

Cruise.com Heuristic Analysis

Ergonomics/Human Factors

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Introduction

Heuristic evaluation or analysis is an engineering method for finding the usability problems in a user interface design so that they can be attended to as part of an iterative design process (Nielsen, 1995a). Applications of heuristic evaluation or analysis can be used in many different situations or studies. In order to use heuristic evaluation or analysis for a study, there are several areas that need to be considered before using this method.

In order to perform the heuristic evaluation and to receive proper results, it is preferred to have a group of three to five people to do the experiment since it's too difficult for a single person to catch all of the usability problems in an interface. If usability experts are not available, then other project members who aren't part of the design team can be trained to become evaluators (Bias, 1994). Having multiple users perform the analysis will allow a variety of problems to be identified, as each individual will detect several problems. There is also a limit on the number of evaluators at which the benefit of having another evaluator is outweighed by the lack of unique findings due to the law of diminishing returns.

Once an interface has started being evaluated, each person has their own style of interaction. Different users have a different process for analyzing, such as glancing from top to bottom or starting at the middle of the interface and scanning outward. Having multiple evaluators will help identify problems of the interface, since one person may catch something that others did not. Some users may have a different technique for observing an interface due to their experience level with user interfaces.

There are general guidelines for creating interactive designs which are considered broad rules of thumb for "heuristics" (Niesen 1995b). It's important for the user to be aware of what

he or she is doing while interacting with an interface. The system should follow a natural and logical order to allow the users to become familiar with the steps associated with completing a task. An interface should give users some control and freedom such as supporting “undo” and “redo”, this will give the users low stress while using the interface as they typically make mistakes. Humans inherently make mistakes, therefore it is important to design useful error messages which will prevent further issues from arising. This will also lead to making objects, actions, and options visible in order to minimize the user’s memory load and probability of making mistakes.

There are some advantages and disadvantages of using heuristic analysis. Advantages such as providing quick and relatively inexpensive feedback to designers and obtaining process improvement ideas for the design. Assigning the correct heuristic can help provide suggestions to the designers. This way the designers can create the most effective and enjoyable interface for users, which will also prevent users from making errors. Heuristic usability testing has some disadvantages such as delaying the completion date for the design and finding more errors while making each improvement. This can extend the testing timeline since finding experts for their experience and knowledge to apply the heuristic effectively is very difficult (Molich, 1990).

Heuristic evaluation can be used in many real world problems to eliminate usability errors such as an interface for ATM machine. Along with the interface for ATM machine, there are countless website or interface that can be improved and make it more easier for users by doing heuristic evaluation to find usability issues. The current interface for ATM machine creates more personal experiences for each customer. Compared to the older interface version

for ATM machine, the newer ones have more highlighted features along with touchscreen to make it easier and efficient rather than only being able to press the buttons only on the side. The newer interface reduces the information that's displayed to a bare minimum and replaces text with icons and visual cues for fast decision-making and provides messages based on a customer's priorities (IDEO 2013).

Methodology

The purpose of this experiment was to use the Nielsen heuristic analysis to evaluate the usability of a website. Each member of the team went online and looked at different websites that requires the user to perform some sort of task. The task needed to be one that required the user to delve deeply into the different functions and layers of the website. Once each member of the team had a website picked out, the group collaborated and identified the one that had a particularly poor User Interface (UI) design. The website that was agreed upon to have poor usability was <http://www.cruise.com>.

Next the group decided to go through different tasks that a user can perform on the website. From all these tasks, the team decided to analyze one task. The main task that a user would be on the site for is to book a cruise vacation. With this in mind, the team decided that the task of booking a 6 to 9 day cruise vacation to the Bahamas for the month of June 2015, with a port of call of New York City, would be analyzed.

Once the task to analyze was decided upon, a shared spreadsheet was created with a different sheet for each group member. The spreadsheet had a table for the steps to book a cruise and a table to evaluate the issues with the website and process of booking the cruise. A

table with the different heuristic categories, their description and a table showing the scale for the severity rating of each heuristic was also included for ease of reference. After this, the team decided that each member, on their own time, would go through the process of booking the agreed upon cruise vacation and fill out their part of the spreadsheet.

Next the team reconvened after each group member had evaluated the task of booking a cruise and filling out the spreadsheet. The team went through what each member had for their steps to book a cruise and the issues that were found while performing the task. Then the team looked at what heuristic each issue that was found violated. Next another sheet was added to the spreadsheet for the overall heuristic analysis. This sheet had all the same tables as the individual members sheets, however, this sheet was where the team combined the information from each member's evaluation into one. The steps that were taken for the task of booking a cruise were agreed upon and put in this heuristic analysis sheet. The team individually gave a severity rating to each issue in the overall heuristic analysis table and the final severity assigned to each issue was a rounded average of the individual ratings.

Finally, based on the information gathered in the heuristic analysis sheet, the team created two Pareto Charts. The Pareto Charts were used to identify the top 80% of heuristics identified as violated, and top 80% of severe issues identified. These were the heuristics and issues that the team then focused on as they had the biggest impact on the usability of the website.

Results

Once each member had spent time on Cruise.com and became familiar with the layout of its contents, an indepth analysis was completed to indenify the heuristics that were violated. The first heuristic identified was Information Design 1 because the website did not fill the entire screen, or it had an unresponsive HTML. It was deemed a low priority, or a severity rating of one, for this issue only became limiting on a smaller screen. This issue is shown below in Figure 1.



Figure 1: Unresponsive HTML

Before a user can search for the available cruises, the next heuristic was encountered and identified as Consistency 1 because there was three different ways to search. It is difficult for the user to differentiate and choose which of the buttons should be chosen, “Search,”

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“Cruise Port Search,” or “Advanced Search”. It is possible to work around this by way of guess and check, but regardless it should be more clearly labeled to “Put Information in the World.” For this reason, this heuristic was given a severity of two. This issue is shown below in Figure 2.

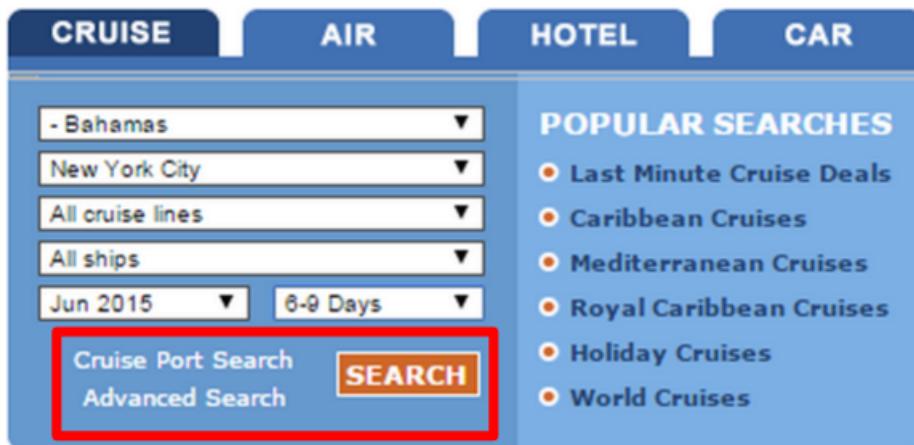


Figure 2: Three Different Search Methods

The next heuristic violation occurs when a user first visits the Cruise.com homepage. The amount of information presented was overwhelming and much of it appeared redundant or very similar. This violation was categorized as Information Design 1 with a severity of two because it made the user question what information was relevant and which was the same. Additionally, the current layout makes the user confused on what should be filled out, since there are multiple different ways to view a cruise. This violation is shown below in Figure 3.



Figure 3: Cluttered Homepage

Once a user has navigated past the home screen by way of searching for a cruise they are bombarded by a pop-up of different websites offering similar cruises. This was identified as a Consistency 1 heuristic violation because it distracts the user from the main objective and causes confusion on which website should be used, Cruise.com or the popup's website. The severity was given as one because most users are familiar with the deceptive nature of popups and typically ignore them. This issue is shown below in Figure 4.

