

## SHAPING DESIGNERS' SEA SENSE: A GUIDE FOR DESIGN-DRIVEN FIELD RESEARCH AT SEA

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### SUMMARY

Designers taking on marine design projects need an in-depth understanding of the context for which they design to be able to make good design judgements. This paper suggests that such an understanding can be referred to as 'designers' sea sense', and argues that field research is paramount for designers to develop such a sense. Building on experiences with field research at the Ocean Industries Concept Lab at the Oslo School of Architecture and Design, a guide for design-driven field research has been developed. This guide can help designers prepare for and make the most of field studies at sea. In this paper, we introduce the guide and discuss the rationale behind it.

### 1. INTRODUCTION

*The seaman must develop **sea sense**, just as the driver of a motor vehicle develops 'road sense'. He must be alert continually to visualize what is happening, and to anticipate what might happen next. A true seaman is always ready to act in time to avoid injury to his ship or to his shipmates, or to himself. He does the right thing because he has learned how the sea behaves, and how it affects a ship afloat, and how she can be kept under control in spite of it [1].*

The above quote is from 'A seaman's pocket-book', published by the Lords Commissioners of the Admiralty in 1943. This book provided an introduction to seamanship to the many men who, because of the Second World War, had entered the navy with little or no experience at sea [2]. Already on the first page of the book the notion of 'sea sense' is introduced; the authors emphasise its importance and urge the seaman to 'lose no time in acquiring sea sense'. Sea sense is what makes the seaman able to do what is right in the situations he faces at sea.<sup>1</sup>

In recent years, designers have been increasingly engaged by the maritime industry. This trend has even resulted in the recognition of a separate field of design referred to as marine design, i.e., design within the maritime domain based on the principles of industrial design [5]. To be able to make good design judgements, a good understanding of the situation of users and their needs is necessary. Thus, marine designers need to develop their own kind of 'sea sense' which, just as a seaman's sea sense enables him to effectively do his job, enables the designers to theirs.

An assumption and starting point for this paper is that, in order to develop sea sense, designers need to go to sea. There has, however, been little use of field research to inform design in the maritime industries [6]. For this

reason, little practical advice can be found about how to carry out field research to inform marine design projects. In this paper, we introduce a guide for design-driven field research at sea, building on the experiences of field studies carried out at the Ocean Industries Concept Lab at the Oslo School of Architecture and Design, most of which were conducted within the Ulstein Bridge Concept (UBC) design research project from 2011 to 2014 [7]. The aim of the UBC project was to design a completely new ship's bridge for offshore service vessels. To be able to do this, we needed to devote considerable time and effort to understanding offshore operations and the work of the deck officers as well as the maritime and offshore context in general. Field studies have played an important role in our gaining this understanding. The motivation for developing the guide for design-driven field research presented in this paper was to share the experiences we have gained from these field studies and make it easier for other designers to carry out field studies at sea.

### 2. DESIGN-DRIVEN FIELD RESEARCH TO SHAPE DESIGNERS' SEA SENSE

Before we present the guide, we will describe what is meant by design-driven field research and discuss what role it can play in shaping designers' sea sense.

#### 2.1 A MODEL FOR DESIGN-DRIVEN FIELD RESEARCH

The model for design-driven field research (Figure 1) emphasises three focus areas we believe should be considered during field studies at sea:

- Data mapping
- Experiencing life at sea
- Design reflection

<sup>1</sup> Prison suggests the related concept of mariners' 'ship sense'. Ship sense refers to mariners' ability to obtain harmony between a ship and the environment in which it is operating [3, 4].

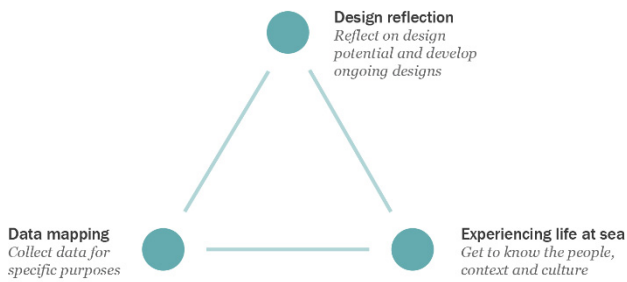


Figure 1: The model for design-driven field research introduced in [7].

