

# Exhibit 17

# EXHIBIT C

# Summary of Opinions

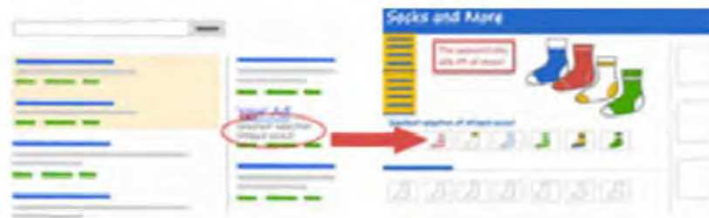
## Google's Adwords Infringes IPE Patents

### Quality Score

Quality Score is an estimate of how relevant your ads, keywords, and landing page are to a person seeing your ad. Having a *high* Quality Score means that our systems think your ad, keyword, and landing page are all relevant and useful to someone looking at your ad. Having a *low* Quality Score, on the other hand, means that your ads, keywords, and landing page probably aren't as relevant and useful to someone looking at your ad.

### Example

Suppose Sam is looking for a pair of striped socks. And let's say you own a website that specializes in socks. Wouldn't it be great if Sam types "striped socks" into Google search, sees your ad about striped socks, clicks your ad, and then lands on your webpage where he buys some spiffy new striped socks?



In this example, Sam searches and finds exactly what he's looking for. That's what we consider a great user experience, and that's what can earn you a high Quality Score.

# Summary of Opinions

**Google's Adwords Infringes IPE Patents because its "Quality Score" is based on content and collaborative data.**

## How we calculate Quality Score

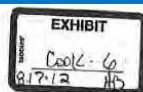
Every time someone does a search that triggers your ad, we calculate a Quality Score. To calculate this Quality Score, we look at a number of different things related to your account, like the following:

- **Your keyword's past clickthrough rate (CTR):** How often that keyword led to clicks on your ad
- **Your display URL's past CTR:** How often you received clicks with your display URL
- **Your account history:** The overall CTR of all the ads and keywords in your account
- **The quality of your landing page:** How relevant, transparent, and easy-to-navigate your page is
- **Your keyword/ad relevance:** How relevant your keyword is to your ads
- **Your keyword/search relevance:** How relevant your keyword is to what a customer searches for
- **Geographic performance:** How successful your account has been in the regions you're targeting
- **Your ad's performance on a site:** How well your ad's been doing on this and similar sites (if you're targeting the Display Network)
- **Your targeted devices:** How well your ads have been performing on different types of devices, like desktops/laptops, mobile devices, and tablets – you get different Quality Scores for different types of devices

**COLLABORATIVE**

**CONTENT**

<http://support.google.com/adwords/bin/answer.py?hl=en&answer=2454010>



7/17/2012  
IPE 0022875

/n/answer.py?hl=en&answer=2454010

7/17/2012  
IPE 0022876

s/bin/answer.py?hl=en&answer=2454010

7/17/2012  
IPE 0022877

# Summary of Opinions

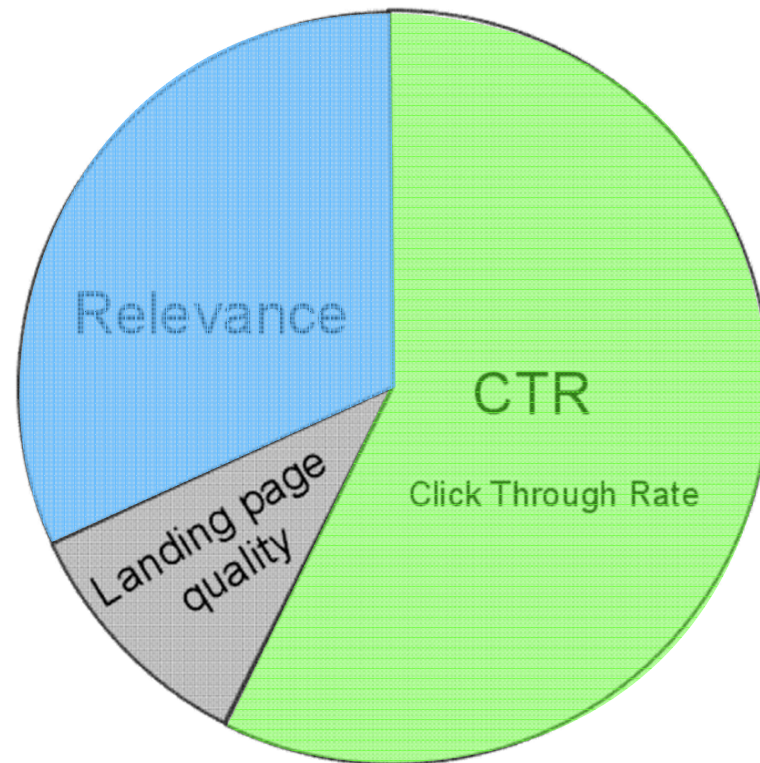
## Google's Adwords Infringes IPE Patents

What is Quality?