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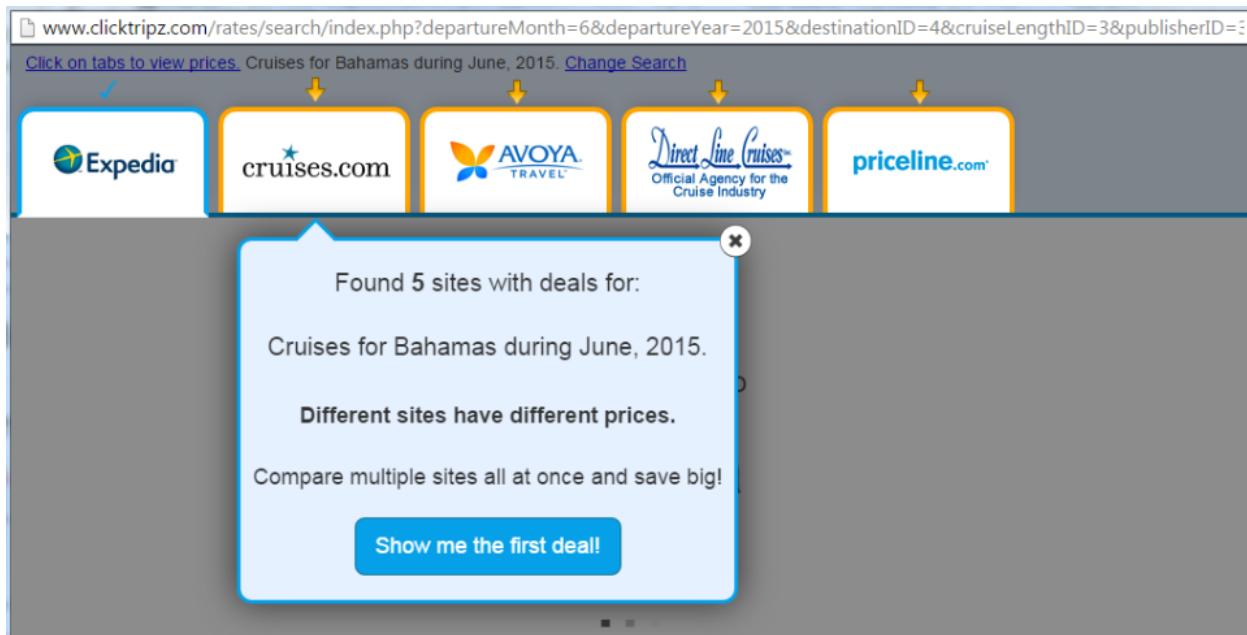


Figure 4: Distracting Popup

After a user has gotten past the popups, they are shown the applicable cruises with available “Bonus Offers.” These “Bonus Offers” were identified as a Consistency 2 heuristic violation because they make the user confused as to whether they are getting the best deal. In other words, the user naturally wants to look at them all, even though most will not apply. The severity of this violation was given a one because the overall task was not affected by this heuristic but rather caused the user slight confusion. This violation could be eliminated by only displaying the “Bonus Offers” that are applicable for the criteria that the user selected. This issue is displayed in Figure 5.

8 Days Caribbean-Eastern

Carnival Cruise Lines • **Carnival Splendor**
New York City, Grand Turk, Half Moon Cay, Nassau, New York City
2 departure dates: Jun 9, 29 2015

Inside from	OceanView from	Balcony from	Suite from
\$649 \$81 per day	\$789 \$99 per day	\$1119 \$140 per day	\$1359 \$170 per day

BONUS OFFERS

- Spa Cabin Sale - Additional Onboard Credit!
- EXCLUSIVE!! Up to \$500 ONBOARD CREDIT
- Carnival Salutes US and Canadian Soldiers
- Enjoy a 2 Night Pre Cruise New York Land Package Add-On
- Up to 3 Category Upgrade
- Discounted Shore Excursions

SELECT

8 Days Bahamas

Norwegian Cruise Line • **Norwegian Gem**
New York City, Port Canaveral, Great Stirrup Cay, Nassau, New York City
1 departure date: Jun 13 2015

Inside from	OceanView from	Balcony from	Suite from
\$749 \$94 per day	\$949 \$119 per day	\$1349 \$169 per day	\$1529 \$191 per day

BONUS OFFERS

- FREESTYLE CHOICE SPECTACULAR: 3rd-8th Free or 50% OFF, Onboard Credits and More!
- EXCLUSIVE!! Up to \$500 ONBOARD CREDIT
- Up to \$50 ONBOARD CREDIT Per Cabin!
- AARP/CARP Special: Save Up to \$200 or up to 5% off
- Enjoy a 2 Night Pre Cruise New York Land Package Add-On
- Discounted Shore Excursions

SELECT

7 Days Bahamas

Norwegian Cruise Line • **Norwegian Gem**
New York City, Port Canaveral, Great Stirrup Cay, Nassau, New York City
1 departure date: Jun 27 2015

Inside from	OceanView from	Balcony from	Suite from
\$929 \$133 per day	\$1099 \$157 per day	\$1349 \$193 per day	\$1449 \$207 per day

BONUS OFFERS

- FREESTYLE CHOICE SPECTACULAR: 3rd-8th Free or 50% OFF, Onboard Credits and More!
- EXCLUSIVE!! Up to \$500 ONBOARD CREDIT
- AARP/CARP Special: Save Up to \$200 or up to 5% off
- Enjoy a 2 Night Pre Cruise New York Land Package Add-On
- Discounted Shore Excursions

SELECT

Figure 5: Excessive Bonus Offers

The user then has the ability to view each cruise on a map which displays the projected voyage. However, the map is very vague about the port details. Put differently, the user could become perplexed about where their cruise is leaving from, and would have to use external resources to find the address for the departure. It was determined that this was a Information Design 2 violation because it fails to adequately inform the user of the details of their voyage. This heuristic was given a severity of one due to the simple fact that many other methods are possible to find this such information. This issue is shown in Figure 6.



Figure 6: Vague Map

The next heuristic violation found was how the website automatically defaults the number of passengers to two. After further analysis, the purpose of this default was recognized. Unlike other industries, cruise companies sell entire cabins, rather than just per person. It was for this reason and the confusion that was caused, that this violation was categorized a Consistency 1 heuristic. It was given a severity ranking of three for the fact that currently the website does not explain this industry standard and could lead to the user into incorrectly booking a cruise. This issue is displayed in Figure 7.

Let us find the best rate for you		Is any guest?	Guest Ages
Cruise lines often offer special rates for guests 55 years and older, for military personnel or for residents of a particular state.		<input type="checkbox"/> 55 yrs+ <input type="checkbox"/> Military <input type="checkbox"/> Past Passenger	Adults • (13+) <input type="text" value="2"/> Children • (2 yrs-12) <input type="text" value="0"/> Infants • (6-23 mths) <input type="text" value="0"/>
Special residency rates	Departure Airport	Cruise line age rules UPDATE RATES	
State/Province <input type="button" value="▼"/>	Cruise Only <input type="button" value="▼"/>		

Figure 7: Default is Two Passengers

Another issue occurs when prompted to select which cabin to book. The website provides a picture for each room to help the user decide which room is a best match. However, the pictures are the exact same for many of the rooms although the prices are different. This

Consistency 2 heuristic was given a severity of two and is shown in Figure 8. Cruise.com should provide more accurate pictures or further explain the price discrepancies.

	Category: 4B	Interior Stateroom	A private bathroom with shower, ample drawer and closet space, mini-safe, hairdryer, color TV, and telephone.	Cabin Price Special Deal \$1,518.00  per person SELECT
Size: 185 sq.ft. Window: none	Deck: <u>2 Main</u> , <u>1 Riviera</u>	Two twin beds that can convert to a king-sized bed		
	Category: 4A	Interior Stateroom	A private bathroom with shower, ample drawer and closet space, mini-safe, hairdryer, color TV, and telephone.	Cabin Price Special Deal \$1,518.00  per person SELECT
Size: 185 sq.ft. Window: none	Deck: <u>1 Riviera</u>	Two twin beds that can convert to a king-sized bed		
	Category: 4C	Interior Stateroom	A private bathroom with shower, ample drawer and closet space, mini-safe, hairdryer, color TV, and telephone.	Cabin Price Special Deal \$1,538.00  per person SELECT
Size: 185 sq.ft. Window: none	Deck: <u>2 Main</u>	Two twin beds that can convert to a king-sized bed		
	Category: 4D	Interior Stateroom	A private bathroom with shower, ample drawer and closet space, mini-safe, hairdryer, color TV, and telephone.	Cabin Price Special Deal \$1,558.00  per person SELECT
Size: 185 sq.ft. Window: none	Deck: <u>6 Upper</u>	Two twin beds that can convert to a king-sized bed		

Figure 8: Identical Room Pictures with Different Prices

Additionally, on the next cabin selection page, a map of the ship was shown. This map was very difficult to view since only half of it was visible at a time requiring constant scrolling to identify where cabins were located. This was classified as an Operation 2 heuristic because it fails to provide proper visibility for the given cabins and locations. It was determined that this issue was not hindering the overall objective of the task, so it was given a severity of one and is presented in Figure 9.

