

Usability evaluation test of the www.stenaline.ie ticket booking system

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Executive Summary

The purpose of this study is to present how the user interface of the ferry travel booking system could be designed to be efficient and effective while being satisfactory to use for novice users of the system. Usability aspects such as operability (system effectiveness and efficiency) and attractiveness (subjective satisfaction) has been measured using a task-based usability test with 5 participants who provided quantitative data of time spent per task, and qualitative data through an After-Scenario Open Questions, SEQ, PSSUQ and NPS questionnaire.

Usability testing was scheduled over the two dates. The first part of testing was on 3rd of March (2 participants involved) and the second one on 17th of March 2022 (3 participants involved). The purpose of the test was to evaluate the usability of the web interface design, information flow and information architecture while going through all the stages of the booking ticket process. The test scenarios were the same for each group. The test scenarios were the same for each group. The site was tested in a desktop view. The study methods included observation of the user testing, task completion time measurement, questionnaires, and semi structured interviews. The observations were complemented with analyses of the video recordings of the evaluation sessions.

Data were gathered to answer the following questions:

- How easy it is to start the booking process from the home page
- How easy it is to navigate through the booking form
- How quickly a user compares and rates search results
- Which part of the booking form is the most difficult to manage/not clear enough?
- How quickly participants can find information
- What the participant liked most
- What the participant liked the least
- Recommendations for improvement

5 participants were involved in a set of 5 tasks. 3 tasks in total have not been completed. 1 participant was unable to start the first task without additional guidance from the test administrator. 1 participant was unable to complete task 4, although he started twice all over again therefore dropped the rest of the test.

The test identified several major problems including:

- unable to complete the ticket booking task due to an error in booking the cabins
- problem with a dog addition to their ticket
- not recognisable ports names
- unable to find the map
- font being too small
- large amount of unnecessary ads

This document includes participant feedback, satisfaction ratings, task completion rates, ratings for ease or difficulty of completion, time spent on the task, mistakes, and recommendations for improvement.

1. Introduction

One of the leading ferry companies in Europe, Stena Line was founded in 1962 and provides ferry services on 17 routes in Europe. Stena Line ferries travel to Britain, France, Denmark, Germany, Latvia and many other destinations. 19 multilingual Stena sites are pointing to different ccTLD domains. Timetables, fares, direct online ferry booking offers from Ireland to UK or France are available on the Stenaline.ie website.

The purpose of the Stenaline.ie usability test was to determine to what extent the interface helps the user with booking tickets from Ireland to France. The usability test was carried out on a group of 5 potential users. Participants are asked to complete a series of 5 routine tasks. Sessions on the Zoom platform were recorded by the test administrator for later analysis. Participant comments, selections, ratings, and task time measurements have been analysed to identify potential areas for site improvement.

Usability metrics have been chosen in order to determine, in a reliable and accurate way, the value for sub-characteristics of usability such as operability: system effectiveness and efficiency and attractiveness: subjective satisfaction. The evaluation usability test was applied to the Stenaline.ie website.

2. Methodology

2.1 Sessions

The test administrator sent emails to attendees informing them of the test logistics and requesting their availability and participation. Participants responded with an appropriate date and time. Each individual session lasted approximately 40 minutes. Before the session, the test administrator explained the test session and asked the participant to answer pre-test screening questions (Canary, 2020). In-test questions supported observation of user's interactions and aimed to collect data that explains user behaviour when they interact with the product. After completing the task, the participant evaluated the system by answering in-test and post-test questions (Appendix A).

Data collected to measure percentage effectiveness and efficiency using the task-based scenario measures included reading task-based scenarios and trying to find information on the website. In addition, participants ranked each question from 1 to 5 depending on how much they agree with the statement they read, using a 7-point Likert scale (from strongly disagree to strongly agree) to measure users' overall impression of the usability and experience (Laubheimer, 2018).

2.2 Participants

The test administrator contacted and recruited participants from the internal group of students enrolled in the DCU system in September 2022. A total of 5 participants engaged in usability tests as part of this usability evaluation project and completed the test. Participants were selected from novice users with no previous experience on the application.

2.3 Procedure

Each session will use the Think Aloud Moderating Technique. During moderated remote testing, participants are observed and interacted with as they complete the testing tasks. The scenario requires the participant to obtain specific data and is successfully completed when the participant indicates that he has found the answer or has completed the task objective. All the questions, answers, and comments collected during testing provided additional interaction metrics.

2.4 Metrics

Operability of use has been measured by system effectiveness (completion rates), system efficiency (task time). The subjective satisfaction has been measured SEQ and PASSUQ-3. Task-level metrics were addressed in the ISO 9241-11 (1998).

Using the PSSUQ-3 metrics (Will, 2016) has been provided an overall score according to three sub factors: system usefulness (items 1–6), information quality (items 7–12), and interface quality (items 13–15) marked on a 7-point Likert scale, with 7 meaning “Strongly agree” and 1 meaning “Strongly disagree” (Appendix C).

2.5 Evaluation Tasks

The user is planning a family vacation in France between March 14 and May 24. The family consists of 2 adults and 2 children (aged 10 and 14). The goal of the user is to purchase a ticket that will include the transport of him and his family, a family car (standard size) and a small dog. The ticket will apply to back and forth travel by sea.

Test participants attempted completion of the following tasks (Appendix B) in 3 phases:

Phase 1 - Information gathering

Task 1 - Search the names of the appropriate ports when deciding to travel from Ireland to France

Task 2 - Compare how many hours the journey takes from Ireland’s port to France’s port.

Task 3 - Decide how to organize a transport for a dog.

Phase 2 - Reservation making

Task 4 - Select a date and book a ticket

Phase 3: Checkout

Task 5 - Input guest details

3 Results

3.1 System effectiveness

The effectiveness of the website stenaline.ie was measured by the task-completion rates (number of tasks completed successfully divided by the total number of tasks undertaken multiplied by 100%) and amounts to 88%.

Participant	TASK 1	TASK 2	TASK 3	TASK 4	TASK 5
User 1	Not completed	Completed	Completed	Completed	Completed
User 2	Completed	Completed	Completed	Completed	Completed
User 3	Completed	Completed	Completed	Completed	Completed
User 4	Completed	Completed	Completed	Not completed	Not completed
User 5	Completed	Completed	Completed	Completed	Completed
Success	4	5	5	4	4
Completion Rates	80%	100%	100%	80%	80%
System Effectiveness	88%				

Figure 1: Task Completion Success Rate

3.2 System efficiency

According to ISO-9241-11 (1998), the product Efficiency is defined as resources spent by the user in order to ensure accurate and complete achievement of the goals. Time on Task data collected below (Figure 2) allows determining the time-based user Efficiency and Relative Time-based Efficiency.

