

ADJUSTING HOME FOR A CHILD WITH AN AUTISM SPECTRUM DISORDER

Recently, the prevalence of autism spectrum disorders has been reported to reach up to 1.5 % of population of the United Kingdom [1], more than ever before. Care for such challenged children is relatively demanding and requires a lot of involvement and devotion from their parents.

Fortunately, the continuing process of technology innovation brings novel tools, which can facilitate the daily care and offer previously unseen possibilities. Houses with advanced technology automation employed are called “smart homes”.

Despite the label, the real results do not have to correspond with the initial expectations and the houses do not have to behave overly intelligent if not designed properly. For this, special guidelines *Autism ASPECTSS Design Index* have been published this year by Magda Mosfata [2] and can be accessed after paying a fee.

The extent of implemented precautions is dependent on the actual form of the disorder and its severity. In each case, however, it is advantageous to ensure that the child is where it is supposed to be and not be elsewhere. Basically, windows in the child’s room should be provided with a parental lock to prevent unexpected escapes. Furthermore, the door must not be lockable from inside so as to avoid potential dead-lock. (When the child is allowed to wander through the house, the scope of all measures should be obviously extended.)

The next step is to try to minimize dangerous scenarios, in which the child gets hurt. Every object made of glass is a potential threat, as it can be easily broken, creating sharp pieces. All other fragile objects and objects with a sharp edge should be also removed (or reformed) as well as little pieces that could be inspired. Objects should be placed stable, not to be easily overturned, heavy items especially. In addition, unplugged power sockets should be safeguarded.

When an emergency happens – despite the common prevention – it should be detected as fast as possible. Alongside with a standard smoke detector, an integrated sound detector designed to identify a cry might be useful. Vital functions (heart-rate) can be monitored via a small bracelet-like device similar to “smart watches” – popular wearable electronics, which directly touches a piece of skin to measure data. The device would have to be unobtrusive in order not to gain much attention from the child or positioned on a less noticeable part of the body. The data can be synchronized with a central control unit e.g. using the Wi-Fi protocol.

A simple web camera installed in the room then offers an instant view on the situation whenever needed. Archiving the footage for several days may be a good practice, delivering a quick solution when investigating a situation. When walking around the house, the child’s position can be tracked e.g. by broadcasting GPS coordinates from the wearable device to the central unit. Thereafter, uncharacteristic walks can be automatically detected, sending a notification to the parents to abort the child’s unexpected journey in time.

Another dimension is the inner environment of the room. Important places should be visually salient for the child, i.e. using the child’s favorite color. Differentiation between similarly looking objects (such as drawers) can be simplified by special marks, distinctly shaped handles, and using more contrast

colors. Everything should be logically arranged and organized. Stable micro-climate can be achieved by a simple air conditioning system.

With a planning system connected to speakers integrated into the room, phases of the day can be clearly distinct by regular announcements, every day in the exactly same time so that the child can expect it and follow it. For instance, designers from Anderson Smart Homes implemented this kind of a system and connected it to a light control. Every morning than, their client's child were awoken at a specific hour turning the lights on and playing his favorite music song [3].

Finally, various aids and toys for communication facilitation and development of child's skills should be present. Visual sequence helpers and schedules can provide a hint of what the child is supposed to do at the moment up to the point when the child learns the whole procedure independently. Cards with symbols and pictograms can be an effective way of communication. Playing video games might be very catchy and comforting for the child, possibly with an additional educational effect.

Implementation of such ideas can bring some benefits as well as disadvantages and possible lapses. A brief SWOT analysis is presented in Figure 1.



Figure 1: SWOT Analysis of the Suggested Approach

From the number of threats listed, it is obvious that the cooperation of the designer and the parents is vital and all current habits and preferences of the child have to be considered before making any adjustments to the child's room and daily regime.

References

- 1) BARON-COHEN, S., F. J. SCOTT, C. ALLISON, J. WILLIAMS, P. BOLTON, F. E. MATTHEWS a C. BRAYNE. Prevalence of autism-spectrum conditions: UK school-based population study. *The British Journal of Psychiatry*. 2009-05-28, vol. 194, issue 6, pp. 500-509. DOI: 10.1192/bjp.bp.108.059345.
- 2) MOSTAFA, Magda. Architecture for Autism: Application of the Autism ASPECTSS™ Design Index to Home Environments. *The International Journal of the Constructed Environment*. 2014, vol. 4, issue 2, pp. 25-38.
- 3) What Home Automation can do for children with Autism. *Anderson Smart Homes: We design and install home automation* [online]. [cit. 2014-09-22]. Available from: <http://www.anderson-smart-homes.com/Autism.html>