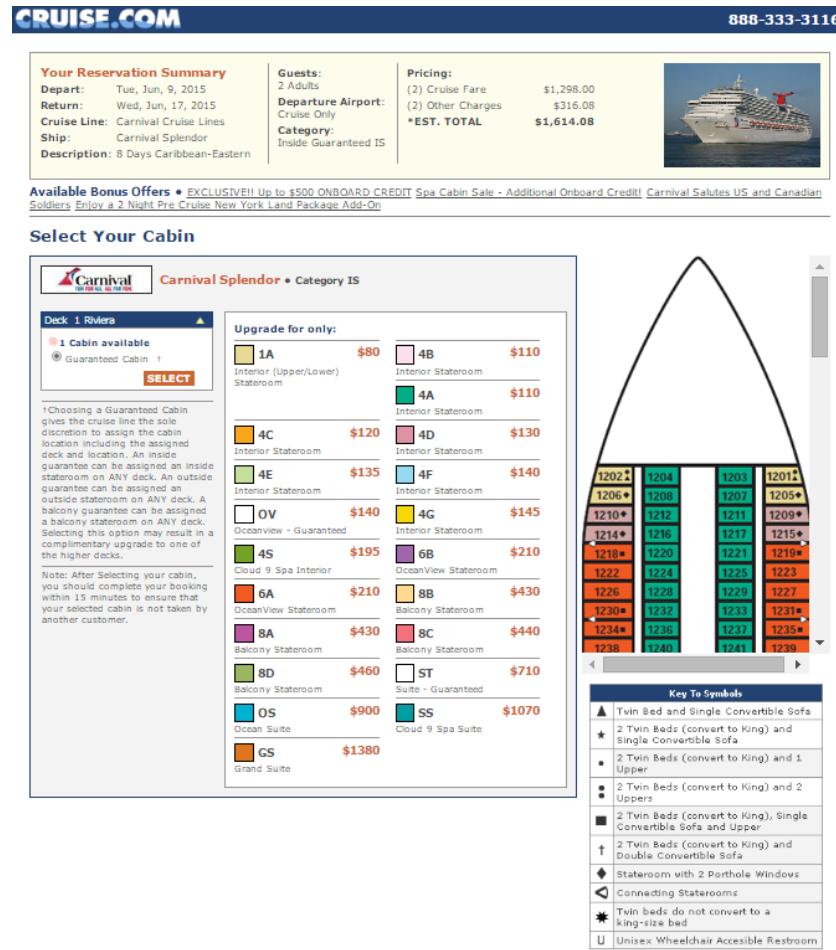


Figure 9: Entire Ship not Viewable

Subsequent to cabin selection, the registration page was displayed which led to the next heuristic violation. On the registration page, three options are given; “I am an existing customer,” “I am a new customer,” and “Book without Registering.” The first two options take the user to a screen where they had to provide logon info or credentials. However, the third option, “Book Without Registering,” requires the user to click “Continue” to then be able to provide info. This minor heuristic was categorized as Operation 1 with a severity of one. It was determined that this was the appropriate rating because the task objective was not hindered, rather just required an extra unnecessary step. This issue is displayed in Figure 10.

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The figure consists of three vertically stacked screenshots from the Cruise.com website, illustrating different user authentication and registration paths:

- Top Screenshot:** Shows the "Existing Customer Login" page. It features fields for "Email" and "Password", a "Remember my Login" checkbox, a "Forgot Password?" link, and a red "CONTINUE" button. Above the form, a timer displays "Cabin Hold Time Remaining 14:55" with a "EXTEND TIME" link.
- Middle Screenshot:** Shows the "New Customer Login" page. It requires users to enter personal information such as "First", "Middle", and "Last" names, along with "Street", "City", "State/Prov", "Postal Code", "Home", "Cell", "Work", and "Fax" numbers, and "Email" and "Password". A "Please notify me about the best cruise deals as they become available" checkbox is present. Below the form, a note states "Mandatory fields are highlighted in yellow." A timer shows "Cabin Hold Time Remaining 14:15" with a "CONTINUE" button.
- Bottom Screenshot:** Shows the "Book without registering" page. It includes a "CONTINUE" button and a timer showing "Cabin Hold Time Remaining 13:30" with a "EXTEND TIME" link.

Figure 10: The three logon methods, with the unnecessary continue step

Another heuristic violation occurs as the user selects their preferred cabin. The low price that is previously shown to the user doubles due to the user having a mandatory guest. This is a violation of Information Design 2, since the user is not previously informed on how the pricing would change. The users are tempted to pick a cruise with a lower price, then are surprised by a big jump in price as soon as the cabin is chosen. The issue is given a severity rating of three as severely important information is not provided to the user where it should be. The website merely states that the price is per person in small text which is easy to overlook. This issue is shown below in Figure 11.

8 Days Bahamas

Norwegian Cruise Line • **Norwegian Gem**
New York City, Port Canaveral, Great Stirrup Cay, Nassau, New York City

1 departure date: Jun 13 2015

Inside from \$739 \$92 per day	OceanView from \$929 \$116 per day	Balcony from \$1319 \$165 per day	Suite from \$1499 \$187 per day
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BONUS OFFERS

- FREESTYLE CHOICE SPECTACULAR: 3rd-8th Free or 50% OFF, Onboard Credits and More!
- EXCLUSIVE!! Up to \$500 ONBOARD CREDIT
- Up to \$50 ONBOARD CREDIT Per Cabin!
- AARP/CARP Special: Save Up to \$200 or up to 5% off
- Enjoy a 2 Night Pre Cruise New York Land Package Add-On
- Discounted Shore Excursions

SELECT

Your Reservation Summary

Depart: Sat, Jun, 13, 2015 **Return:** Sun, Jun, 21, 2015 **Cruise Line:** Norwegian Cruise Line **Ship:** Norwegian Gem **Description:** 8 Days Bahamas

Guests: 2 Adults	Pricing: (2) Cruise Fare \$1,478.00
Departure Airport: Cruise Only	(2) Government Fees \$306.08
Category: Guaranteed Inside IX	(2) ON BOARD CREDIT (\$12.50) Free
*EST. TOTAL \$1,784.08	

Figure 11: Inconsistent Price

After a cabin is selected the price not only doubles due to the heuristic violation previously explained, additional charges are also added on top of that. These additional charges are added without any prior warning or any explanation of why they are added; it is simply labeled as “Other Charges”. This violates Information Design 2 as the user is not provided the necessary help/documentation regarding the final price. This issue was given a severity rating of 3 as users are highly likely to want to know what they are paying for and with the current system no information is provided. This issue is shown below in Figure 12.

Your Reservation Summary

Depart: Tue, Jun, 9, 2015 **Return:** Wed, Jun, 17, 2015 **Cruise Line:** Carnival Cruise Lines **Ship:** Carnival Splendor **Description:** 8 Days Caribbean-Eastern

Guests: 2 Adults	Pricing: (2) Cruise Fare \$1,298.00
Departure Airport: Cruise Only	(2) Other Charges \$316.08
Category: Inside Guaranteed IS	*EST. TOTAL \$1,614.08

Figure 12: Miscellaneous Charges

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Once all of the selections are completed, a timer appears at the top of the screen that starts counting down from fifteen minutes. The timer counts down in five second intervals and indicates the time remaining for the user to complete the purchase. This issue was identified to violate Operation 1, since it rushes the user. This issue is given a severity rating of two as it is likely to bother the user but is not a major issue. This issue is shown below in Figure 13.



Figure 13: Cabin Hold Time

When passengers are prompted to fill in their personal information after completing their selections some boxes appear in yellow and some in white. While, experienced users may be aware that yellow boxes indicate required information it should not be assumed all users will know the meaning behind the difference in colors. This violates Information Design 2 as users are deprived of the information that it required by them to fill out their personal information in the most efficient way possible. This issue is given a severity rating of two; the lack of information definitely slows down the user, yet does not affect them greatly. This issue is shown below in Figure 14.

Figure 14: Required vs. Unrequired Information

Another Information Design 2 that was encountered has to do with the dining choices presented to the user. This problem is encountered when users are prompted to fill in information about themselves and they are presented with a range of possible selections for their dining time. The various options can be seen in Figure 15, yet no further explanation for the options are given and how the price will be affected by the user's choice is unknown. This issue was given a severity rating of 2 as there is a serious lack of information that should have been provided.

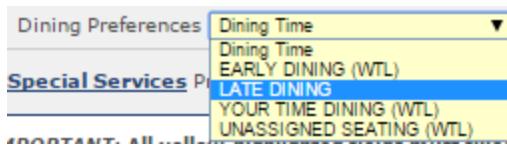


Figure 15: Dining Preference

One of the biggest problems encountered with the website was the lack of a crumbtrail as users progressed through the process of booking their trip. This causes two issues for the user; firstly the user is unaware of where they currently are in the process, also they are not given the option to go back to a specific page if they choose to do so. Users have to use their browser's "back" button, which deletes the previously entered information. This issue was labeled as a violation of Errors 3 as it does not allow users to go back a step and correct a mistake they have made. This issue was given a severity rating of 3 and should definitely be fixed to provide a better, easier experience to users. Figure 16 below is an example of a crumbtrail.



Figure 16: Crumb Trail

One of the most surprising violations was the inability to click the website’s name “CRUISE.COM” at the top of some page. With the way almost every website is built, users have come to expect to be able to click the name of the website, or the “title” at the top of the page to have it lead them to the homepage. This issue was found to be a violation of Consistency 1. Not only having the title clickable or not is inconsistent throughout the website, it is also very inconsistent with what internet users have come to expect from websites in general. A severity rating of two was found to be appropriate, since it does not present a serious usability issue, but there is a lack of a feature that has become very common for websites. This issue is shown below in Figure 17.