Participant	Task 1 completion time [min : sec]	Task 2 completion time [min : sec]	Task 3 completion time [min : sec]	Task 4 completion time [min : sec]	Task 5 completion time [min : sec]
User 1	Not completed. User quit the task: 7:36	2:20	4:00	8:57	2:53
User 2	3:26	1:56	4:15	5:20	2:30
User 3	1:47	1:20	0:58	7:01	2:14
User 4	4:10	3:03	2:37	Incomplete. User quit the task: 3:45	Incomplete. User didn't start the task: 0:00
User 5	2:03	0:54	4:04	3:40	2:20
Average user time	2:71	1:07	3:03	4:08	2:29
Expert estimation	1:11	00:21	1.35	2.52	2.06
Time-Based Efficiency	0.14 goal/sec	0.26 goal/sec	0.18 goal/sec	0.08 goal/sec	0.11 goal/sec
Relative time-based Efficiency	38.8%	18.32%	49.79%	43.06%	79.15%

Figure 2: Time on task

The potential efficiency relative to actual system efficiency with regards to its user effectiveness refers to the comparative performance level of the decision making units (experts) based on their inputs (Sergeev, 2010). Relative time-based efficiency of the Stenaline.ie system shows that the most efficient sections are: a checkout section (79.15%) and an information section (49.79%). Relative time efficiency of ticket flow for booking reached 43.06% proficiency. Information about the travel duration is not displayed automatically. Searching for information about the journey time and its manual calculation reduces the efficiency to 18%.

3.3 SEQ Metric

After each task, the user received a single easy question (Appendix C) about whether the task he was performing was 1: very difficult or 7 very easy. Each question was supported by open-ended additional questions.

Demographic questions allowed us to distinguish 2 groups of users: users in the group A: 20-24 age range (User: 2, 3) and group C: 34-39 years old (User: 1, 4, 5).

Users in group A rated the tasks as more difficult than users in group C. The minimum average mark is 1 (all tasks rated very difficult), the maximum is 7 (all tasks rated very easy). The average result for users from group A = 3.4, from group C=4.53 (Figure 3).

Participant	Task 1 SEQ Score	Task 2 SEQ Score	Task 3 SEQ Score	Task 4 SEQ Score	Task 5 SEQ Score	Avg. Rate [User]
User 2 (A)	1	3	2	4	7	3.4
User 3 (A)	1	3	5	1	7	3.4
User 1 (C)	1	1	5	5	7	3.8
User 4 (C)	3	4	6	4	7	4.8
User 5 (C)	2	7	4	6	6	5
SEQ Average	1.6 (-12)	3.6 (-2)	4.4 (2)	4 (1)	6.8 (14)	
The Most Common Indicated Issues	No map to check destination port location	Manual calculation of travel time needed	Too much text	It is not possible to add a dog at the initial stage of booking. The "Cabin error" is displayed only at the end	The system wants to collect too much personal details	

Figure 3: Single Ease Question (SEQ) Results by Task.

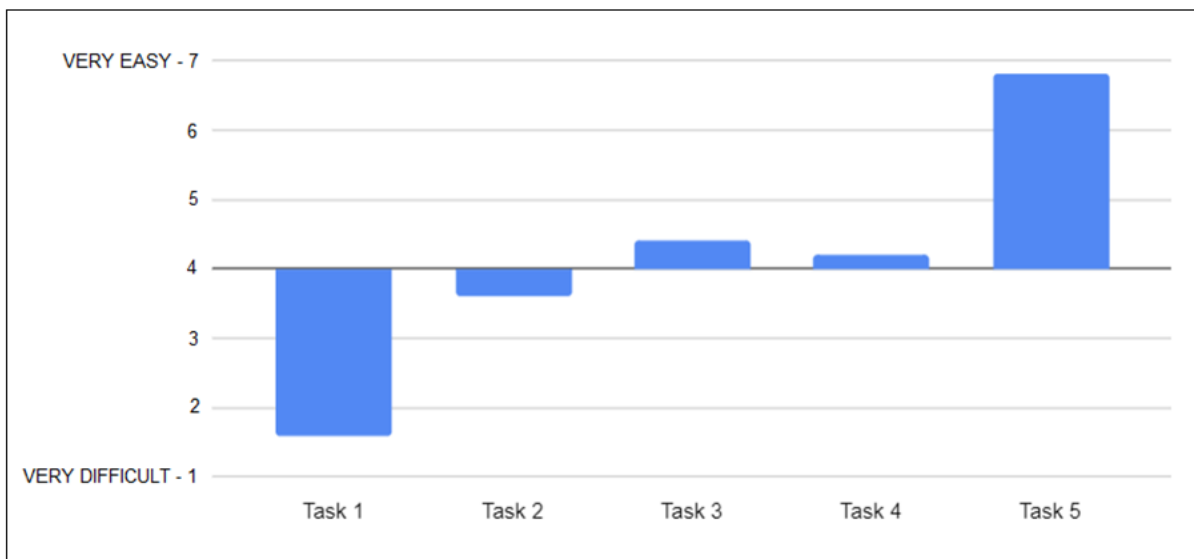


Figure 4: Single Ease Question (SEQ) Metric Result.

3.4 Indicated errors/issues:

60% of users rated the task of finding a port name as "very difficult" (Task 1). Four users switched to Google Maps to be able to finish Task 1. One user was not able to complete the task. The lack of visualization of where and where the ferry is going, unrecognizable port names, and the lack of a proper map disrupted the process of initial trip planning.

