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GREEN BUILDINGS FOR NEW ECONOMY

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Abstract: *Green building, intelligent control systems and software building systems in households can contribute to savings in heating up to 30%, while energy savings can be up to 5%. Intelligent or a smart house is a house that has a built-in central control system. Such a system is able to integrate multiple systems (heating, hot water, cooling, lighting, and security). One of the essential functions of this system is the optimization of energy consumption in the home. The system can regulate the temperature in every room in the house in a given mode, be it winter or on the fly, can control the lighting in some areas, on or off electrical appliances, ventilation systems, exterior shutters and fire alarm system.*
In this paper the analysis and architecture for the green buildings and Cisco® Connected Real Estate for intelligent or smart house is presented.

Keywords: *Environment, Software system, Management technology, Green buildings, Cisco® Connected Real Estate*

1. INTRODUCTION

THE POWER OF TECHNOLOGY to transform societies is a cornerstone of our history. In the last 150 years, scientific exploration and invention led to huge technology infrastructures that transformed built environments and the way we use them. Technology led to metropolitan, then national and international infrastructures for power, water, transportation, and communications. These advances added value to real estate by creating environments that liberated human activities from site and climate, intensified space use, and facilitated urban development.
Information System (IS) is a set of activities for the processing of information. The new millennium marked a new Knowledge-Based Society (KBS) or shorter Knowledge Society (KS). The basis of the society mainly consists of non-material software and technology. Research in the field of environment is becoming more attractive with the increase of the number of inhabitants on Earth. Many services which are being used at the moment represent a simple IS expansion of Web internet service [1,2].
Environmental management system (EMS) presents a decentralized system set up in the areas of pollution control, central and offshore ecology, bio-degradation of wastes and environment management, toxic chemicals, environmentally sound and appropriate technology, etc.
The scale of development concepts and technologies for Environmental Management System (EMS) and the application of ISO 14000 series of standards is shown on figure 1.
The system by that ensures environmental information collection, collation, storage, retrieval and dissemination to all concerned. EIS provides environmental information to decision makers, policy planners, scientists and engineers, research workers, etc.

Intelligent control systems and software building systems in households can contribute to savings in heating and up to 30%, while energy savings can be up to 5%.

2. GREEN BUILDINGS

New building rating systems, such as the Leadership in Energy and Environmental Design (LEED™), better evaluate a building's environmental and energy performance. Green building products certification programs strengthen the growth of green building practices by making it easier to identify and evaluate options for buildings.

Why not green? Sustainable buildings cost less to heat, cool and light. That means lower operating costs for the owner. Sustainable buildings have shown improved comfort and performance for the occupants. That translates into higher sales prices and rents for the builder and developer.

Sustainable buildings produce less pollution because they use less energy. They make wisely use natural resources in their construction by lowering the consumption of building materials. Most importantly, they are healthier spaces to live and work.

Many builders are reluctant to consider constructing "green" because they believe the marketplace is not interested. The fear the public views sustainable buildings as "something strange." Moving off the "tried and true" path is always uncomfortable; however, those builders willing to take the risk have found a very responsive audience. Take, for instance, the Four Times Square commercial structure in New York City. The developer and builder of this 48 story, 1.6-million-square-feet green giant, committed to environmental responsible design. This building includes high energy efficiency features, indoor air quality, sustainable materials and responsible construction, operations and maintenance. As a result, Four Times Square commands top dollar from its willing occupants and is 100 percent occupied.

3. FIVE BASIC PRINCIPLES

Sustainable building practices consider environmental factors, human health and well-being, in addition to the traditional criteria of function, cost and aesthetics. According to the Primer on Sustainable Building by the Rocky Mountain Institute; there are five "must do" principles an architect, developer and builder should consider before starting a sustainable project.

1. Green is a building philosophy not a building style. It's not the green features that dominate the architecture. Energy efficiency and sustainable measures are basically invisible and can be blended into any design.
2. Thorough planning. There is no substitute for taking enough time to "think through" all the sustainable features you want included in the structure. Sustainable buildings are front-loaded - extra work must be done in the planning stage to incorporate green features into the design.

Green buildings are not after-thoughts. The green agenda is an ambitious one and, at first glance, is intimidating. Today, these building types require more planning and thought for the developer and builder. More lead time is needed to understand new information and become comfortable with new building products and approaches.

3. Sustainable buildings aren't necessarily more expensive or complicated. You could spend more, and it certainly would be justified with all the quick paybacks from reduced operating costs; however it's not necessary. The success of sustainable buildings comes not from what mechanical features are included but rather, which ones are left out. The best systems are the ones you no longer need.
4. An integrated approach is critical. You cannot design a conventional building and then decide to add efficient technologies, natural daylighting, and green materials as an afterthought. You cannot design a green building without considering the site, the placement of the building or its impacts on the surrounding environment. Try that approach and what you get is a building that ends up as an expensive, piecemeal mess that performs only slightly better than a conventional structure that appears as a wart on the landscape.
Integration is the name of the game. For instance, upgrading windows to super efficient ones can reduce the size of the heating and cooling system you need. By spending more up front, you will have lower operating costs down the road.
5. Minimizing energy consumption is the central goal and organizing principle. Design elements fall into three categories: energy-saving architectural features, an energy-conserving building shell and energy-efficient mechanical devices such as water heaters and lights.