The screenshot shows the Cruise.com homepage with a search summary for a cruise departing on July 3, 2015, returning on July 6, 2015, with Norwegian Cruise Line's Norwegian Sky for 3 days in the Bahamas. It lists guests as 2 adults and departure airport as Cruise Only. Below the summary, there are promotional offers for onboard credit and AARP/CARP specials. A large blue button labeled "Category Availability" is prominently displayed. Below this button, there are four price options: Inside from \$249.00, OceanView from \$399.00, Balcony from \$489.00, and Suite from \$1,45. To the left of the "Category Availability" button is a small thumbnail image of a cruise cabin.

Figure 17: Inconsistent Cruise.com homepage button

When the user chooses to sort the prices of the cruises that match their search from the cheapest option to the most expensive, the sort feature does not seem to work properly. Users are presented with multiple pricing options for each cruise: suite, balcony, and ocean view price being some of them. However, the sort option does not seem to sort the options depending on a specific price. This issue violates the Consistency 1 heuristic as it is not specified how the prices are sorted and it does not appear to be consistent. This issue was given a severity rating of two. The website does seem to sort the pricing cheapest to expensive but in an unspecified manner, it could definitely be improved to be make more sense. This issue is shown below in Figure 18.

Inside from	OceanView from	Balcony from	Suite from
\$249 \$83 per day	\$399 \$133 per day	\$489 \$163 per day	\$1209 \$403 per day

Inside from	OceanView from	Balcony from	Suite from
\$309 \$103 per day	\$349 \$116 per day	\$509 \$170 per day	\$599 \$200 per day

Inside from	OceanView from	Suites from
\$329 \$110 per day	\$359 \$120 per day	\$749 \$250 per day

Figure 18: Inconsistent Price Sorting

Another violation of Consistency 1 heuristic takes place when the user is prompted to enter their and their guest's phone number and address. After user checks a box that clearly states "Address and Phone same as Passenger 1" the system unchecks the box as soon as any information is entered for Passenger 1. This was given a severity rating of one, since it is does not present the user too much trouble. This issue is shown below in Figure 19.

The image displays three stacked forms for entering passenger information. The top form is for 'PASSENGER 1 - Adult'. It includes fields for First, Middle, and Last names, Country (set to USA), Street, City, State/Prov, Postal Code, Email, Date of Birth, Past Passenger #, Nationality, Passport Issue Date, and Passport Expire Date. The middle form is for 'PASSENGER 2 - Adult'. It includes fields for First, Middle, and Last names, and a checked checkbox labeled 'Address and Phone same as Passenger 1'. The bottom form is also for 'PASSENGER 1 - Adult' and is identical in structure to the first one, including the 'Address and Phone same as Passenger 1' checkbox. A red arrow points from the checkbox in the middle form down to the corresponding checkbox in the bottom form.

Figure 19: Same Address and Phone Number

Figure 20 below represents the total occurrences for each Neilson Heuristic that was violated according to group. The first 5 Heuristics are the vital violations of focus where two are information design violations and two are consistency violations. Information design violations were expected because the group found the website to be disorganized by advertising looking similar to the information of interest. There was also a lot of white space throughout each step of booking a cruise which forced the evaluators to focus on smaller detail to

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discriminate between valuable and unvaluable information. Consistency violations were expected because different options or decisions weren't clearly defined or displayed. An example was the three different search engines to begin looking for a cruise at the home page in the cruise tab. Another instance was when selecting a room, the only difference was in price and it couldn't be visually seen in the picture of the room.

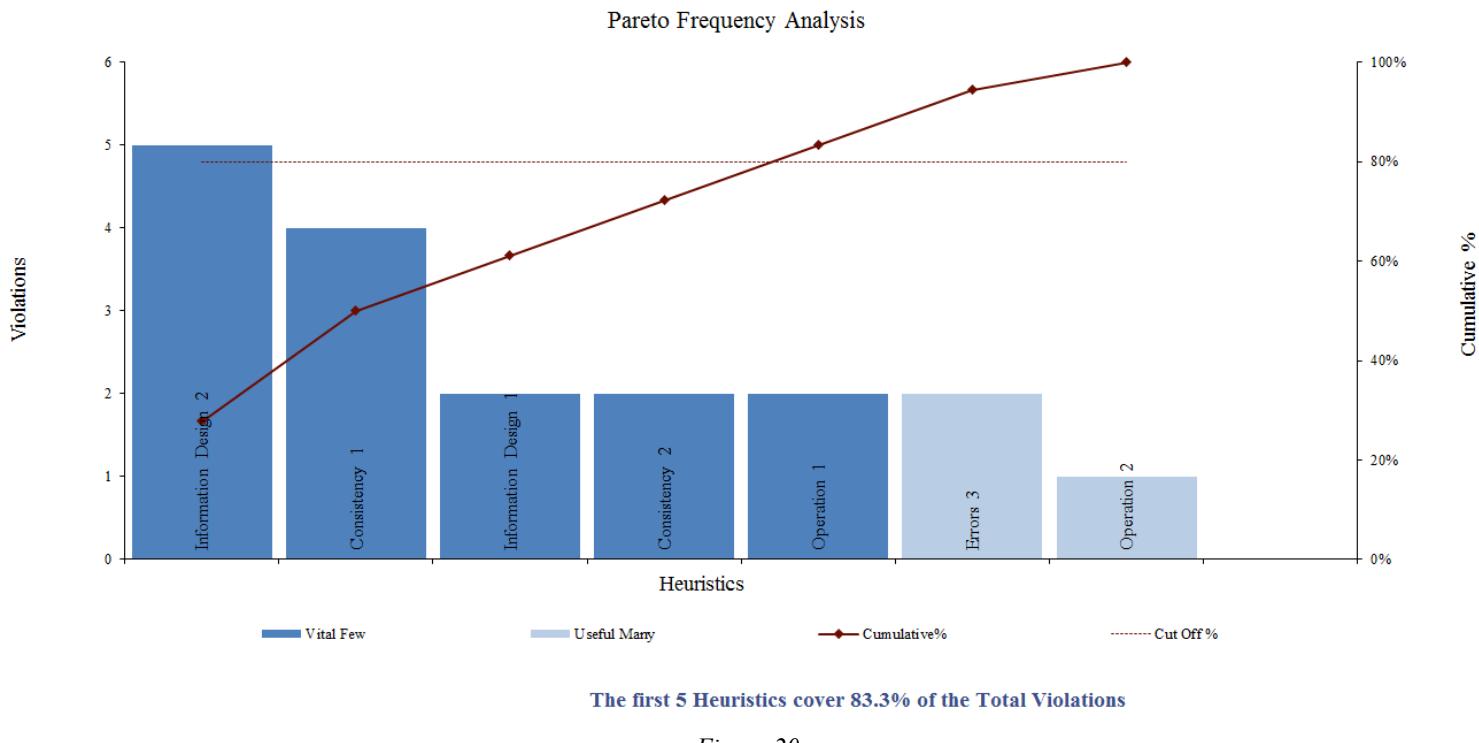


Figure 20

Figure 21 below represents the severity for each issue that was found by the group.

Levels were chosen based on a rounded average. The first 12 issues are the vital issues of focus where four are level 3 severity, major usability issues. Issue 7 was the default setting to book a cruise is for two people which is untypical for booking a trip in general. This becomes an issue for a person buying a ticket they never wanted. Issue 11 is when a person changes the setting to one person, the price doubles. This means that people are all of a sudden paying twice as much as their first impression because the prices are set at per person for a default two people. Issue

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12 is also centered around total cost in that additional charges are added, such as miscellaneous fees at hundreds of dollars, without an explanation. The lack of information presented is unsettling as the price continues to rise. Issue 16 is the lack of a crumbtrail which leaves the user with no sense of where they are in the process and unsure if by clicking the back arrow on the internet browser will wipe out information already completed.

