The architecture of tomorrow, *today*

> *Green buildings require intelligence* **to deliver on their financial and sustainability promise.**

The power of technology to transform societies is a cornerstone of our history. In the 20th century, new technologies in the form of the steel frame, curtain wall, elevator, electricity, and air conditioning led to buildings as we know them today. In the 21st century, digital technology is again changing how we design and construct buildings and the building fabrics themselves: both how we operate and maintain them as well as how their occupants experience and use them.

The real estate, design and construction industry began with first steps in exploring the concept of an intelligent building in the 1980s, when electronic devices influenced office and building automation, and were incorporated into the physical fabric of buildings. Today, we are increasingly working towards smart buildings as environmental sustainability grows as a major global trend and today's technology is used to modernise building operations, design-build processes, and the environmental performance of buildings. Taken together, these real estate transformations enhance user experiences, streamline design-build processes, reduce the cost of the building lifecycle, and foster environmental sustainability.

Integrating a building's technology systems and constructing a sustainable or 'green' building have much in common. Green buildings are about resource efficiency, lifecycle effects and building performance. Smart buildings, whose core is integrated building technology systems, are about construction and operational efficiencies, and enhanced management and occupant functions.

Part of what a smart building will deliver is energy control and energy cost savings beyond that of traditional system installation, due to the tighter control system integration. Smart and green buildings both deliver the financial and conservation benefits of energy management.

The question, then, is what is the difference? And how do smart buildings make a building green? Wolf Stinnes, Solutions Architect for Special Projects, Dimension Data Middle East and Africa, says a smart building rests on a 'nerve centre', which provides the brain of a building, allowing enhanced performance and functionality.

"Smart buildings enable green buildings, and green buildings are invariably smarter," he says. "The green building predicates an integrated design approach, and the resultant holistic assessment of technologies is the transformational agent that enables this vision, with connectivity as the critical attribute it creates. In this context, connectivity can be thought of as the ability to facilitate interaction among devices and systems to enable new services. A prerequisite for a green building is intelligence in the building, so a converged network is therefore essential."

Innovative services

Laurent Leclercq, CEO of Dimension Data Advanced Infrastructure, adds that it's all about creating environments where building owners and users have full visibility of their systems and energy utilisation. "We can think of connectivity in buildings from two perspectives: the IT perspective and the buildingsystems perspective. In the IT world, convergence combines data, voice and video onto a common network. The real-estate perspective combines these IT elements with building-automation systems to form a single, digital infrastructure. With this fully integrated digital infrastructure, building owners and operators can transform their properties and business models, differentiate themselves from competitors, and deliver innovative services at lower costs."

The effectiveness of these actions, however, is greatly influenced by the building envelope — a roof, walls and windows. The most impressive energy management system has limited benefit in a building with single-pane windows, inadequate insulation and inefficient incandescent lighting — all of which cause extreme energy inefficiency. While it's better to build a smart building from the ground up, it's also possible to retrofit so that green building management becomes a standard and automated practice, eliminating the common causes of inefficiency and allowing the intelligence of the network to fully come into play.

Network as a utility

This converged network becomes the fourth utility alongside water, electricity and gas. The benefits it offers not only encompass productivity and competitive advantage for owners and tenants alike, but provides savings across the triple bottom line: environmental, economic and financial.

Stinnes points out that this is also resulting in a change in how the cost of services is approached. "We are seeing an appreciation of how converged real estate can be a competitive differentiator for building owners and developers, which creates additional economic value. Historically, the costs of all utilities in a building were simply attributed to tenants by the landlord; smart buildings are now providing tools whereby tenants can control these costs, and benefits are shared by tenants and landlords." He adds that this also provides significant new revenue opportunities for landlords who are willing to take a more proactive approach to meeting their tenants' needs.

The result is a convergence of the worlds of ICT and facilities management. Booysen explains that this is the reason CIOs are increasingly getting involved in the facilities management side of the business, as the technologies involved in building and energy management systems become part of the ICT operational layer of a business.

"It's a natural progression from the CIO's responsibility for the reduction of energy utilisation in datacentres. In enabling and reporting on energy efficiency throughout a building, they are taking their management of an intelligent environment to a new level. While IT systems are essential, strategic components of buildings, they are rarely factored into the environmental sustainability equation. Taking advantage of these systems provides many opportunities to improve sustainability, including reducing the resources needed in manufacturing and distribution, cutting the energy and materials consumed during operational lifecycles, improving health and productivity effects on users, and properly disposing of toxic electronic waste," he says.

Smart building advantages

- Allows the creation of new tenant services (from wireless internet access and IP telephony to unified messaging and video), generating new revenue streams with guaranteed quality of service and high levels of security and resilience.

- Enables easy implementation of innovative building amenities and applications – such as virtual concierge, soft signage and online room booking – increasing tenant attraction and retention rates.

- Provides tenants with solid outcomes such as reduced cost and complexity in the move to new premises, reduced operational expenditure on network upkeep and upgrade, and access to productivity tools without capital outlay.

- Offers investment protection from the cyclical nature of the real estate industry through the ability to enhance property values and create differentiated buildings.

- Reduces capital expenditure and operational expenditure over the building lifecycle, and provides greater control over the management of building systems and facilities.

- Support, repairs, and maintenance are faster with more integrated crew support through wireless technology.

- Improved asset management and tracking – together with automated work scheduling, billing and help desks – linked to existing enterprise resource planning (ERP) systems.