# Summary of Opinions

## Ad Quality Score

Three factors:



**The Lif**

<http://>



abo

by Dan H  
Haifeng  
Sunil Ko  
Phoeni

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G-IPE-0008829



# Adwords Infringes the '420 Patent

## Claim 10

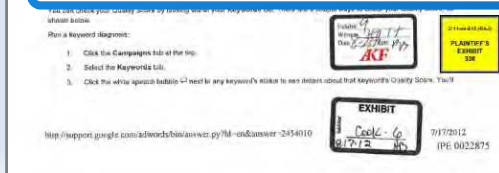
a feedback system for receiving collaborative feedback data from system users relative to informons considered by such users;

**“Collaborative feedback data” means “data from system users with similar interests or needs regarding what informons such users found to be relevant”**



Every time someone does a search that triggers your ad, we calculate a Quality Score. To calculate this Quality Score, we look at a number of different things related to your account, like the following:

- **Your keyword's past clickthrough rate (CTR):** How often that keyword led to clicks on your ad



# Adwords Infringes the '420 Patent

## Claim 10

the filter system combining pertaining feedback data from the feedback system with the content profile data in filtering each informon for relevance to the query.

### How we calculate Quality Score

Every time someone does a search that triggers your ad, we calculate a Quality Score. To calculate this Quality Score, we look at a number of different things related to your account, like the following:

- **Your keyword's past clickthrough rate (CTR):** How often that keyword led to clicks on your ad
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- **Your targeted devices:** How well your ads have been performing on different types of devices, like desktops/laptops, mobile devices, and tablets – you get different Quality Scores for different types of devices

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CONTENT



- **Your keyword's past clickthrough rate (CTR):**  
How often that keyword led to clicks on your ad

- **Your keyword/ad relevance:**  
How relevant your keyword is to your ads

- **Your keyword/search relevance:**  
How relevant your keyword is to what a customer searches for

**US PATENT  
6,314,420**

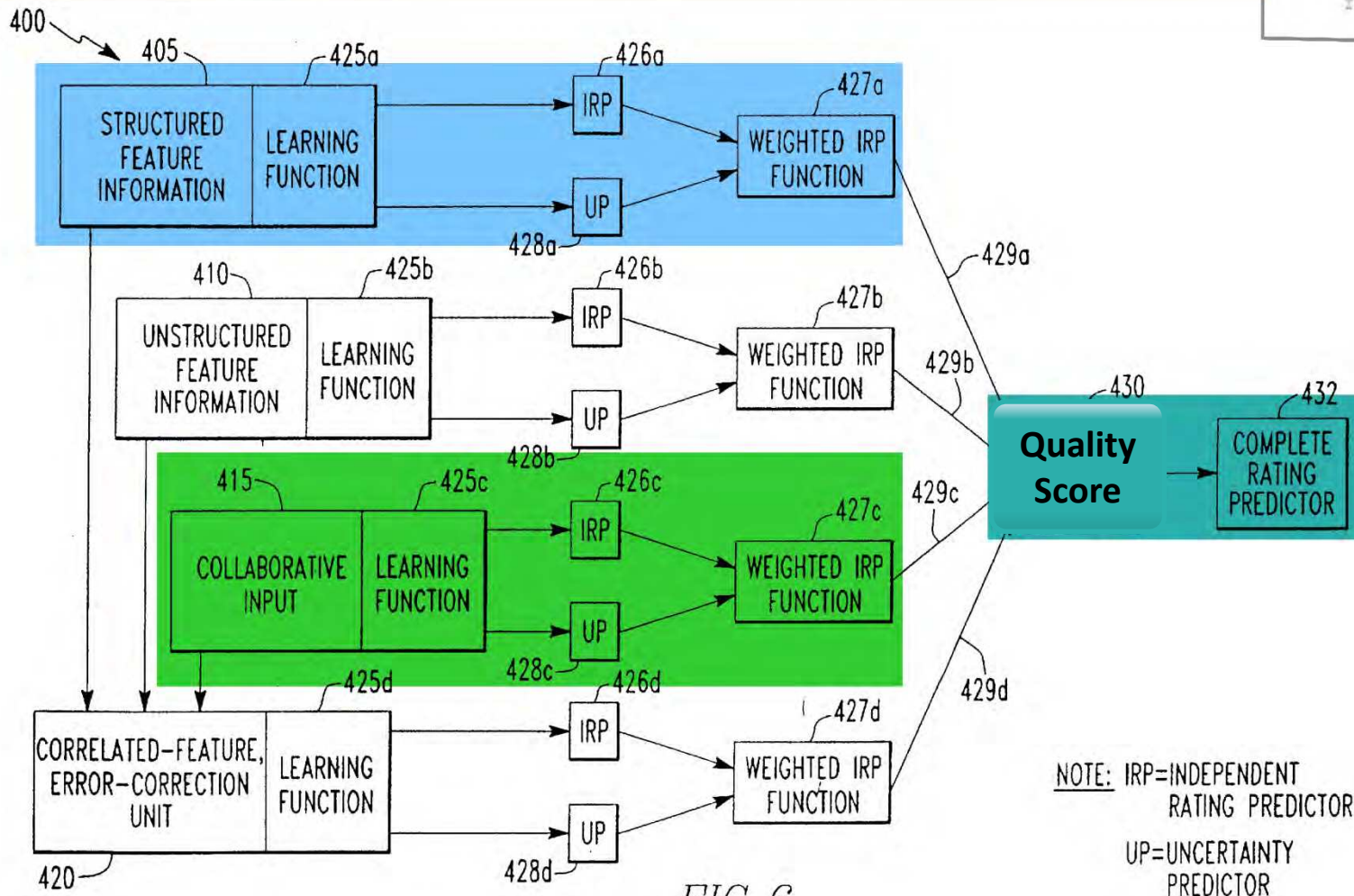
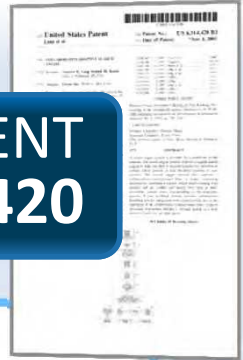