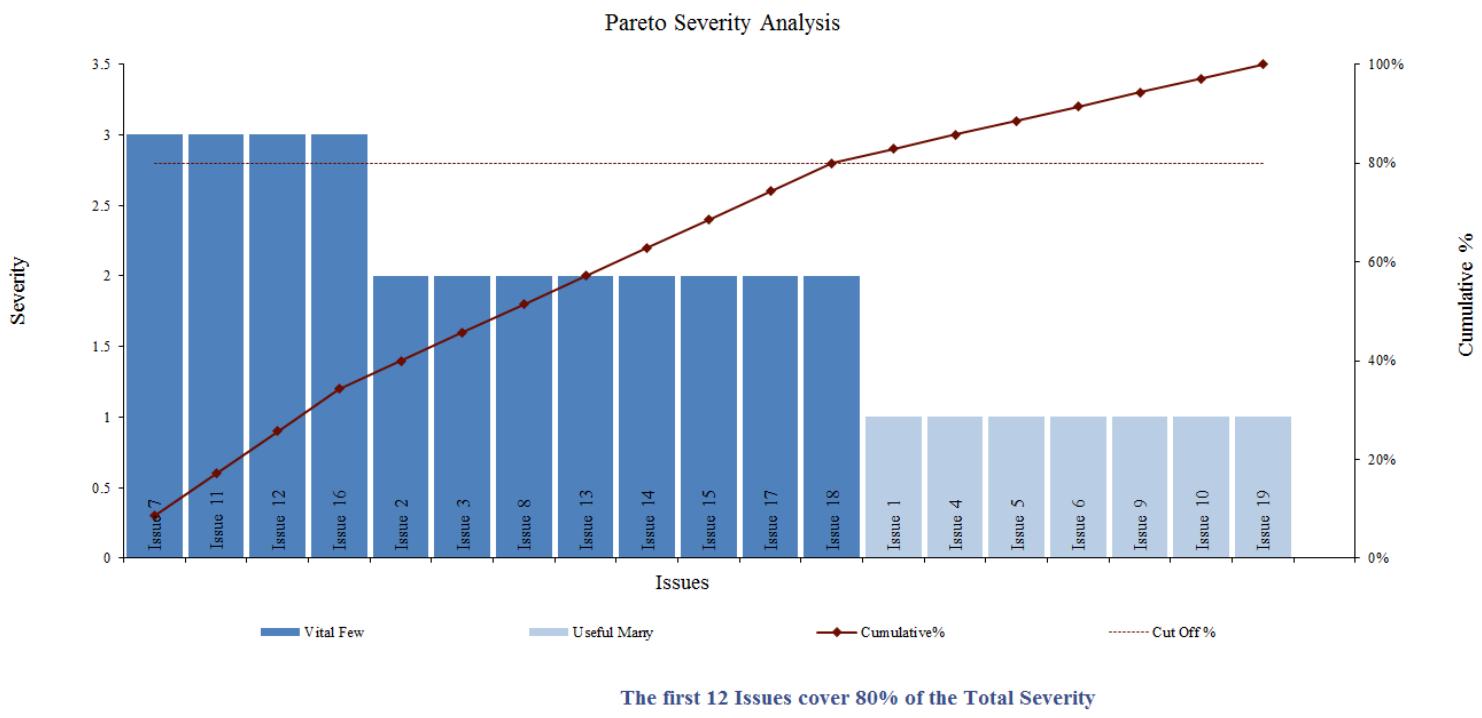


Figure 21

Figure 22 below represents the growth of new issues identified by each evaluator. The trend shows to level out as more unique issues after five evaluators will become scarce. The cost-benefit ratio is rising across evaluators because more time and resources are being spent for lesser new issues to be identified. This is seen by over half of the final issues being identified by 2 of the 5 evaluators. The logarithmic trend was the best fit to describe the issues identified across evaluators.

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ISSUES IDENTIFIED BY EVALUATORS

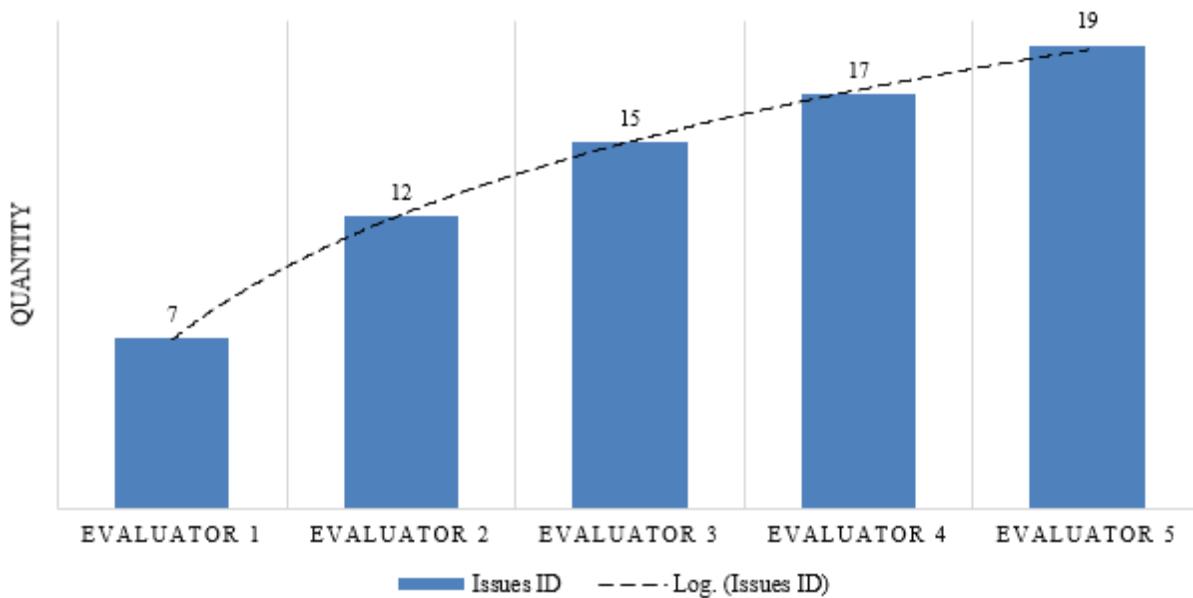


Figure 22

Discussion

After identifying all the heuristic violations that occurred while completing the task of booking a cruise, the violations that had a severity of three or two were further analyzed. One of the main violations was how cruise.com defaulted to two passengers, as seen in Figure 7. It was determined that a solution to this problem would be to create a prompt that requires the user to state the number of passengers before selecting a cruise. This could be done via a popup window which would inform the user how on cruises, passengers pay per cabin. A proposed example can be seen in Figure 23.

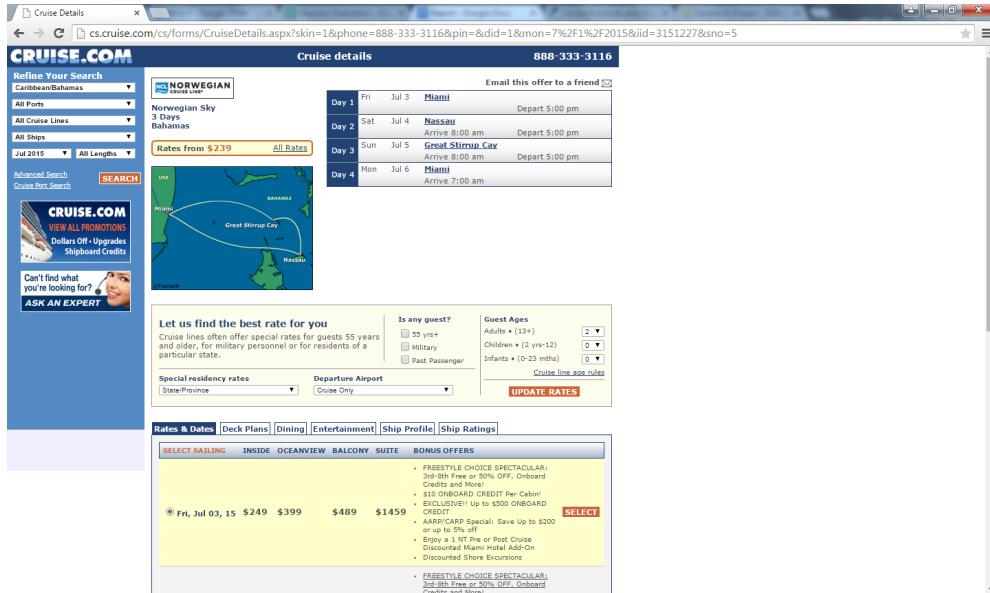


Figure 7: Current Cruise Selection Page

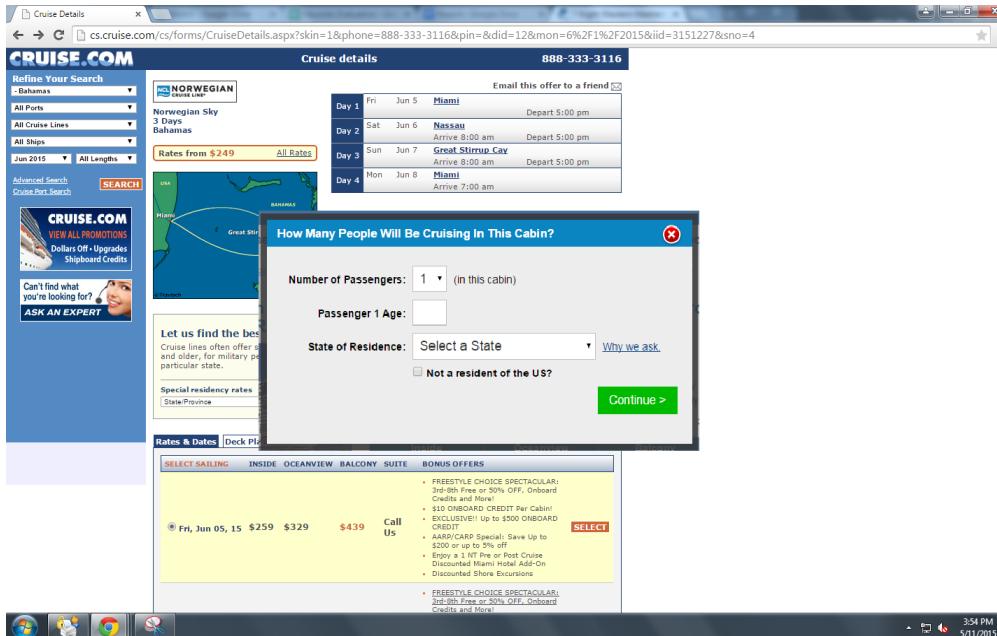


Figure 23: Proposed Solution to Cabin Default Issue

Two of the main information design violations occur on the same screen after a cruise is selected. User's previously agreed upon price is increased to the ill-explained mandatory guests and miscellaneous charges may be added on top of that price jump depending on the chosen cruise as seen in Figure 12. This lack of communication between the system and

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customers can be eliminated by creating a more detailed cost breakdown as can be seen in Figure 24. The suggested solution, in comparison to current state, has a more detailed breakdown of where the charges are coming from and how much it is costing per passenger.

