

Best Practice: Technology Assisted Living Applications

Presented by Paul Foulkes, Theben UK and KNX UK Vice Chair

Census 2021 results show the population of England and Wales has continued to age since 2011. The number of people aged 65 years and over increased from 9.2 million in 2011 to over 11 million in 2021 and the proportion of people aged 65 years and over rose from 16.4% to 18.6%.

Many of these people prefer to live in their own homes.



Seven years ago, I reported on an initiative in France that addressed this need in society.

In order to provide 'safe at home' environments the scheme sought to retain their independence and improve their security and comfort. It was necessary to examine resident's way of life and the space in which they live. Solutions were implemented employing simple modifications and KNX technology. This technology is part of the daily routine starting in the morning.

Each year falls affect one in two people aged 80 or over some of these are due to poor lighting, so sensor controlled lighting was installed, other modifications included easier to operate shower fittings and a shower that has no step to help limit the risk of accident. The sink was fitted to allow access for a wheelchair.

If the occupant has a fall or loses consciousness, then the installed movement detectors recognize a lack of movement and an alert would be shown on the building interface panel along with the local visual and aural alarm an alert can also be sent via text or email to specific people or the emergency services indicating that the resident is not responding to the local alarm. The same alert sequence can be activated manually by push-button movement detectors and manual alarms can be installed in any room and profile depending upon the needs of the resident the profiling is specific to that resident it can include various parameters such as the amount of time spent sleeping or active and allows the detection of any abnormal situations and alerts can be activated as required.

KNX technology can offer a number of advantages for discreet monitoring and control remotely energy monitoring and leak or flood detection can be monitored locally and also remotely by care staff or facilities management thanks to the integration of this KNX technology multiple functions can be carried out with a single action this is particularly useful when the resident leaves the house if someone tries to break into the house the installation can be designed to carry out a number of actions this could include local alarms lights turning on opening up a shutters and alert messages to the resident or emergency services this technology combined with correctly adapted living space can offer a new quality of life allowing independence at home with ease and security.

Independence issues don't just affect the elderly, the office of National Statistics reports that there are 10,444,770 people between the ages of 15 – 50 listed as Disabled under the Equality Act: Day-to-day activities limited. Injury, illness and congenital conditions.

The use of KNX technology is increasing in these settings because it is a worldwide standard and guarantees seamless interoperability between thousands of products from over 500 different manufacturers. Using this technology at the core of a smart control system ensures the core system never needs to be replaced. Functionality can be endlessly added to or adapted as needs change and provides endless adaptability, allowing components to be changed without a complete re-design.

One of my passions is the need to design better buildings from the outset, creating buildings for life that adapt and change as the needs of the occupants' change, rather than being forced to move from a beloved home that is no longer fit for purpose. To achieve this, it is necessary to identify long-term goals by focusing on who the building is being designed for what that building is going to be used for. Is it a starter home? Is it aimed at a retirement home? Is it within a community? Is it a standalone?

When designing homes for life it is necessary to look at user profiles the requirements for a single person are going to be considerably different than a requirement for a family of four. Requirements will also be different for a household with a disabled family member. A further consideration is the potential for change in requirement throughout the lifetime of the occupants. What is needed by an occupant at 25 years old may be considerably different from what is required or desirable for that same occupant at 65 years old.

We have a tendency in the UK to think of houses as elements just passing through our lives but actually a house is going to stand for probably at least 100 years. In fact, much of our housing stock in UK is considerably older than that. Focus on this aspect of a building at the design point needs to be a day one objective. It is short-sighted to design and build the house then subsequently consider adding in functionality retrospectively.

We need to be thinking from day one about cabling requirements, services, ventilation, water, waste. Most importantly we need be thinking beyond basic wiring regulation. On larger projects the building services design should include controls of all of the elements within the building – heating, ventilation, light, glazing all of these need to be assessed from day one and they need to be assessed by someone that has an overarching viewpoint. Quantity Surveyors will look at each individual aspect of a building and what that means is that the overall design gets broken down and individualized resulting in disparate systems. If a controls integrator oversees the design and specification process, the result is a building that flows much better.

The planning stage needs to reflect the here and now but we've also got to look at beyond that here and now what it's going to be doing not in five years time, but what's going to be happening in that building in 25 years time.

The future use of that building could change not only for the initial occupant of that building but also if the needs of that resident changes, perhaps from a single person to a disabled

person to a family or even as new technology is developed. The building needs to be able to adapt to each of those users needs. We need to be designing buildings that don't need to be stripped back to base build in order to put in a completely new infrastructure. Far better to plan for changes in future requirements in the houses that we build right now.

Unfortunately, within the UK volume house building market to the lowest possible common denominator which generally seems to be cost to that particular developer.

This is how we build and sell houses. We consider it acceptable to put the minimum amount of insulation in, the minimum amount of technology in. That's not a sustainable build route in any way shape or form.

In conclusion I would like to share the following quote:

"In our anxiety to leave the housing market as free as possible we allow short-term costs to dominate our policies

...every year we add to the country's housing stock, dwellings whose inflexibility makes them even less suitable for any but the young and agile ..." Rowe 1991

Guest Editor Paul Foulkes



Paul has over 30 years of experience in building technologies working in mainland Europe and the UK. His experience has included building automation, the energy industry and manufacturing. He is passionate about the use of smart building technologies and the real-world advantages in future proofing buildings, providing occupants with greater choice, improved energy management and healthier living environments.

Graduated with Merit - MSc in Architecture: Advanced Environmental and Energy Studies from the UEL University of East London at the Centre for Alternative Technology (CAT). " Are ever tightening UK building regulations the panacea to curbing residential energy use? Does social engineering of lifestyles via policy and legislation have a complementary role?"