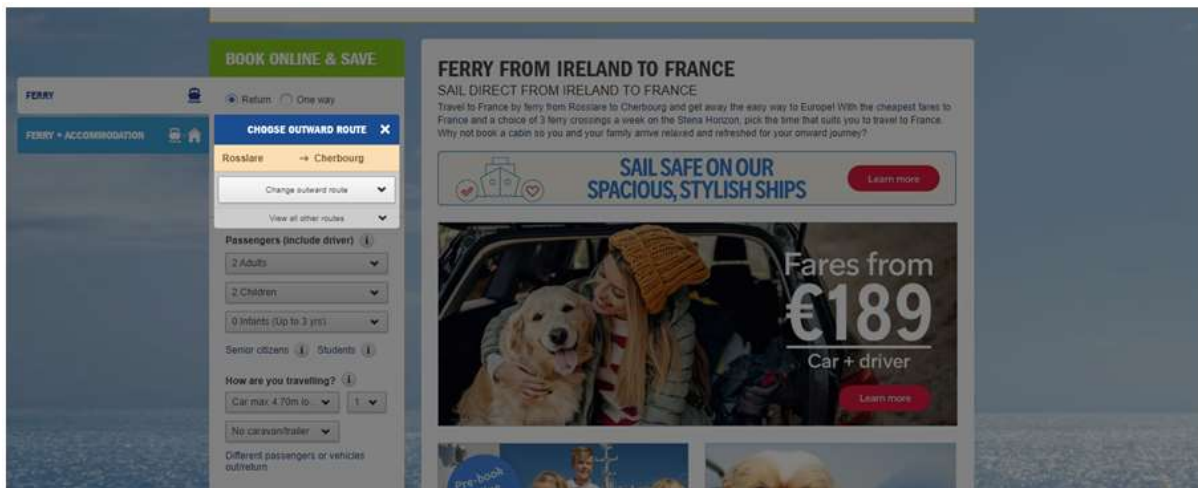


Figure 5: Example of port names without destination country information

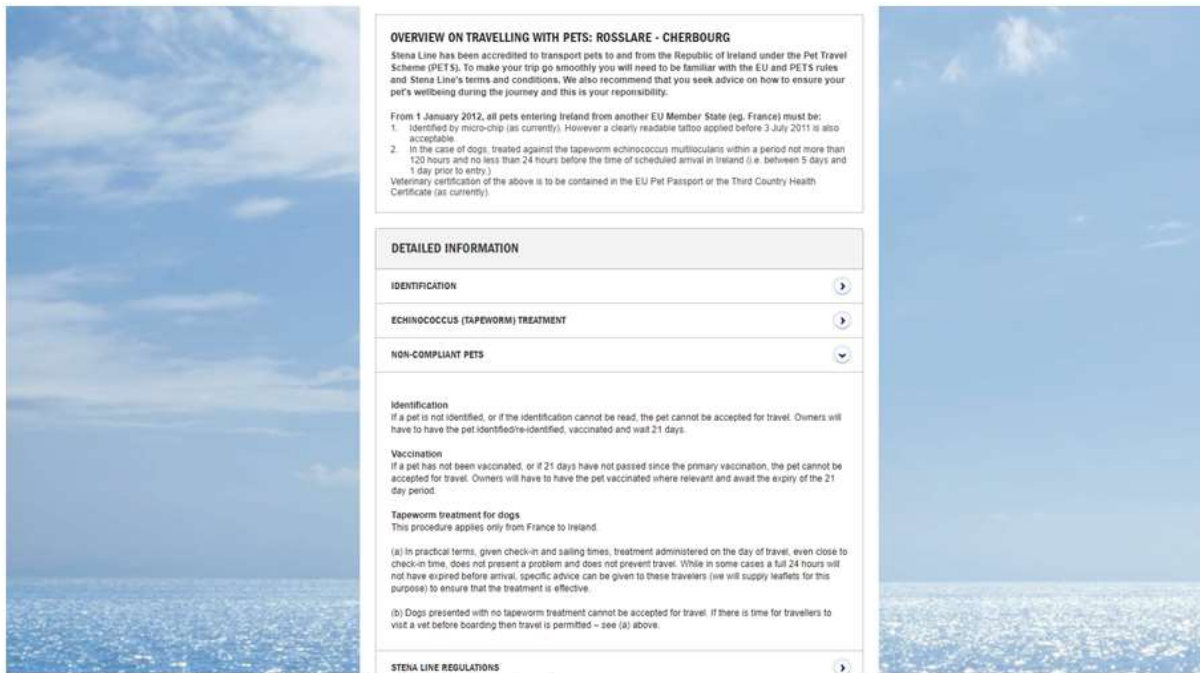
Main issue in Task 2 was about finding out how long a ferry is going, users tried to find information by searching the timetable (unsuccessfully) or starting the ticket booking process (to be able to find a duration of the journey later). The respondents believe that the information about the travel time is "hidden", and the travel time must be recalculated by hand, having an arrival and departure time. Task 2 is rated as a "difficult" (Avg. -2).



Figure 6: Displaying the travel time in the Stenaline.ie reservation system

Task 3 required to collect all the necessary information regarding the journey with the dog. Two respondents were not able to find information on where to place a dog during the trip and whether renting a lodge for a dog involves additional costs. All respondents considered it not sufficient enough for both readability and legibility of content (too much text, too little distance between letters, too small font size, or not enough space between words and lines) (Figure 7).

Adding a dog to the ticket process is the most frequently indicated issue (indicated by 80% of the respondents). The option to add a dog appears only at the end of the reservation flow. During the process the user stays unsure if was (or will be) able to take the dog on board. The lack of compatibility of the return ticket, which does not contain previously added (dog, cabin, dinner) choices, forces the user to select the same options and add them again to the return ticket.



OVERVIEW ON TRAVELLING WITH PETS: ROSSLARE - CHERBOURG

Stena Line has been accredited to transport pets to and from the Republic of Ireland under the Pet Travel Scheme (PET S). To make your trip go smoothly you will need to be familiar with the EU and PET S rules and Stena Line's terms and conditions. We also recommend that you seek advice on how to ensure your pet's wellbeing during the journey and this is your responsibility.

From 1 January 2012, all pets entering Ireland from another EU Member State (eg. France) must be:

1. Identified by microchip (as currently). However a clearly readable tattoo applied before 3 July 2011 is also acceptable.
2. In the case of dogs, treated against the tapeworm *echinococcus multilocularis* within a period not more than 120 hours and no less than 24 hours before the time of scheduled arrival in Ireland (i.e. between 5 days and 1 day prior to entry.)

Veterinary certification of the above is to be contained in the EU Pet Passport or the Third Country Health Certificate (as currently).

DETAILED INFORMATION

IDENTIFICATION

ECHINOCOCCUS (TAPEWORM) TREATMENT

NON-COMPLIANT PETS

Identification
If a pet is not identified, or if the identification cannot be read, the pet cannot be accepted for travel. Owners will have to have the pet identified/re-identified, vaccinated and wait 21 days.

Vaccination
If a pet has not been vaccinated, or if 21 days have not passed since the primary vaccination, the pet cannot be accepted for travel. Owners will have to have the pet vaccinated where relevant and await the expiry of the 21 day period.

Tapeworm treatment for dogs
This procedure applies only from France to Ireland.

