

Intelligent Buildings and Smart Homes.

Intelligent Buildings technologies encompass an enormous variety of technologies, across commercial, industrial, institutional and domestic buildings, including energy management systems and buildings control.

Lebanese have always been pioneers in innovation, since the days when they invented alphabets, and sailing into new continents way before Columbus. The Intelligent Buildings market will be the next innovative project for the Lebanese developers in the coming years.

The function of Building Management Systems (BMS) is central to 'Intelligent Buildings' concepts; its purpose is to control, monitor and optimize building services,

The potential within these concepts and the surrounding technology is vast; the impact on facilities planning and facilities management is also potentially immense. Any facilities manager considering premises development or site relocation should also consider the opportunities presented by Intelligent Buildings technologies and concepts.

Energy Usage:

Intelligent Buildings and Building Management Systems technologies contribute directly to the reduction in energy use.

Until recent years, energy efficiency has been a relatively low priority and low perceived opportunity to building owners and investors. However, with the dramatic increase and awareness of energy use concerns, and the advances in cost-effective technologies, energy efficiency is fast becoming part of real estate management, facilities management and operations strategy. The concepts are also now making significant progress into the domestic residential sectors.

For lighting, energy savings can be up to 75% of the original circuit load, Which represents almost 5% of the total energy consumption of the residential and commercial sectors.

Energy savings potential from water heating, cooling, or hot water production, can be up to 10%, which represents up to 7% .

Government Initiatives around the world are also driving the development and adoption of Building Management Systems technologies.

However according to our records as many as 95% of all existing buildings in Lebanon have inapplicable or ineffective controls, many of which require complete refurbishment of control systems. It is more convenient to adopt this

system in new projects which will encounter an affordable additional cost of 15-20 %.

Moreover conventional control systems stop short of automated Intelligent Buildings full capabilities. A significant human element is required for optimal effective operation even if control systems were correctly specified and installed.

Given typical installations and equipment there is often a difficulty for building occupants (residential) or managers (commercial) to operate them correctly. Usage and correct operation are vital for effective results.

Education of users; improved systems-design user-friendliness, and the provision of relevant instructions and information are all critical to enable theory to translate into practice, and for potential effectiveness and savings to be realized.

Practical benefits:

Energy-effective systems balance a building's electric light, daylight and mechanical systems for maximum benefit.

Enhanced lighting design is more than an electrical layout. It must consider the needs and schedules of occupants, seasonal and climatic daylight changes, and its impact on the building's mechanical systems.

Lighting systems:

Adding daylight to a building is one way to achieve an energy-effective design. With the reduced need for electric light, a great deal of money can be saved on energy. Nearly every commercial building is a potential energy saving project, where the electric lighting systems can be designed to be dimmed with the availability of daylight. Up to 75% of lighting energy consumption can be saved. In addition, by reducing electric lighting and minimizing solar heat gain, controlled lighting can also reduce a building's air conditioning load. This requires proper power supply system to avoid and power gaps.

Mechanical systems:

The HVAC system and controls, including the distribution system of air into the Workspaces are the mechanical parts of buildings that affect thermal comfort. These systems must work together to provide building comfort. While not usually a part of the aesthetics of a building, they are critical to its operations and occupant satisfaction.

Occupants can be driven to distraction trying to adjust the comfort in their space. Improper temperature, humidity, ventilation, and indoor air quality can also have significant impacts on productivity and health. When we are thermally comfortable we work better, breathe easier, and focus our attention better.

Intelligent homes :

With the widespread adoption of digital technologies there will be a profound change in how we communicate with others. Even how, in our homes, we shop for goods and services, receive news, manage our finances, learn about the world, and, conduct business, manage resources, find entertainment, and maintain independence and autonomy as we enter old age.

These activities increasingly take place in the home. As our perception of banks, shops, universities, communities, and cities change in response to new technologies, so home building management systems are taking on an extraordinary new importance.

As it exists today the home cannot meet these demands or take advantage of new opportunities created by social and technological changes. Until recently, the majority of homes were wired with little more than the main electrical circuits, a few phone lines, and a few TV cables. Times have changed. Electrical and security system contractors routinely install low voltage communication network cables for a wide range of intelligent home or 'smart home' systems.

Services and equipment that utilize these networks include: security; home theatre and entertainment; telephones, door-phones and intercoms; PC and internet networks; surveillance cameras; driveway vehicle sensors; communicating thermostats; motorized window blinds and curtains; entry systems; and irrigation systems.

Smart homes :

'Smart home' is an alternative term for an intelligent residential building, or an intelligent home. These terms are now commonly used to define a residence that uses a control system to integrate the residence's various Automation systems.

Integrating the home systems allows them to communicate with one another through the control system, thereby enabling single button and voice control of the various home systems simultaneously, in pre-programmed scenarios or operating modes.

The development of smart home systems focus on how the home and its related technologies, products, and services should evolve to best meet the opportunities and challenges of the future. The possibilities and permutations are endless.

A scenario such as 'I'm Home' could be triggered by pressing one button on a key-ring remote-control from your vehicle as you approach the driveway. The control system receives the key-ring remote-control's command. This will then trigger a pre-programmed sequence of functions. For example starting by turning on the lighting in the driveway, garage, hallway, and kitchen. It then disarms the security system, opens the garage door, unlocks the interior garage entry door, adjusts the heating to a preset temperature, and turns on the whole-house audio system playing your favorite CD.

The control system is programmed to meet specific user requirements, initiating sequential automatic operation of the home systems, in response to 'one button' commands based on the situation and or time.

At 7:30am as you awake to the sound of your favorite CD playing in the background; the lights in your bedroom switch on; 'fading up' to allow you to wake up in your own time. The downstairs intruder alarm system is de-activated. In the kitchen the coffee machine turns on to make a drink. The ground floor curtains and blinds open; the towel heater in the bathroom warms the towels. And you haven't even got up yet.

These simple examples demonstrate how smart home technology will change people's lives. Designing systems that group together and automate everyday simple tasks improve quality of life and reduce stress levels.

Abdallah Hayek P.E
CEO
Hayek Group s.a.r.l.
Beirut – July 2007