

"What Travelers Say... Using Sentiment to Improve User Engagement"

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Agenda

- What is TripAdvisor?
- The problem: Sorting through so many reviews
- Early research and proposed solutions
- Testing and evaluation
- The solution: Adding Sentiment
- Questions?

World's Largest Travel Site with 50M+ UUs

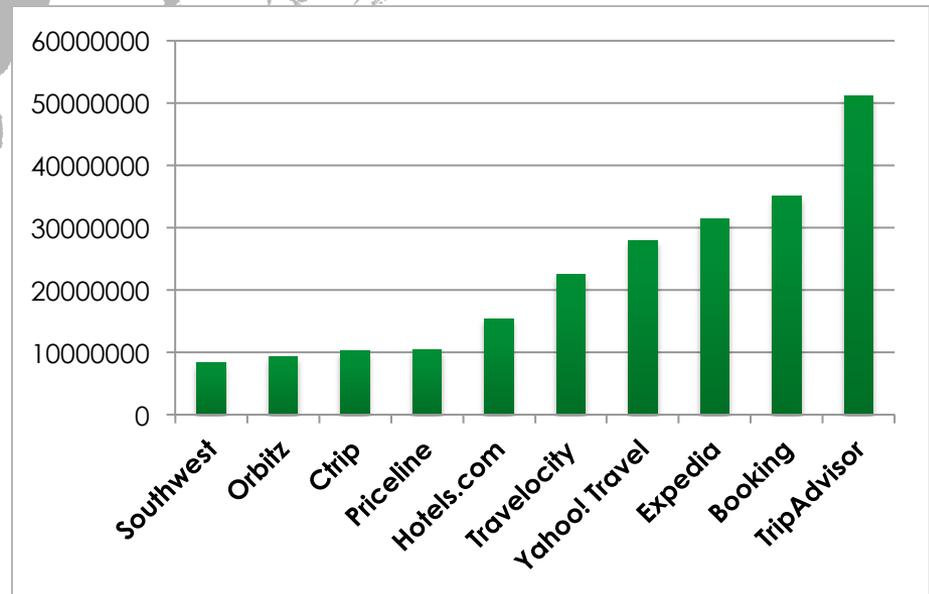
North America
15.7m

LATAM
4.2m

Europe
19.8m

Middle East & Africa
2.2m

APAC
9.2m



Source: Comscore, August 2011

What is TripAdvisor?



- 50MM unique visitors per month
- 20MM highly loyal registered members
- 50MM++ traveler reviews and opinions
- 25 new contributions per minute every day
- 520K hotels, 155K attractions, 715K restaurants in 93K destinations worldwide
- 245,000 registered owners

TripWatch 

Your weekly e-mail update with deals, reviews and news for:

- ▶ Boston
- ▶ Update your destinations
- ▶ **Add Chatham** to your TripWatch list.

▼ advertisement



SELECT DISNEY
VALUE RESORTS

7 DAYS/6 NIGHTS



TripAdvisor Traveler Reviews

Language:

English first ▼

Sort by:

Date: Oldest first ▼

Reviews of Captain's House Inn (1-5 of 81)

[next »](#)

"British Hospitality on Cape Cod" Captain's House Inn



A TripAdvisor Member

[Save Review](#)

Feb 28, 2001

3/3 found this review helpful

A small "compound" of buildings, each housing unique guest rooms, most with fireplaces, all well-appointed. The all-British staff was courteous and went out of their way to satisfy a special request. The bed was so high it had steps! Breakfast was the most elegant and gourmet I've had on the Cape. Part of the Distinctive Inns of New England network -- stay at all 12 and get a free weekend.

A bit pricey -- in the \$200 to \$300 range, but a most pleasant experience.

This review is the subjective opinion of a TripAdvisor member and not of TripAdvisor LLC.

