



Executive Summary

After conducting the paired t-tests with 30 participants, we found the Travelocity search function to be on average of 2.2 seconds faster than the Farecast search function. Also, by the probability of the results 0.041 we rejected the null hypothesis and accepted the alternative hypothesis. Thus, the difference between the conditions (websites) is real (caused the difference in time). We also conducted a keystroke level model analysis and noticed a gap in efficiency ranging from 5.6 seconds (Farecast) to 16.2 (Travelocity) seconds from the empirical analysis which, can be accounted for by the user navigating through the form fields using the tab key. A more detailed analysis of the report is provided in the findings and recommendations section below.

Purpose and test objective

Compare the search function of www.farecast.com with www.travelocity.com based on both time and a user survey rated using a likert scale. During the testing of Farecast.com we had a majority of users comment on the search function of the web site which, uses web 2.0 (Ajax) to automatically populate the departure and arrival city based on the users entry of the city. Most users found this to be very efficient compared to manually entering the city into a field then filtering the results. Thus, we wanted to measure this efficiency with a comparison test using time as a dependant variable. We also wanted to measure the overall satisfaction with a survey rated on a likert scale between 1 and 7.

Method

We ran **30 tests** of the search functions comparing www.farecast.com and www.travelocity.com based on both time and a user survey (found in the appendix), rated using a likert scale. The test was a **within-groups design**, thus each participant tested both search functions. To counter balance the test we alternated the site that each user starts with. The odd number of participants started with www.farecast.com while the even number started with www.travelocity.com. This is a **paired T test**, so each participant had a pair of results. All participants were experienced with e-commerce web sites.

For the test we used the live versions on the internet of www.farecast.com and www.travelocity.com. The 30 participants were tested in their environment and each signed a consent form before starting the study. The survey questions and consent form can be found within the appendix of this document.

Materials used: the user tasks were printed out on paper for the participants, pens, stop watch, computer keyboard, monitor, mouse

About the participants: these include users that are familiar with or have used travel websites and have a general knowledge of computers.

Results

t = 2.14

Degrees of freedom = 29

Probability of result = 0.041

	Average/Mean	95% Confidence Interval	Keystroke Level Model
Farecast Search:	22.3	19.03 thru 25.57	27.9
Travelocity Search:	20.1	17.40 thru 22.72	36.3

Findings and Recommendations

With a probability result of .041 we can assume that the test was reliable and there is a noticeable difference between the efficiency of the Farecast search and that of the Travelocity search. (The null hypothesis is rejected and the alternative is accepted.)

Our confidence interval states that 95% of the time it should take between 19.03 and 25.57 seconds to perform a search using the Farecast web site. It can also be noted that the theoretical average falls outside of the 95% confidence interval which, is explained below.

Our results indicated that the theoretical average from the keystroke level model are approximately 5.6 seconds greater than that of the empirical result for the Farecast search function. This discrepancy can be accounted for by the user navigating the search function by using the tab key on the keyboard instead of the mouse. If the user was to navigate via the tab key they would save .9 seconds for each pointing or mouse activity and cut down on the honing or moving the hand to mouse which, is estimated at .4 seconds. Accounting for these actions the keystroke analysis would be around 18 seconds falling within the 95% confidence interval.

The same discrepancy exists between the theoretical average and the empirical average on the Travelocity search and can be accounted for using the same rationale. However the discrepancy is much greater at 16.2 seconds. Looking at the Travelocity web site it is noted that there are a total of 13 points that average 1.1 seconds each and account for a total of 14.3 seconds. There are also 3 honing or hand to mouse/keyboard that account for 1.2 total seconds. Thus, if the user was to navigate the search fields using the tab key they could cut their time by approximately 15.5 seconds creating an average of 20.8 which, falls into the 95% confidence interval of 17.40 thru 22.72.

