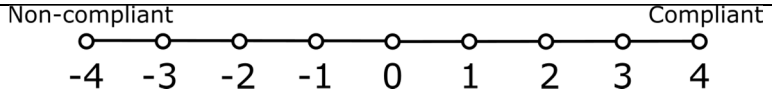
Heuristics for the Design and Evaluation of Natural User Interface (NUI)

[NH1] Operation Modes

The system must provide different operation modes (visual, auditory, tactile, gestural, voice-based, etc.). In addition, the system must provide an explicit way for the user to switch between the modes, offering a smooth transition.

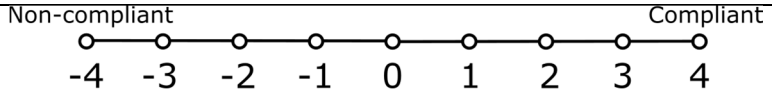
Rationale



[NH2] "Interactability"

In the system, the selectable and the "interactable" objects should be explicit and allow both their temporary and permanent selection.

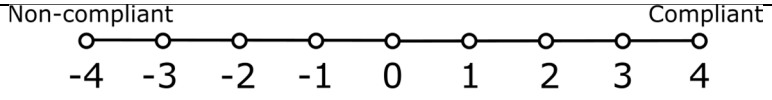
Rationale



[NH3] Metaphor Adequacy

The sets of interaction metaphors the system provides should make sense as a whole, so that it is possible to understand what the system can and cannot interpret. When applicable, there should be a visual grouping of semantic similar commands. In addition, the interaction metaphors should have a clear relationship with the functionalities they execute, requiring from the user a reduced mental load and providing a sense of familiarity. Finally, the metaphors should not be too similar to one another, to avoid confusion and facilitate recognition.

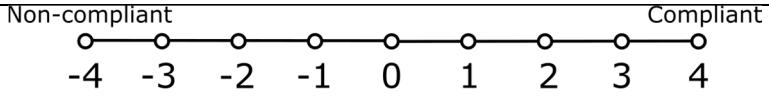
Rationale



[NH4] Learnability

There has to be coherence between learning time and frequency of use. Therefore, if the task is performed frequently then it is acceptable to require some learning time; otherwise, the interface should be usable without much learning effort. In addition, the design must consider that users learn from each other by copying when they work together, so it is important to allow them to be aware of each other's actions and intentions.

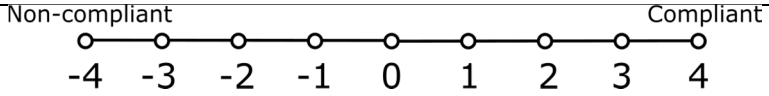
Rationale



[NH5] Guidance Balance

There has to be a balance between exploration and guidance, to maintain a flow of interaction to both the expert and the novice users. To enhance transition from novice to expert usage, active exploration of the set of interaction metaphors should be encouraged by the system. Finally, it is important to provide shortcuts for the expert users.

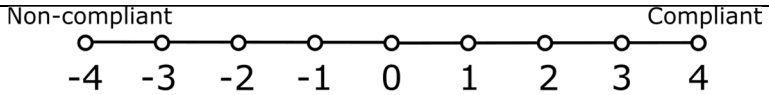
Rationale



[NH6] Wayfinding

At any time, users should be able to know where they are from a big picture perspective and from a microscopic perception. This is important regardless of user proficiency with the system, i.e., novice and expert users need both views of the system.

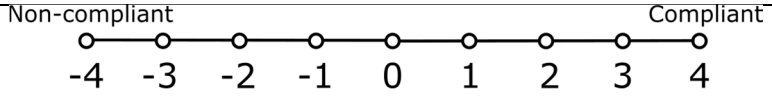
Rationale



[NH7] Comfort

Interacting with the system should not require much effort from the user and should not cause fatigue.

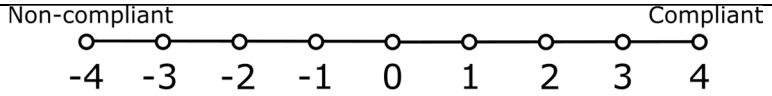
Rationale



[NH8] Space

The location where the system is expected to be used must be appropriate for the kinds of interactions it requires and for the number of simultaneous users it supports.

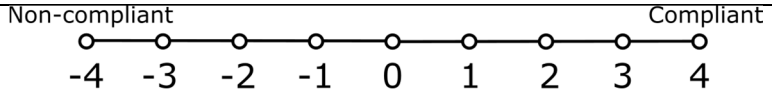
Rationale



[NH9] Engagement

The system should provide immersion during the interaction, at the same time allowing for easy information acquiring and integration.

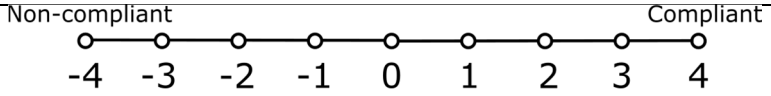
Rationale



[NH10] Device-Task Compatibility

The system has to offer kinds of interactions that are compatible with the task for which it is going to be used.

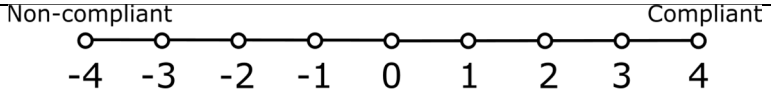
Rationale



[NH11] Social Acceptance

Using the system should not cause embarrassment to the users.

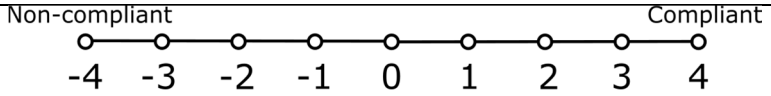
Rationale



[NH12] Awareness of Others

If the system supports multiple users working in the same task at the same time, then it should handle and prevent conflicting inputs. Therefore, users must be able to work in parallel without disturbing each other, but having awareness of the others.

Rationale



[NH13] Two-way Communication

If multiple users are working on different activities through the same interface, and are not necessarily in the same vicinity, the system must provide ways for both sides to communicate with each other.

Rationale