As described in [7, p. 29]: ‘*Data mapping* involves collecting the specific data designers need in order to develop relevant designs. This can include recognising the user groups, documenting functions and tasks, identifying the equipment used to conduct the different tasks, mapping out the physical working environment etc. *Experiencing life at sea* suggests an ethnographic-inspired approach. [...] For us, the ethnographic-inspired approach involves becoming familiar with life on board the vessel, gaining insights into the offshore culture, and getting to know ‘the men behind the users’, i.e. what kind of people choose to work at sea, how they experience their life at sea, and what their needs are, beyond those of their work performance. Another important aspect of experiencing life at sea is to understand the environmental, temporal and bodily aspects of staying on board. *Design reflection* involves reflecting on possible design opportunities and on the potential of design ideas while in the field. It also concerns being conscious of using the field study to create a basis for generating ideas and for getting ‘aha-moments’ later in the design process. This involves being curious, not setting strict boundaries for the scope of the field study, and seeing everything on board as interesting. It also relies on documentation of conceptual thinking while on board.’

Through the model for design-driven field research, we highlight that field studies in design differ from those of other disciplines. Whereas, for example, biologists conduct field research to collect samples [8] and the intention of the fieldwork of ethnographers is to understand and give a detailed description of a unique case [9], the purpose of field studies in design is to gain insight and inspiration that enables designers to create better designs. This aspect of field research in design is acknowledged although, in the literature, field research is commonly seen as something taking place before designing [10]. By emphasising design reflection as part of field research, we encourage designers to engage in designing while in the field. As becomes apparent from the guide presented in this paper, we even encourage the making of design reflections and engaging in designing before the field study takes place as part of the preparation.

## 2.2 DESIGNERS’ SEA SENSE

*Designers’ sea sense* deals with tacit and explicit knowledge about work and life at sea. Such knowledge is part of a designers’ maritime domain knowledge which Mills, among others, states is a prerequisite for successful designing of marine equipment [11] and, thus, specifically supports designers’ judgement making when designing for marine environments. The concept of sea sense is connected to sensemaking, which can be seen as a continuous process of making sense of situations, events and data [12, 13]. Just as a mariner cannot develop sea sense without going to sea, neither can a designer. Tacit knowledge of a situation can only be achieved by ‘indwelling’, [14] which is difficult to gain without taking part in the situation one aims at understanding. Also, explicit knowledge is more easily formed at sea because access to users (the most important source of information) is limited onshore [15].

We can extract some of the characteristics of designers’ sea sense by drawing on the model for design-driven field research. With regards to data, designers’ sea sense implies having a general insight into maritime operations, what they consist of, and what demands they place on the crew. Further, it implies having an understanding of fundamental marine data that would affect most marine design processes within their field. For instance, interaction designers should have fundamental knowledge about regulations, crew, operations, and ship functionality that commonly affect the design of marine equipment.

In experiencing life at sea, the designer needs to get an embodied understanding of what it is like to be a mariner. Such experiences can help develop a tacit understanding of physical and mental aspects of being in a ship environment as well as enhance the designer’s ability to empathise with the mariners. Empathy is a strong driver in design [16]. ‘It is much easier to get excited about designing for people once we know them and understand their situation’ [17, p. 54].

Carrying out design reflection within the situation one designs for at sea is also necessary to develop a designer’s sea sense. This is important since design reflections help designers situate and activate their embodied experiences and knowledge of maritime-related data to design projects. This way, domain knowledge is connected with design practice. In carrying out design reflection, designers extend their personal *repertoire* [18, p. 138] of possible designs for a marine context and, thus, become better marine designers.

## 3. PRESENTING A GUIDE FOR DESIGN-DRIVEN FIELD RESEARCH AT SEA

The guide for design-driven field research addressed in this paper is included in the appendix and is also available online at <http://hdl.handle.net/11250/294200>. The guide

builds on and expands a specific guide developed for and used within the UBC project (see Figure 4 in [7]), and experiences drawn from the field studies carried out by design researchers and students in which this version of the guide was used. The guide aims at helping designers develop sea sense and emphasises all three areas of focus of the model for design-driven field research. In the following, we will introduce the sections of the guide and discuss the rationale for that which is included in each section.