Although all of our participants were experienced web and e-commerce users, it was noticed that some had problems interacting with the Farecast search features. Therefore, if this test were to be repeated again we would recommend that each participant have 5-10 minutes to become comfortable with the Farecast search. This is because the search uses web 2.0 technology that was new to some users. This could also account for the discrepancy between the theoretical analysis and the empirical analysis between the Farecast and Travelocity search as seen below. Note, that according to the keystroke level model the Farecast search should be more efficient than the Travelocity search.

	Average/Mean	Keystroke Level Model
Farecast Search:	22.3	27.9
Travelocity Search:	20.1	36.3

Keystroke Level Model

The keystroke analysis was done to estimate the overall length of time it would take an expert user to go through each system. This allowed us to estimate the time by focusing on each task that the user had to perform to achieve their goal. However, this was not 100% accurate because the user could navigate the search function by using the tab key on the keyboard instead of the mouse. If the user was to navigate via the tab key they would save .9 seconds for each pointing or mouse activity. Furthermore, this would cut down on the Honing or moving the hand to mouse which, is estimated at .4 seconds.

Starting by hand on the keyboard (Assume the users do not use tab and know the airport code)

Task: Searching for 2 plane tickets from Chicago O'Hare airport to Los Angeles LAX airport on departure date November 15, 2006 and return date November 20, 2006 for 2 passengers.

Farecast Website	Travelocity Website
<p>Departure City H: Move hand to mouse P: Point in "From" text box K: Click on text box H: Move hand to key board MK: Type "C" MK: Type "H" MK: Type "I" H: Move hand to mouse MP: Move mouse to O'Hare airport on drop down menu K: Click from drop down menu for O'Hare airport</p> <p>Arrival City P: Move mouse to "To" text box K: Click on "To" text box H: Move hand to key board MK: Type "L" MK: Type "O" MK: Type "S" H: Move hand to mouse</p>	<p>Departure City H: Move hand to mouse P: Point in "From" text box K: Click on text box H: Move hand to key board MK: Type "O" MK: Type "R" MK: Type "D"</p> <p>Arrival City H: Move hand to mouse P: Point in "To" text box K: Click on "To" text box H: Move hand to key board MK: Type "L" MK: Type "A" MK: Type "X"</p> <p>Departure Date H: Move hand to mouse</p>

MP: Move mouse to LAX airport on drop down menu
K: Click from drop down menu for LAX airport

Departure Date

P: Move mouse to "Leave" text box
K: Click on text box
P: Move mouse to November 15
K: Click on "15"

Arrival Date

P: Move mouse to "Return" text box
K: Click on text box
P: Move mouse to November 20
K: Click on "20"

Passenger

P: Move mouse to Adults arrow
K: Click on arrow
P: Move mouse to number 2
K: Click on "2"

Search for ticket

P: Move mouse to "Go" button
K: click on "Go"

P: Point on Depart date text box or calendar
K: Click on Depart date text box
MP: Move mouse to November 15
K: Click on "15"
MP: Move mouse to anytime arrow
K: Click on arrow
MP: Move mouse to "Anytime"
K: Click on "Anytime"

Arrival Date

P: Move mouse to "Return" text box
K: Click on text box or calendar
MP: Move mouse to November 20
K: Click on "20"
MP: Move mouse to anytime arrow
K: Click on arrow
MP: Move mouse to "Anytime"
K: Click on "Anytime"

Passenger

P: Move mouse to Adults arrow
K: Click on arrow
P: Move mouse to number 2
K: Click on "2"

Search for ticket

P: Move mouse to "Search Flight" button
K: click on "Search Flight"

Performing a Keystroke steps for analysis

Farecase Website	Travelocity Website
$K = K15 * 0.2 = 3$ $P = P11 * 1.1 = 12.1$ $H = H5 * 0.4 = 2$ $M = M8 * 1.35 = 10.8$	$K = K19 * 0.2 = 3.8$ $P = P13 * 1.1 = 14.3$ $H = H5 * 0.4 = 2$ $M = M12 * 1.35 = 16.2$
Total = 27.9	Total = 36.3

Appendix All Results

Task description:

Searching for 2 plane tickets from Chicago O'Hare airport to Los Angeles LAX airport on departure date November 15, 2006 and return date November 20, 2006 for 2 passengers.