FIG. 6

# Google's Internal Documents Prove Infringement

Google

Understanding Search Ads Quality

Dan Friedman  
August 26, 2009

Google  
Understanding Search Ads Quality  
Dan Friedman  
August 26, 2009

When we run the auction, we look at the historical performance of the specific query, keyword, and creative pairing. If we do not have enough significant data on that specific pairing, we may look at the performance of other keywords or creatives in the ad group, campaign or account to help inform the calculation. In general, our system prefers to use the most granular and specific data possible, which is why the specific query, keyword, creative pairing is the primary focus.

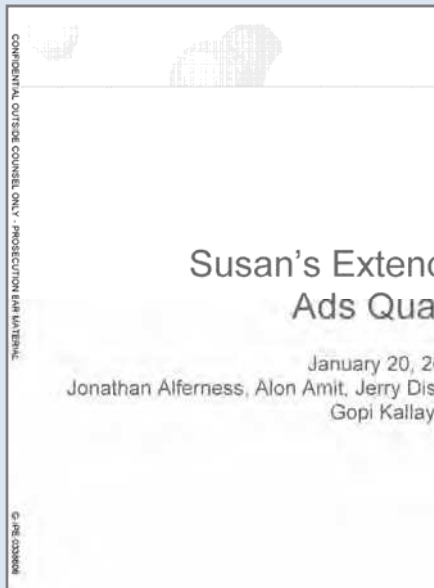
2:11-cv-512 (RAJ)  
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EXHIBIT  
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G-IPE-0313099

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# Google's Internal Documents Prove Infringement



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## What does Ads Quality do?

### Measure properties of ads (and users)...

- CTR
- Landing page
- Advertiser attributes
- User behavior
- Bids/pricing
- ...

### ...to show the best ads to users:

1. **Targeting:** Determine which ads to consider
2. **Ranking:** Show highest quality, highest revenue ads first
3. **Disabling:** Prevent low quality ads from showing at all
4. **Promotion:** Show the highest quality ads above search results. Show lower quality ads on right-hand-side
5. **Display (Ads UI):** Attract attention to the most relevant ads and show most useful information to users

G-IPR-0338608

Google

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# Google's Internal Documents Prove Infringement

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## The Life

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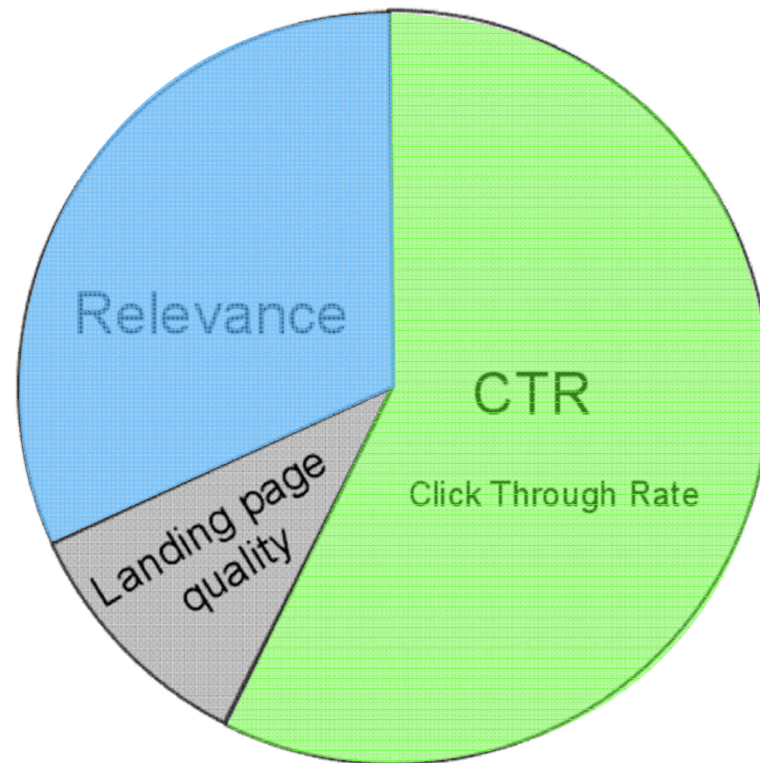
by Dan H  
Haifeng  
Sunil Ko  
Phoeni

