



HOME AUTOMATION

what you need to know to shape
the smart living of the future

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Home Automation - what you need to know to shape the smart living space of the future

Home automation is moving steadily on its way towards becoming the norm, rather than the exception, for many new properties. Its progress may not be as fast as some technophiles have been predicting – but it remains a much more plausible scenario than that of the ‘household robot’ which regularly surfaces in the media.

High speed wi-fi is now standard; most people have smartphones; and a whole host of Internet-connectable products are entering the market. By 2020, most people in the UK will have smart energy meters and thermostats, with other kitchen and household appliances connected to them to ensure more efficient energy use.

Connection and communication are the underlying principles of home automation and, once in place, offer expanding possibilities. Not least, home automation has the potential to save householders money – a major asset given the likelihood of future energy price rises. Meanwhile, with inevitable progress in technology, systems will become progressively easier to use and more affordable to the wider population.

The main attraction lies in the ability to deliver sophisticated and efficient overall management of the home itself, the electrical equipment that operates inside it, and daily household needs ranging from internal and external security to home entertainment. For all of these, it offers the time-and cost-saving benefit of centralised and personalised control – internally or remotely via the internet. It can also support applications to meet specific needs, such as those of the elderly, disabled or disadvantaged. It can give them a better quality of life and make them less dependent on carers or likely to go into institutional care.

Typical examples of benefits over and above the standard control features include personal activity and health monitoring, sending automatic SOS calls in emergencies, and giving safety-critical important reminders, for example, to turn off an oven or centrally lock all doors.

The main reasons for the rising interest in home automation are:

- ➊ The growing availability of ‘smart’ household appliances
- ➋ Better-quality cable and cellular communications
- ➌ The fact that, in this age of mobile computing, a wireless router for internet access already exists in most homes in the UK
- ➍ Greater operational simplicity, via smartphone and tablet connectivity
- ➎ Greater affordability, resulting from developments in technology that are opening up new markets

“Home automation is moving steadily on its way towards becoming the norm”



Architects and designers

Home automation is now seen as an integral element of the growing Internet of Things (IoT) and Smart Living agendas. Therefore, UK buyers and renters are going to be looking for significant elements of home automation in standard, not just high-end, homes and expecting designers, developers and housebuilders to be able to offer relevant solutions.

In aesthetic terms, home automation offers architects and interior designers tools for creating living spaces and experiences offering new levels of security, convenience and flexibility. For example, automated lighting, curtains and shutters could enable the creation of 'soft' divisions within the physical structure, allowing multi-purpose areas and 'rooms' that can be changed at will.

As a result, building industry professionals can expect requests for detailed information on home automation options from their clients – both individual buyers of new and remodelled properties and the residential developers of multiple dwelling units. In turn, designers will be looking to experienced system integrators for reliable and up-to-date technical advice and information.

The full implementation scenario can involve the strategic planning in and installation of sensors and communications links for a wide range of applications. This can include, among other things, the detection of and reaction to suspected intrusion or gas/water leaks; the movement of people (or its absence); changes in temperature or daylight level; as well as the management of domestic electrical appliances such as fridges and washing machines, pet feeders during owners' absences, and the operation of home entertainment and cinema.

The new EU Directive 2014/61, on the physical infrastructure for home automation, will make it easier to design and allow for the future upgrade or replacement of components. At a more basic level, the widespread adoption of mobile devices such as tablets are providing a simple and minimal-cost option for wall-mounted control panels, using specialised apps to display the status or activity of home features, and then control them.

The Institution of Engineering and Technology sees the impact of home automation on domestic lifestyles being as far ranging as was that of factory automation on industry, with the benefits filtering down to be available eventually to all sectors of society. The Royal Institute of British Architects (RIBA) sees it as an integral element of a wider SMART Living agenda, which would cover the planning and design of built structures ranging from individual homes to major cities. The institute has been working to persuade the Government to commit itself to such an agenda, involving the use of data and technology to enhance the built environment at all levels.

In 2013, RIBA issued a report jointly with Arup, an independent firm of designers, planners, engineers, consultants and technical specialists, on 'Designing with Data: Shaping our Future Cities'. It offers a starting point for smart architecture and planning, but the Institute stresses that Government action is needed to take place - making into the digital age. This would help to extend the economic, social and environmental benefits of big data to the spatial disciplines of planning and design, as well as analyse the implications of current Internet of Things standards.



Standards and guarantees

As with any emerging technology, robust standards are critical to ensure interoperability between successive ranges of products and to avoid the risk of lock-in to any individual manufacturer as more competitive models reach the market or upgrading becomes necessary. Until recently, the effective integration of home automation components has presented something of a challenge for the construction industry.

This has been largely due to the lack of cost-effective, open and standardised means of communication with and between components. As a result, home automation systems have tended to be expensive – and often over-dependent on particular manufacturer technology and processes. However, in one important step forward, large-scale home automation standardisation activity is already under way among major domestic manufacturers across Europe, with the aim of ensuring that their equipment is reliable and compatible. Parallel initiatives in other areas are also on the way.

The harmonisation of relevant standards and system architectures (the means of coordinating individual components) in the IoT sphere is seen as critical for growing the market in specific sectors such as home automation, which would give specifiers, designers and builders the confidence that they need.