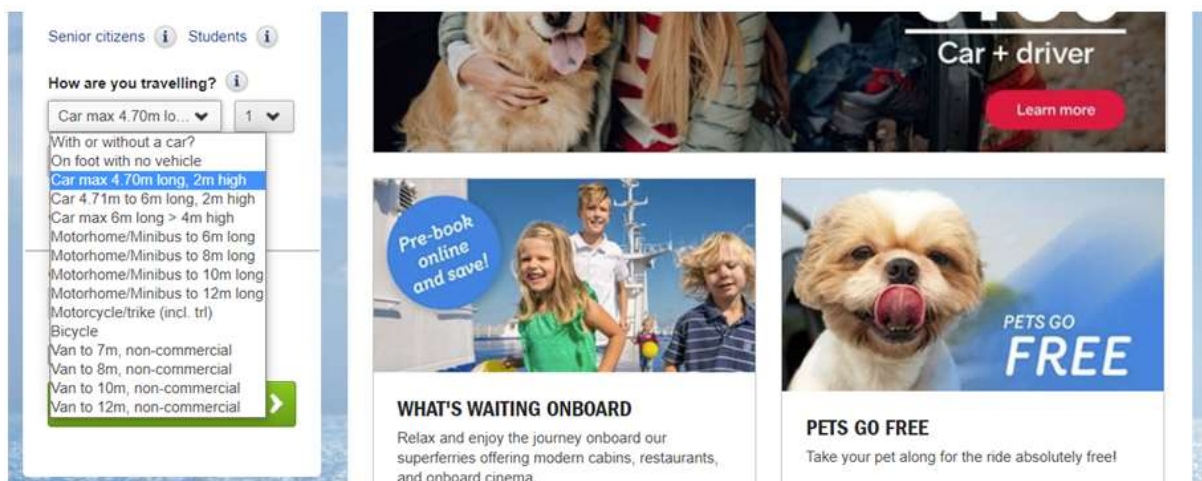
(a) In practical terms, given check-in and sailing times, treatment administered on the day of travel, even close to check-in time, does not present a problem and does not prevent travel. While in some cases a full 24 hours will not have expired before arrival, specific advice can be given to these travelers (we will supply leaflets for this purpose) to ensure that the treatment is effective.

(b) Dogs presented with no tapeworm treatment cannot be accepted for travel. If there is time for travellers to visit a vet before boarding then travel is permitted – see (a) above.

STENA LINE REGULATIONS

Figure 7: Example of a readability and legibility of content

From the user's perspective (3/4 of respondents) a "How are you travelling?" drop down menu list (Figure 8) is too long, not sorted, hard to use and almost randomized.



Senior citizens ⓘ Students ⓘ

How are you travelling? ⓘ

Car max 4.70m lo... 1 ▾

With or without a car?
On foot with no vehicle
Car max 4.70m long, 2m high
Car 4.71m to 6m long, 2m high
Car max 6m long > 4m high
Motorhome/Minibus to 6m long
Motorhome/Minibus to 8m long
Motorhome/Minibus to 10m long
Motorhome/Minibus to 12m long
Motorcycle/trike (incl. trl)
Bicycle
Van to 7m, non-commercial
Van to 8m, non-commercial
Van to 10m, non-commercial
Van to 12m, non-commercial ▶

Car + driver
Learn more

Pre-book online and save!

WHAT'S WAITING ONBOARD
Relax and enjoy the journey onboard our superferries offering modern cabins, restaurants, and onboard cinema.

PETS GO FREE
Take your pet along for the ride absolutely free!

Figure 8: Uncategorized vehicle list

Task 4, was successfully completed by only 4 respondents. As the information about the availability of cabins appears at the end of the ticket booking process, when the cabins are not available (sold out) the user is obligated to go back to the beginning to choose a different travel date. Since the information about the availability of cabins does not appear when selecting new dates, the user must start over every time after receiving an error from the system that cabins are not available ("No cabin selected") (Figure 9).

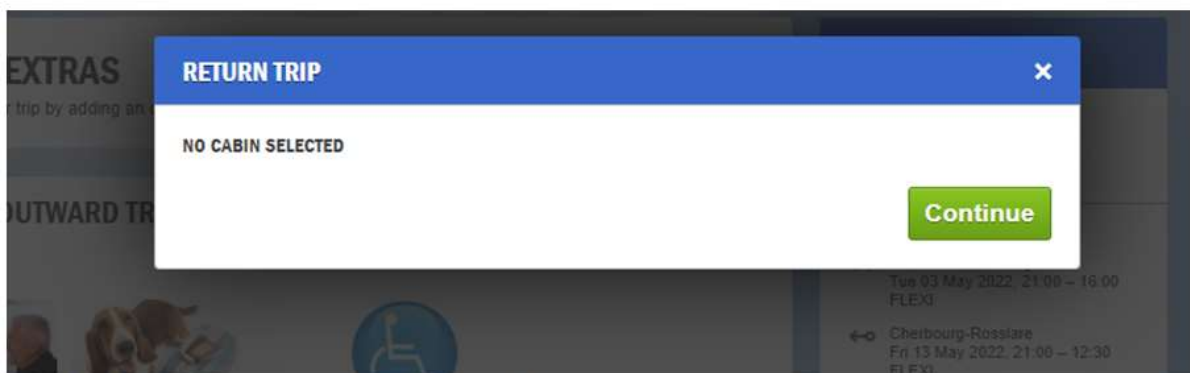
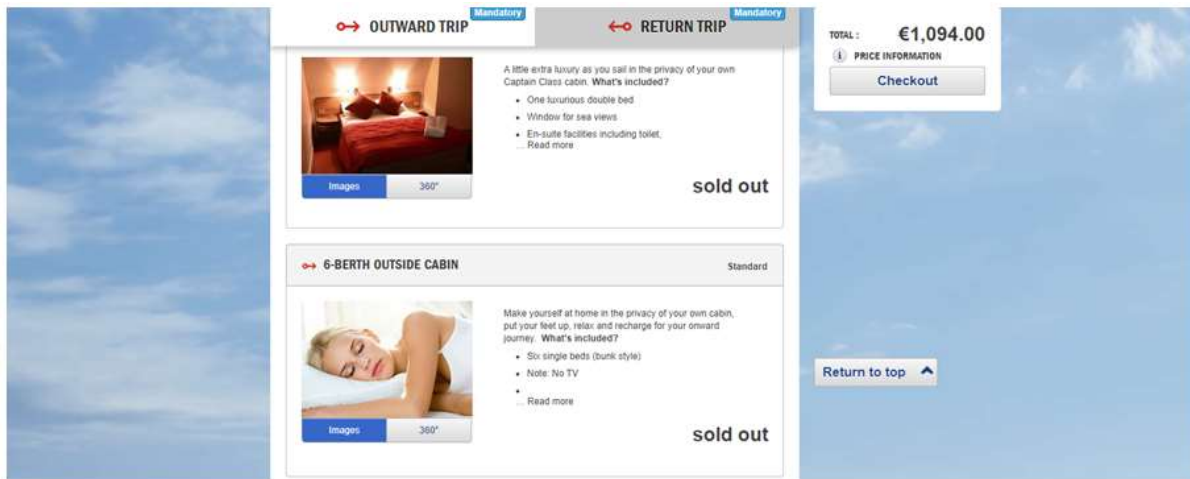


Figure 9: Ticket registration process interruption example

Task 5 has been rated in the SEQ scale as a "very easy" (avg. 6.8). Four respondents completed the task successfully, 1 respondent did not start the task (was unable to complete task 4). All respondents who completed the tasks suggested that the staline.ie system was asking about too many details (separated email addresses for any person from the family, date of birth or nationality).