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G-IPE-0008829

Three factors:

## Ad Quality Score



# Source Code Includes Content & Collaborative

**Bartholomew  
Furrow**



**Q.** Well, assuming that they named ["bucketized\_query\_expanded\_creative\_cosine\_similarity\_no\_SW\_line\_1\_2\_3"] appropriately and you are correct in your interpretation, what is this feature attempting to get at?

**A.** I would say it's attempting to get at the **textual similarity between the query and the creative.**

**CONTENT**

**Q.** What inputs does SmartAds use to train to build a model?

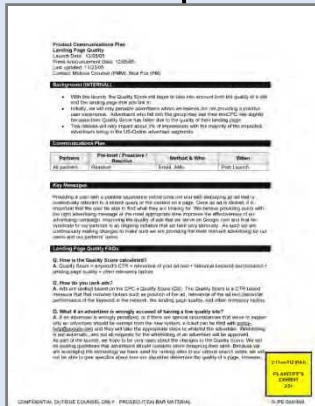
**A.** One of the inputs it uses is configuration that we have invented for it. We configure it to learn at a certain rate, to learn based on certain facts. **The other major input is historical data. So we give it billions of previous instances of users seeing ads and then either clicking on them or not, to build, to build the model.**

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# Use of Content & Collaborative Filtering For Search Ads

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012



Last updated: 11/23/05

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**Q. How do you rank ads?**

**A.** Ads are ranked based on the CPC x Quality Score (QS). The Quality Score is a CTR based measure that includes factors such as position of the ad, relevance of the ad text, historical performance of the keyword in the network, the landing page quality, and other relevancy factors.

CONTENT

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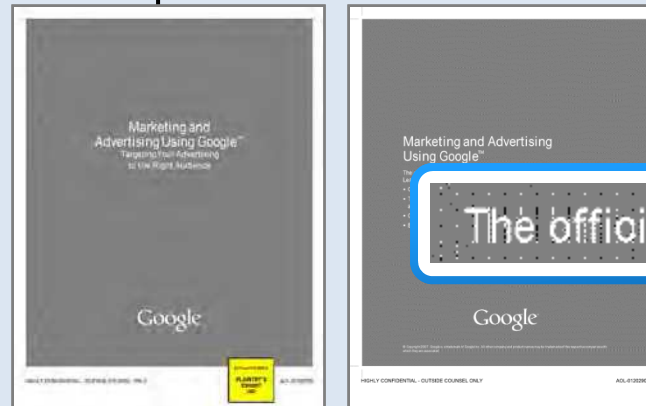
**Q. How is the Quality Score calculated?**

**A.** Quality Score = keyword's CTR + relevance of your ad text + historical keyword performance + landing page quality + other relevancy factors

CONTENT

# Use of Content & Collaborative Filtering For Search Ads

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012



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Then Google looks at relevance – that is, which ads match a user’s search query as closely as possible. Google measures relevance through Quality Score, a numeric rating of the keyword’s and related ad’s quality. The Quality Score is based on several factors. These include:

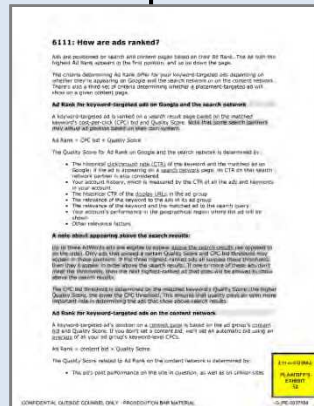
- A keyword’s click-through rate (CTR). This is the number of clicks an ad receives divided by the number of impressions.
- Ad text relevance (such as if the ad text contains a keyword).
- Overall historical keyword performance with Google (i.e. how the keyword has performed in the past).
- User experience on the landing page or site associated with an ad.

