lot. Accordingly, if a method is to enable advertisers to pay searchers the maximum amounts for attention, that method must ensure that advertisers pay only searchers who are imminent buyers. The method of probabilistic payment and purchase verification does precisely that.

When are people interested in receiving advertising?

Most people are only interested in receiving advertising - product information - when they are ready to buy. Of course, there are exceptions to this rule, but in general, people don't want to spend their time, or be paid to spend time, receiving random ad messages. Do you want to listen to a 5 minute pitch about, say, a Steinway piano, right now? Yet, in that rare time when they are ready to buy, a piano for instance, people actively seek pitches about piano's. So, a system that pays imminent buyers and only imminent buyers to receive messages is not only highly efficient for advertisers, but also for recipients of those messages as well.

Verification + Payment Enables Extreme Targeting.

The probabilistic payment + verification method and system sketched above enable an advertiser to target a pay-message to people who match virtually any objective criteria. This means advertisers can target pay-messages to an extreme degree not generally possible with conventional targeting systems. As discussed, pay-messages can even be targeted to match specified future actions, such as specified purchases. For example, the Venetian Hotel could target and pay \$10 EV only to people who are going to:

Rent a hotel room

- In Las Vegas
- In the next 60 minutes
- For over \$400 a night
- From the Bellagio Hotel.

This kind of targeting may succeed for three basic reasons:

1. The messages include EV payments that incentivize the targets themselves to find and receive those messages
2. Verification assures advertisers (message producers) that payoffs only go to people who match all the target conditions

3. A directory system with an appropriate search interface can make hyper-targeted pay-messages easy for advertisers to post and for buyers to find.

For instance, a directory could enable an auto insurance company to post offers to pay prospects who match detailed targeting conditions, which could be found via a search form:

Search Form Fields

When are you going to buy:

Your zip code:

Your age:

Number of moving violations last 3 years:

Thus, a directory can enable the producer of a pay-message, particularly a sales message, to hail precisely defined audiences.

Notes

¹Expected Value Payment Amounts

The formula for expected value (EV) is:

$EV = (\text{your chances of winning}) \times (\text{the payoff you can win}).$

So, for example:

\$1 EV = a 1/100 chance to win \$100

1% EV of a sale = a 1/100 chance to win a 100% rebate on the sale.

As Paybuyer-type directories develop, it is likely that bidded amounts and bidded placement under search terms will be used.

The EV amounts can be denominated in EV dollars and cents. For instance, under the search term "grand piano" Steinway might bid \$5 EV to be ranked #1, Yamaha might bid \$4.90 EV to be ranked #2, and Young Chang might bid \$4.80 EV to be ranked #3. Or, the EV amounts can be denominated in terms of a percentage of a sale. For instance, under the search term "grand piano" Steinway might bid 1.2% EV of a sale to be ranked #1, Yamaha might bid 1.1% EV to be ranked #2, and Young Chang might bid 1.0% EV to be ranked #3.

²Efficiency of EV Payments

For more on the efficiency of EV payments, see the second paragraph of Electronic Lottery Tickets as Micropayments(pdf) by Ronald L. Rivest, which explains that, "This scheme is exceptionally efficient because the bank only handles winning tickets, instead of handling each micropayment."

³New way to target messages is fundamentally better because verifying purchases is more reliable than predicting them.

The probability that a purchase will result from an ad message depends crucially on the attractiveness of an advertiser's product offering. We will not consider this aspect of advertising. Instead, we will just consider the targeting of paid-for messages, and assume that an advertiser has a "competitive" offering.

Now, if we look at targeting at a fundamental level, we see that conventional methods rely on correlations, especially correlations between a user's actions and the probability of a purchase - for example, a user who enters "piano" into a search engine, or visits a site about piano's, or buys piano sheet music, or receives emails that contain the word "piano," has a higher probability than the average person of purchasing a piano in the near future. Such correlations, while much better than nothing, are usually weak predictors that usually yield far less than a 1/10 probability of reaching an imminent buyer with an ad exposure.

Moreover, the probability of a making a sale per message in conventional ad delivery systems generally ranges from 1/10,000 to 1/20 depending on the particular correlation method and sales situation. Most advertising delivery systems operate in this probability range.

Simply put, conventional targeting methods attempt to predict future buying behavior from past and/or current behavior, an attempt that almost always fails. By contrast, the method sketched above relies on verification of a user's stated purchasing intent. Verifying behavior is, of course, far more reliable than predicting it. With a verification-based approach an advertiser can have a nearly 100% probability of paying only for reaching an imminent buyer.

4Formula for the maximum an advertiser can pay a prospect

Not counting transaction costs, the formula for the maximum amount an advertiser can, without losing money, pay a prospect for exposure to a sales message is:

$$\text{max amount} = (\text{probability of a sale}) \times (\text{lifetime value of the customer}).$$

In other words, payment is directly proportional to the probability of a sale: the lower the probability, the lower the payment; the higher the probability, the higher the payment. It is because the probability of a sale per impression is very low, advertisers usually pay tiny amounts for ad impressions - often less than .5 cent per banner ad exposure, and generally, from .5 cent - 2.0 cents per impression for TV, radio, and billboard ads. As discussed, when using a Paybuyer-type system, advertisers only pay for reaching prospects who have a 100% probability of buying a specified product or service. So, if the advertiser's product or service provides a competitive value, the sales conversion rate will justify meaningful payments to those imminent buyer prospects. To give but one example, GEICO, which has a high phone sales conversion rate (see page 7, paragraph 4 of the Chairman's Letter), should be able to pay, at least, \$15 EV to each imminent buyer caller.