3.5 Satisfaction

Level of satisfaction combined rating across three post-task measures: ease of finding the information, ability to keep track of location in site, and site information prediction accuracy has been measured by using PSSUQ metric. The satisfaction level is lower than the average obtained by Levis (2002) and amounts to: -39.36% (Overall), -21.43% (System Usefulness Score), -11.14% (Information Quality Score), -25.38% (Interface Quality Score). The Users Satisfaction = 35.39% (average).

Participant	Overall PSSUQ Score	System Usefulness (SYSUSE) Score	Information Quality (INFOQUAL) Score	Interface Quality (INTERQUAL) Score
User 1	4.0625	4.1666	3.3333	5.6666
User 2	5	5.5	4.8	4
User 3	6	6	5.5	7
User 4	3.6875	3.8333	4.1666	2.6666
User 5	2.125	2	2.3333	2
Lower Score	6	6	5.5	7
Higher Score	2.125	2	2.3333	2
Mean Cons. (Levis)	2.82	2.8	3.02	2.49
Mean (Stenaline.ie)	5.575 (-39.36%)	4.3 (-21.43%)	3.8 (-11.14%)	4.2666 (-25.38%)
Satisfaction level	20.36%	38.57%	45.71%	39.05%

Figure 10: Satisfaction level PSSUQ

3.6 Results of after-scenario open questions

In answer to the open question about user's overall experience with this booking system, participants mentioned:

- no possibility to add a dog to the ticket together with passengers
- having to add the same options to the return ticket again
- no filter to choose a proper cabin
- difference between a flexi and economy tickets are not clear enough
- too many ads

As the reasons that caused negative feelings (frustration, confusing), participants indicated:

- question about the dimensions of the car
- error appearing "no cabin selected"
- no field for adding a dog to the ticket
- crossing out from scratch if no cabin is available
- too much unnecessary information
- too small buttons and input fields

Among the best-rated aspects of the Stenaline.ie website, users listed:

- the ability to view the inside of the cabins using a 360-degree view
- the information (such as online help, on-screen messages, and other documentation) provided with this system is clear
- photos with the pet friendly people

3.7 Net Promoter Score (NPS)

Net Promoter Score (NPS) has been used to measure customer loyalty and recommendation of the website for others. NPS score for stenaline.ie indicated NPS = -80 (Promoters: 0, Detractors: 4, Passives: 1)

3.8 Usability Score

The booking system usability score (%) has been calculated by averaging three metrics (effectiveness, efficiency and satisfaction) scores (Hussain and Fitria, 2018) and amounted to: 60.22 % (Appendix D).

4. Recommended changes

There is no need to show users all of main and sub-navigation items at once (Figure 11). I recommend reducing the size of the navigation bar. All existing categories should be reduced and grouped in the more recognizable categories. "Routes and Timetables" can be merged with the "Day Trips", "Low Fares Finder" should be grouped with "Special offers", "Europe by car" with a "Short Breaks and Holidays" (Figure 13-a). Items from the navigation bar can be moved to the footer section, which currently has empty, undeveloped spaces (Figure12).

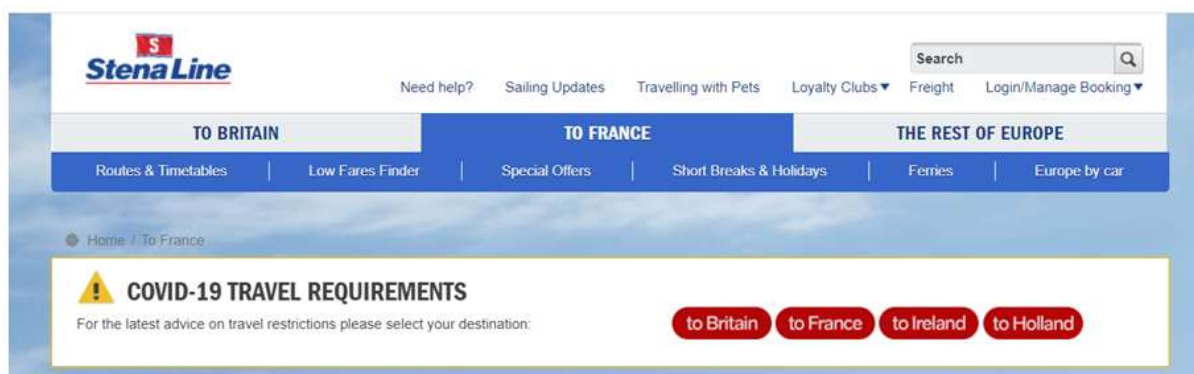


Figure 11: A visually overwhelming Stenaline.ie navigation bar

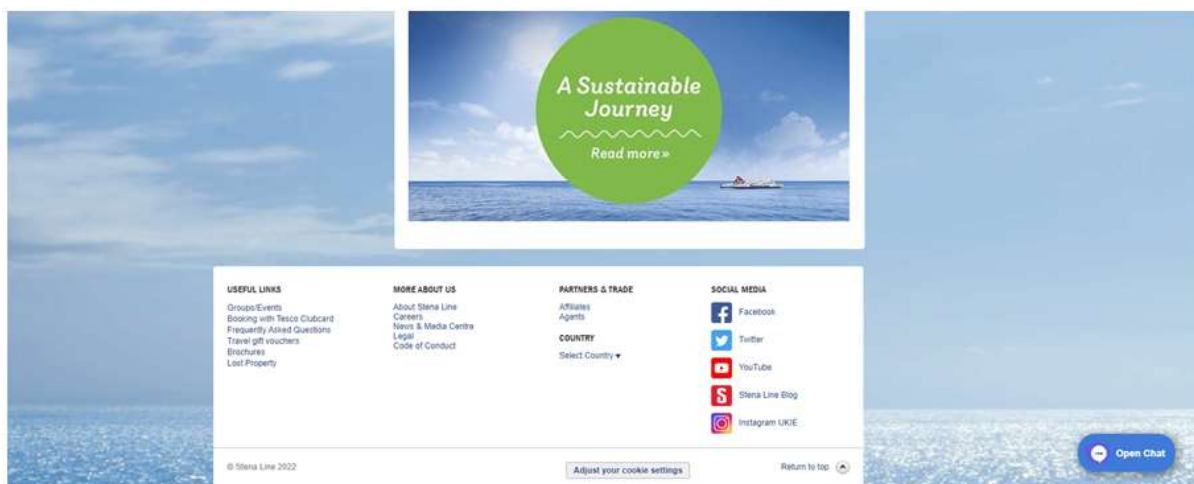


Figure 12: An example of blank areas in the footer space

All maps placed on the front page should be designed according to accessibility requirements. The map view should change to the correct map each time the customer selects to book a different destination. Additionally, photos of interesting places to visit can be placed on the right side of the map (Figure 13-c):