Was this review helpful? [Yes](#) | [No](#)

Friends who kn

- ▶ Their Hotel Review
- ▶ Favorite Destinat
- ▶ Can Advise Me (0)
- ▼ Been There (4)

Rachel Kraus

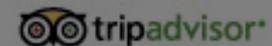
Claire Dienhart

Karen Kirsten

Zoe Wakefield

▶ Going There (0)

▼ ad



Weekend geta

Overnight esc

Exciting day tr

Find places to

The Problem

- With many properties, we have an overwhelming amount of content
 - Hundreds to thousands of reviews
 - Hard to find the gestalt of the hotel without reading through all reviews
 - Filters are a part of the solution, but not the whole thing

Example: Bellagio Las Vegas

Reviews you can trust

Filter traveler reviews

Write a Review

Trip type

- All reviews (5,056)
- Business reviews (383)
- Couples reviews (2,341)
- Family reviews (463)
- Friends reviews (484)
- Solo travel reviews (142)

Traveler rating

- All (5,056)
- Excellent (3,013) 
- Very good (1,094) 
- Average (462) 
- Poor (288) 
- Terrible (199) 

1-10 of 5,056 reviews

« 1 2 ... 506 »



Initially looked at a variety of different approaches...

- Internal work:
 - Human editing vs. algorithmic solutions
 - Word cloud of terms
 - Recent review titles
 - Recent “helpful” review titles based on voting
 - Style cloud
 - “Interesting Sentences” algorithm
- Using 3rd party Language Analysis Tools
 - “Concept/fragment” cloud
 - “Strongest emotive” opinions
 - “Facet” identification

User tested approaches side-by-side, anonymously...

- TripAdvisor employees voted on what they found most helpful/useful in understanding what the hotel had to offer

A

Really nice back side
botanical gardens
 business trip clean hotel comfortable bed
 comfortable room comfortable stay dining room flat screen
 modern hotel nice bathroom **nice hotel**
 nice interiors nord train station pleasant surprise
public transport red light district
 underground station

Sucks Indifferent Has Potential Great

B

1. The room was warm and inviting and very centrally located.
2. It is not so very well located for the average tourist however.
3. Located in a non touristy area, it is near many local restaurants.
4. Good breakfast, very clean, excellent location.
5. We didn't use it but it's very conveniently located.
6. Convenient location
7. Its located a few streets down from the Redlight district.
8. It has a good location close to city centre, metro and train station.
9. The location was great for me because I had business to do nearby.

Sucks Indifferent Has Potential Great

C

1. Trendy, design-y hotel with a focus on atmosphere
2. Convenient location but a little removed from the main attractions
3. Breakfast is crazily overpriced, but good
4. Street-side rooms can be quite noisy; there are quieter options in the back
5. Overall well-renovated hotel; maybe lagging in some of the bathrooms (serviceable but not outstanding)

Sucks Indifferent Has Potential Great

D

1. Rooms: The pancakes are very good!- Very comfortable room.
2. Rooms: Rooms are large and funky.
3. Rooms: Our room was cleaned everyday to immaculate standards.
4. Location: The location was great for me because I had business to do nearby.
5. Location: Good breakfast, very clean, excellent location.
6. Location: Convenient location
7. Bed: Bed is comfy.
8. Bed: Comfy bed, lots of space, nice bathroom, clean, and relaxing.
9. Bed: Beds were excellent and the pillows nice and soft.
10. Staff: Staff were very helpful and pleasant and all spoke excellent English.
11. Staff: However, staff was unfriendly and just not very welcoming.
12. Staff: The staff was friendly and helpful and the fitness center was lovely.
13. Bathroom: The bathroom was similar -- broken tiles and rust stains.
14. Bathroom: Comfy bed, lots of space, nice bathroom, clean, and relaxing.
15. Bathroom: Idem for the bathroom, it was OK but somewhat worn-out.

