USER DRIVEN AUTONOMOUS ECOSYSTEM PLATFORM FOR SMART OFFICE OR THE LIKE

BACKGROUND OF THE INVENTION

1. Technical Field

The present invention relates to building control system and, in particular, to a smart office or the like user driven autonomous ecosystem platform. Still more particularly, the present invention provides an ecosystem that uses algorithm based on users' data to autonomously manage the environmental conditions of a space.

2. Description of Related Art

Today building control system is very focused within the facilities managers' usage. There is very minimal, if at all, input from users of space or the like. Such systems and solutions available today in the market include fragmented silo building features what are managed from administrator side, but there is no system which allows the occupants to have a say in the settings of the building. There is no ecosystem available that ties in various protocols from different sensors, equipment, and no system to allow the users to choose the features they want in a single smart office monitoring system. Also, there is no user driven smart office/commercial solution that uses algorithm based on users' data to autonomously manage the conditions of the space. In other words, there is no single easy to use platform that can consolidates myriad of IoT solutions available.

Currently available Smart Office Solutions lack input from users and the industry needs easy to use Smart office system with universal compatibility.

Other various factors what motivate overcoming drawbacks of the available smart office solutions include Green energy movement including Green 2030 will require companies to do more in terms of energy management; tenants, occupants and users are being more aware and showing more interest in indoor air quality and energy usage; there is more emphasis on office space quality as a factor of employees' satisfaction; many MNC choose office space based on green level and energy management features; developers need to differentiate themselves from competitors- Developers are no longer just selling space - they are selling a space solution, ecosystem and an experience.

The physical space is just one part of it; Smart Space solutions that offer future expansions for unforeseeable requirements in the environment for example contact tracing and thermal

sensing during breakouts. For example, with inclusion of a thermal sensor in the smart office solution- when high temp is sensed, alert sent to facilities manager, and notification can be sent to the employee; and with the advent of Covid- contactless autonomous technology is even more required.

The present invention recognizes the disadvantages of the prior art and provides a user driven autonomous ecosystem platform for smart office or the like. The unique features of the present invention will fit the market needs.

SUMMARY OF THE INVENTION

A main object of the present invention is to provide a user driven autonomous ecosystem platform for smart office or the like, wherein the user driven smart office software solution is provided with a server software and user mobile application. The autonomous ecosystem platform allows building owners to manage their space based on inputs from occupants via a voting mechanism or solicited input.

It is an object of the present invention to provide a user driven autonomous ecosystem platform for smart office or the like, wherein an algorithm logic is used to derive from collective data received from space occupants. The level of control for the environment is maximised with open platform compatible with multiple industry protocols. This is combined to achieve optimal environmental conditions based on users' feedback, for instance, shoppers give feedback that the environment is too cold, or office workers give input that the lighting is too dim. These data are fed into the algorithm that enables autonomous management of the environment in response to the feedback receive from the users.

Another object of the present invention is to provide a smart office user driven autonomous ecosystem platform comprising:

an embedded system which is configured for control by software applications;

a mobile system wherein the mobile system comprises a touch sensitive display, a processor, a memory, and a wireless transmit and receive unit for wireless local area network (WLAN) communication; and

an information system, wherein a plurality of data are collected and processed by an algorithm are delivered to occupants of a premise.

Yet another main object of the present invention is to provide a method for using smart office user driven autonomous ecosystem platform comprising the steps of:

collecting a plurality of users' data on input and opinions of an environment;
collecting a plurality of users' preferences for the environment;
processing by a system and algorithm to convert users' data and user's preferences contribute influence to control of the environment; and
triggering a change of the environment by adjusting controls to a plurality of mechanical devices equipped at a premise.

Yet still another object of the present invention is to provide a smart office user driven autonomous ecosystem platform, wherein the software applications include a server software and a user driven smart office software, allowing a user or an occupant to input data (vote) on conditions of environment.

Another object of the present invention is to provide a smart office user driven autonomous ecosystem platform, wherein the input data from the user or the occupant is collected and is translated by the Algorithm to determine a change in environmental conditions.

It is yet another object of the present invention to provide a smart office user driven autonomous ecosystem platform, wherein the change in environmental conditions is determined autonomously by adjusting controls of a plurality of mechanical devices equipped at the premise.

Further object of the present invention is to provide a smart office user driven autonomous ecosystem platform, wherein the input data by the user is real time and the change in environmental conditions is in real time autonomously.

Further object of the present invention is to provide a user driven autonomous ecosystem to the followings: smart building, smart officers, smart residential, Internet of Things, building and Office Energy Management, and environmental wellness.