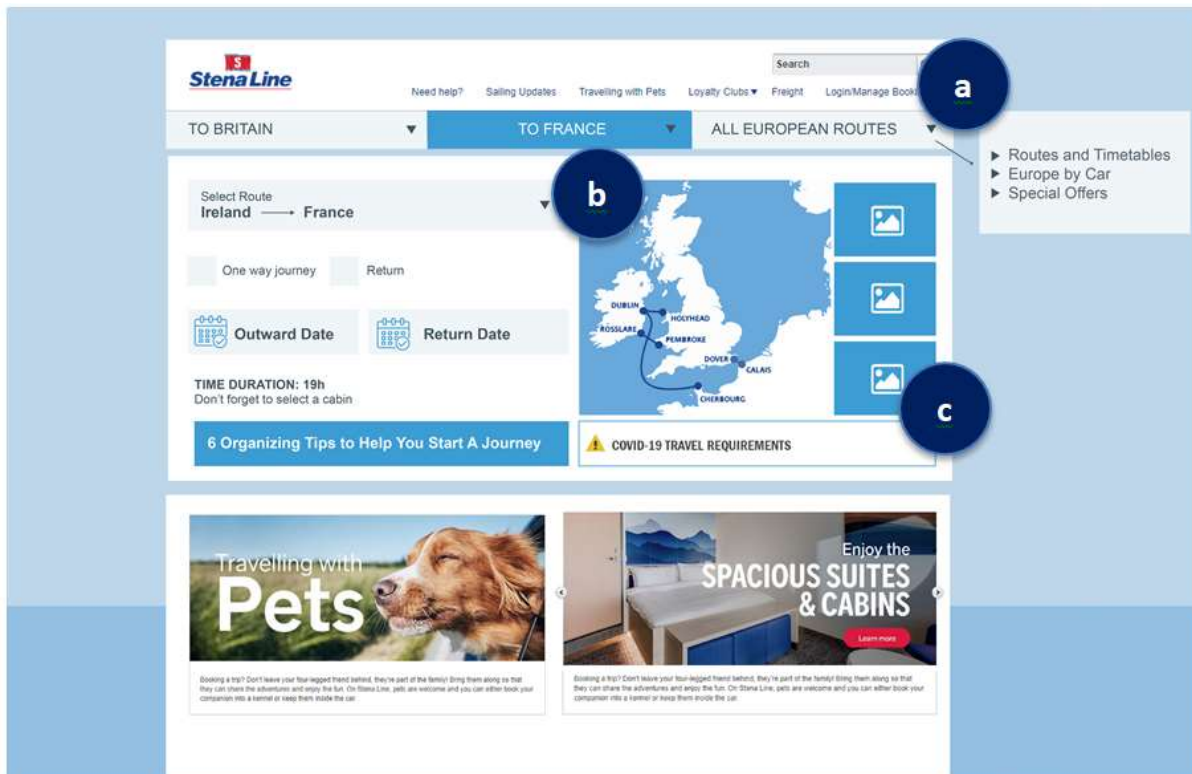


Figure 13: Recommended Changes: a) reduced navigation bar; b) compatible map; c) photos of places to visit

In the passengers section, an extra field "Pets" should be added (Figure 14-a). Dropdown menus should include dog and be expanded to include "other animal". In the "How Are You Travelling?" section all categories can reduce the list of categories for creating an easier to use and more readable interface (Figure 14-b).

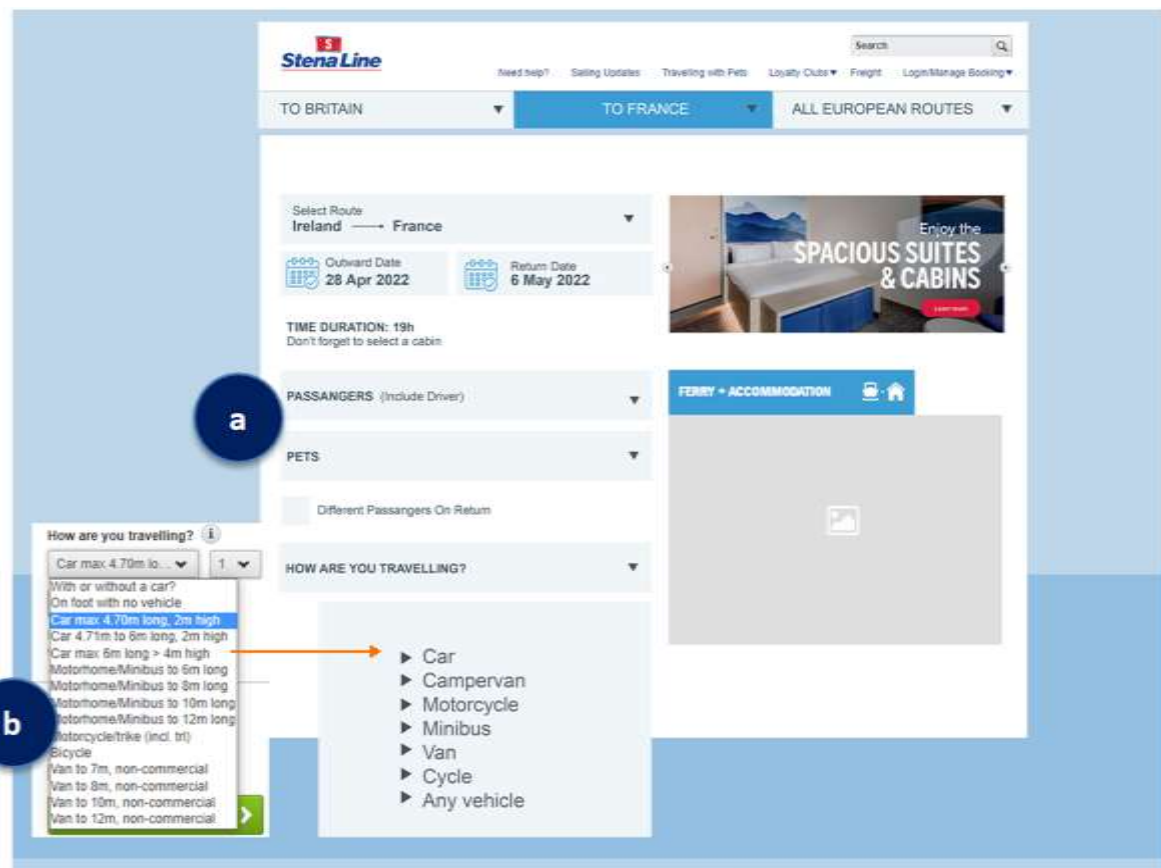


Figure 14: Recommended changes: a) add a pet's area; b) create a vehicle category

80% of the respondents had a problem with finding information about the duration of the trip and calculated the travel time manually. Since the average SEQ score was 1.6, which describes the task as "Very difficult" and "difficult", the system should display the date, time (in 24- or 12-hour mode), travel hours and suggest that it is worth booking a cabin and a dog lodge for such a long journey.

