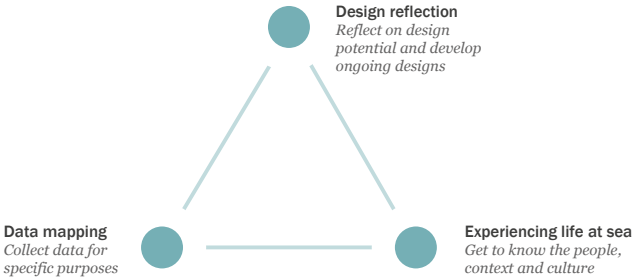
Design-driven field research at sea

Design-driven field research



Design-driven field research[1] 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.

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 and in Google. Identify what kinds of operations the ship normally takes part in. Consult written documentation, such as training material, guidelines, books and online material. The Nautical Institute[2] publishes a range of specialist maritime books. 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,[3] hierarchical task analysis and link analysis,[4] coms usage diagrams,[5] and applied cognitive task analysis.[6] 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

[1] 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.

[2] http://www.nautinst.org/en/shop/

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

[4] 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.

[5] Stanton N. A. et. al (2005). *Human factors methods: a practical guide for engineering and design.* Aldershot: Ashgate.

[6] Militello L. G. & R. J. B. Hutton (1998). Applied cognitive task analysis (ACTA): a practitioner's toolkit for understanding cognitive task demands. *Ergonomics,* 41(11), 1618–1641;

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

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[7] 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-

[7] Guide: Layered scenario mapping. Available at: http://hdl.handle.net/11250/294118

What to pack?

- ☐ Passport.
- ☐ Comfy, 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.

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.

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-

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[8] 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 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.

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, N.J.: 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.

[8] http://www.systemsorienteddesign.net/index.php/giga-mapping/zip-analysis