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CONTENT

# Use of Content & Collaborative Filtering For Search Ads

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012



Dec 13, 2007

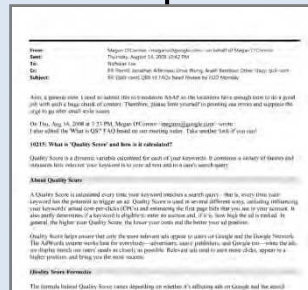
The Quality Score for Ad Rank on Google and the search network is determined by:

- The historical clickthrough rate (CTR) of the keyword and the matched ad on Google; if the ad is appearing on a search network page, its CTR on that search network partner is also considered
- Your account history, which is measured by the CTR **COLLABORATIVE** and keywords in your account
- The historical CTR of the display URLs in the ad group
- The relevance of the keyword to the ads in its ad group **CONTENT**
- The relevance of the keyword and the matched ad to the search query
- Your account's performance in the geographical region where the ad will be shown
- Other relevance factors



# Use of Content & Collaborative Filtering For Search Ads

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012



August 14, 2008

## Quality Score Formulas

The formula behind Quality Score varies depending on whether it's affecting ads on Google and the search network or on the content network.

### I. Quality Score for Google and the Search Network

While we continue to refine our Quality Score formulas for Google and the search network, the core components remain more or less the same:

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- The historical clickthrough rate (CTR) of the keyword and the matched ad on Google; CTR on the Google Network is not considered
- Your account history, which is measured by the CTR of all the ads and keywords in your account
- The historical CTR of the display URLs in the ad group
- The quality of your landing page
- The relevance of the keyword to the ads in its ad group

**CONTENT**

# Use of Content & Collaborative Filtering For Search Ads

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012



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The Quality Score for Ad Rank on Google and the search network is determined by:

- o The historical clickthrough rate (CTR) of the keyword and the matched ad on Google; if the ad is appearing on a search network page, its CTR on that search network partner is also considered
- o Your account history, which is measured by the CTR of all the ads and keywords in your account
- o The historical CTR of the display URLs in the ad group
- o The relevance of the keyword to the ads in its ad group
- o The relevance of the keyword and the matched ad to the search query
- o Your account's performance in the geographical region where the ad will be shown
- o Other relevance factors

CONTENT



# Use of Content & Collaborative Filtering For Search Ads

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012



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## Improving your ranking

Having relevant keywords and ad text, a strong CTR on Google, and a high CPC bid will result in a higher position for your ad. Because this ranking system rewards well-targeted, relevant ads, you can't be locked out of the top position as you would be in a ranking system based solely on price. Also, the AdWords Discounter monitors your ad's performance and automatically reduces your bid to pay the lowest price possible for your ad's position on the page.

CONTENT

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# Use of Content & Collaborative Filtering For Search Ads

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012



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## Quality Score Formula

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- The historical clickthrough rate (CTR) of the keyword and the matched ad on the Google domain; note that CTR on non-Google sites (such as AOL.com) only ever impacts Quality Score on our search partners – not on Google
- Your account history, which is measured by the CTR of all the ads and keywords in your account
- The historical CTR of the display URLs in the ad group
- The quality of your landing page
- The relevance of the keyword to the ads in its ad group
- The relevance of the keyword and the matched ad to the search query
- Your account's performance in the geographical region where the ad will be shown
- Other relevance factors

CONTENT

# Use of Content & Collaborative Filtering For Search Ads

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012

We measure relevancy for search and ads differently.

- For search results, relevance and ranking are automatically determined by over 100 factors, including Google's patented PageRank algorithm.
- For AdWords ads, the most important factor in relevance and ranking is the ad's quality, also called the Quality Score. This measurement is the strongest representation of how useful a user has found an ad to be and is central to the AdWords cost-per-click (CPC) pricing model.

How AdWords Monitors Performance

[Back to Top](#)

AdWords uses a dynamic variable called 'Quality Score' to evaluate keyword relevance. Quality Score is based on **your keyword's clickthrough rate (CTR) on Google**, the relevance of your ad text, keyword, and landing page; and several other relevance factors.

A Quality Score is calculated every time your keyword matches a search query—that is, every time your keyword has the potential to trigger an ad. Quality Score is used in several different ways, including influencing your keywords' actual cost-per-clicks (CPCs) and the first page bid estimates that you see in your account. It also partly determines if a keyword is eligible to enter the ad auction that occurs when a user enters a search query and, if it is, how high the ad will be ranked. In general, the higher your Quality Score, the lower your costs and the better your ad position.

Quality Score helps ensure that only the most relevant ads appear to users on Google and the Google Network. The AdWords system works best for everybody—advertisers, users, publishers, and Google too—when the ads we display match our users' needs as closely as possible. Relevant ads tend to earn more clicks, appear in a higher position, and



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CONTENT



# Use of Content & Collaborative Filtering For Search Ads

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012

updated 10/13/2011

## Quality Score Formulas

The formula behind Quality Score varies depending on whether it's affecting ads on Google and the [Search Network](#) or ads on the [Display Network](#). Click the links below for details.

