

## Chapter 6

# An Approach to Adapt the Product Functionality to the Abilities of Seniors

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### ABSTRACT

*Elderly people are restricted in their efficiency due to the aging process. Technical systems provide a considerable potential to support the elderly in their domestic environment. It is important, to focus not only on aspects of ergonomics and operability, but the functionality of the products themselves should be stronger in these considerations. To be able to support the designers in their complex development tasks at first typical age-related restrictions and medical conditions from an engineer's point of view will be described in the framework of this presentation, as well as, the influence of the biography on the use of technique will be analyzed. Considering these aspects, an approach for classification and structuring can be derived, in which typical symptoms and their characteristics are related to appropriate product requirements.*

### INTRODUCTION

The number of older people in our society is rising due to the demographic development. At the same time the part of people in paid work drop which eventually leads to a number of needy people set in contrast to a significantly smaller number of people who are able to shoulder assistance, mentoring, or care.

Technical systems, mainly innovations of the past years can relevantly contribute to support both seniors themselves as well as the mentoring and care staff and with it assure a preferably long and independent life style. In the following considerations is focused on the seniors who in fact due to the aging process or age-related diseases are restricted in their capabilities, but live in their familiar domestic environment. It should be aimed on their independence in the domestic environ-

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ment as long as possible by products specifically adapted to their requirements.

In order to efficiently develop products a detailed requirement description is always necessary to begin with. Here needs to be considered that a multitude of requirements to senior-suited products result from the specific situation of live which on the one hand comprises of course the concrete performance restrictions, thus, on the other hand stems from their social environment, their individual life style resp. their educational horizon. This means for the engineer, however, that he must deal with the medical and gerontological explanations of the aging-process and their associated diseases in order to initially record the potential performance restrictions. Not until accurate knowledge on this can solutions be searched that may be appropriate to compensate performance restrictions. The procedure to describe performance restrictions is shown more detailed in chap. Analysis and Description of Performance Restrictions.

Mainly for economic reasons it is of essential interest to assure the acceptance of found solutions. Examples of senior-suited products from the past like e.g. the cell phone for seniors showed that senior-suited technical solutions are not always accepted and used. Therefore, an exact analysis of the target group by the engineer additionally comprises social and psychological questions of aging (chap. Consideration of the Acceptance Aspect in Development). The main task of the engineers eventually is to derive concrete development parameter the actual product development is based upon from the rather softly worded requirements, demands and performance restrictions.

By viewing both latter approaches it quickly becomes clear that a very wide profile of requirements opens up due to individual performance restrictions and the personal situation of live of those concerned. This eventually leads to the assumption that it is necessary to adapt products very individually to the user in order to efficiently compensate performance restrictions on the one

hand and to be accepted by the user on the other hand.

An involved variant diversity in turn greatly challenges the manufacturers since this is generally combined with very high costs in development and production. For a demanded individualization of products therefore, product structures are necessary which with comparable low interface and production effort allow an as high as possible flexibility of the product functionality.

## **ANALYSIS OF PERFORMANCE RESTRICTIONS**

### **Definitions**

To record the specific needs of seniors first a definition is needed what aging means in general. The aging process is thereby distinguished between normal and pathological aging. While normal aging describes the process that occurs without physical or psychological diseases, the term of pathological aging is used when also diseases occur, which namely have nothing to do with aging and can occur in younger people as well, but are more frequent in old age, take a more severe course or occur in combination with other diseases (multi morbidity) (Oerter & Montada, 2002).

From a medical perspective the perception of aging is described as a degenerative biological process that leads to mental and physical detritations with increasing age (Pschyrembel, 2007). As consequences a number of physical restrictions are named (slowdown of intellectual abilities, impaired short-term-memory, obliviousness, decreasing performance of internal organs, nerves, muscles and sense organs), additionally, restrictions in quality of life are listed (social isolation), which, in the end, result from such physical ailment.

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