Sucks Indifferent Has Potential Great

E

1. Bad staff and location
2. Would not recommend
3. Great hotel - bad customer service
4. Clean and Modern, but a bit of a walk...
5. Try Again
6. Horrible staff manner. Very rude hotel staff
7. Worst hotel service experienced ever!
8. Lovely centrally located hotel

Sucks Indifferent Has Potential Great

F

1. It's a little out of the way, but it's an easy walk into the city and near to a Metro. i love this hotel. why:"quirky! every room is different and mine was a delight."great restaurant*free internet*close to cheap restaurants*close to public transportthe downside is that in the weekends it is a bit away from activity (it was almost a ghost town on the roads outside on saturday morning), but since it is so close to public transport it is not a problem really.
2. The artist-decorated room we had was very nice, again, it creates an atmosphere i really enjoy. very good, was very impressed with the design elements, sometimes there was too much noise in the morning from the airline people staying there but overall it is a great hotel.
3. The only fault we could find was that our toilet door would not latch shut, apart from that it was a great find and I would recommend it to anybody looking for somewhere different to stay, like I say it's not a chain!
4. Walking into the broad, scented foyer is wonderful, and I had high hopes, but a small list of petty incidences just really spoiled the stay for me.- I asked the guy I was checking in with for a room at the back, and was given one at the front- that room had no handtowels

What did we learn?

- **Human summaries were rated twice as good as other algorithms**
- **Others were evenly split between 'good/potential' and 'bad/indifferent'**
 - But, no clear “killer” auto-summarizer (yet)
- **Next step:**
 - Usability and beta-test human summaries and a concept generator on live site to compare to control see if any measures change
- **Measurements of Hotel_Review to evaluate impact:**
 - **Look for changes in:**
 - Bounce Rate (BR), Commerce, Click Through Rate (CTR)
 - Hard to specifically measure impact of summarization, no clear metric, combination of changes
 - **Customer Satisfaction Score**
 - Baseline score, score again after summarization implemented

Human Edited Summaries - Bulleted List

The screenshot shows the TripAdvisor page for The Lenox Hotel in Boston. The page includes a navigation menu, hotel photos, and a 'Check Rates and Availability' section. A prominent feature is a 'Reviews you can trust' section with a bulleted list of expert summaries:

- Immaculately clean rooms and comfortable beds.
- Rooms are in good condition and very clean and roomy.
- Excellent room amenities and extras.
- Excellent location centrally located close to downtown.
- Pleasant check-in and check-out and exceptional service.

Test:

- For the Top 100 properties, a human editor analyzed and summarized reviews for the hotel and created 5-7 interesting summary sentences
- Editor used best judgment to capture essence of review by using representative statements

Results:

- 91% of users found this feature helpful
- No significant impact on commerce
- Bounce rate remained neutral

Human Edited Summaries - Advantages/Disadvantages

The screenshot shows the TripAdvisor page for The Lenox Hotel in Boston. The page includes a navigation menu, a search bar, and a sidebar with various travel options. The main content area features the hotel's name, address, and a 'Check Rates and Availability' section. A 'Reviews you can trust' section is visible, showing a 'NEW!' notification and a summary of advantages and disadvantages. The advantages listed are: Clean, comfortable rooms; Friendly staff; Rooftop deck & pool; Lots of charm; and Downtown location. The disadvantages listed are: Rooms are small and Above average price.

Test:

- Using summary sentences, editor used best judgment to sort into Advantages and Disadvantages for staying at property

Results:

- 94% of users found this feature helpful
- Positive impact on commerce
- Bounce rate increased

NEW! I found this helpful yes no

Advantages

- Clean, spacious rooms
- Beautiful beaches
- Attentive wait staff on beach
- Complimentary beach activities
- Great value

Disadvantages

- Dated rooms, aging resort
- Stairs throughout resort

Concept Algorithm

tripadvisor

THE BEST HOTELS FOR 2010 GET THE LIST

Home Hotels Flights Restaurants Vacation Rentals Trip Ideas Write a Review

City, hotel name, etc. Search Over 60 million trusted traveler reviews & opinions

Orlando Home → United States → Florida (FL) → Central Florida → Orlando → Orlando Hotels