### [Quality Score for Google and the Search Network](#)

While we continue to refine our Quality Score formulas for Google and the Search Network, the core components remain more or less the same:

- The historical [clickthrough rate \(CTR\)](#) of the keyword and the matched ad on the Google domain; note that CTR on non-Google sites (such as AOL.com) only ever impacts Quality Score on our search partners – not on Google
- Your account history, which is measured by the CTR of all the ads and keywords in your account
- The historical CTR of the [display URLs](#) in the ad group
- The [quality of your landing page](#)
- The relevance of the keyword to the ads in its ad group
- The relevance of the keyword and the matched ad to the search query
- Your account's performance in the geographical region where the ad will be shown
- Other relevance factors

CONTENT

Note that there are slight variations to the Quality Score formula when it affects ad position and first page bid:

- When calculating ad position on a search partner site, Quality Score considers the CTR on that particular site in addition to CTR across all non-Google search partners as a whole.
- For calculating first page bid, Quality Score doesn't consider the matched ad or search query, since this estimate appears as a metric in your account and doesn't vary per search query.

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# Use of Content & Collaborative Filtering For Search Ads

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012



updated 11/09/2011

## Ad Rank formulas

The criteria determining Ad Rank differ for your keyword-targeted ads depending on whether they're appearing on Google and the search network or on the Display Network. There's also a third set of criteria determining whether a placement-targeted ad will show on a given Display Network page.

A keyword-targeted ad is ranked on a search result page based on the matched keyword's maximum cost-per-click (CPC) bid and Quality Score. Note that some search partners have a different page layout than Google.

The Quality Score for Ad Rank on Google and search partners is determined by:

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- The historical clickthrough rate (CTR) of the keyword and the matched ad on the site. For Google, only historical performance on Google is considered. For search partners, performance on the specific search partner is used, along with how the ad performs across the search network.
- Your account history, which is measured by the CTR of all the ads and keywords in your account
- The historical CTR of the display URLs in the ad group
- The relevance of the keyword to the ads in its ad group
- The relevance of the keyword and the matched ad to the search query
- Your account's performance in the geographical region where the ad will be shown
- The quality of your landing page.
- Other relevance factors

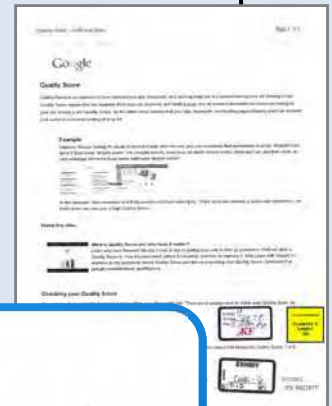
**CONTENT**



# Use of Content & Collaborative Filtering For Search Ads

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012

7/17/2012



## How we calculate Quality Score

Every time someone does a search that triggers your ad, we calculate a Quality Score. To calculate this Quality Score, we look at a number of different things related to your account, like the following:

- **Your keyword's past clickthrough rate (CTR):** How often that keyword led to clicks on your ad **COLLABORATIVE**
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# Internal Documents Discussing "Message"

2005 — 2006 — 2007 — 2008 — 2009 — 2010 — 2011 — 2012



December 05, 2007

**From:** Clay Bavor <cwb@google.com> on behalf of Clay Bavor  
**Sent:** Wednesday, December 05, 2007 3:54 PM  
**To:** Kai Hansen  
**Cc:** Megan O'Connor; adsquality-ps@google.com  
**Subject:** Re: [Adsquality-ps] Re: Change to Quality Score FAQ

That statement seems mostly correct to me. Account history is just the aggregate of all your keyword stats, and "CTR across all your keywords" captures that pretty well. That being said, as you say **we do look at the historical performance of your particular ad text** and your keyword with that ad text, but I would prefer lumping that in with "Other relevance factors".

**COLLABORATIVE**

-Clay

On Dec 4, 2007 10:21 PM, Kai Hansen <[khansen@google.com](mailto:khansen@google.com)> wrote:  
As we are at it. :)

**I think there is another slightly inaccurate wording in this FAQ**, two bullet points further down. I might be wrong here though. It states:

- *The historical performance of your account, which is measured by CTR across all your keywords*

Is the historical performance of an account really only depending on the historical CTR across keywords? I thought we would take into account ad texts and the relation between keywords and adtext as well.

# Internal Documents Discussing “Message”

2005

2006

2007

2008

2009

2010

2011

2012

Dec 13, 2007

On Dec 13, 2007 1:51 PM, Clay Bavor <[cwb@google.com](mailto:cwb@google.com)> wrote:

(1) Deleting poor performers doesn't help account history immediately, but will help going forward. The reason is that the system will still have record of your keywords having performed poorly in the past, but you'll no longer be accumulating lots of impressions and few clicks (bad history) which over time will bring up your account-level quality.

(2) These two edits look good to me. The new text more accurately reflects what we're actually doing.

-Clay

On Dec 13, 2007 12:16 PM, Megan O'Connor <[megano@google.com](mailto:megano@google.com)> wrote:

Good point Kai. It looks like we have three outstanding questions: two for **Clay** and one for **Abhishek**.