### 3.1 PLANNING AND PREPARING THE FIELD STUDY

A successful field study relies on good planning. Once out at sea, things may get overwhelming, taking the focus away from the purpose of the trip, or one may experience motion sickness which, even if one does not feel nauseous, may influence one's concentration [7]. For these reasons, planning is given a lot of attention in the guide.

The guide stresses the necessity of familiarisation with the context and of getting acquainted with the ship one will visit. This provides the designers with a frame of reference to use when making sense of what happens at sea. In addition to using standard written documentation, the guide suggests consulting online blogs kept by mariners. Such blogs provide concrete descriptions of life and work at sea and can help designers gain an initial understanding of the marine context and get to know the kinds of people who choose to work at sea [19].

Familiarisation makes it easier to define the purpose of the field study. The purpose informs the choice of methods and techniques, as well as the means of reporting from the field study, which we advise designers to decide on before going to sea because it can help them stay focussed and ensure that all needed data is collected. The guide stresses identifying data sources as part of planning because this influences the choice of methods and techniques. One should consider other data sources in addition to the human users, including capturing data from technical systems. At the Ocean Industries Concept Lab initial studies suggest that when such quantitative data is combined with data of a more qualitative nature, designers may get new insights valuable to the design process.

Designers often have an urge to do things from scratch. However, there are a lot of resources to draw on in planning a design-driven field study. The guide encourages looking to the design and human factors literature for methods and techniques to use during the field study and provides some examples of methods which we found useful in the field studies of UBC. However, the guide also emphasises that the methods chosen should be adapted as needed.

Both observation sessions and interviews to be carried out in context should be planned prior to the field study.

Designers are normally not trained in such methods, as social scientists are; for that reason, the guide gives concrete advice on how to plan observations and how to prepare questions to ask the users. These suggestions are based on the experiences of the members of the UBC team as well as literature used to prepare for the field studies carried out within UBC (e.g. [20–23]).

An important part of the guide is encouraging designers to start working with design ideas as a part of planning. To start designing 'without insight' may feel disagreeable to some. There are, however, several reasons why we stress this in the guide. First, the act of designing leads to insight (as pointed out by Schön, [18] among others) and also elicits what we do not know. Second, by engaging in design reflection as part of planning, we can develop design proposals to discuss with users at sea. In our experience, many mariners do not question why things are as they are and how things could be improved and, therefore, find it difficult to give concrete input on what could be different. Providing them with some suggestions may spark their imagination. Even if there are several flaws in the proposed designs, our experience indicates that concrete design ideas are good starting points for discussions with users (see Figure 2). The design proposals can thus serve as 'boundary objects' [24] that both designers and users can refer to. During one field study, the users referred to the design proposals a day or two after being presented with them, during a specific situation, and described how the ideas would and would not work in those circumstances.



Figure 2: Presenting design proposals from the UBC project to a user during a field study, December 2012 (Photo: UBC).

Finally, as part of planning, the guide highlights the importance of practical preparations. Attention is given to ensuring the privacy of the crew members and preparing information for the crew because designers are usually not used to considering such issues. The guide also gives concrete advice on what to bring based on experiences from the field studies we have conducted. For example, readers are advised to bring a water bottle because the

water in the cabins cannot be drunk and we have found that it can be very difficult to bring a glass of water from the mess to one's cabin in rough seas. This is especially helpful if one experiences motion sickness, when the need for drinking water in one's cabin may be particularly strong.

### 3.2 CONDUCTING THE FIELD STUDY

Most designers are landlubbers [15] and may not know what to expect and how to behave on a ship. The guide covers signing on and off as well as observing and on-site design reflection.