Your Reservation Summary		Guests: 2 Adults	Pricing:
Depart:	Tue, Jun, 9, 2015	(2) Cruise Fare	\$1,298.00
Return:	Wed, Jun, 17, 2015	(2) Other Charges	\$316.08
Cruise Line:	Carnival Cruise Lines	*EST. TOTAL	\$1,614.08
Ship:	Carnival Splendor		
Description:	8 Days Caribbean-Eastern		

Figure 12: Miscellaneous Charges

④ Total Price		Save 	Print 
Passenger	Cruise Fare	Taxes/Fees	Total
1)	\$379.00	\$97.93	\$476.93 USD
2)	\$379.00	\$97.93	\$476.93 USD
3)	\$259.00	\$97.93	\$356.93 USD
Subtotal:	\$1,017.00	\$293.79	\$1,310.79 USD

Figure 24: Proposed Solution with Detailed Cost Breakdown

One of the biggest flaws of the website was its lack of a crumbtrail or “back” buttons. This leads to two separate problems, yet can be solved with one simple addition to each page. With no current crumb trail or a button that allows users to go back a page, users are forced to use their browsers “back” button or simply start over. With the addition of a simple crumb trail and a button that allows users to go back a step, this problem could be eliminated entirely. The suggested additions can be seen below in Figure 25. With having both a back button and a clickable crumbtrail, a user is enabled to navigate as they please without having to re-enter information.

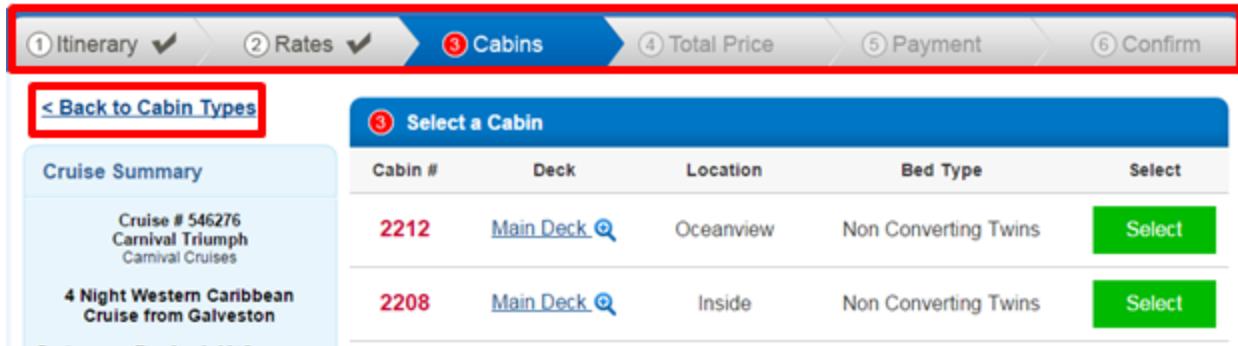


Figure 25: Proposed Solution to the Lack of a Crumbtrail

On the cruise.com homepage, the overall design is very cluttered and has three different ways to search with creates confusion as to which one is preferred, seen in Figure 3. The proposed homepage consists of a more simple layout with one main search box to accommodate all cruise searches. This streamlined approach will lessen user confusion and distractions. The proposed design is shown in Figure 24.



Figure 3: Current Homepage

Ergonomics/Human Factors

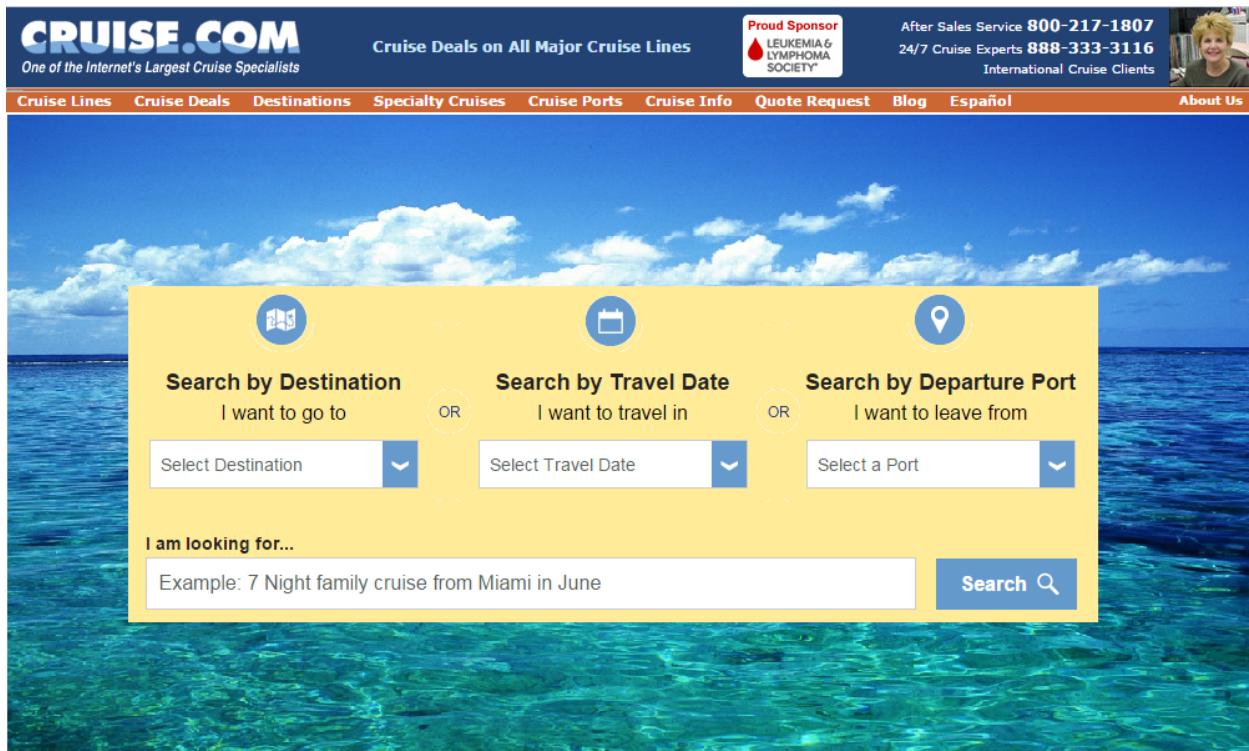


Figure 26: Suggested Homepage

Referring back to figure 3, the homepage of Cruise.com is overwhelming. There are so many icons and advertisements throwing back at you while observing the interface. It would be better to have much simple interface so the user won't have any difficulty understanding what to look for or where to start. Little more than 75% of the homepage is filled with advertisements so it's best to eliminate the majority of it to avoid confusions. It may be best thing to do is have the main focus point as searching for the cruise ship in a large print at the center of the interface instead of upper right corner. I also would eliminate the tabs such as "Cruise Lines", "Cruise Deals", "Destinations", and "Specialty Cruises" across the top of the interface to avoid any distractions while surfing the interface. It's also not good to have redundant informations at multiple locations in the interface. Also the main page is consistent

of blue color. It should have some color variation to distinguish the different between advertisement and search engine to find cruise line. The figure below represents what the interface should look with fewer advertisements.

