COMPUTER SYSTEM SUPERVISION AND INTELLIGENT CONTROL

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Summary: The buildings are designed and built, but in our country there are not those where items such as comfort, saving time, effort, supervision, monitoring and control their electronic services is included. Satisfaction providing a place where people spend the most time of his life.

In our local environment as society evolves and grows, with it also increases the need to manage what goes on inside a building, to set its usage, as the owners can not spend much time inside their homes because of the different activities performed. So the automation of these processes become as necessary as life itself, often these factors depend ourselves and our families.

This application focuses on the lights on and off, open and close curtains, intruder alarm, entry control through an electronic plate and reports the status of the building allow monitoring of housing also control schedules on and off generates an inhabited environment.

Prevent intruders, reduce the concern of the people to have a schedule of tasks to be performed in the home should not be in the same indicates the opportunity for development of this application, for this reason, the creation of computer system enriched this control will facilitate and cover user needs (speed, efficiency, effectiveness, comfort, security, saving time and timely reports.).

1. Introduction

The daily activities most people take place outside of their homes. Several of the household tasks are omitted for lack of time to accumulate the short or long term, this crime makes people feel unsafe to leave her home alone it adds. That is why the need to implement a system that creates a simulation environment with the presence of automated control services the same. Provide users with efficient, effective and timely solution to your problems contributing to the technological advancement in the homes of our environment.

Product costs, energy use, reliability, security, easy management system and mode of maintenance: an analysis among technologies that automate buildings taking into consideration is performed.

The computer system implemented to manage the control of a building services and security monitoring intelligently.

Among the main processes is the access to the building by means of an electronic key, which verifies the user's identity by entering your password for opening, otherwise the alarm signal if unwanted entry or theft. The movement programmed opening and closing of curtains in a room at a time predetermined by the user. The on and off the lights in time defined by the system administrator, general safety level of the building using intrusion alarm, it detects which part of the building the security breach took place.

For the design of this thesis has taken materials of excellent quality, low cost and recycled printing materials, the technology used for the transmission of information is performed by wireless, making the safest building in their protection and in their access, it is also comfortable and reduces energy consumption.

Goals

- **General**

  mplement a computer system that manages the control of a building services and security monitoring in a smart building.

- **Specific**

➢ Improving the safety of persons and property controls and intrusion alarms in building techniques.

➢ Create an atmosphere of inhabited dwelling.

➢ Check the operation of lights and shades of the building according to the user programming.

➢ Control of entry into the building through electronic lock with password entry per user.

➢ Provide information through reports of the current status of the building.

➢ Provide a suitable software tool, which is easy to use for users involved in the management, control and monitoring of the building.

➢ Design and implement a prototype system of management, control and monitoring for a smart house.

- **Justification**

The reality of the current buildings is that their inhabitants can not be at all times within it, whether for work, travel or other. That is why several of the buildings need our

habitat monitoring and control, allowing create a presence simulation environment, and show their behavior in real time.

The design and construction of buildings makes architects more and more items for your customers to meet their needs when wishing to purchase or build a home added.

Because the technology is today one of the means to communicate, or used in any circumstances to perform tasks that facilitate and enhance everyday life, society chooses its benefits, which require the implementation of a computer system controlling home especially to monitor the activities carried out within it, even though its inhabitants are not at home.

Las Edificaciones Inteligentes dependen de un conjunto de tecnologías para poder subsistir, estos elementos se desarrollan dentro de la Domótica, la cual provee los recursos tecnológicos, la automatización y control centralizado y, o remoto de aparatos en la vivienda.

Intelligent buildings depend on a set of technologies to survive, these elements are developed within the Smart Home, which provides the remote technological resources, automation and centralized control or devices in the home.

- **Scope**

The system will allow users to monitor their home through the computer system, including processes for intelligent building control are monitoring, lighting control, shade control, income through electronic locks, reporting of events in home at certain times. For purposes of this project it is set to build a prototype in a room of the building where test the functionality of both the electronic part how the computer system.

- **Limitations**

The way Windows system does not allow viewing platform controls the application via the Internet.

2. Materials y Methods

2.1 Desing

For the development of this project will be used:

HARDWARE
Programming PIC Microcontrollers:

➤ MicroCode Studio 4.0 - IDE
➤ IC-prog – PIC programmer
➤ Pbp (PICBasic PRO Compiler 3.0)– Compiler for PIC

SOFTWARE

Technology Platform:

➤ .NET

IDE development:

➤ Microsoft Visual Studio 2012
➤ Visual Basic. NET

Database:

- Microsoft SQL Server 2008 R2 Express

2.2 Methodology

The RUP methodology was applied in the development of software. A continuous process of testing and feedback is applied, guarantee performance quality standards. The process is defined in

terms of activities, goals, strategic and artifacts (documentation) for each phase of development goals. Thus the human resource can optimize their skills, competencies and capabilities assuming specific roles responsibly.

- **RUP Phases**

➢ **Design phase**

Define limits the scope, identify potential risks, it proposes an overview of the software architecture and produce the plan of the phases and iterations of the project.