With regards to observation, an underlying assumption of the guide is that observation is 'interpretation rather than recording' [20]. This is why the guide stresses reflecting on that which is observed. Emphasis is placed on not restricting what is considered and on seeing everything as interesting, as suggested by, for example, Smith [21]. To designers, part of observing is normally to try to experience what it feels like 'to be in the user's shoes'. Though gaining first-hand experience of use may be difficult on a ship because operating the equipment requires being a certified seafarer, the guide encourages readers to try experiencing what it feels like to operate the equipment when it is not 'in command'<sup>2</sup> (Figure 3).



Figure 3: Testing what it feels like to sit in the DP (dynamic positioning) operator chair at a field study, September 2012 (Photo: UBC).

The guide provides concrete advice on how to engage with the crew. Showing respect is emphasised. There are two main reasons respecting the users is particularly important when doing field studies on a ship:

- The ship is not only the users' workplace but also their home.

- It may be difficult for users to refuse to take part in the field study, even if they are offered the possibility of not participating, given the restricted space on a ship.

In our experience, sometimes designers may be so focussed on the task of gaining insight that they forget to consider the people they encounter. Respecting the crew, as written in the guide, implies being honest about intentions, acknowledging that it may feel uncomfortable to be observed, and accepting if users do not want to talk or be photographed. The guide encourages openness: for the crew to learn about what the designers do. It even suggests 'forgetting' one's notebook in public spaces to give the users the opportunity to take peek at what is documented.

### 3.3 INTERPRETATION AND ANALYSIS

It is well established that one cannot rely on one's memory [25]. The guide builds on the assumption that if you forget what you observed, the field study will be of limited value to your design work. Given that it is difficult to get access to the field in marine design projects, one must make the most of it when one gets the opportunity to conduct a field study [15]. For this reason, the guide stresses documenting and interpreting as much as possible while in the field (Figure 4). The guide also emphasises that the designer should set aside sufficient time after each observation session to debrief and interpret what was observed. This involves identifying the most important things observed and reflecting upon what they mean for one's situated design work. It also implies identifying what one should focus on in the next observation session. The guide suggests ZIP-analysis [26] as a framework for the debriefing session.

The ethnographer Fetterman says: 'Fieldwork ends when the researcher leaves the village or site, but ethnography continues' [22, p. 10]. In the UBC project, we found that it was, at times, difficult to set aside sufficient time for analysing the field study when back at the office [7]. For this reason, what happens after the field study has ended is given attention in the guide. The topic of analysis in design-driven field research, however, is vast and deserves its own guide, and thus the guide presented here merely aims at pointing out the importance of analysis following a field study and suggests some starting points for the designer. The guide also makes the point that designing based on the insight gained normally leads to further questions, which means that it is a good idea to plan for several field studies, if possible. Often designers cannot expect to be given the opportunity to conduct several field studies, though, let alone one [15]. This fact is another reason for the emphasis on on-site design reflections in the guide.

<sup>2</sup> The equipment (e.g., an operator chair) is 'in command' when it is controlling the ship's technical systems.





Figure 4: Designer documenting and interpreting what is observed during a field study, December 2012 (Photo: UBC).

#### 4. DISCUSSION

The guide for design-driven field research is intended as a tool to help design practitioners and researchers planning field research at sea and, thus, to help designers shape their sea sense. The guide does not require any prerequisite knowledge and can instantly be picked up and put into use. Furthermore, it emphasises the practical aspects of field research and designers' personal needs, such as what to bring on board, since these kinds of details are sometimes overlooked in method descriptions.

This generic guide for design-driven field research has not yet been put into use and is presented for the first time here. However, it builds directly upon the specific guide for field research developed within the UBC project, which has proved valuable in planning and conducting field studies informing the design of a ship's bridge. The former guide has also been used by students at the Oslo School of Architecture and Design who are doing marine design projects. There are a lot of things to consider when planning a field study, and our experiences with this specific guide suggest that such a guide makes it easier to conduct field research for design.

With regards to our proposed focus area of design-driven field research, we found that field studies helped us acquire the sort of knowledge that can be seen as part of

the designers' sea sense. As described in [7], the field studies helped us get a holistic understanding of the situation we were designing for and specific insight into the operations, users, and tasks involved. We also found that going to sea gave us a spatial understanding of the bridge environment and an embodied understanding of what being on board a vessel is like. Finally, field studies helped us assess the appropriateness of emerging designs in the context of current use.