Orlando Tourism

Orlando Hotels

Ritz-Carlton Orlando Grande Lakes

Vacation Rentals

Flights to Orlando

Ritz-Carlton Orlando Grande Lakes

Hotel photos

Map this hotel

Hotel amenities

Virtual tour: VFM Interactive

Compare Orlando business hotels

TripAdvisor Popularity Index

#8 of 350 hotels in Orlando

Ranked #7 for business in Orlando

Rating

Reviews

800-45-HOTEL from

VACATION RENTALS FOR 2010

at a smart price

Orlando hotels =

Hilton Grand

Reviews you can trust

Reviews at a glance **NEW!** I found this helpful yes no

- Continental breakfast (In 32 reviews)
- Complimentary wine (In 16 reviews)
- Nice touch (In 14 reviews)
- Helpful staff (In 4 reviews)
- Favorite hotel (In 3 reviews)
- Hidden gem, Quiet area, Deluxe double room

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E-mail this page

advertisement

AMAZINGLY

• Friendly (In 37 reviews)

• Rooftop deck & pool (In 28 reviews)

• Noisy location (In 28 reviews)

• Lots of charm (In 26 reviews)

Show reviews by

All reviews (477)

Business reviews (59)

Couples reviews (164)

Family reviews (54)

Friends getaway reviews (27)

Solo travel reviews (27)

1-10 of 477

Sort by [Date] | [Rating]

One of the Less

Room service In 11 reviews

Room service was expensive with tips on top of extortionate service charges." ... more

Jan 15, 2011

"The other nights and all mornings we ordered room service and the food was amazing...you can get organic eggs, the best blueberry pancakes ever and wonderful vanilla infused belgian waffles...YUM!" ... more

Dec 29, 2010

"The only people here that were a pleasure to deal with were our bellman and the room service attendants." ... more

Nov 9, 2010

"My Room Service coffee, that I ordered, was wonderful too!" ... more

Nov 2, 2010

"The room service is available 24/7 and at very reasonable prices and you'll be pleasantly surprised at the presentation." ... more

Aug 1, 2010

"Room service was great and they had a very kid friendly menu." ... more

Jun 1, 2010

"Check-in, Housekeeping and room service staff were ideal- discrete, quiet & polite." ... more

Dec 3, 2010

Test:

- Present 2 word concepts to user
- Include score/count of occurrences of concepts
- Link to additional representative statements

Results:

- 90% of users found this feature helpful
- No significant impact on commerce
- Bounce rate neutral

- Baseline of CTR for concepts
 - CTR good for first pass

What we learned ...

- Advantage / Disadvantages
 - Users like to see content “digested” for them
- Phrases better than concepts
 - Can convey “tone”
 - Better context
 - But, occurrence rate of phrases lower
- Hard to detect tone of concept
- Interaction may lead to distraction
 - Propensity to click on concepts may be a user type
- Usability testing showed us that 2-3 word concepts meet users needs
 - Competitive implementations overly complex

Chosen solution: TA Top Concepts Summarization

Part 1

- Build a concept generator
 - Summarize English language reviews only
 - All properties with at least 50 reviews updated in last 24 months
 - Use internally developed algorithm to generate 2 to 3 word concepts
 - Displaying 3-10 concepts per property
 - Build tool to manage concepts
 - Generated ~55K concepts
 - ~25K properties will have summarization
 - Roll out to our 6 English language POS

Part 2

- Test of Advantages / Disadvantages to gauge effectiveness of sentiment overlay
 - Manually added sentiment to concepts
 - Use Lexalytics Saliency to add sentiment

TA Top Concepts Summarization – Part 1

tripadvisor® World's most trusted travel advice™

Library Hotel, New York City

Home Hotels Flights Restaurants Vacation Rentals **NEW** Trip Ideas Write a Review

City, hotel name, etc. Search Over 35 million trusted traveler reviews & opinions

Home → United States → New York (NY) → New York City → New York City Hotels → Library Hotel

New York City Tourism

New York City Hotels

Library Hotel

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Travel Guide

Photos

Videos

Map

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Save Library Hotel

E-mail this page

Library Hotel

Hotel photos

Map this hotel

Hotel amenities

Virtual tour: VFM Interactive

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Check Rates and Availability

Check-in: 9/3/2010 Check-out: 9/5/2010 Adults: 2

CHECK RATES!

