Department of Media Computing and Human-Computer Interaction

RWTH AACHEN UNIVERSITY

Presentation Strategies
for Micro-Navigation in the Physical World

Nur Al-huda Hamdan, Marcel Lahaye
Christian Corsten, Jan Borchers

Typically, people arrange their belongings in **hierarchical storage structures**, such as cupboards, drawers, and other containers. To help people locate and retrieve an object, we need to present **navigation information** in an efficient way. Motivated by the advancements in AR and localization technologies, we investigate **presentation strategies** in tasks that involve navigating to an object inside a hierarchy of physical containers within the user's reach.
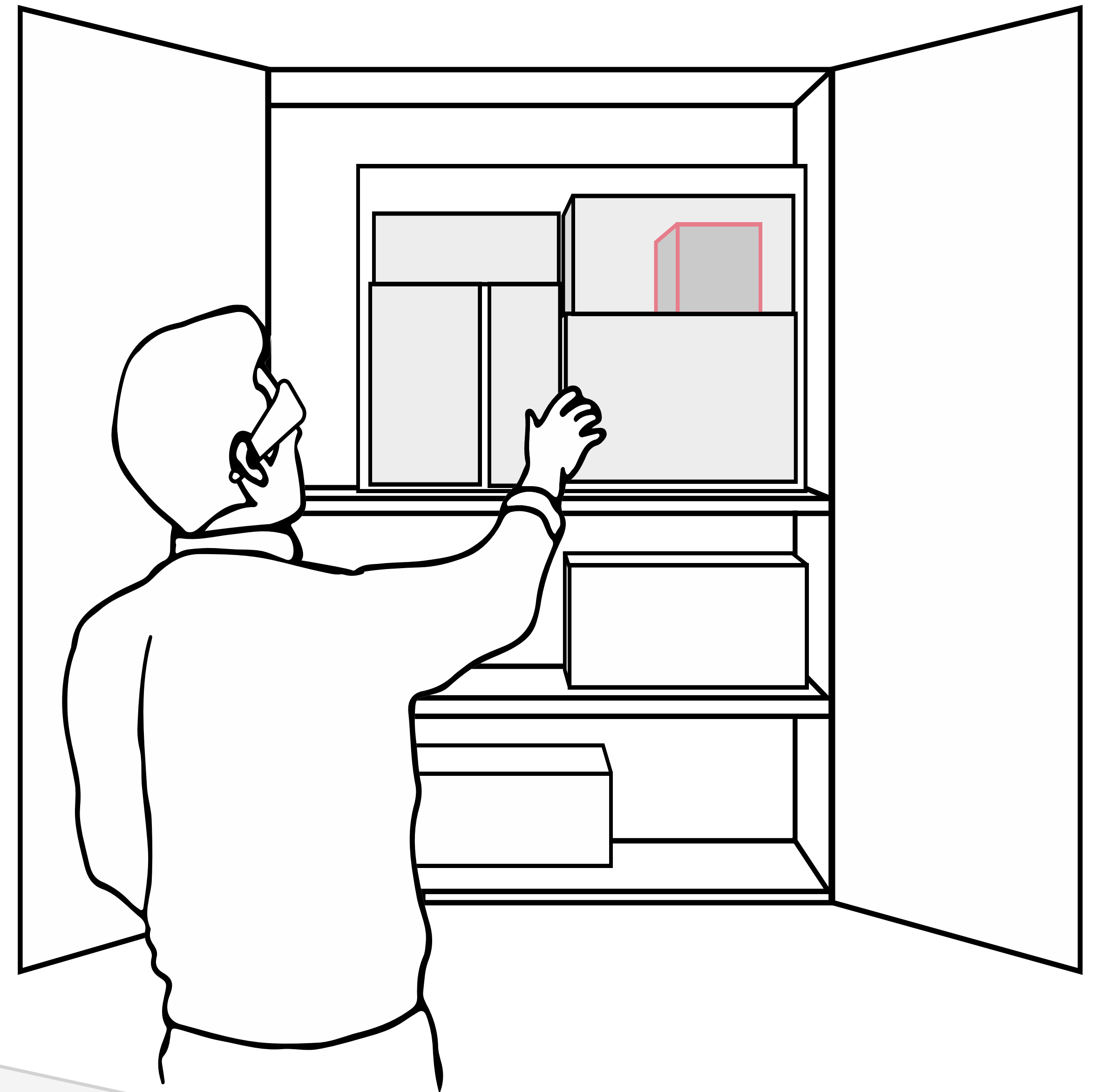
Presentation Strategies

We consider two types of navigation aids: Those that provide route knowledge via **step-by-step instructions**, using simple graphical overlays, and those that provide survey knowledge via **map-like overviews**, using 3D depth visualizations.

