

# Design and ergonomics of software HMIs

Hands-on course of 5 days - 35h

Ref.: DHM - Price 2024: €2 970 (excl. taxes)

## EDUCATIONAL OBJECTIVES

At the end of the training, the trainee will be able to:

- Understand the purpose and principles of software ergonomics
- Design software interfaces that meet ergonomic criteria
- Critically analyze an interface and suggest recommendations to improve its ergonomics
- Model an application's user profiles
- Create the design and dynamics of a user interface
- Model an application's users in order to design a software interface
- Understand the existing standards and different techniques for mastering software interface quality
- Create a software HMI model using a design tool
- Audit the quality of an existing interface based on the ergonomics criteria presented
- Set up a user test scenario, implement it, and analyze its results

## THE PROGRAMME

last updated: 06/2022

### 1) Introduction: What are ergonomics?

- Definition of ergonomics and user experience.
- Why do we need ergonomics?
- The role of ergonomics. Ergonomics and innovation.
- Ergonomics at the intersection of multiple disciplines.
- Fundamentals: Cognitive psychology and organizations, communication, and sociology of uses.
- Human processing of information.

### 2) Ergonomics in the development cycle.

- The V design cycle.
- Types of intervention, design, or correction.
- Return on investment from ergonomics.
- Ergonomics in depth. Design and structure.
- Overview of different ergonomics methods.
- Surface ergonomics, presentation, comfort.
- Incorporating ergonomics into an IT company: What skills, which role.
- ISO 9241-210 usability standards: Definition of effectiveness, efficiency, and satisfaction.
- Ergonomics in the context of agile and iterative methods.
- BtoB and BtoC interfaces: What differences in terms of ergonomics and interface issues.
- Thick clients and web technologies: What differences in terms of ergonomics?

### 3) Modeling a program's end users

- ISO 9241-210 standard: Modeling users, the task, and the interaction context.
- What data to collect about users: Anthropometric, sociological, and psychological aspects.
- Taking into account users with particular needs: Accessibility.

## TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

## ASSESSMENT TERMS

The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more. Participants also complete a placement test before and after the course to measure the skills they've developed.

## TEACHING AIDS AND TECHNICAL RESOURCES

- The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
- At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
- A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

## TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

## ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at [psh-accueil@ORSYS.fr](mailto:psh-accueil@ORSYS.fr) to review your request and its feasibility.

- Gathering qualitative data: Focus groups, Interviews, Field observations, etc.
- Gathering quantitative data: Surveys.
- Knowing the context of interaction with the future product.
- Formalizing the results: Personas.
- Information architecture: What wording and what organization?
- Card sorting.

*Role-playing : Building personas for model project offered to participants.*

#### 4) Ideation and design: Design Thinking

- User experience as central to the digital transition strategy.
- Ergonomics and Change Management.
- Technology-driven and user-driven innovation.
- Project Owner and Project User: What are the differences?
- The double-diamond Service Design model.
- Design Thinking techniques ("If I were..." list, experience map, user journey, mood board, etc.).

*Role-playing : Planning a design thinking session for a model project offered to participants.*

#### 5) User-centered design for designing software

- How do you present information on-screen? Visual organization.
- Human learning. Gestalt laws.
- Criteria legibility.
- Colors. Using images and icons.
- Managing the display and resizing the windows.
- Menus, widgets, shortcuts.
- Fitts' law and Hick's law.
- Human-machine dialogs. Grice's principles.
- Contents, semantic aspects. Nielsen's heuristics.
- Importance of a home page or dashboard.
- Graphic design: Skeuomorphism, flat design, material design.
- Specific features of mobile HMIs: Display and usage.
- Formalizing user tasks and browsing with Xmind.

*Hands-on work : Formalizing the tasks and browsing of the future target users (Personas) using Xmind on a model project*

#### 6) Ergonomic prototyping

- Difference between models and prototypes.
- Vertical and horizontal modeling.
- Modeling with low, medium, and high levels of fidelity.
- Fast modeling tools.
- Overview of Balsamiq and Axure.

*Hands-on work : Creating interface models based on specifications and earlier work (Personas and browsing modeling), using Balsamiq.*

#### 7) Basics of the user testing methodology

- Basics of the experimental method.
- The difference between experience and testing.
- How to measure effectiveness, efficiency, and satisfaction.
- When should you conduct a user test?
- How do you set up a user test?
- The pre-test and post-test questionnaire.
- Data collection: From "discount" methods to eye tracking.
- Data analysis.

*Hands-on work : Setting up a test protocol for the project worked on during the training*

#### 8) Heuristic analysis of software

- Methodology of heuristic analysis: Advantages and limits.

- Gravity and severity of the problems identified.
- Existing heuristic analysis grids.
- The principles of Nielsen, Bastien, and Scapin.

*Case study* : A software publisher wants to develop CV management software with a revolutionary interface for hiring firms. Suggest an approach and actions to take to create it with "user-centered design" and HMI ergonomic principles.

## DATES

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### REMOTE CLASS

2025 : 03 Mar, 14 Apr, 07 Jul, 06 Oct