LISA - User-centered Design for the new SBB Shunting Radio

Usability and User Experience Optimization

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About us

Lorenz Born (SBB AG)

Engineer for development and testing of mobile telecommunication devices at SBB Telecom. Responsible for integration of mobile GSM-R equipment into the SBB GSM-R Network.

L. Born received a Bachelor Degree in Electrical Engineering and Computer Science and a Master of Advanced Studies in Information Technology at the University of Applied Sciences in Bern. Moreover L. Born is a Certified Professional for Requirements Engineering.

Dr. Christopher Müller (The Ergonomen Usability)

Usability and User Experience Expert, CEO of The Ergonomen Usability AG

Dr. Mueller received his doctorate in 2000 at the Swiss Federal Institute of Technology ETH. Dr. Mueller is one of the leading Swiss experts in usability and user centered design. He is founder and owner of The Ergonomen Usability AG. Dr. Mueller is also columnist for the “Netzwoche”, the leading Swiss IT journal.
Overview

1. LISA – Light and Integrated Shunting Accessory: Project Outline
2. User Centered Design Approach and Benefits
3. Be prepared! – Lessons Learned from the Business Perspective
Take Away Messages

- User-centered Design process helps to identify project risks early on
- Preparing “more finalized” elements of the system can help keeping project risks at bay or to be better able to plan the development phase
- Iterative Proof-of-Concept = Validation-of-Specifications
- Developing a new ruggedized device for shunters requires a lot of time. Think in terms of years rather than months.
- Design and Usability are both on one side of the medal. The other not to be underestimated side is the technical functionality. This highly iterative developing requires a lot of time and effort.
“LISA” - Light and Integrated Shunting Accessory
Goals and Objectives

- Easy operation
- Shorter training
- Less errors and false alarms
- Mitigate known errors
- Enhance user acceptance
- Improved quality perceived by the users
- Make it successful
Timeline

2007
1. Design Competition (The Ergonomen Usability AG and Hörmann Funkwerk)
2. Contextual Inquiry, User Requirements Analysis including User Walkthroughs and Interviews
3. Design Concept
4. Usability Testing with Operators

2008
5. Design of Harness, Prototyping
6. Usability Tests with complete System (prototypes of harness and LISA, non-functional)

2011
7. Concept for (Graphical) User Interface including Requirements Analysis, Modelling and User Testing
8. Alternative Harness Design Concept including User Acceptance Testing

2013
9. Concept and Design of Quick Manual and Training Poster
10. Start operational tests
User Centered Design Approach and Benefits
What are the user requirements?
How do we integrate Human Factors?
How do we enable and support our users?
User Centered Design (ISO 9241-210)
Contextual Inquiry, User Requirements Analysis
User Requirements based on Hands-On Experience / Prototypes
Usability Test with Mock-Up and Prototype of Harness
Graphical User Interface Design – Personas

Persona SBB LISA

„Man darf sich hier keinen Fehler erlauben.“
„Das Schlimmste ist, wenn ein Signal überfahren wird. Dann wird’s gefährlich.“
„Das Beste an meinem Job ist, dass man alleine arbeiten kann. Natürlich arbeite ich oft mit Kollegen zusammen, aber solange man alles richtig macht, kommt der Chef nicht vorbei.“

Ziele
Das Wichtigste ist natürlich, dass die Züge, die wir vorbereiten müssen, zur bestellten Zeit bereit stehen. Dafür muss alles reibungslos ablaufen.
Wenn’s mal eng wird, kann ich mich selbst entscheiden, dass z.B. ein Wagen erst später zur Reparatur gebracht wird. Der Fährdienstleiter ist mit meinen Entscheidungen meist einverstanden.

Anliegen
Die Sicherheit steht natürlich an oberster Stelle. Um diese zu gewährleisten, ist rasche und klare Kommunikation unerlässlich.
Zwischen den Personenwagen ist es sehr eng. Das macht es schwierig, rasch und genau zu arbeiten. Um etwas mehr Bewegungsfreiheit zu haben, lege ich manchmal das Funkgerät ab, um rascher arbeiten zu können.

Hindernisse
Graphical User Interface Design – Requirements
Graphical User Interface Design - Paper Prototype
Instructional Design – Manual and Poster

Kurzübersicht
Rangierfunkgerät LISA

Sicherheitshinweis
Die Sicherheit darf keinesfalls vom Zustandekommen einer Kommunikationsverbindung abhängig sein.

Collegare l’apparecchio radio

1

2

3
Involving the Users Has Many Benefits

- Smaller number of R&D projects
- Higher quality concepts
- Higher project success rate
- Concepts fit the users needs and expectations
- Efficient, effective production
- Less support needed
- Higher customer satisfaction

Usable, useful, desirable products plus Great Customer Experience = higher profit
Be prepared! - Lessons Learned from the Business Perspective
Setting up a field test.
Where are the shunters?
What do they have to do?
Don’t forget the other end of the communication path.
Train the Trainer.
Ready for first use.
Are really all shunters ready?
Discussion between shunting leader and manufacturers of carrying vest
And the technical side:
Does LISA what it should do?
Over and over again: Testing in the lab.
What about the other use case?
Is productive work still possible?
Finally, getting a smile from happy shunters.
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Thank you very much for your attention!
Our Background