Route aids (Spotlight, Icon) cue the absolute location of the target from the user's perspective. Icon instructs whether to open or remove a container to retrieve the target.

➤ Gradual guidance, reduces stress and anxiety of planning

Spotlight   Icon
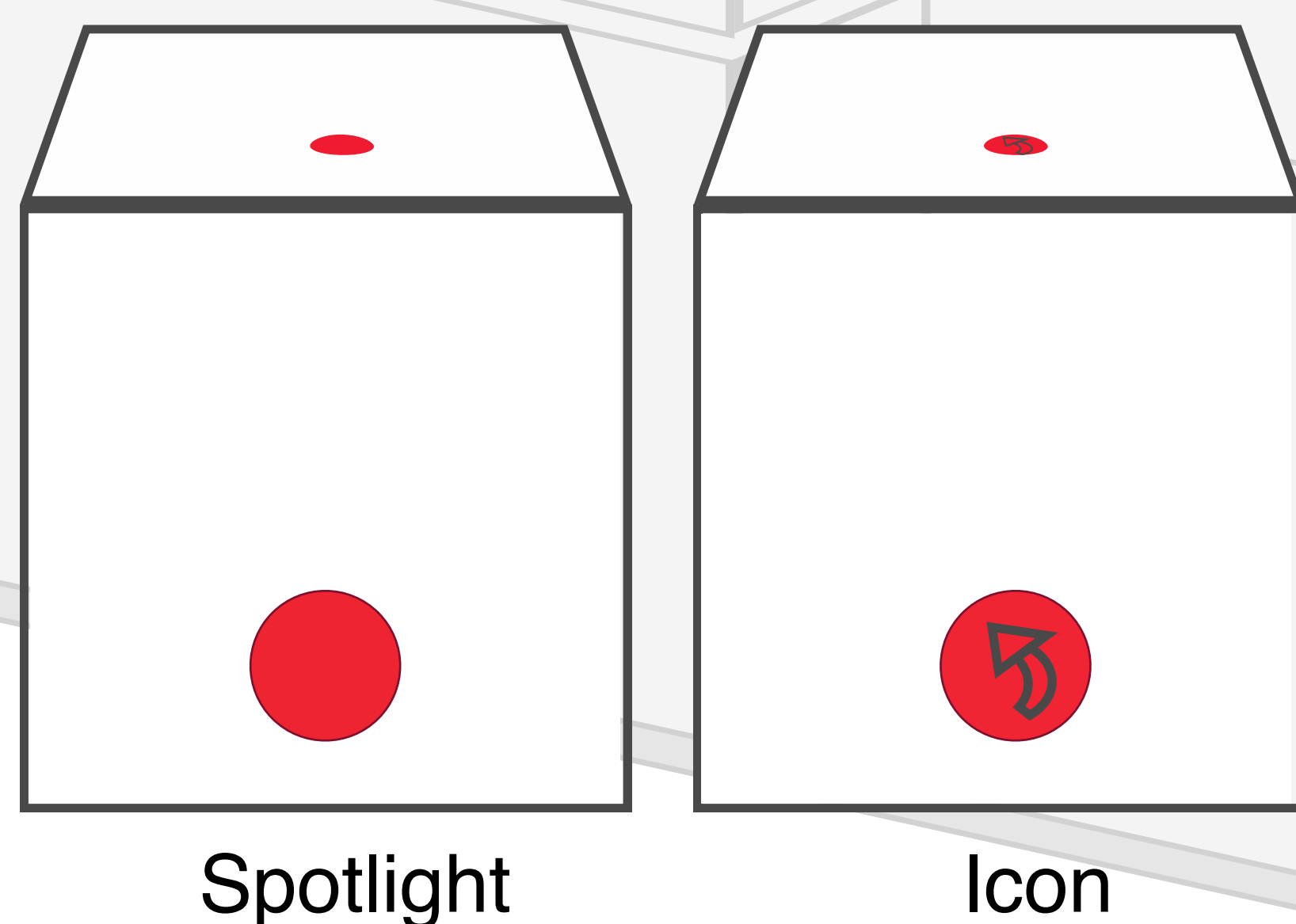
Survey aids (X-ray, Cutaway) show the containers that require interaction from the user to retrieve the target.