Booking.com Venere.com Hotels.com

Opens one window for each offer. Please disable pop-up blockers.

NEW FROM TRIPADVISOR!

Find Cheap Flights from Boston to New York

Reviews you can trust

Reviews at a glance **NEW!** I found this helpful yes no

- Grand Central (79)
- Friendly and helpful (34)
- Continental breakfast (34)
- Times Square (34)
- Very nice (33)
- Reading room (31)
- Great location (29)
- Rooftop bar (28)
- Rooms are small (25)
- Empire state building (17)
- Would definitely stay (15)

Show reviews by trip type and rating

All reviews (786) 95% of travelers recommend

Business reviews (85)

Couples reviews (443)

Family reviews (69)

Excellent 611

Very good 133

TripAdvisor Popularity Index

#1 of 423 hotels in New York City

Ranked #9 for business in New York City

Rating Details Photos (169) Map

TripAdvisor Traveler Rating

786 Reviews

95% | Write a review

"Great Boutique Hotel"

Aug 19, 2010

"Perfect!"

Aug 18, 2010 - XTim

Call now to book: 1-800-454-6835 from hotels.com

Get a great room at a smart price

Avg. price/night for top New York City hotels = \$472

\$391* Casablanca Hotel 95% recommend

\$435* Hotel Elysee 94% recommend

\$148* Hotel 99 78% recommend

Show more Top Values »

Average price/night*

Best deals: New York City hotels

Library Hotel. Save money and time. book online

Booking.com No fees excellent customer care.

Library Hotel. Book Now - Pay Later!

Venere.com Best Prices & No Cancellation Fees!

Results:

- Rolled out to .com, .co.uk, .ie, .au, .ca, .in, .sr
- No significant impact on commerce
- Bounce rate increased marginally
- CTR on concepts up to 2X baseline

Manually add sentiment to concepts – Part 2

What travelers say about The Lenox Hotel

Advantages

- "Convenient location" (10)
- "Spotless rooms" (9)
- "Comfy beds" (8)
- "Terrific view" (6)
- "Amazing pool" (3)

Disadvantages

- "Expensive neighborhood" (5)
- "Noisy rooms" (3)

Test:

- Manually added sentiment to concepts for 1K test properties
- "eyeball" sentiment
- Sentiment was the same for a concept regardless of the property
- "Other" concepts are neutral

Results:

- No significant impact on commerce
- Bounce rate increased marginally
- **CTR 3.25X baseline**
- **CTR By Type:**
 - Advantages 12%
 - Disadvantages 59%
 - Other 29%

Using Lexalytics Salience to add sentiment – Part 2

What travelers say about The Lenox Hotel

Advantages

- "Convenient location" (10)
- "Spotless rooms" (9)
- "Comfy beds" (8)
- "Terrific view" (6)
- "Amazing pool" (3)

Disadvantages

- "Expensive neighborhood" (5)
- "Noisy rooms" (3)

Test:

- Salience used to add sentiment to concepts for 1K test properties
- Concept sentiment varies between properties

Results:

- No significant impact on commerce
- Bounce rate increased marginally

•CTR 4X baseline

•CTR By Type:

- Advantages 25%
- Disadvantages 55%
- Other 20%

Current State of Summarization

- Coverage of summarization increased to ~35K properties
 - All properties with at least 25 reviews updated in last 36 months
 - ~46K concepts
- Concepts translated into TripAdvisor POS languages
 - 21 POS now have summarization implemented, more to come
- Advantages/Disadvantages not the right user experience
 - Most concepts not polarized enough to put into these categories
 - Concept sentiment varies in intensity and strength
- Future work will look at refining the summarization user experience

QUESTIONS?

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