Yet still an object of the present invention is to provide a single easy-to-use smart office platform what consolidates various IoT solutions which gives occupants and facilities team single access to the most useful IoT solutions and data quickly and proficiently. The present invention provides the capability to integrate industry multiple protocols over a single server platform that delivers essential control and data, supports focused attention and efficiency in the management of an optimal environment.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

FIG. 1 depicts a pictorial representation of a user driven responsive IoT space of the ecosystem platform in accordance with the present invention;

FIG. 2 is a schematic view indicating the implementation of the user driven autonomous ecosystem platform on building automation, building energy management, lighting & blind control, environment monitoring & data collection, schedules, alerts & reports of the preferred embodiment of the present invention;

FIG. 3 depicts a pictorial representation of a user driven responsive IoT space on temperature of the present invention.

FIG. 4 depicts a pictorial representation of a user driven responsive IoT space on lighting of the present invention.

FIG. 5 depicts a pictorial representation of a user driven responsive IoT space on energy of the present invention.

FIG. 6 depicts a pictorial representation of a user driven responsive IoT space on Internal Air Quality of the present invention.

FIG. 7 depicts a pictorial representation of a user driven responsive IoT space, allowing users to influence environment variables in accordance with the present invention.

FIG. 8 depicts a pictorial representation of a user driven responsive IoT space, allowing users to influence environment sensing in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention provides a user driven autonomous ecosystem platform for smart office or the like. Therefore, the following FIGS. 1–8 are provided as exemplary diagrams of user driven autonomous ecosystem platform in which the present invention may be implemented. It should be appreciated that FIGS. 1–8 are only exemplary and are not intended to assert or imply any limitation in which the present invention may be implemented. Many modifications to the depicted environments may be made without departing from the spirit and scope of the present invention.

As shown in FIG. 1, which depicts a pictorial representation of a user driven responsive IoT space of the ecosystem platform in accordance with the present invention, based on a preferred embodiment, a space is created where the space serves the occupants. A smart space solution communicates environmental data to and collects input from the occupants. Data collected from the occupants or occupants' data is used to ensure workspace attributes like sound, light and space adapt to occupants needs and preferences including light dimming to natural circadian rhythms, glare management, indoor air quality level and temperature. This leads to enhanced in-office/environment experience.

A preferred embodiment of the present invention a smart office user driven autonomous ecosystem platform comprising:

an embedded system which is configured for control by software applications;

a mobile system wherein the mobile system comprises a touch sensitive display, a processor, a memory, and a wireless transmit and receive unit for wireless local area network (WLAN) communication; and

an information system, wherein a plurality of data are collected and processed by an algorithm are delivered to occupants of a premise.

Referring to FIGs. 1 and 2, there is shown a preferred embodiment of a user driven responsive IoT space in accordance with the present invention. The user is in charged, which means putting the user at the center of the system of the preferred embodiment, as a point of integration, originating and control, for instance, user driven responsive space. The system invites feedback and comments and votes from for example lab users. Based on the input of the users, system will consolidate the information and real time adjust the environment.

The ecosystem platform of the present invention has the capabilities to deliver solutions to meet occupants requirements and has the capability to capture end users' responses to the environment and consolidate into data pool for analysis and amalgamation into autonomous management of the environment. The unique features of the preferred embodiment include

collection of users input and opinion on the performance of the environment. The first time a systematic collection of users' data is employed in the operation of the facilities. The system and a algorithm are employed to convert users' input to contribute influence to the control of the environment. Another feature is that mobile app is used to engage space occupants with the environment and to collect occupants' data.

The present invention which employs autonomous user driven software such that users' data is collected and the users data drive the control of the space. The smart office solution communicates environmental data to and collects input from the occupants. The occupants' data is used to ensure workspace attributes like sound, light and space adapt to the occupants needs and preferences including light dimming to natural circadian rhythms, glare management, indoor air quality level and temperature. This leads to enhanced in-office experience.

In accordance with the preferred embodiment, the autonomous control of the environment is via algorithm logic which is based on users' data. Such control allows increase productivity of facilities manager, and integrating technology into a physical office environment streamlines or completely automates a number of tasks, allowing the facilities team to focus on strategic tasks rather than fir fighting. The present invention also provides integration of technology in the day to day operations , eliminating chance of errors. The devices of IoT can be used to complete the daily routine tasks, for instance collecting the data and keeping a track record of all the work taking place, without employee intervention.

As mentioned, the present invention relates to a suer driven smart office software solution with a server software and a user mobile application. The ecosystem of the present invention allows building owners to mange their space based on inputs from the occupants via a voting mechanism or solicited input. This is done with algorithm logic derived from collective data received from space occupants. The level of control for the environment is maximised with open platform compatible with multiple industry protocols. This is combined to achieve optimal environmental conditions based on users' feedback. Example will be shoppers giving feedback that the environment is too cold, or office workers giving input that the lighting is too dim. These data are fed into an algorithm that enables autonomous management of the environment in response to the feedback receive from the users.