The research objectives of the UBC project were not originally centred on the role of field research in marine design projects. However, during the course of the project, we experienced the explicit need to conduct field research and to be able to do so in an efficient manner. The main reason for this was our unfamiliarity with the situation we were designing for, particularly the environmental and cultural differences between the situation on board an offshore service vessel and life onshore [7]. Through our work, we discovered that the field studies we had conducted were valuable outside the scope of the UBC project. We also experienced a need to develop field research practices for design in order to make field studies more useful and more efficient in marine design settings. We have, therefore, started a new three-year research project named 'ONSITE' which is picking up on the work of UBC in design-driven field research at sea. ONSITE will develop knowledge about how to collect, process, store and share field data for human-centred marine design processes.

#### 5. CONCLUSIONS

In this paper, we have presented a guide for design-driven field research at sea, which aims at helping designers develop what we refer to as *designer's sea sense*—that is, the tacit and explicit knowledge designers need to make good design judgements in marine design projects. The guide is included in the appendix and is available online at: <http://hdl.handle.net/11250/294200>.

#### 6. ACKNOWLEDGEMENTS

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## **8. AUTHORS’ BIOGRAPHIES**

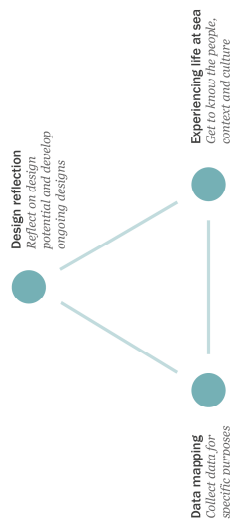
**Sigrun Lurås** has been a PhD research fellow since 2011 at the Oslo School of Architecture and Design within the Ulstein Bridge Concept (UBC) design research project. Her research interests lie in how systemic design approaches may support designing for complex, high-risk settings, such as a ship’s bridge. Before starting her PhD, she worked for six years as an interaction designer and human factors specialist at the Norwegian design consultancy Halogen and at DNV GL. She has recently returned to DNV GL, where she holds the position of senior consultant, while completing her PhD.

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## **9. APPENDIX: GUIDE: DESIGN-DRIVEN FIELD RESEARCH AT SEA**

# Design-driven field research at sea

## Design-driven field research



Design-driven field research<sup>1</sup> is an approach to field research specifically aimed at the needs of designers. The approach focusses on three areas:

- **Data mapping:** Collecting data for specific purposes in the design project. Examples include data related to users and their distribution of roles and responsibilities, user tasks, equipment used, and the users' information needs.
- **Experiencing life at sea:** Addressing social and cultural aspects of sea life as well as understanding its environmental, spatial, temporal and bodily aspects.
- **Design reflection:** Reflecting on design potential, developing ideas in the field, and using the field study to create a basis for generating ideas and 'aha moments' later in the design process.

These focus areas are considered throughout the planning, conducting, and analysing of the field study.

Guide: Design-driven field research at sea  
Version 1.0 | 1 August 2015  
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## Planning and preparing the field study

It is useful to prepare as much as possible before carrying out a field study. While at sea, one gets quite tired due to the constant motion and because observing is, itself, demanding. A detailed plan can help you stay focussed and cover all that you have planned.

### Familiarisation

Familiarise yourself as much as possible with the ship you will be visiting. Identify its technical outfitting and equipment. This can often be found online. Search for the ship's name at [www.marinetraffic.com](http://www.marinetraffic.com) and normally takes part in. Consult written documentation, such as training material, guidelines, books and online material. The Nautical Institute<sup>2</sup> publishes a range of specialist maritime books. [gCaptain.com](http://gCaptain.com) is a valuable online resource. There are also mariners keeping useful online blogs.

### Define the study's purpose

Define the purpose of the field study. This purpose depends on your situated design work. Will it be a narrow study focusing on specific operations, user tasks or equipment, or a broad study aiming at identifying possibilities without a specific design object in mind?

