Digital Home High Level Requirements Definition (9/15/2010)

Introduction

This is a "high-level" definition of the requirements (HLRD) for the development of a "Smart House", called DigitalHome, by the DigitalHomeOwner Division of HomeOwner Inc. A "Smart House" is a home management system that allows home owners (or renters) to easily manage their daily lives by providing for a lifestyle that brings together security, environmental and energy management (temperature, humidity and lighting), entertainment, and communications. The Smart House components consist of household devices (e.g., a power and lighting system, an air conditioning unit, a sound system, a water sprinkler system, small appliances, security system, etc.), sensors and controllers for the devices, communication links between the components, and a computer system, which will manage the components.

The HLRD[1] is based on the *DigitalHome Customer Need Statement*. It is made up of a list of the principal features of the system. This initial version of DigitalHome will be a limited prototype version, which will be used by HomeOwner management to make business decisions about the future commercial development of DigitalHomeOwner products and services. Hence, it does include all features discussed in the *Need Statement* and the HLRD is not intended as a comprehensive or complete specification of DigitalHome requirements. The main purpose of the HLRD is to support an effective project planning activity. The HLRD was prepared by the Marketing Division of HomeOwner Inc, as part of a needs assessment for the DigitalHome project.

DigitalHome Prototype Features

The DigitalHome System shall allow any web-ready computer, cell phone or PDA to control a home's temperature, humidity, lights, and the state of household appliances (coffee maker, stove, etc.). The communication center of the system shall be a personal home owner web page (maintained by DigitalHomeOwner - at http://www.DigitalHomeOwner.ccc), through which a user can monitor and control home devices and systems.

Each DigitalHome shall contain a master control device that connects to the home's broadband Internet connection, and uses wireless communication to send and receive communication between the DigitalHome system and the home devices and systems.

The DigitalHome shall be equipped with various environment sensors (temperature sensors, light sensors, humidity sensors, power sensors, contact sensors, water sensors, etc.). Using wireless communication, sensor values can read and saved in the home database.

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[1] This HLRD could be considered a concept of operations (ConOps) document, a user-oriented document that describes system operational characteristics from the end user's viewpoint.

The DigitalHome security system consists of a set of contact sensors and a set of security alarms, which are activated when there is a security breach.

  a. The security system shall use wireless signals to communicate, through the master control unit.
  b. The system shall use both sound and light alarms and will be able to manage up to thirty door and window sensors.

The DigitalHome programmable Thermostat shall allow a user to easily monitor and control a home's temperature from wherever anywhere, using any web ready computer, cell phone, or PDA.

  a. Thermostats can be placed throughout the home and can be controlled individually or collectively, so that temperature can be controlled at different levels in different home spaces.
  b. A thermostat unit shall communicate, through wireless signals, with the master control unit.
  c. The system shall support Fahrenheit and Celsius temperature values.
  d. The system shall be compatible with most centralized HVAC (Heating, Ventilation and Air Conditioning) systems: gas, oil, electricity, solar, or a combination of two or more.
  e. The user shall always be able to override the scheduled settings at any time.

The DigitalHome programmable Humidistat shall allow a user to easily monitor and control a home's humidity from anywhere, using almost any web ready computer, cell phone, or PDA.

  a. Humidistats can be placed throughout the home and can be controlled individually or collectively, so that humidity can be controlled at different levels in different home spaces.
  b. A Humidistat unit shall communicate, with wireless signals, through the master control unit.
  c. A Humidstad unit shall manage humidity sensors and dehumidifiers/humidifiers located in a specified home space.
  d. The user shall be able to select the humidity levels found most comfortable — from 30% to 60%.

The DigitalHome programmable Power Switch shall provide for management of a home's household appliances and shall allow the user to turn appliances and lights on or off as desired.

  a. The Power Switch unit can control the central lighting in each room and up to forty 115 volt, 10 amp appliances that plug into a standard wall outlet.
  b. The system shall be able to provide information about whether a Power Switch device or la ight is off/on.
  c. A user shall be able to monitor the state of the appliance, and turn on or off any appliance through any web ready computer, cell phone or PDA.

The DigitalHome Planner shall be able to provide a user with the capability to direct the system to set various home parameters (temperature, humidity, security level, and on/off appliance/light status) for specified time periods.

  a. DigitalHome provides a monthly planner on its web site.

b. Parameter values can be scheduled on a daily or hourly basis.
c. All planned parameter values can be overridden by a user.
d. Various plan profiles (normal monthly profile, vacation profile, summer profile, holiday profile, etc.) may be stored and retrieved to assist in planning.
e. The DigitalHome Planner shall be able to provide various reports on it management and control of the home (e.g., historical data on temperature, humidity, lighting, etc.).