## Clay:

1. Is it true that the 'account history' component of Quality Score considers past performance of deleted keywords? If so, how does deleting poorly performing keywords benefit Quality Score?

2. In FAQ 10215 'What is Quality Score...?', I'd like to make two edits, which are highlighted in the Writely:

- For min bid and ad position QS, I'd like to say that account history is measured by the performance *of all the ads* and keywords in the account - it currently says that account history is measured only by keywords
- For ad position QS, I'd like to say that the CTR *of the ad* and of the matched keyword on Google is a factor - we used to not mention ad CTR, but advertisers wonder why some ads are always at a lower position than other ads in the same ad group

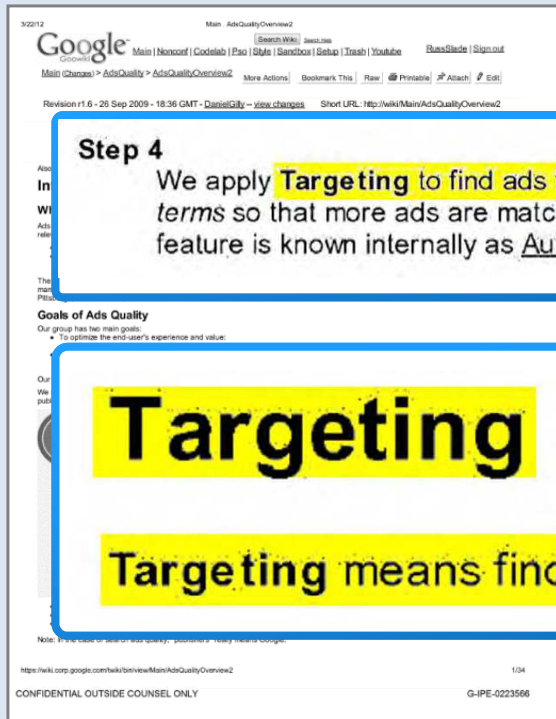
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# Adwords Infringes the '420 Patent

## Claim 25

scanning a network to make a demand search for informants relevant to a query from an individual user;

**“Scanning a network” means: Looking for or examining items in a network**



### Step 4

We apply **Targeting** to find ads that match the user's query. A related feature is Expanded Match. This broadens the user's *query terms* so that more ads are matched. (Similarly, we allow advertisers to broaden their *keywords* to match more queries. This AWFE feature is known internally as Autopilot.)

# Targeting

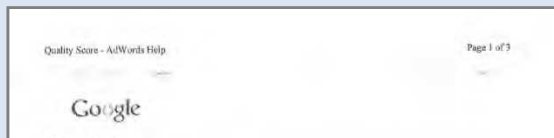
**Targeting** means finding (and displaying) ads that best match the user's query.



# Adwords Infringes the '420 Patent

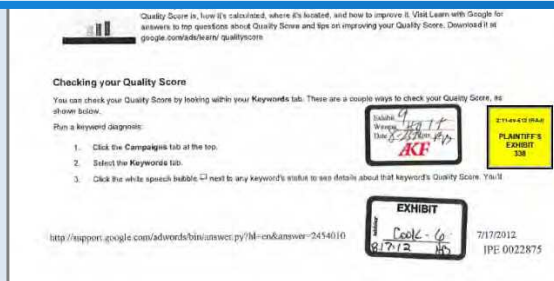
## Claim 25

receiving the informons in a content-based filter system from the scanning system and filtering the informons on the basis of applicable content profile data for relevance to the query;



Every time someone does a search that triggers your ad, we calculate a Quality Score. To calculate this Quality Score, we look at a number of different things related to your account, like the following:

- **Your keyword/ad relevance:** How relevant your keyword is to your ads
- **Your keyword/search relevance:** How relevant your keyword is to what a customer searches for





# Adwords Infringes the '420 Patent

## Claim 25

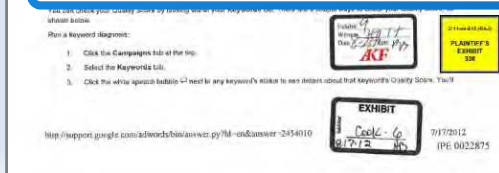
receiving collaborative feedback data from system users relative to informons considered by such users; and

“Collaborative feedback data” means “data from system users with similar interests or needs regarding what informons such users found to be relevant”



Every time someone does a search that triggers your ad, we calculate a Quality Score. To calculate this Quality Score, we look at a number of different things related to your account, like the following:

- **Your keyword's past clickthrough rate (CTR):** How often that keyword led to clicks on your ad



# Adwords Infringes the '420 Patent

## Claim 25

combining pertaining feedback data with the content profile data in filtering each informon for relevance to the query.