Remember, going green is not a yes or no, all-or-nothing proposition. Once you make the decision to move down the sustainable path, do what you can handle. A building that has thoughtfully incorporated a few well-designed sustainable features is far better than one that doesn't. So, as the Rocky Mountain Institute suggests, "Go as green as your time, skills, client and project allow. If your decisions save some lumber, some energy, or even water, you're definitely doing the right thing."

4. CISCO® CONNECTED REAL ESTATE

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. Here in the 21st century, digital technology continues to accelerate our ability to increase real estate values.

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.

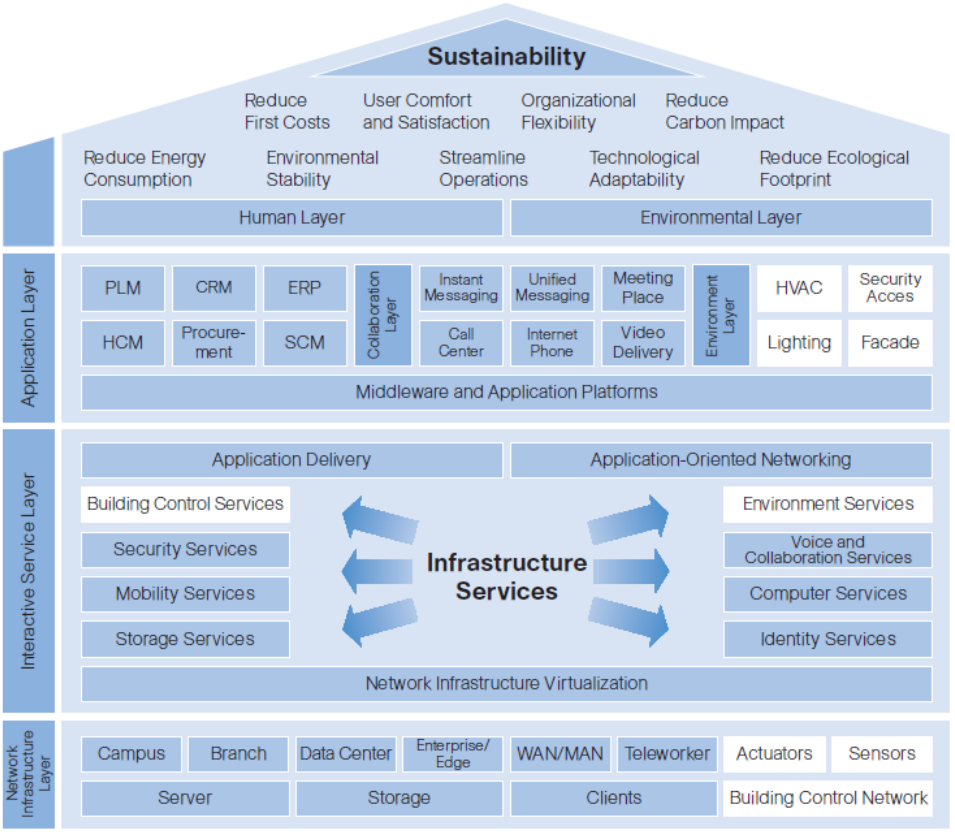

Figure 1: Integration of building systems (white) in the intelligent information network architecture
CRM = Customer Relationship Manager, ERP = Enterprise Resource Planning,
HCM = Human Capital Management, HVAC = Heating, Lighting, Air Conditioning,
PLM = Product Lifecycle Management, SCM = Supply Chain Management.

Critical to the success of Information Technology-Enabled Sustainability is the convergence of building systems and information technologies. This diagram illustrates the integration of building systems (white) in the intelligent information network architecture. The resulting networking benefits for humans and the environment are shown in the top triangle.
Source: Carnegie Mellon University, 2006.

As the digital Building Information Model takes hold, we expect new ecosystems of partners to emerge that are better able to meet client demands. The detailed databases created during the design-build phases of the building lifecycle have additional value for the operations and maintenance phases. Handing off these databases to operational organizations provides a strong, real-time knowledge base for day-today operations. It also assists them with simulating user requirements.

Future sensor and sensor network systems must successfully address the following factors:

- User needs and decision support to create comfortable, healthy, and productive settings;
- Organizational requirements for flexibility;

- Technological adaptability to ensure easy introduction of new technology, and the removal of outdated technology, without waste;
- Energy and environmental effectiveness in operation and maintenance throughout the building's lifecycle.