A cabin and a lodge for a dog not automatically added to the return ticket. Instead of selecting the cabin again, the user should be asked if he/she wants the same cabin, the same dog cage, and the same dinner set on the return journey. If the same cabin would not be available for the return journey, the system should signal availability of the other cabins at the same / similar price.

Information about all sold out cabins should be displayed at the very beginning of the ticket booking flow, when the user selects the dates of the trip. Knowing that the journey takes 19 hours and a cabin rental is necessary, users can change the travel date if any cabins are not available, and before the ticket booking process begins. A calendar view (on which days the cabins are still available) can help users to reduce the time of making a decision which dates are the best for the trip and avoid starting the booking process (Figure 15).

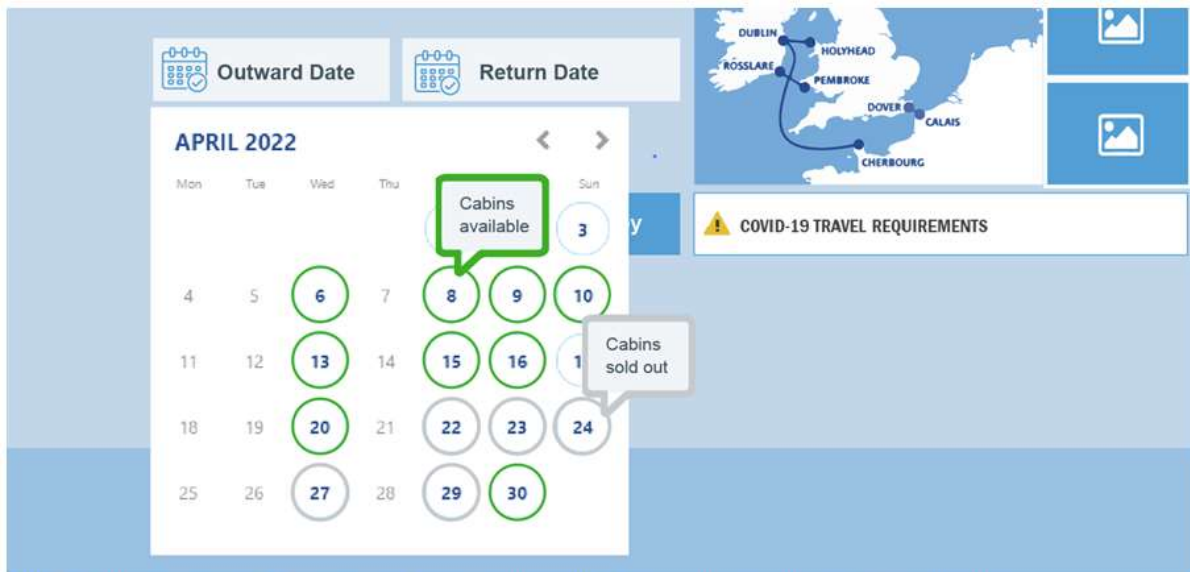


Figure 15: Recommended Changes: information about the availability of cabins displayed at the beginning

Ads occupy more than 60% of the usable area of the front page. Instead of advertising, a map, a video showing how to order a ticket and information on why the ferry trip is more attractive will be more profitable. Because the respondents stated that they are afraid to sail because they have never sailed and they know nothing about it. Showing how the process of buying a ticket is, how to get on the ferry and why it is easier and more comfortable to go on a ferry than traveling by plane may reduce the concerns of users who never before used this mode of transport (Figure 16).



Figure 16: Recommended changes: additional button linked to tips how to start a journey

Users in age group A (20-24 years old) had more difficulty in finding specific information due to too much text and too small font. These users indicated sites such as: Everbrite.com, Booking.com, Kayak.com is given as an example of an easy to navigate interface, allows you to find prices, dates and destinations very quickly. According to respondents, an intuitive system integrated with a Google Calendar and suggesting next user steps allows to "not thinking too much", thus is more attractive for users.

5. Reflection

Before starting evaluation testing, I tried to clearly define what usability aspects will be the most important and which kind of questions will support measurements of the system effectiveness, efficiency and user satisfaction. I prepared tasks and created a set of questions that were used during sessions with participants. Data collected in a specific order. I noticed that users often only tried to get the tasks done, so in the future I'll try to create a more natural structure of the interview (I shouldn't inform users that the time of the task completed will be measured).

Younger participants had a weaker idea of traveling with the family. I should think about the scenario and adapt it to age groups. The use of software (such as Lookback) could facilitate data collection. In the future I can try to find a software that will measure the number of user clicks. Usability evaluation test has been completed on the desktop view. It will be necessary to check how the users cope with the mobile view of the website. In addition, it can be profitable to reach out to the people who travelled on the ferry before, and check the different user's perspective and experience with the booking systems of the other ferries.

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APPENDIX A:

PRE-TEST QUESTIONS

Q1: Identification of the type of device used.

Which device do you use most often when booking tickets for a trip abroad?

1. Smartphone
2. Tablet
3. Laptop
4. PC
5. Other / If you selected "other way", please specify which one

Q2: Travel frequency

How often do you travel during the year?

1. I'm not travelling abroad
2. 1-2 times a year
3. 3-4 times a year
4. More than 6 times a year

Q3: The reason of the user to travel on the ferry – a multiple choice question

Have you ever travelled by ferry? If so, why did you choose this type of transport?

1. My holiday begins the moment I step on board
2. No car parking charges
3. I can take everything I need
4. Comfort of your own car
5. Pets are allowed
6. I can bring more presents home
7. I have never travelled on a ferry
8. Other / If you selected "other ", please specify which one

Q4: The reason why the user does not want to travel on the ferry

What do you think people misgiving most when booking ferry tickets?

Q5: Booking system features – a multiple choice question

1. Which features do you use most when you book tickets online?
2. Online bookings in real time
3. Various currencies and languages
4. Voucher generation and management via the online booking system
5. Payment via PayPal
6. Intelligent calendar/diary
7. Online and telephone support for booking software
8. Automated e-mails make management easier
9. I do not book tickets online

Q6: User experience / convenience of using an another/alternative application to online ticket booking

If you have a favourite website where you book your tickets? If so, why is it right for you?

Q7: Subjective opinion of users which is the most important

What do you consider the most important when buying a ticket online?

Q8: Age

What's your age range?

