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How to create user-descriptions and scenarios to design a knowledge-base for RiverCare research?

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Introduction

Increasingly, online knowledge platforms are being designed in river management (Maurel et al., 2007). The benefits of these platforms differs for the varieties of user groups which include water professionals of government, private and stakeholder organizations. Users have preferences for different data types, information means, and needs for understanding (Janssen et al., 2009). Therefore, users may benefit from having multiple and complementary options for interaction to understand water systems (Rijcken et al., 2012). Recent literature shows an increased interest in the role of user descriptions for driving the design process (Anggreeni & Van der Voort, 2008). User profiles allow the design team to focus on and effectively communicate the needs, desires, capabilities, and limitations of the intended users (Nielsen, 2002). User profiling generates scenarios for testing developed prototypes and evaluating the design (LeRouge et al., 2013). The definition of scenario is 'a description of the future use of a system or a web site from a specific user's point-of-view' (Nielsen, 2002). In Scenario Based Design (Van der Bijl-Brouwer & Van der Voort, 2013), users are analysed in the design process to ensure that the resulting prototype fits the way people will actually use the product.

The RiverCare programme is designing a web-based knowledge-base (KB) as part of the communication strategy. The KB is designed to provide (Cortes Arevalo et al., 2017): 1) easy access, search and overview of research programs such as RiverCare; 2) ease of understanding by explaining results from a river management perspective via storylines; and to 3) get feedback about the potential interest in and use of the results. The KB is envisioned to be part of the Netherlands Centre for River studies (NCR)

network. The study introduced in this abstract focuses on how to present the website content while linking to existing platforms for accessibility and reach to water professionals. Following Scenario Based Design, we are involving users in creating and developing the KB itself as well as an understanding of the context of its use. The KB is developed iteratively with both NCR and RiverCare stakeholders through several user tests and feedback sessions.

User profiling

Due to the multidisciplinary audience, it is important to investigate information needs for both researchers and practitioners related and not-related to RiverCare. Referring to previous research (Cortes Arevalo et al., submitted), the objective was to gain insights into user goals and characteristics. User profiling is the starting point for the user requirement analysis, limiting the research to particular users (Delikostidis, van Elzakker, & Kraak, 2016). Based on the interviews, we consider two types of users: 1) researchers and technical-driven experts; and 2) experiential and management-driven practitioners. Those are represented by the "personas" Alex and Tina. The user profiles help to determine the type of knowledge users want to access, search, understand and visualize. They are used as design features during the design process of the KB. To reflect these features, the analysis of the interview outcomes consisted of the following steps: 1) developing an user profile that focuses on the participants' experience with the effects of riverine interventions; 2) completing the profile with information about data type to access and share; and 3) embedding the profile in a scenario. Therefore, to further define the user requirements, scenarios were created and described from Alex's and Tina's perspective.

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Scenario creation

Two scenarios were created, one for Alex and one for Tina to: 1) introduce the two types of users; 2) state their interest towards river management; 3) explain why they visit the KB; and 4) describe the river management related problem they are dealing with. To do so, we selected the two most relevant types of scenarios:

1. The *problem scenario* describes problematic events related to the user's problems and needs dissatisfactions.
 2. An *interaction scenario* describes the solution through interaction between user and product.
- These scenarios needed to be validated by users to verify whether the elements were realistically integrated into the scenario. Therefore, a workshop with the communication team was conducted. Fig. 1 shows the generative techniques used in the session which produced varied and rich feedback about the explored context.

Usability testing

In the evaluation phase, the first prototype was tested through an experimental set up in real use and user contexts. The goals were: 1) to collect empirical data while observing potential end-users using the product to perform realistic tasks; and 2) to determine the satisfaction, effectiveness, efficiency, and overall usability. The evaluation indicators that were evaluated are shown in Table 1. Typical usability evaluation methods, such as an interview, and thinking-aloud, supported the elicitation of these issues (Dumas and Redish, 1993). During the experiment, the test persons represented either Alex or Tina and validated their respective user profiles. The feedback acquired from this experiment provides guidelines to improve the prototype and to increase its usability further.

Table 1. List of evaluation criteria for the usability test.

Criteria	Description	Indicator
Effectiveness	Do users find the answer they need?	Accuracy
		Representativeness
		Timeliness
		Relevance
		Completeness
Efficiency	Do they find the answer to a question in as little time and effort as possible?	Time on task
		Simplicity
		Lostness
		Number of control actions
		Responsiveness
Satisfaction	How does the user feel about the tasks to complete?	Comfort
		Positive attitude

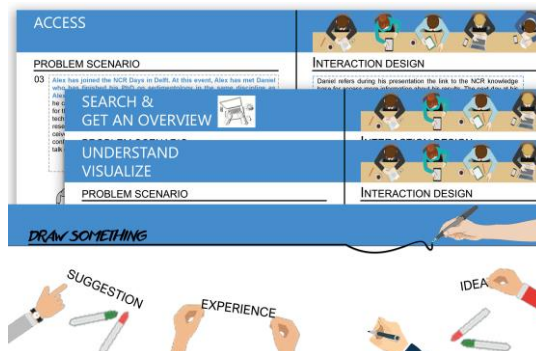


Figure 1. The generative techniques used during the workshop to discuss user experience and needs.

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References

Anggreeni, I. & Van der Voort, M.C. (2008) Classifying Scenarios in a Product Design Process: a study towards semi-automated scenario generation. CIRP Design Conference 2008.

Cortes Arevalo, V.J., Verbrugge, L.N., den Haan, R.J., Baart, F., Hulscher, S.J., van der Voort, M.C., 2017. Users' perspectives about the potential usefulness of online storylines to communicate river research to a multi-disciplinary audience. Manuscript submitted for publication.

Delikostidis, I., Elzakker, C. P. J. M. van, & Kraak, M.-J. (2016). Overcoming challenges in developing more usable pedestrian navigation systems. Cartography and Geographic Information Science, 43(3), 189–207. <https://doi.org/10.1080/15230406.2015.1031180>.

Dumas J.S., Redish, J. A. (1993). Practical Guide to Usability Testing, Ablex Publishing Norwood NJ. p. 31, "Co-discovery".

Janssen, J. A. E. B., Hoekstra, A. Y., Kok, J.-L. de, & Schielen, R. M. J. (2009). Delineating the Model-Stakeholder Gap: Framing Perceptions to Analyse the Information Requirement in River Management. Water Resources Management, 23(7), 1423. <https://doi.org/10.1007/s11269-008-9334-9>

LeRouge, C., Ma, J., Sneha, W., & Tolle, K. (2013). User profiles and personas in the design and development of consumer health technologies. International Journal of Medical Informatic. 82(11):(pp.251–268).

Maurel, P., Craps, M., Cernesson, F., Raymond, R., Valkering, P., Ferrand, N., 2007. Concepts and methods for analysing the role of Information and Communication tools (IC-tools) in Social Learning processes for River Basin Management. Environ. Model. Softw. 22, 630–639. <https://doi.org/10.1016/j.envsoft.2005.12.016>

Nielsen, L. (2002). From user to character – an investigation into user-descriptions in scenarios. DIS2002. pp. 99-104.

Rijcken, T.; Stijnen, J. & Sloopjes, N. (2012). "SimDelta"—Inquiry into an Internet-Based Interactive Model for Water Infrastructure Development in The Netherlands. Water 2012, 4, 295-320.

Van der Bijl-Brouwer, M. & Van der Voort, M.C. (2013). Advanced design methods for successful innovation; Recent methods from design research and design consultancy in the Netherlands. Design United, 2013.