



User-driven design of Environmental Virtual Observatories

- Environmental Virtual Observatories (EVOs) provide increasing opportunities to create knowledge and deliver computer-based decision support for **multiple types of users across scales**.
- However, EVOs need to be tailored to meet diverse **user requirements** and types of actors.
- To realise this aim, we developed a participatory framework for designing EVOs that emphasizes a deeper understanding of the decision making structures and the importance of iterative design with users.

Key Steps of the EVO Design Process

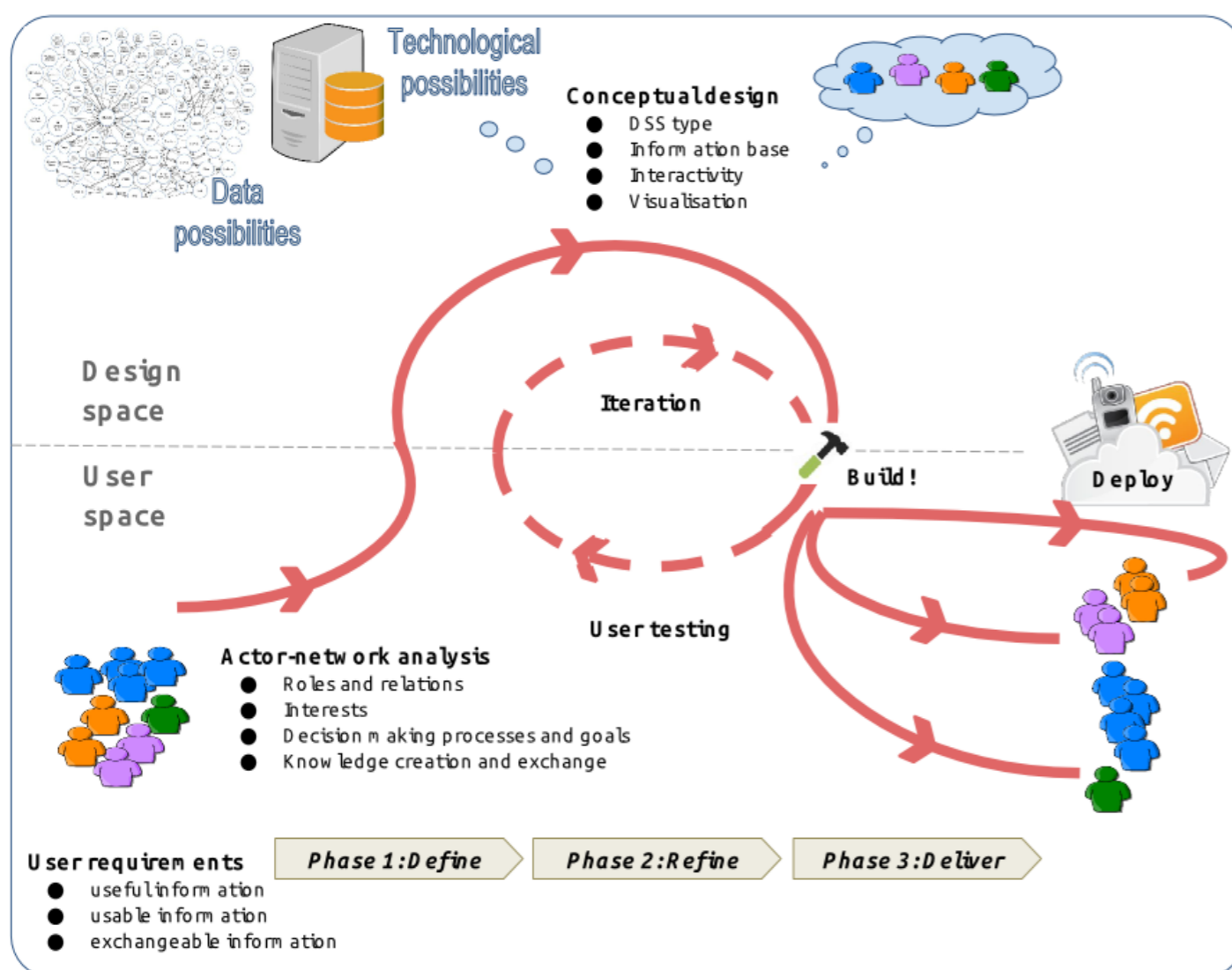


Figure 1. A sketch of the EVO wireframe provides a quick means for testing design ideas.