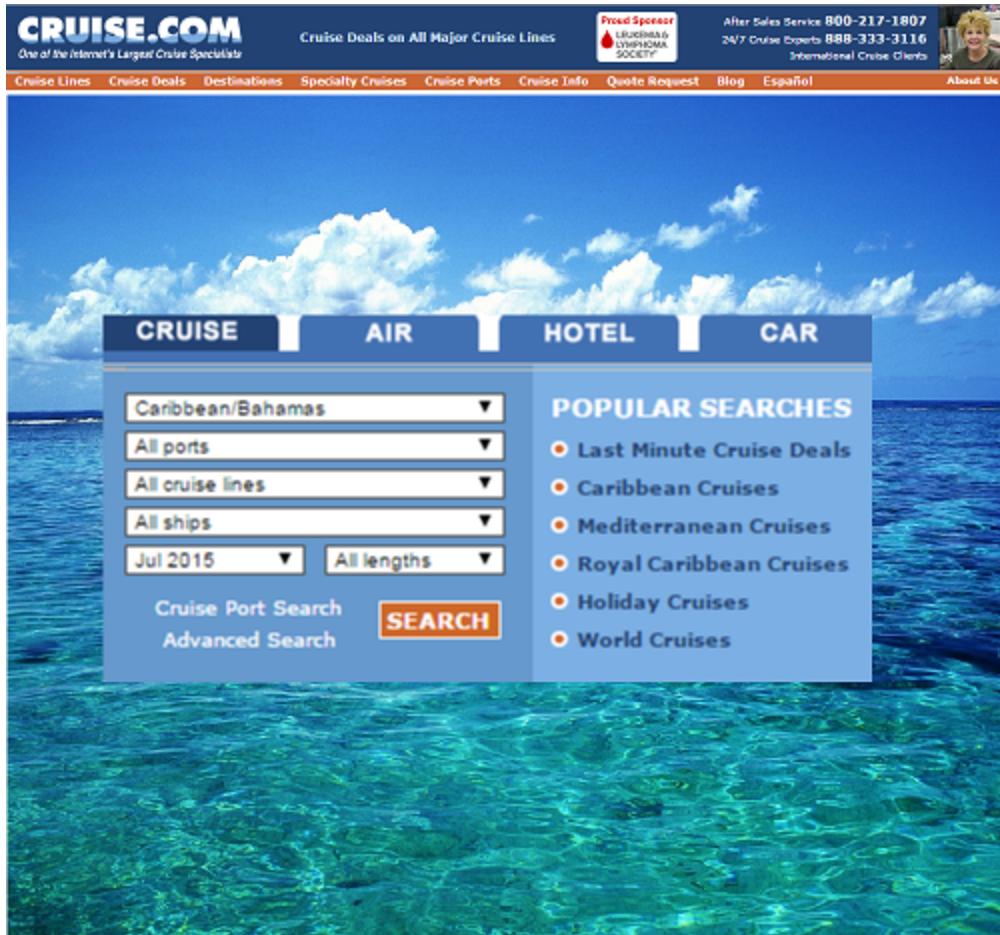


Figure 27: An ideal homepage with less advertisement

When it comes down to selecting a room, the pictures of the rooms are exactly the same like shown in figure 8. This will confuse the customers once they approach to this page. They will have no idea how each room are different from each other since the pictures are exactly the same. People like to avoid from having to read texts on the screen so they simply like to look at the pictures and prices. If all pictures are the same then they may assume they are the same

room but at different location so they would pick the cheapest room while the reality they aren't the same. It would be ideal to be more accurate with the picture selection when it comes to redesigning the web page.

The screenshot shows the 'Existing Customer Login' page. At the top right, there is a timer box displaying 'Cabin Hold Time Remaining 15:00' with a blue 'EXTEND TIME' button. Below the timer, the login form has fields for 'Email' and 'Password'. There is also a 'Remember my Login' checkbox and a 'Forgot Password?' link. A red 'CONTINUE' button is located at the bottom right of the form area.

Figure 28: Cabin Hold Timer

Figure 28 above represents the current design of the system, which has a cabin hold timer. This was identified as an Operation 1 issue with a severity of 2 since it is pressuring to the user to fill out the information within the allotted time. However, there is an option to extend the time that the user has to complete the process. This is redundant and just another item that the user has to pay attention to. A simple solution to the issue of the cabin hold timer, is shown in Figure 29 below. The solution being to remove the timer from the web page, this way users don't feel pressured and one less item on the screen for the user to worry about.

This screenshot shows the same 'Existing Customer Login' page as Figure 28, but the 'Cabin Hold Time Remaining' timer and its associated 'EXTEND TIME' button are removed. The rest of the page, including the login form and 'CONTINUE' button, remains identical.

Figure 29: No Timer

Figure 30 below, shows the passenger details page that the user is required to fill out. This page is where the user enters their information for booking the cruise. There are fields that are required to be filled out and fields that aren't. This is shown by the yellow and white boxes respectively. The issue is that users might not understand the difference between the two

different colored boxes and what it means. This was identified as an Information Design 2 violation with a severity of 2.

Passenger Details

You are logged in as Guest. To login as another user [click here](#).

PASSENGER 1 - Adult

Cabin Hold Time Remaining **14:55** [EXTEND TIME](#)

First	Last	
Country USA	Phone	
Street	Street 2	
City	State/Prov	Postal Code
Email	Date of Birth DD	YYYY
Past Passenger #		
Nationality	Passport Issue Date DD	MMM YYYY
Passport #	Passport Expire Date DD	MMM YYYY

PASSENGER 2 - Adult

Select Passenger from Profile [New Traveler ...](#)

First	Last	
<input checked="" type="checkbox"/> Address and Phone same as Passenger 1		
Email	Date of Birth DD	YYYY
Past Passenger #		
Nationality	Passport Issue Date DD	MMM YYYY
Passport #	Passport Expire Date DD	MMM YYYY

Dining Preferences **Dining Time**

Special Services Preferences are on a request basis and subject to availability [CONTINUE](#)

IMPORTANT: All yellow-highlighted fields must be filled in. Infants are considered passengers and their passenger information must be included on this form. All passenger names and birthdates must exactly match proof of citizenship documentation (passport, birth certificate or drivers license). Discrepancies can result in change fees or even denied boarding at the pier without a refund.

* All prices are per person, in US dollars, based on double occupancy. Triples and quad cabin pricing is based on the ages selected for each passenger. Changing the ages prior to purchasing the cruise may result in a change to the final cruise price. Government taxes are not included. Rates are not final until booking is completed. Actual details of cabins may differ from the samples shown. For bookings made within 14 days of sailing and during peak holiday periods, the air portion of your trip is NOT guaranteed.

Guests occupying Handicapped Accessible Staterooms may be required to provide medical documentation to secure the cabin. Failure to provide proper medical documentation may result in the cancellation of the cabin assignment with a re-accommodation in another cabin at a potentially higher cost.

Figure 30: Passenger Details

Figure 31 below represents the proposed solution to this heuristic violation. The solution would be to move the disclaimer to the top of the page and have the text explaining what the yellow boxes mean in red. This will grab the user's attention at the beginning, before they start the process of filling in their information. This will also help the user avoid performing any non-value added activities.

IMPORTANT: All yellow-highlighted fields must be filled in. Infants are considered passengers and their passenger information must be included on this form. All passenger names and birthdates must exactly match proof of citizenship documentation (passport, birth certificate or driver's license). **Discrepancies can result in change fees or even denied boarding at the pier without a refund.**

Figure 31: Proposed solution with disclaimer at top of page.

Figure 32 below represents the proposed solution for the Information Design 2 issue shown below in Figure 15. The violation was due to users being prompted to choose their dining time without further explanation for the given options given, or how the price differs. This solution would be a ‘What is This’ link that user can click on to present a box of information explaining the selected dining preference. Figure 32 specifically would be the explanation for the ‘YOUR TIME DINING’ option in Figure 15. In addition to the explanation

in Figure 32, there should also be financial information included regarding the price for a dining preference. This is a quick and easy fix that puts more information into the user's decision-making. This solution will appeal especially to new users who aren't accustomed to dining preferences.

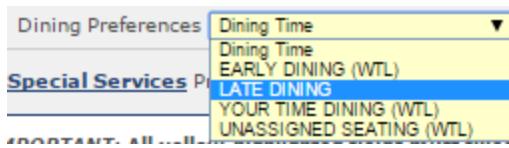


Figure 15: Dining Preference

(What is This?) 

Reservations

To ensure quick seating, we encourage guests to place a reservation for each evening. If you're already booked and have chosen the My Time Dining option, you can easily pre-reserve specific days and times online. Seating can also be reserved while onboard. Maximum of 10 guests per reservation.

Figure 32

Figure 33 below represents the proposed solution for the Consistency 1 issue of a non-clickable website icon. The violation was due to users being unable to get back to the homepage via the 'CRUISE.COM' icon in the top-left corner of every page. This requires the user to re-type the website in the url, or click the 'back' button to the left of the url multiple times just to get back to the home page. Figure 33 shows that a competing cruise trip booking website, iCruise.com, has this basic functionality of returning to the homepage after clicking on the website icon found in the top left header of any page. This can be fixed by a programmer in a matter of minutes to achieve a common website standard and to satisfy a known expectation of users.