Empirical testing (dependent variable = time)

Preparing and conduction the test:

1. Inform user of the task instructions
 - Before performing a task, please put your hand on keyboard
 - Search for 2 plane tickets from Chicago O'Hare airport to Los Angeles LAX airport on departure date November 15, 2006 and return date November 20, 2006 for 2 passengers.
2. Allow participant to practice on similar tasks. (We can use the same task for the user to practice)
3. Run test and time

Farecast Time	Travelocity Time
Seconds	Seconds
11	13
8	11
22	12
11	11
15	23
22	13
20	15
24	16
15	18
16	17
13.64	23.42

20.56	16.01
15.66	13.91
23.13	19.74
15.85	16.73
28.03	30.04
34.54	27.53
12.32	17.13
24.69	27.02
20.69	14.23
20	25
35	32
43	38
35	22
40	35
30	22
27	15
22	17
23	20
21	21
22.3 AVG	20.1 AVG

t = 2.14

Degrees of freedom = 29

Probability of result = 0.041

Farecast website:

Average/Mean: **22.3**

Standard Deviation: **8.75**

95% Confidence Interval: **19.03 thru 25.57**

Travelocity website:

Average/Mean: **20.1**

Standard Deviation: **7.12**

95% Confidence Interval: **17.40 thru 22.72**

Questionnaire:

Please circle the number that best describes your answer

Ease of use (1 being easy / 7 being difficult)

From your perspective: How easy do you find **farecast.com** to use

1 2 3 4 5 6 7

From your perspective: How easy do you find **travelocity.com** to use

1 2 3 4 5 6 7

Overall Satisfaction (1 being the best / 7 being the worst)

Please rate your overall satisfaction of the search on **farecast.com**.

1 2 3 4 5 6 7

Please rate your overall satisfaction of the search on **travelocity.com**

1 2 3 4 5 6 7

Efficiency (1 being very efficient / 7 being not efficient)

From your perspective, how efficient did you find **farecast.com**

1 2 3 4 5 6 7

From your perspective, how efficient did you find **travelocity.com**

1 2 3 4 5 6 7

Ease of Use		Overall Satisfaction		Efficiency	
Farecast	Travelocity	Farecast	Travelocity	Farecast	Travelocity
1	3	1	4	2	5
2	1	1	2	2	1
4	2	5	2	5	2
1	1	1	1	1	1
1	4	1	4	2	2
4	2	5	2	4	2
2	2	3	2	2	3
3	2	3	2	3	2
1	2	2	2	2	1
2	2	1	2	1	2
2	3	2	3	2	3
5	4	6	3	5	4
2	3	2	3	2	2
2	2	2	3	2	4
1	2	1	3	1	3
2	3	2	3	2	3
3	2	3	3	2	2
6	2	4	2	3	2
1	4	1	2	1	3
2	1	3	2	2	2
2	2	2	2	2	2
2	1	1	1	1	1
1	4	2	4	1	4
1	1	2	2	2	2
3	2	4	3	3	2
1	1	1	1	1	1
1	2	2	1	1	1
2	2	2	2	2	2
3	2	3	2	2	2
1	1	1	1	1	1

2	2	2	2	2	2
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Comparison Study Consent Form

Please read and sign this form.

In this usability test:

- You will be asked to perform certain tasks on two different websites.
- You will be timed.

Please note that participation in this usability study is voluntary. All information will remain strictly confidential. The descriptions and findings may be used to help improve the web site. However, at no time will your name or any other identification be used. You can withdraw your consent to the experiment and stop participation at any time.

I have read and understood the information on this form and had all of my questions answered.

Participant's Signature

Date