In accordance with the present invention, there is provided a method for using smart office user driven autonomous ecosystem platform comprising the steps of:
collecting a plurality of users' data on input and opinions of an environment;

collecting a plurality of users' preferences for the environment;
processing by a system and algorithm to convert users' data and user's preferences contribute influence to control of the environment; and
triggering a change of the environment by adjusting controls to a plurality of mechanical devices equipped at a premise.

The smart office user driven autonomous ecosystem platform of the present invention delivers a new user experience for the space occupants by providing user engagement with the space for the first time; users' feedback being incorporated autonomously into the control of the environment for the first time, which increases the productivity and efficiency of facilities manager in their management of the environment; and
a much wider range of data be made available with a wider selection of sensors monitors and instruments available for easy integration.

FIG. 2 is a schematic view indicating the implementation of the user driven autonomous ecosystem platform on building automation, building energy management, lighting & blind control, environment monitoring & data collection, schedules, alerts & reports of the preferred embodiment of the present invention.

FIG. 3 depicts a pictorial representation of a user driven responsive IoT space on temperature of the present invention. The ecosystem invites feedback and comments and votes from for example, Lab Users. The Users can vote to "turn temperature down a notch" or "bring temp up a notch". The ecosystem will consolidate the information and real time adjust the temperature. This action will be communicated to the users. The users will be further informed when the temperature has changed.

FIG. 4 depicts a pictorial representation of a user driven responsive IoT space on lighting of the present invention. The users can feedback to "No Glare" or "Up the lights please!". The ecosystem will consolidate the information and real time adjust the lighting level. This action will be communicated to the users. The users will be further informed when the lighting level and lux level has changed.

FIG. 5 depicts a pictorial representation of a user driven responsive IoT space on energy of the present invention. The users are being engaged and told what is being done to save energy. Inform! – how much energy is used today. Engage! - What action can the users participate in to contribute to energy conservation.

FIG. 6 depicts a pictorial representation of a user driven responsive IoT space on Internal Air Quality of the present invention. The users can feedback on their perception of air quality in environment. The ecosystem adjusts air filter and freshener based on number of people in the space and the air quality. Inform! Let User know before and after environment adjustments. Let User know quality of environment.

FIG. 7 depicts a pictorial representation of a user driven responsive IoT space, allowing users to influence environment variables in accordance with the present invention. The environment variables include :Lux Level Data – Daylight & Artificial lighting;
Occupancy Data – WorkStation, Common Area, Meeting Rooms;
Temperature Data: IAQ – CO2, VOC, PM2.5, PM10;
Humidity;
Energy Consumption etc.

FIG. 8 depicts a pictorial representation of a user driven responsive IoT space, allowing users to influence environment sensing in accordance with the present invention. The environment sensing includes:

(i) Mobile Phone presence sensing;
(ii) People counting cameras and sensors;
(iii) Air Filtering and Freshener;
(iv) Indoor Air Quality Sensor; and
(v) Temperature and Lux sensing.

The description of the present invention has been presented for purposes of illustration and description, and is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated.

CLAIMS

1. A smart office user driven autonomous ecosystem platform comprising:
an embedded system which is configured for control by software applications;
a mobile system wherein the mobile system comprises a touch sensitive display, a processor, a memory, and a wireless transmit and receive unit for wireless local area network (WLAN) communication; and
an information system, wherein a plurality of data are collected and processed by an algorithm are delivered to occupants of a premise.

2. The smart office user driven autonomous ecosystem platform as set forth in Claim 1, wherein the software applications include a server software and a user driven smart office software, allowing a user or an occupant to input data (vote) on conditions of environment.

3. The smart office user driven autonomous ecosystem platform as set forth in Claim 2, wherein the input data from the user or the occupant is collected and is translated by the Algorithm to determine a change in environmental conditions.

4. The smart office user driven autonomous ecosystem platform as set forth in Claim 3, wherein the change in environmental conditions is determined autonomously by adjusting controls of a plurality of mechanical devices equipped at the premise.

5. The smart office user driven autonomous ecosystem platform as set forth in Claim 3, wherein the input data by the user is real time and the change in environmental conditions is in real time autonomously.

6. A method for using smart office user driven autonomous ecosystem platform comprising the steps of:
collecting a plurality of users' data on input and opinions of an environment;
collecting a plurality of users' preferences for the environment;
processing by a system and algorithm to convert users' data and user's preferences contribute influence to control of the environment; and
triggering a change of the environment by adjusting controls to a plurality of mechanical devices equipped at a premise.