T. BOCK. T. LINNER, C. GEORGOULAS. ***Co-adaptation of assistive mobility devices and residential functions.*** *Gerontechnology 2012;11(2):363;* doi:10.4017/gt.2012.11.02.124.00 **Purpose** We developed a method at TUM-BR2 for facilitating independent life for elderly or disabled people. The method aims to create intelligent living environments by adjusting mobility systems and everyday objects (e.g. appliances) as modular and complementary subsystems. The proposed system consists of an intelligent wheelchair enabling simplified use of the bath-room, kitchen, living room, etc. It can dock at certain functions, e.g. the toilet, both on a physical and information technology level. **Method** Studies show that a major problem for people with physical and/or cognitive disabilities in everyday routine and in managing the activities of daily living (ADLs) is surmounting different height levels and distances. Even for someone with good physical ability it is extremely difficult to transfer from a wheelchair to a couch autonomously. The reason is the height difference between the furniture and wheelchair, as well as the space or gap that occurs mostly between the transport device and the piece of furniture. The proposed work presents a thorough research study, representing a huge gain in knowledge concerning the re-design of household appliances and devices, so they can be straightforwardly and cost-effectively integrated with mobility supporting robots[1-3]. As a result of this research 7 companies and 3 universities now participate on a research project. In order to realize the co-adaptation of an assistive mobility device and residential functions, the following development approach steps were followed: (i) research and identification of needs, (ii) definition of requirements, (iii) identification of technologies and processes, (iv) initial concept, (v) experiment in real environment, and (vi) final concept and further development roadmap. **Results & Discussion** Most wheelchairs are designed with a fixed height and do not provide features for altering their elevation level. Additionally, handicapped individuals face major problems when reaching high items, due to the fact that objects in the environment are mostly located statically, and it is difficult for disabled users to reach them. Especially for disabled people, functions should serve them instead of the other way around. The results of the study prove that the co-adaptation of assistive mobility devices with various residential functions, allow the complexity reduction of mobility robots. Companies notice a huge potential in such an approach, as it would allow them to design less complex, and thus more cost-effective robots for ADL-use. The high cost of robots is currently one of the main obstacles for deploying them in the home environment. Based on this study, TUM was finally able to set up a government funded 3-year R&D project (total funding cost: 3.9 Million Euro starting from April 2012) where major strategies, processes, and components necessary to achieve uninterrupted mobility chains for elderly people will be brought to product market level.

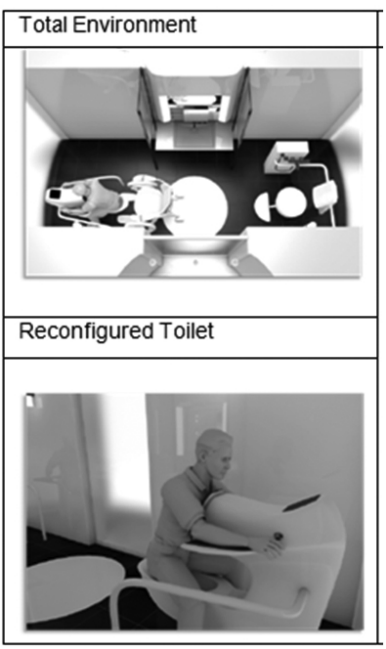

Figure 1. Proposed system environment

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