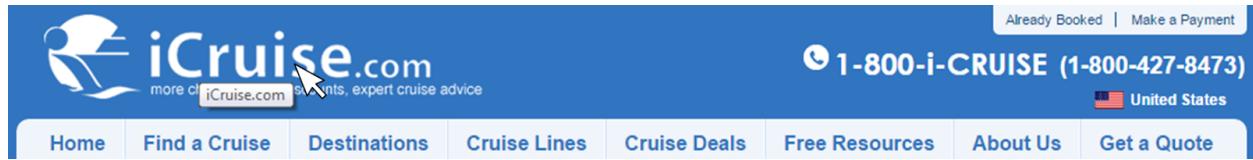


Figure 33

Figure 34 below represents the proposed solution for the Consistency 1 issue of unclear price sorting shown below in Figure 18. The violation was due to there being only one type of price sorting that may just be sorting by the ‘Inside from’ but this isn’t clear. This is an issue for users who may have a preference for a certain room, such as ‘Balcony from’, and they want to see the price sorted accordingly for an organized decision-making process. The proposed solution is to organize this information into a table with columns for Departure Date, Itinerary & Ship, Trip Length, Type of Room, and Price. This would allow users to sort the pricing clearly as well as sort by any of the mentioned columns. This solution is shown in Figure 34 from a competing cruise trip booking website, iCruise.com. The top half of Figure 34 shows the cheapest price when sorting low to high, and the bottom half shows the most expensive price when sorting high to low.

3 Days Bahamas [Compare](#)

Norwegian Cruise Line • Norwegian Sky
Miami, Nassau, Great Stirrup Cay, Miami
5 departure dates: Jul 3, 10, 17, 24, 31 2015

Inside from	OceanView from	Balcony from	Suite from
\$249 \$83 per day	\$399 \$133 per day	\$489 \$163 per day	\$1209 \$403 per day

BONUS OFFERS

- FREESTYLE CHOICE SPECTACULAR: 3rd-8th Free or 50% OFF Onboard Credits and More!
- \$10 ONBOARD CREDIT Per Cabin!
- EXCLUSIVE!! Up to \$500 ONBOARD CREDIT
- AARP/CARP Special: Save Up to \$200 or up to 5% off
- Enjoy a 1 NT Pre or Post Cruise Discounted Miami Hotel Add-On
- Discounted Shore Excursions

SELECT

3 Days Bahamas [Compare](#)

Carnival Cruise Lines • Carnival Ecstasy
Miami, Nassau, Miami
5 departure dates: Jul 3, 10, 17, 24, 31 2015

Inside from	OceanView from	Balcony from	Suite from
\$309 \$103 per day	\$349 \$116 per day	\$509 \$170 per day	\$599 \$200 per day

BONUS OFFERS

- EXCLUSIVE!! Up to \$500 ONBOARD CREDIT
- Carnival Salutes US and Canadian Soldiers
- Enjoy a 1 NT Pre or Post Cruise Discounted Miami Hotel Add-On
- Up to 3 Category Upgrade
- Discounted Shore Excursions

SELECT

3 Days Bahamas [Compare](#)

Royal Caribbean Int. • Majesty of the Seas
Miami, Coco/Little Stirrup Cay, Nassau, Miami
5 departure dates: Jul 3, 10, 17, 24, 31 2015

Inside from	OceanView from	Suits from
\$329 \$110 per day	\$359 \$120 per day	\$749 \$250 per day

BONUS OFFERS

- BOGO+SAVINGS: 50% OFF 2nd Guest, up to \$200 OFF + 3rd/4th guest 50% OFF 2016/2017 sailings

SELECT

Figure 18: Inconsistent Price Sorting

Departing	Itinerary and Ship	Length	Save to Favorites	Priced from
Jun 26, 2015 (Friday) Other Dates	<p>3 Night Bahamas Cruise</p>  <p>Norwegian Sky Norwegian Cruise Line</p> <p>★★★★ 3.8 based on 405 ratings</p> <p>Starts: Miami, Florida Ends: Miami, Florida</p> <p>Ports of Call: Great Stirrup Cay, Miami, Nassau (see itinerary)</p> <p>Special Promotions</p> <ul style="list-style-type: none"> Freestyle Choice - Book an Oceanview Stateroom & Choose 1 of 4 Great Offers! (View) 	3 Nights	<input type="checkbox"/> Compare Favorites	<p>Interior Stateroom from</p> <p>\$249 per person (double occupancy)</p> <p>Learn More</p>
Jun 06, 2015 (Saturday) Other Dates	<p>7 Night Eastern Caribbean Cruise Itinerary A</p>  <p>Disney Fantasy Disney Cruises</p> <p>★★★★★ 4.8 based on 32 ratings</p> <p>Starts: Port Canaveral, Florida Ends: Port Canaveral, Florida</p> <p>Ports of Call: Castaway Cay, Port Canaveral, Sint Maarten, St Thomas (see itinerary)</p>	7 Nights	<input type="checkbox"/> Compare Favorites	<p>Balcony from</p> <p>\$2,673 per person (double occupancy)</p> <p>Learn More</p>

Figure 34

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Appendix

Table 1

Steps to Book a Trip	
1	Choose Destination - Bahamas
2	Choose NYC as Port of Call
3	Choose All Cruise Line and All Ship
4	Choose Departure Date - June 2015
5	Choose June 2015 & 6-9 days
6	Click Search
7	Click Price for 'Sort By:'
8	Select Cheapest 'Inside from' Cruise Option
9	Change 'Guest Ages: Adult (13+)' to 1
10	Change 'Specialty residency rates' to New York
11	Click Update Rates
12	Click select for the cheapest 'Rates & Dates' option
13	Click select for the cheapest 'Inside from' option
14	Click select under 'Guaranteed Cabin'
15	Choose 'Book without Registration' & Click Continue
16	Fill Out Passenger Information & Choose Dining Preference
17	Fill out Credit Card Information
18	Check that you agree to the terms and conditions and click 'Agree & Book'

Table 2

Category	Heuristic	Description of Heuristic	Reference
Consistency 1	Consistency and standards	Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.	Nielsen 1990
Consistency 2	Show conceptually similar items in a similar fashion and different items differently.	Consistency measures application regularity, and can be summed up in a simple generic rule: Treat conceptually different elements differently and conceptually similar elements in a similar fashion.	Garzotto, et al., 1995
Errors 1	Error Prevention	Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.	Nielsen 1990
Errors 2	Help users recognize, diagnose, and recover from errors	Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution. Even better than good error messages is a careful design that prevents a problem from occurring in the first place.	Nielsen 1990
Errors 3	User control and freedom / Permit easy reversal of actions	Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.	Nielsen 1990
Information Design 1	Aesthetic and minimalist design	Dialogues should not contain information, which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.	Nielsen 1990
Information Design 2	Help and documentation	Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.	Nielsen 1990
Information Design 3	Recognition rather than recall	The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.	Nielsen 1990
Navigation	Match between system and real world	Accelerators – unseen by the novice user -- may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions. Enable frequent users to use shortcuts.	Nielsen 1990
Operation 1	Flexibility and efficiency of use	The system should always keep users informed about what is going on, through appropriate feedback within reasonable time. For every user action there should be system feedback.	Nielsen 1990
Operation 2	Visibility of system status		

Ergonomics/Human Factors

Table 3

Rating	Severity	Priority
0	I don't agree that this is a usability problem at all	
1	Cosmetic problem only	Need not be fixed unless extra time is available on project
2	Minor usability problem	Fixing this should be given low priority
3	Major usability problem	Important to fix, so should be given high priority
4	Usability catastrophe	Imperative to fix this before product can be released

Table 4

Issue Number	Issue	Possible solution	Heuristic violated	Severity
1	Doesn't fill entire screen	Design website to be a responsive website.	Information Design 1	1
2	3 different ways to search	Pop up note to discriminate between search engines	Consistency 1	2
3	Information Overload	Streamline the option into relevant categories	Information Design 1	2
4	Pop Up Windows distract from the objective	Eliminate pop ups	Consistency 1	1
5	Too Many Bonus Offers	Streamline the bonus' to only applicable to user	Consistency 2	1
6	Map Does not provide adequate detail about possible trip	Insert in Port of Call location Make a note to explain that this is an industry standard. Buying a cabin as opposed to a seat	Information Design 2	1
7	Default is 2 person	Buying a cabin as opposed to a seat	Consistency 1	3
8	Images are exactly the same	Actual photos with proper details	Consistency 2	2
9	Can't view the whole ship at one time	Show the whole ship across the top of the screen	Operation 2	1
10	Have to click continue after selecting Book without registration	If you choose book without registration it should just go to the next page/step.	Operation 1	1
11	Price jumps up for single person when ship is selected	Explicitly state how the customer will be charged	Information Design 2	3
12	Other charges added on to the pricing I picked without explanation	Cost breakdown display or hyperlink	Information Design 2	3
13	Cabin Hold Time with extendable time is redundant and pressuring	don't have it	Operation 1	2
14	Hard to find what the difference between the yellow and white boxes means.	Put the meaning at the top above where you fill in information	Information Design 2	2
15	Doesn't tell you what the differences of the dining preferences means. Also does this effect the price you will pay?	Have information about the dining preferences next to the drop down menu.	Information Design 2	2
16	No crumbtrail to go back to previous screen	show crumbtrail at top to allow user to reverse actions	Errors 3	3
17	Cruise.com Title at top is not clickable to lead to the homepage as one would expect	Add a clickable image that takes you to the home page	Consistency 1	2
18	Sort by price doesn't sort low to high on any pricing category	Specify what category to sort by	Consistency 1	2
19	Different Phone number	one phone number	Consistency 1	1