➢ **Processing Step**

Select and develop use cases to define the basis of the system architecture, make the specification of each use case and the first analysis of the problem domain designing the preliminary solution.

➢ **Construction phase**

Here you must complete system functionality, sorting the pending requirements, according to

assessments users make changes to the project improvements.

➢ **Phase transition**

It verifies that the software meets the specifications of the project, the errors found in acceptance testing is set, enables users and provides the necessary technical support. The product is ready for end users.

- **Main characteristics**

a) Has a scheme assigned tasks and responsibilities (who does what, when and how).

b) Its development is iterative.

c) Manages requirements.

d) Its architecture is based on components.

e) Track Changes.

f) Visually modeling software.

g) Verify software quality.

- **Specification of Phases**

a) It defines the scope.

b) Identify the entities or actors will interact with.

c) Identify use cases.

RUP process comprises:

Process: The steps in this section are:

a) Business Modeling

b) Requirements

c) Analysis and Design

d) Implementation

e) Testing

f) Deployment

Support: In this part we get to the following steps:

a) Change management and configuration

b) Project management

c) Environment

d) The iterative development process:

e) Home (also called Inception)

f) Development (Also called Implementation, Construction)

g) Close (called Transition)

3. Results

The software manages the following functions: user Income security, management and control of users, administration and control of employees, revenue management and control employee entrance door, lighting management and control, administration and control, curtain control intrusion alarm-protected areas, each module reports. Besides this only made an administrator user type, a general user only displayed reports.

A. External Interfaces

- Authentication window containing: username, password.

Figure 3.1 Entry form for a user to the system.

- Vertical System menu.
- Windows Windows dialog box type with standardized controls.

Figure 3.2 Form Manager.

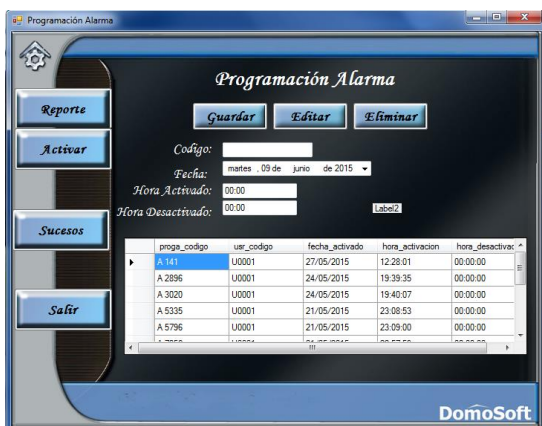- Earnings reports and schedules control devices controlled by the system.

Figure 3.3 Form for programming the alarm.

B. Functions

Sets of functions dependent on the type of user who established plays.

- **Administrator**

- User Management and Employees.
- Creation, deletion, editing schedules for lighting control, curtain and alarm.
- View all times and report by date.
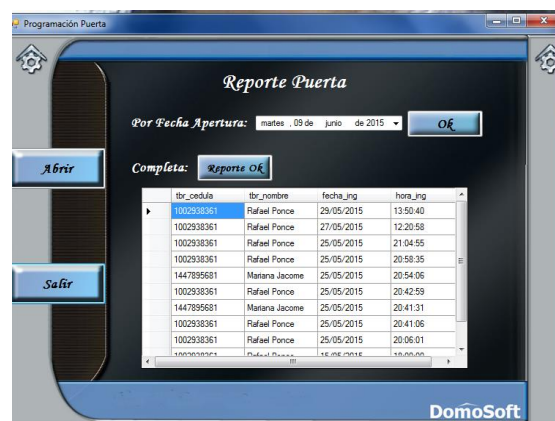- Display Total income of employees and by date.

Figure 3.4 Form for managing the door

- Viewing events intrusion alarm activation.
- Open the front door from the application.
- Controls access by keyboard entry door of employees.
- Turn on, off or totally independent lights.
- Open or close the curtain of the room.
- Activate the alarm from the system and keyboard.

- **General**
- Show report caused by unwanted intrusion of individuals.

➢ Display reports of income for employees.

Figure 3.5 Form for displaying reports for the general user.

C. System Attributes

○ Security

➢ Access the application using a valid username and password

➢ Income employed by door through keyboard key.

➢ Access Setup only employee in the employee module that controls the system administrator.

➢ Income front door intrusion alarm activation.

➢ Turning key keyboard and system.

➢ If income from other means activating the alarm immediately.

➢ If there is shortage of electricity the system is disabled and the alarm is activated only.

○ Maintainability

➢ User Manual and technical assistance available.

➢ Full documentation of the source code sequence.

○ Portability

In Windows platform application flows naturally.

4. Conclusions

• Achieved Implement the implementation of a computerized system to manage the control of a building services and monitoring it up this way is fulfilled with the overall objective of this project.

• The building is more comfortable with the automatic management of the movement of the curtain.

• The safety of people and property is controlled by the control devices and alarm intrusion within the building.

- The development tools are free license to help reduce costs in product development.

- The system displays your reports with real-time information on the current situation of the building.

- The computer tool was developed with a simple interface for easy understanding and management of the users involved in the management, control and monitoring of the building.

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