### Decide what to do

Decide which methods and techniques to use to achieve your purpose. Different methods are needed for different focus areas of design-driven field research. It can be helpful to consult literature on design and

human factors methods to identify approaches. Methods that may prove useful include the following: shadowing,<sup>3</sup> hierarchical task analysis and link analysis,<sup>4</sup> coms usage diagrams,<sup>5</sup> and applied cognitive task analysis.<sup>6</sup> Adapt the methods to suit for your specific needs. The sources you choose will influence your choice of methods. The users are an obvious source. It may also be helpful to retrieve data from other sources, such as log data from technical systems on board.

Plan the observation sessions. Although it is useful to have a clear idea about what to observe, once in the field you should have an open mind and also consider that which is not planned for. It is useful to prepare some questions that can be used during interviews and as a starting point for discussions with users. Some type of questions, and ways of phrasing

<sup>1</sup> Lurås, S. & K. Nordby (2014). Field studies informing ship's bridge design at the Ocean Industries Concept Lab. In *Human Factors in Ship Design & Operation*, 26-27 February 2014, London, UK (pp. 27–35). London: RINA.

<sup>2</sup> <http://www.nautinst.org/en/shop/>

<sup>3</sup> Design Council. 2015. *Design Methods for Developing Services*. Available at: <http://www.designcouncil.org.uk/resources/>

<sup>4</sup> Kirwan B. & L. K. Ainsworth (1992). *A Guide to task analysis*. London: Taylor & Francis; Stanton et. al (2005). *Human factors methods: a practical guide for engineering and design*. Aldershot: Ashgate.

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questions, are better than others. Things to consider when preparing questions:

- Using a narrative to make people start talking is a good strategy. You can, for example, use 'a day at work' as a starting point, saying, 'Tell me about a typical day at work. What do you do?' You can also use a specific operation or task as a basis for discussion: 'Think about <the operation of interest>. Can you describe what you do? To shed light on the diversity of the task, you may ask, 'How does your task differ in different circumstances? What about at different times of year? What if the weather turns bad? What if you are chartered by a different company? What if you are performing the operation in a different country? What if you are on a different ship?' etc.
- Consider using 'how' or 'what' rather than 'why' to avoid being perceived as confrontational and making the people you ask defensive. You can ask, 'How did you end up as a mariner?' rather than 'Why did you become a mariner?' to avoid the person feeling that he must have a specific reason for his career choice. If you observed the use of a system during an operation, and you want more information on the user's actions, ask, 'What made you use this system?' rather than 'Why did you use this system?' The latter might imply that the choice of system was wrong, while the former assumes that there was a good reason for the user's action.
- To encourage the user to talk about what works well and not, you can ask, 'Are things better or worse around here than they used to be?'
- To identify what the users consider the most important information, you can ask questions like,

'If you were to go away for a minute to get a cup of coffee, and I was to keep watch for you, what should I pay attention to?' **Note:** The mariners may not accept such a question because it would be against the procedures and compromise safety, but if they accept the question, it can give valuable insight.

- If you are interested in the risk aspects of the mariners' work, you can ask 'What possible occurrence on watch do you fear the most?' to get an understanding of what is the worst event that they find plausible and 'What do you expect will be the nature of the next accident that occurs?' to gain insight on what they consider most likely.
- To elicit the users' strategies for coping with incidents, you may ask: 'If <an event> happened now, what would you do?'

### Design reflection during planning

Design reflection should start before you enter the field, and you should consider making some design proposals that can be presented to the mariners on board to serve as a starting point for discussions. Presenting design ideas is a great way to involve the users in the design process as many find it easier to comment on concrete design proposals than to come up with design ideas themselves.

### Decide on the format of reporting

It is a good idea to plan how to document and communicate regarding the field study even in the planning stage as this will help you to capture the data you need in the field. If you plan to make a written report, make an outline for it before entering the field. If you plan to use video, consider what to record and which

views may provide useful information. If you plan to develop personas or make other types of maps or models, identify what kind of data you will need.