Across the construction industry, quality and guarantee schemes are already expanding to take home automation into account. A good example of this is the Building Research Establishment's (BRE) new Home Quality Mark (HQM) initiative, an integral part of its established BREEAM family of quality and sustainability standards. This was introduced to give people buying or renting new homes the assurance that the property will be well designed and built, as well as cost effective to run. It also aims to offer housebuilders an authenticated way of demonstrating product value and achieving marketplace differentiation.

BRE has introduced the new system to meet the needs of developers who have found it difficult to convince a house buying public, increasingly sceptical about marketing information, about the accuracy of, for example, lower energy cost and better sound insulation claims. With home automation involving more complex technology, the HQM process will be all the more important.

BRE has been developing it jointly with partners from the both the private and social housing sectors, using 'study sites' as practical testbeds. In a specific acknowledgement of the growing role of home automation, these include a 50-unit scheme in Hampshire – of 30 standard and 20 affordable homes – where the developer has built in from the outset the digital connectivity needed to support smart building functionality.

BRE is using the resulting information to refine its HQM scoring system and indicators. There are explicit criteria for housebuilders wanting to take advantage of the accreditation such as the expectation that the resulting new home will be fully functional from the moment that the occupier moves in. Delivering on this commitment will demand robust checking and commissioning of all internal systems, including those for home automation, through a pre-agreed commissioning strategy and testing programme, for which the input of an experienced system integrator will be invaluable.

The new occupier also needs to be confident of their ability to operate their new home. The HQM process explicitly requires project team support in giving them a practical understanding of all the home systems and their controls; accessible methods of monitoring their performance; and clear information on their maintenance needs.

The basis of this fulfilment is:

- ➊ The requirement for knowledge sharing to enhance understanding and cooperation between the entire project team and the developer or householder client, supported by
- ➋ Efficient and effective communications between all those involved in its procurement.

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Security

Automated and effective domestic security is integral to a comprehensive home automation installation. This whole concept has, in fact, developed largely from the core infrastructure of intercom systems allowing audio and video communications between entrances and as many rooms or units as necessary. Since these systems typically came with links to telephones and TV sets for monitoring of entry cameras, the necessary communications links for full-scale home automation were already available.

Relevant security applications include central locking of outside doors and windows; monitoring suspicious movements around or inside the property via motion sensors and communicating alerts as necessary; and simulating the occupation of an empty home by automatically adjusting lighting or window curtains or shutters. Sensors can also detect hazards such as leaks of water or gas, or fire risks, and trigger warnings for remote notification.

As the home automation concept has become more sophisticated, it has predicated the incorporation of adequate safeguards and data encryption levels. This is designed to protect systems against being hacked from the outside with the aim of capturing profiles of homeowners' habits and routines. High-level security is also vital when the range of control systems extends beyond the home itself, for example through Wi-Fi links or connections with the internet.

The recent attack on an Internet infrastructure company highlights the real risk of poorly protected IoT devices. This significant attack was launched using more than 500,000 hacked webcams and digital video recorders, which possessed weak factory-default usernames and passwords. Therefore, the ultimate solution lies in making the entire IoT concept highly resilient against such attacks and introducing automatic fail-safe defaults resulting in temporary manual operation when necessary.

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Costs and savings

The initial costs of home automation are those of the components and their custom installation. Ongoing costs include the electricity to run the control systems, the maintenance of these and of their network connections, and eventual upgrades as standards advance.

In terms of cost benefits, inbuilt communication between a home automation system and the national grid can enable 'green automation' or 'demand response'-based energy management strategies, enabling the householder automatically to defer energy use to low-cost periods. For example, they could take advantage of higher output from installed solar panels in the middle of the day to run washing machines automatically.

Home automation systems are now being seen as integral components of the 'smart grid' concept that combines usage data with energy resource price and availability movements.

In 2014, the European Parliament and Council of Ministers adopted EU Directive 2014/61 on measures aimed at reducing the costs that are limiting the desired roll-out of high-speed electronic communications networks, a major part of these costs being attributable to 'inefficiencies in the roll-out process'. In Article 08, it required member states to ensure that all newly constructed buildings at the end-user's location, for which applications for building permits have been submitted after 31 December 2016, are equipped with a high speed-ready in-building physical infrastructure, up to the network termination points.

The same obligation applies to major renovation works for which applications for building permits have been submitted after 31 December 2016; while multi-dwelling buildings newly-built or subject to major renovation under permits submitted after the same date must be equipped with an access point. The Directive defines this physical infrastructure as including, for example, mini-ducts and access points convenient for the use by public communications network operators.



About Us

Interphone is a security systems and building technology integrator providing design, installation and maintenance services for the commercial residential property marketplace. With more than 50 years of experience, Interphone is ideally-placed to overcome the unique challenges faced by managing agents, house builders, property developers, construction contractors, facilities managers and residents, delivering upgrades and complete installations for retrofit and new build developments.

Interphone has established longstanding relationships within the property management, development and specifier communities, resulting in its solutions being fitted in many large and prestigious buildings across the UK. In addition, the company services a portfolio of more than 3,100 rental and standalone maintenance contracts covering 2,800 sites and 65,000 individual units.

Interphone is also providing advanced home automation and entertainment systems through its dedicated division Ingenuity, providing complete control of virtually any technology in the property at the tap of a touchscreen, smartphone or tablet. These integrated and smart building solutions, suitable for projects of all sizes, are designed to make everyday life easier by combining familiar systems that work seamlessly together for added simplicity, convenience and enjoyment.