➤ Help plan a route and develop alternative routes

Cutaway   X-ray
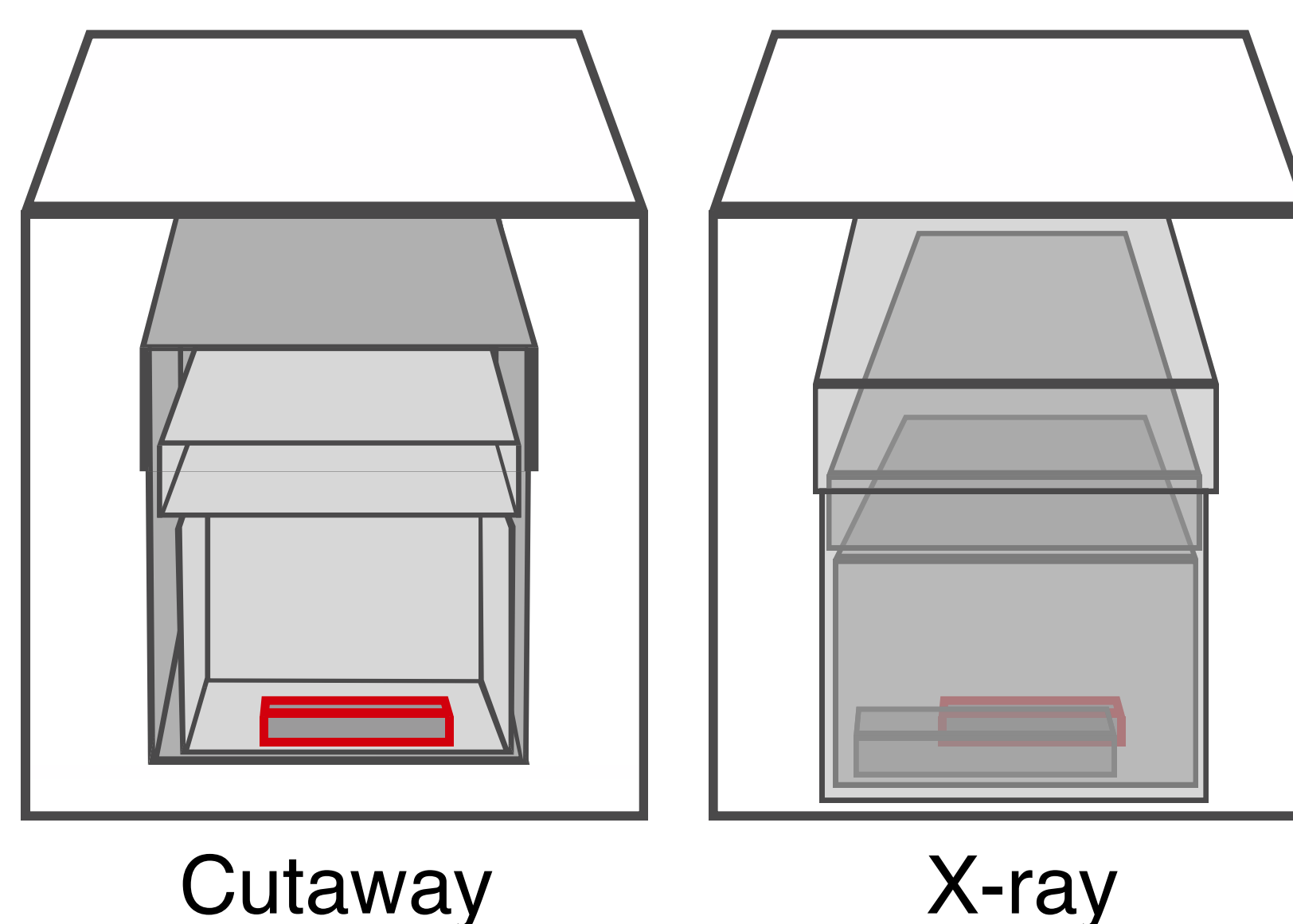
Experiment

We compared the performance of survey and route aids in terms of task completion time, error rate, and user preference.