Layered scenario mapping<sup>7</sup> is a technique that can be used to map out a scenario on several layers—along several dimensions and at different levels of abstraction. If you plan to make such a map, it is useful to identify the scenario to map out before going to sea.

### Practical preparations

Find a shipping company and captain that will allow you on board. Note that this may be difficult and time consuming. Personal contacts are helpful. Once a shipping company has approved the field study and you know which ship you will be visiting, try to contact the captain directly to make practical arrangements.

Consider how to ensure the privacy of the crew. If you would like to take photos and video recordings, decide if you want to include identifiable people and ask for their permission; otherwise, stick to taking photos and videos where people can't be recognised or anonymise them afterwards. Consider also if the material will be used only within the design project or if you would like to use it externally as well.

Prepare information about the field study for the crew. Consider whether you need to obtain 'informed consent', which means that the crew signs off that they have been informed about the study, its purpose, and how the data collected will be used. Informed consent is normally obligatory for student and research projects. Whether informed consent is required or not, you should make a written sheet including the following: information about the project, which insti-

<sup>7</sup> Guide: Layered scenario mapping. Available at: <http://hdl.handle.net/11250/294118>



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## Conducting the field study

### Signing on

When you arrive at the port, there may be a gate where you will need to identify yourself. The guard may contact the ship for you, or you may have to call the ship yourself. You may be told to walk to the quay where the ship is moored, or someone may come and collect you. Note that a port can be a hazardous area. Always do as you are told and keep within restricted zones.

Once on board, report to the bridge. Tell the captain that, as soon as is convenient for him, you would like to tell him and relevant crew members about your research. Ask when the best time for this is. During transit may be a good choice. This does not need to be a plenary session, and it need not be formal. You may also have one-on-one sessions with individual crew members at times that suit them. If you use a consent form, make sure you go through it with all relevant crew members; which crew members are relevant depends on the purpose of the study.

Before observation sessions take place, ask the captain on a general basis if it is okay to take photos and/or make video and audio recordings, if you plan to do so.

Safety is important on board. Pay attention to safety instructions, particularly location of muster stations and safety zones. During an exercise or an actual emergency, do as the captain or officer in charge tells you.

### Observing

Document what you observe using notes, sketches, photos, and recordings (if relevant and allowed). Make sure to reflect on what you document, particularly on problem areas and design potential. It is a good idea to tag your notes with where they originate from.

### What to pack?

- Passport.
- Comfortable, casual clothes. Warm clothes if it may be cold.
- Indoor shoes (sandals).
- Water bottle.
- Motion sickness pills.
- Equipment needed for the study, such as sketchbook, notebook, observation forms, camera and audio recorder.
- Chargers and/or batteries for technical equipment.
- A hard drive to make backups of digital data.

**Note:** Acknowledge sailor superstitions: consider not packing in a rucksack or bringing an umbrella on board.

tution is responsible, and contact information to the project manager and/or yourself.

Develop the material necessary to carry out the planned activities, such as observation forms, interview guides, design proposals to discuss, a list of what to photograph, etc. Obtain the equipment you need, such as a camera, an audio recorder, and a sketchbook.

### Be all set to go!

Life at sea can be unpredictable, and the opportunity to join a vessel may come suddenly. Be prepared to leave on short notice and have your bag packed with all the equipment and materials needed.

Guide: Design-driven field research at sea  
Version 1.0 | 1 August 2015  
Sigrun Lurås | The Oslo School of Architecture and Design

If possible, try out what it's like to be in 'the user's shoes'. Be aware that you must be a certified seafarer to operate some of the equipment; thus, it may need to be tested while it is not 'in command', i.e., when it is not controlling the ship. Always ask before touching the equipment!

Be explorative, and see everything as interesting. Use all your senses when observing. Pay attention to details, look for patterns and make connections. Notice things that puzzle you and that are not as expected. Be conscious of what things are just as you thought they would be. Document everything, even trivial stuff. When you observe, keep as a mantra that 'something is always happening'. Look for what is happening, even when 'nothing is happening'. What are the mariners doing when it seems like they are doing nothing? What are they paying attention to?

Stick to your plan if possible, but do not let it restrict you while on board. Allow time to hang out with the crew without your notebook and with no special purpose in mind.