- a. 20-24
- b. 25-29
- c. 30-34
- d. 25-39
- e. More than 39

IN-TEST QUESTIONS

NUMBER	IN-TEST QUESTIONS	ADDITIONAL QUESTIONS
Q1-IN	When you open the stena-line.com website you can see that it offers ferry trips. Can you name any competitors of this product?	Which ones?
Q2-IN	What do you think is the most important part when booking a ticket online?	Why?
Q3-IN	Which part of the stena-line.ie website do you focus on most when you want to book a ticket?	Why?
Q4-IN	Where on the website in your opinion is the best place to place the ticket booking form?	Does the stena-line.ie booking form meet your expectations?
Q3-IN	What additional information do you expect to find on the stena-line.ie website?	Do you see all the information you need?
Q4-IN	What do you think about this design?	Why? Why not?
Q5-IN	Would you like to say something else about the Stenaline.ie website?	Would you change something about it?
Q6-IN	I noticed you [did something]. Why?	Why not?

PAST-TEST QUESTIONS

Single Ease Question (SEQ)

Task 1: Find the names of the appropriate ports you need when deciding to travel directly from Ireland to France.

Overall, this task was:

1: Very difficult 7: very easy

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Task 2: Find out how many hours it takes to travel from an Irish port to a French port.

Overall, this task was:

1: Very difficult 7: very easy

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Task 3: Find all the information you need on how to transport your dog

Overall, this task was:

1: Very difficult 7: very easy

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Task 4: Proceed with booking and add cabin (s) to the booking request

Overall, this task was:

1: Very difficult 7: very easy

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Task 5: Confirm your booking and proceed to checkout

Overall, this task was:

1: Very difficult 7: very easy

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Past-task open questions:

What features do you find most valuable and why?

What prevents you from completing a task?

APPENDIX B

You are planning a family vacation in France, between March 14 and May 24. The family consists of 2 adults and 2 children aged 9 and 14. You want to take your small dog Russell terrier too. You are planning to take a car (standard e.g. Volvo XC90 2018) and go on a journey by sea. You have chosen to go to the stenaline.ie website to book a ticket (outward and return).

Task 1: Find the names of the appropriate ports you need when deciding to travel directly from Ireland to France.

Task 2: Find out how many hours it takes to travel from an Irish port to a French port

Task 3: Find all the information you need on how to transport your dog

Task 4: Proceed with booking and add cabin (s) to the booking request

Task 5: Confirm your booking and proceed to checkout

APPENDIX C

Net Promoter Score (NPS)

How likely are you to recommend Stena-line.ie to a friend? (0: not likely, 10: very likely)

0: Not likely

10: Very likely

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----

Satisfaction PSSUQ

1: Strongly disagree

7: Strongly Agree

	1	2	3	4	5	6	7	N/A
1. Overall, I am satisfied with how easy it is to use this system								
2. It was simple to use this system								
3. I was able to complete the tasks and scenarios quickly using this system								
4. I felt comfortable using this system								
5. It was easy to learn to use this system								
6. I believe I could become productive quickly using this system								
7. The system gave error messages that clearly told me how to fix problems								
8. Whenever I made a mistake using the system, I could recover easily and quickly								
9. The information (such as online help, on-screen messages, and other documentation) provided with this system was clear								
10. It was easy to find the information I needed								
11. The information was effective in helping me complete the tasks and scenarios								
12. The organization of information on the system screens was clear								
13. The interface of this system was pleasant								
14. I liked using the interface of this system								
15. This system has all the functions and capabilities I expect it to have								
16. Overall, I am satisfied with this system								

Questions 1 to 16: Overall

Questions 1 to 6: System Usefulness (SYSUSE)

Questions 7 to 12: Information Quality (INFOQUAL)

Questions 13 to 16: Interface Quality (INTERQUAL)

After - Scenario additional open questions:

1. How would you describe your overall experience with this booking system?
2. If you could change one thing in this booking system, what would it be and why?
3. What do you expect to see in the Stena-line.ie booking system in the future?
4. How would you describe your overall experience with the booking system?
5. What did you like the most about using this booking system?
6. What did you like the least?
7. What, if anything, surprised you about the experience?
8. What, if anything, caused you frustration?

APPENDIX D

Calculation of effectiveness

Calculating formula: <http://ui-designer.net/usability/efficiency.htm>

$$\bar{P}_t = \frac{\sum_{j=1}^R \sum_{i=1}^N \frac{n_{ij}}{t_{ij}}}{NR} \quad \bar{P}_E = \bar{E} * \frac{R \sum_{i=1}^N t_{0i}}{\sum_{j=1}^R \sum_{i=1}^N t_{ij}}$$

Task1

- Time-Based Efficiency = (0/7:36 + 1/ 3:26 + 1/ 1:47 + 1/ 4.10 + 1/ 2.03) / (1*5) = (0/456 + 1/206 + 1/107 + 1/250 + 1/123) / 5 = ~ (1/35) / 5 = (1/7) = 0.143 goal/sec
- Relative time-based Efficiency = (75% *(5*1) * 71) / 686 = 38.8%

Task 2

- Time-Based Efficiency = (1/2:20 + 1/ 1:56 + 1/ 1:20 + 1/ 3:03 + 1/ 0:54) / (1*5) = (1/140 + 1/116 + 1/80 + 1/183 + 1/54) / 5 = ~ (1/19) / 5 = 0.257 goal/sec
- Relative time-based Efficiency = (100% *(5*1) * 21) / 573 = 18.32%

Task 3

- Time-Based Efficiency = (1/ 4:00 + 1/ 4:15 + 1/ 00:58 + 1/ 2.37 + 1/ 4:04) / (1*5) = (0/240 + 1/255 + 1/58 + 1/157 + 1/244) / 5 = ~ (1/28) / 5 = (5/28) = 0.18 goal/sec
- Relative time-based Efficiency = (100% *(5*1) * 95) / 954 = 49.79%

Task 4

- Time-Based Efficiency = (1/ 8:57 + 1/ 5:20 + 1/ 7:01 + 0/ 3:45 + 1/ 3:40) / (1*5) = (1/537 + 1/320 + 1/421 + 0/225 + 1/220) / 5 = ~ (1/61) / 5 = (5/61) = 0.08 goal/sec
- Relative time-based Efficiency = (75% *(5*1) * 172) / 1498 = 43.06%

Task 5

- Time-Based Efficiency = (1/ 2:53 + 1/ 2:30 + 1/ 2:14 + 0/ 0:00 + 1/ 2:20) / (1*5) = (1/173 + 1/150 + 1/134 + 0/0 + 1/140) / 4 = ~ (1/37) / 4 = (4/37) = 0.11 goal/sec
- Relative time-based Efficiency = (75% *(5*1) * 126) / 597 = 79.15%

Calculation of usability

Usability (%) = Effectiveness + Efficiency + Satisfaction / 3 =
 = (88% + ((38.8% + 18.32% + 49.79% + 43.06% + 79.15%) / 5) + ((20.36% + 38.57% + 45.71% + 39.09%) / 4)) = (88% + 57.28% + 35.39%) / 3 = 60.22 %