References: Zulkafli, Z., Perez, K., Vitolo, C., Buytaert, W., Karpouzoglou, T., et al. (2017). User-driven design of decision support systems for polycentric environmental resources management. *Environmental Modelling & Software*, 88, 58–73. <http://doi.org/10.1016/j.envsoft.2016.10.012> | Karpouzoglou, T., Zulkafli, Z., Grainger, S., Dewulf, A., Buytaert, W., & Hannah, D. M. (2016). Environmental Virtual Observatories (EVOs): prospects for knowledge co-creation and resilience in the Information Age. *Current Opinion in Environmental Sustainability*, 18, 40–48. <http://doi.org/10.1016/j.cosust.2015.07.015> | Karpouzoglou, T., Dewulf, A., & Clark, J. (2016). Advancing adaptive governance of social-ecological systems through theoretical multiplicity. *Environmental Science & Policy*, 57, 1–9. <http://doi.org/10.1016/j.envsci.2015.11.011> | Zulkafli, Z., Perez, K., Vitolo, C., Buytaert, W., Karpouzoglou, T., Dewulf, A., De Bièvre, B., Clark, J., Hannah, D. M., Shaheed, S., 2017. User-driven design of decision support systems for polycentric environmental resources management. *Environmental Modelling & Software*, 88, 58–73. <http://doi.org/10.1016/j.envsoft.2016.10.012>

Polycentric Governance

- Participatory EVO design is strongly conscious of the **polycentric** arrangement of governance institutions.
- That is crucial for optimizing **information exchange across actors and scales** (i.e. not just one but multiple decision makers operating at different jurisdictional scales).

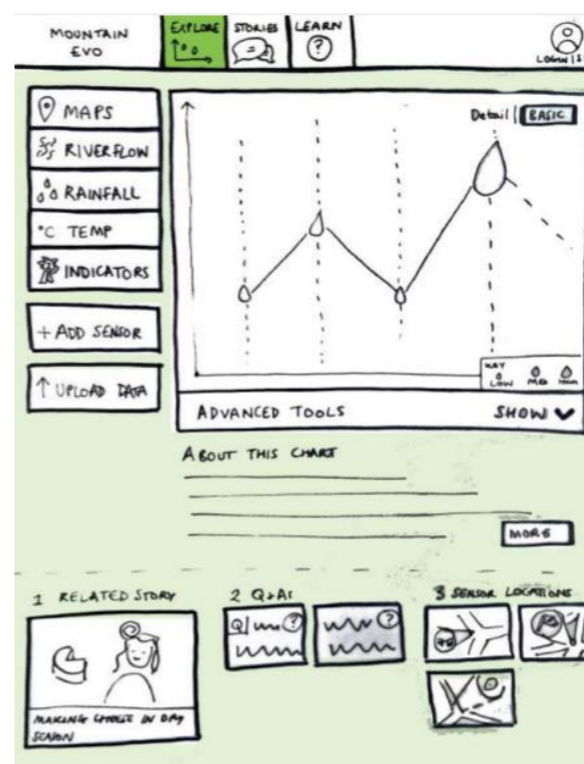


Figure 2. A tablet-based prototype is being tested with a farmer in Huamantanga.

Peru Case Study

- In the context of upstream/downstream water users in Lima, Peru, see reference [Zulkafli et al. 2017](#).
- The case study focuses on EVOs that can respond to the information needs for adapting to water scarcity at the community as well as at the regional and national scale.

Useful Tips For Practitioners

- Participatory design promises **more socially inclusive development of technological tools** for collecting and disseminating environmental information.
- Participation in the design **can be time intensive** while EVOs require strong support and investment by community stakeholders and governing bodies to ultimately succeed in the long term.

- **Want to find out more?** Visit the EVO prototype website <http://mevo.envisim.org/>



Huamantanga
Lima, Peru