Cisco Smart+Connected Real Estate Advisory Services (Figure 2)
Cisco adopts an end-to-end lifecycle approach to Cisco Smart+Connected Real Estate. It starts with initial advisory consulting, which covers understanding the vision and key value drivers, identifying key services that help realize the vision and targeted goals, creating business cases for the services, and specifying the underlying architecture to enable the desired services. Cisco advisors can continue by providing Master System Integrator (MSI) support and RFI/RFP selection, as well as additional aspects of implementation and testing, operations, and optimization.

Cisco Smart+Connected Real Estate solutions are the building blocks for the real estate of the future. The converged network becomes an intelligent building infrastructure and the foundation for change in any development project.

Cisco Smart+Connected Real Estate can increase profitability by providing additional revenue streams and enabling new, differentiated opportunities. It can provide end-customers with a superior standard of living while maintaining environmental sustainability [19].

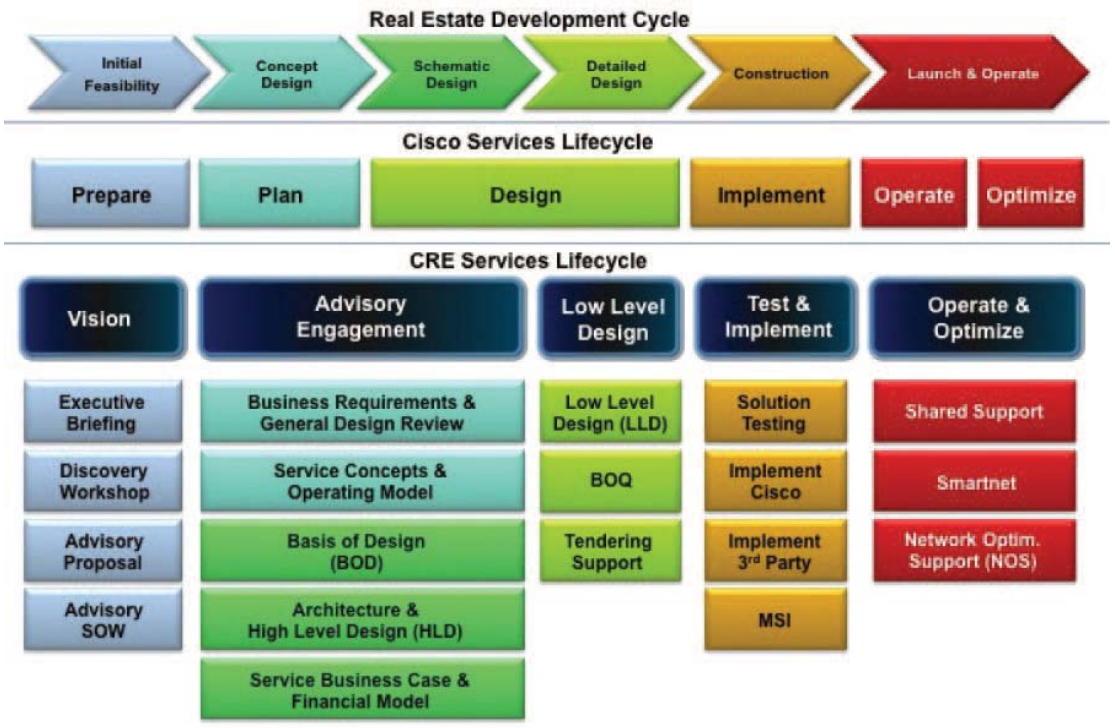

Figure 2: Roadmap for Success Cisco Smart+Connected Real Estate

5. CONCLUSION

Set of activities for the processing of information, together with associated organizational resources such as human, technical and financial, to provide and distribute information in the field of environment, which is called the environmental information system.

The term eco-efficiency is based on the concept of creating more goods and services while using fewer resources and creating less waste and pollution.

Integrated design stands on the pillars of human needs for healthful, safe, and productive environments; on societal needs for energy, resources, and security; and on environmental needs for healthy and diverse ecological systems. To develop a new model for integrated design, new metrics for accurately assessing the cost effectiveness of alternative design scenarios for enhanced health and productivity in high-performance buildings must be developed, including cost-effective monitoring tools and control strategies that can be integrated into the next generation of automated building control systems.

Therefore, in close cooperation with the industry, is developing ubiquitous, flexible, re-addressable, and wireless sensing systems, combined with advanced logic concepts. These systems have to be integrated with flexible, adaptable, and responsive building technologies, such as those that have been realized in the IW. These new sensing systems require advanced decision making processes that have distributed intelligence. The distributed intelligence aspect could then be a major gateway to advance the entire field of sensing systems.
This vision is now realizable with advances in IT infrastructures and software innovations. Every fixture in a workspace can be addressed: lights, air diffusers, radiators, blinds, window openers, PCs, printers, radios, and locks. The IW is pursuing this future vision as the Information Technology Enabled Sustainability Test bed (ITEST).
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