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CONTENT

IPE 0022876

<http://support.google.com/adwords/bin/answer.py?hl=en&answer=2454010>

7/17/2012

IPE 0022877



# Adwords Infringes the '664 Patent

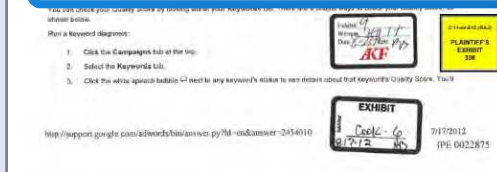
## Claim 1

a feedback system for receiving information found to be relevant to the query by other users; and



Every time someone does a search that triggers your ad, we calculate a Quality Score. To calculate this Quality Score, we look at a number of different things related to your account, like the following:

- **Your keyword's past clickthrough rate (CTR):** How often that keyword led to clicks on your ad





# Adwords Infringes the '664 Patent

## Claim 1

a content-based filter system for combining the information from the feedback system with the information from the scanning system and for filtering the combined information for relevance to at least one of the query and the first user.

### How we calculate Quality Score

Every time someone does a search that triggers your ad, we calculate a Quality Score. To calculate this Quality Score, we look at a number of different things related to your account, like the following:

- **Your keyword's past clickthrough rate (CTR):** How often that keyword led to clicks on your ad
- **Your display URL's past CTR:** How often you received clicks with your display URL
- **Your account history:** The overall CTR of all the ads and keywords in your account
- **The quality of your landing page:** How relevant, transparent, and easy-to-navigate your page is
- **Your keyword/ad relevance:** How relevant your keyword is to your ads
- **Your keyword/search relevance:** How relevant your keyword is to what a customer searches for
- **Geographic performance:** How successful your account has been in the regions you're targeting
- **Your ad's performance on a site:** How well your ad's been doing on this and similar sites (if you're targeting the Display Network)
- **Your targeted devices:** How well your ads have been performing on different types of devices, like desktops/laptops, mobile devices, and tablets – you get different Quality Scores for different types of devices

COLLABORATIVE

CONTENT

# Adwords Infringes the '664 Patent

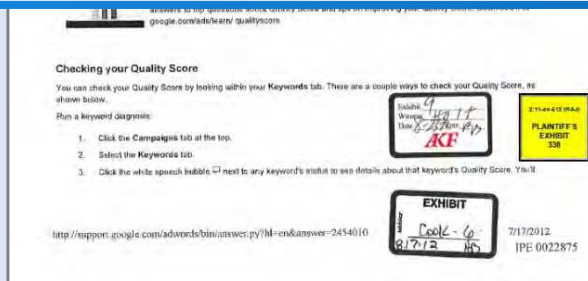
## Claim 26

searching for information relevant to a query associated with a first user in a plurality of users;



Every time someone does a search that triggers your ad, we calculate a Quality Score. To calculate this Quality Score, we look at a number of different things related to your account, like the following:

- **Your keyword/ad relevance:** How relevant your keyword is to your ads
- **Your keyword/search relevance:** How relevant your keyword is to what a customer searches for



# Adwords Infringes the '664 Patent

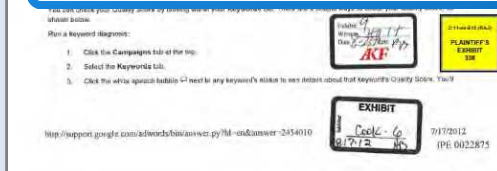
## Claim 26

receiving information found to be relevant to the query by other users;



Every time someone does a search that triggers your ad, we calculate a Quality Score. To calculate this Quality Score, we look at a number of different things related to your account, like the following:

- Your keyword's past clickthrough rate (CTR): How often that keyword led to clicks on your ad





# Adwords Infringes the '664 Patent

## Claim 26

combining the information found to be relevant to the query by other users with the searched information; and content-based filtering the combined information for relevance to at least one of the query and the first user.

### How we calculate Quality Score

Every time someone does a search that triggers your ad, we calculate a Quality Score. To calculate this Quality Score, we look at a number of different things related to your account, like the following:

- **Your keyword's past clickthrough rate (CTR):** How often that keyword led to clicks on your ad
- **Your display URL's past CTR:** How often you received clicks with your display URL
- **Your account history:** The overall CTR of all the ads and keywords in your account
- **The quality of your landing page:** How relevant, transparent, and easy-to-navigate your page is
- **Your keyword/ad relevance:** How relevant your keyword is to your ads
- **Your keyword/search relevance:** How relevant your keyword is to what a customer searches for
- **Geographic performance:** How successful your account has been in the regions you're targeting
- **Your ad's performance on a site:** How well your ad's been doing on this and similar sites (if you're targeting the Display Network)
- **Your targeted devices:** How well your ads have been performing on different types of devices, like desktops/laptops, mobile devices, and tablets – you get different Quality Scores for different types of devices

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<http://support.google.com/adwords/bin/answer.py?hl=en&answer=2454010>

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