### On-site design reflection

Work with ideas while on board. It may be difficult to conduct focussed sessions with the users for longer periods of time, however, so take advantage of periods when the crew is less busy. Present the users with design ideas developed prior to or during the field study. While on board, work on design ideas based on what you see and keep the users in the loop.

### On a personal level

Always keep your social antenna up. Be courteous and respectful but, at the same time, interested in what goes on. Be honest about your intentions. Ask ques-



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tions if the situation allows for it, but accept it if the users don't want to talk. Note customs on board: for example, fixed seating arrangements in the mess and whether you are expected to clean the cabin before departing the ship. Empathy takes you a long way, and some humour never hurts.

Remember that your notes may be read by others—for example, over your shoulder or if you walk away and leave your book. You may even want to leave your book out intentionally to let people have a look and, thus, avoid suspicion. Notes of a more personal nature can be made on your computer or in a different book while in your cabin. Being open and telling the users why you do the things that you do is good for increased acceptance.

Beware of photo and documentation fatigue'. The users may find it annoying or intrusive if you are too eager, always using your camera or writing in your book. Always ask before taking photos of people or if you want to make video/audio recordings. If the users accept it, be clear on when you start and stop the recording. If the users say no, respect their wishes.

Be prepared for sea sickness. It can happen to anyone. Even mariners get sea sick at times. Make sure you eat and drink properly during your stay. Bring motion sickness pills, and if you know that you get sea sick easily, consider taking one before you board the ship.

### Signing off

Before you depart the ship, ask the captain and the crew members if they want to be informed about how the project evolves. If so, record their contact information. You may also consider offering the captain and the shipping company a report of the field study.

## Interpretation and analysis

To make the most of the field study, what you have seen must be interpreted in relation to your situated design work.

### Interpretation while on board

After each observation session, do a debriefing. This implies making a summary of the most important observations and reflecting on how they are important for the study's purpose and for your design work. You may want to keep a separate account for these summaries, e.g. on your computer. This way, you can reflect openly about what you have observed without being afraid of others reading it. Consider using ZIP-analysis<sup>8</sup> as a probe for reflection on and interpretation of your observations:

- **Z = Zoom.** Used to identify areas or points where you need to do more research.
- **P = Potential.** Used to identify areas with potential for improvement.
- **I = Innovation/intervention.** Used to identify ideas or solutions to a problem.

After long hours of observing, debriefing may be tough, but it is very important to do it while the observations are fresh. Remember: You cannot rely on your memory!

### Back home

After the field study, you need to finalise the analysis and document your findings and ideas. The more analysis you've been able to do on board, the easier this will be. Do this as soon as possible—it gets more difficult the longer you wait! Focus the analysis on interpreting the findings in relation to your situated design work. If others will be using the analysis, strive

### Further reading for inspiration

About observation:

- Lipshitz, R. (2005). There is more to seeing than meets the eyeball: the art and science of observation. In B. Brehmer, H. Montgomery, & R. Lipshitz (Eds.), *How professionals make decisions* (pp. 365–378). Mahwah, NJ: Lawrence Erlbaum.
- Smith, K. (2008). *How to be an explorer of the world*. New York: Penguin Books.
- Suri, J. F. (2011). Poetic observation: what designers make of what they see. In A. J. Clarke (Ed.), *Design anthropology: object culture in the 21st Century* (pp. 16–32). Wien: Springer-Verlag.

Practical advice on ethnographic field research:

- Fetterman, D. M. (1998). *Ethnography: step by step*. 2nd ed. Thousand Oaks, CA: Sage.
- On going to sea to learn about the work on the ship's bridge:
  - Hutchins, E. (1995). *Cognition in the wild*. Cambridge, MA: MIT Press.

to communicate the experience in ways that enable others to gain the needed insight. Reflect on the field study and make notes of lessons learned.

Designing based on field study insight often leads to further questions. For this reason, it can be a good idea to plan several field studies in a given design project, if possible.

<sup>8</sup> <http://www.systemsorientateddesign.net/index.php/giga-mapping/zip-analysis>