Experiment setup with cardboard mock-up

Results

Empirical data shows that users **performance** with route and survey aids is **comparable** in simple hierarchies, but deteriorates for survey aids in complex hierarchies. Users showed **no preference** of one aid over the other (n.s).
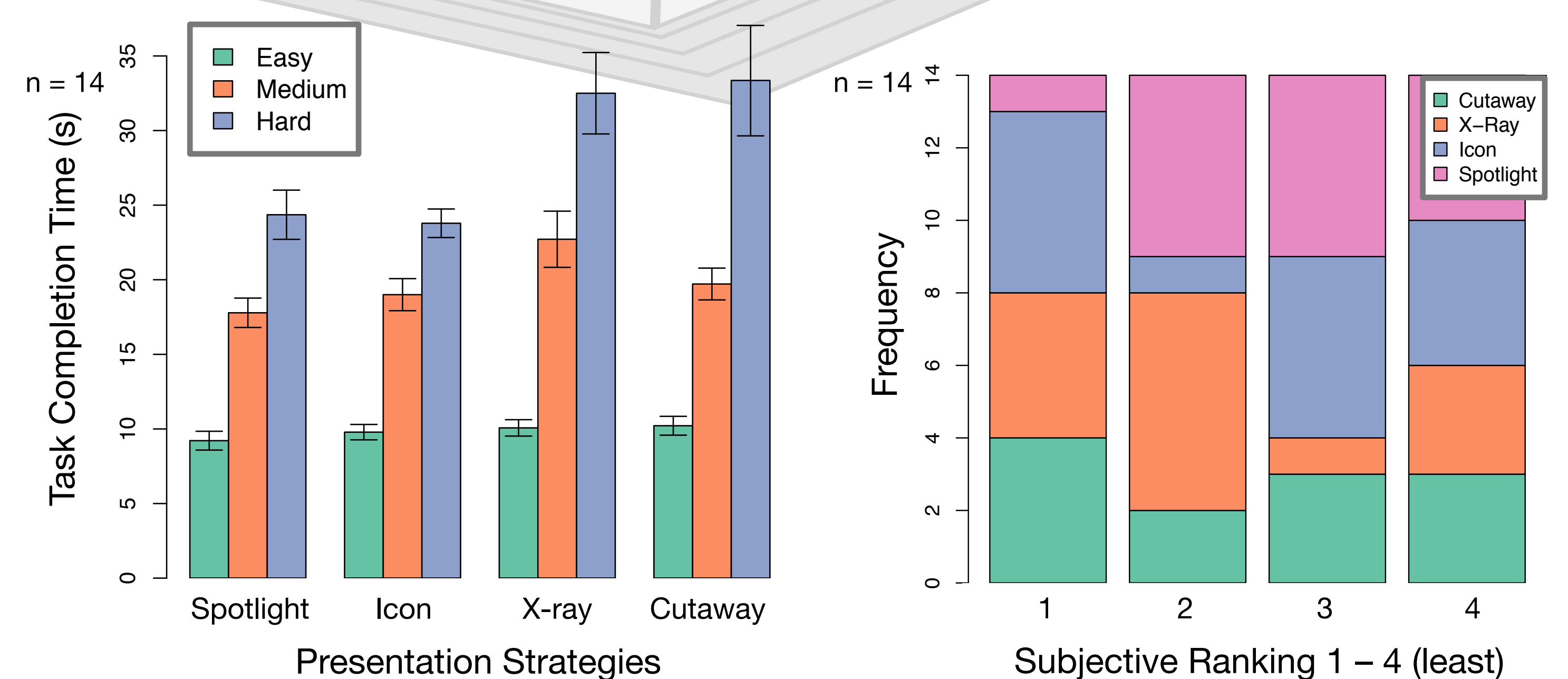
Users found that **route aids** require **less processing time** and effort, and **survey aids** help **understand a container hierarchy**. Further investigations on more complex tasks in different contexts (e.g., warehouse) could reveal the value of each aid.

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