

SMART WORKSPACE MANAGEMENT SYSTEM

RELATED APPLICATIONS

[0001] This application claims priority to U.S. Patent Application No. 16/446,440, filed on June 19, 2019, which is a continuation-in-part of U.S. Patent Application No. 16/240,124, filed on January 4, 2019, the entireties of both are hereby incorporated herein by reference.

BACKGROUND

[0002] The Internet of Things (IoT) and big data are allowing enterprises to analyze, understand, manage, and act upon data insights in ways never before imagined.

SUMMARY

[0002a] An aspect of the disclosure provides a system to manage a workspace. The system includes a plurality of docking stations located at corresponding workstations, each docking station to provide a network connection and power to a computer device at a corresponding workstation. Each docking station of the plurality of docking stations includes a power input, one or more sensors to monitor one or more metrics selected from the group consisting of power consumption, occupancy, and usage at the corresponding workstation, and a network interface to communicate with a network. The system also includes a system computer including a system network interface to communicate with each docking station of the plurality of docking stations via the network. The system computer is configured to receive, over the network, information regarding monitored metrics from the plurality of docking stations, generate heat-mapping data based on the information regarding the monitored metrics received from each docking station, and generate a graphical user image including heat-mapping representing the monitored metrics at each workstation, wherein the system computer is configured to enable remote software installation, software uninstallation, and software updating of each docking station.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0003] To easily identify the discussion of any particular element or act, the most significant digit or digits in a reference number refer to the figure number in which that element is first introduced.

[0004] FIG. 1 is a block diagram of a system to manage a workspace, according to some embodiments.

[0005] FIG. 2 is a block diagram of an example of a portion of the system of FIG. 1, according to some embodiments.

[0006] FIG. 3 is an example view of a main dashboard user interface (UI), according to some embodiments.

[0007] FIG. 4 is an example view of a reports UI, according to some embodiments.

[0008] FIG. 5 is an example view of a reports UI, according to some embodiments.

[0009] FIG. 6 is an example view of a reports UI, according to some embodiments.

- [0010] FIG. 7 is an example view of a command center UI, according to some embodiments.
- [0011] FIG. 8 is an example view of a firmware update UI, according to some embodiments.
- [0012] FIG. 9 is an example view of a reports UI, according to some embodiments.
- [0013] FIG. 10 is an example view of a reports UI, according to some embodiments.
- [0014] FIG. 11 is an example view of a user management UI, according to some embodiments.
- [0015] FIG. 12 is an example view of an alerts UI, according to some embodiments.
- [0016] FIG. 13 is an example view of an alerts UI, according to some embodiments.

DETAILED DESCRIPTION

[0017] Embodiments disclosed herein are directed to capturing, analyzing, and deriving actionable value from data collected at the workspace level. These embodiments provide a system and methods for accurately understanding how workstations are performing. Docking stations located at these workstations may include processors, and may be connected via a communications network to a system computer. The ability to communicate with the docking stations at the workstations enables the system computer to perform various valuable operations. For example, real estate costs are likely a top two operational expense for a business. Embodiments disclosed herein enable monitoring of how assets at a workspace (e.g., desks, workstations, etc.) are being used (e.g., which assets are being used most) and determining why or why not the assets are being used. By way of specific, non-limiting example, embodiments disclosed herein enable determining whether a workspace including 2,000 (e.g., each including a desk) workstations is being effectively used, or if a smaller, cheaper workspace

CLAIMS

What is claimed is:

1. A system to manage a workspace, comprising:
 - a plurality of docking stations located at corresponding workstations, each docking station to provide a network connection and power to a computer device at a corresponding workstation, each docking station of the plurality of docking stations including:
 - a power input;
 - one or more sensors to monitor one or more metrics selected from the group consisting of power consumption, occupancy, and usage at the corresponding workstation; and
 - a network interface to communicate with a network; and
 - a system computer including a system network interface to communicate with each docking station of the plurality of docking stations via the network, wherein the system computer is configured to:
 - receive, over the network, information regarding monitored metrics from the plurality of docking stations;
 - generate heat-mapping data based on the information regarding the monitored metrics received from each docking station; and
 - generate a graphical user image including heat-mapping representing the monitored metrics at each workstation,
 - wherein the system computer is configured to enable remote software installation, software uninstallation, and software updating of each docking station.
2. The system of claim 1, wherein each docking station of the plurality of docking stations is further configured to monitor user-entered input of the computer device located at the corresponding workstation and transmit information indicating the monitored user-entered input to the system computer.
3. The system of claim 1, wherein each docking station of the plurality of docking stations further comprises:
 - a sensor to monitor user occupancy at the corresponding workstation and generate sensor data relating to the user occupancy; and
 - a memory including a location identifier stored thereon, the location identifier identifying a location of the docking station and the corresponding workstation.

4. The system of claim 3, wherein the sensor includes an infrared sensor to confirm user occupancy.

5. The system of claim 3, wherein the system computer is further configured to:
receive the location identifier of each docking station,
receive the sensor data from each docking station, and
transmit usage data identifying usage of the corresponding workstation to the system computer, the usage data based on the received location identifier and the received sensor data.

6. The system of claim 5, wherein the system computer is further configured to generate an availability notice based on the usage data, the availability notice indicating one or more of the workstations that are currently unoccupied by users and locations of the one or more currently unoccupied workstations.

7. The system of claim 6, wherein the system computer is configured to communicate with portable computer devices over the network to provide the availability notice to the portable computer devices.

8. The system of claim 5, wherein the system computer is further configured to generate a schedule of currently available workstations based on the usage data.

9. The system of claim 8, wherein the system computer is further configured to generate an occupancy alert when the usage data indicates user occupancy at a scheduled currently available workstation.

10. The system of claim 5, wherein the system computer is further configured to generate a usage report indicative of the user occupancy at the workstations and corresponding locations based on the usage data.

11. The system of claim 5, wherein the system computer is further configured to:
receive a user reservation request to reserve a workstation;
generate a reservation for a specific available workstation; and
generate a schedule and indicate that the specific available workstation is reserved.

12. The system of claim 11, wherein the system computer is configured to confirm the user occupancy of the specific available workstation during the reservation based on the usage data.

13. The system of claim 5, wherein the system computer is further configured to generate a schedule of users currently assigned to the corresponding workstations and locations of the currently assigned workstations.

14. The system of claim 13, wherein the system computer is configured to communicate with portable computer devices over the network to provide the schedule to the portable computer devices.

15. The system of claim 13, wherein the system computer is configured to, responsive to a query for a specific user, provide a location of the specific user's assigned workstation.

16. The system of claim 15, wherein the location of the specific user's assigned workstation is presented to the specific user in a graphical user interface including an uploadable map.

17. The system of claim 5, wherein the system computer is further configured to generate an availability alert when the usage data indicates extended vacancy at a workstation that is scheduled to be occupied.

18. The system of claim 1, wherein the system computer is further configured to analyze the sensor data and generate a graphical user interface with indication of current user occupancy at the workstations.

19. The system of claim 18, wherein the graphical user interface includes an identification of currently available workstations.

20. The system of claim 1, wherein the system computer is further configured to analyze the information regarding the monitored metrics and generate the heat-mapping in real-time.

21. The system of claim 1, wherein the system computer is further configured to analyze the information regarding the monitored metrics and generate a snapshot of heat-mapping at a certain point in time.

22. The system of claim 5, wherein the system computer is further configured to generate a graphical user interface with indication of electronic devices identified at the workstations based on the usage data.

23. The system of claim 1, wherein:
each docking station of the plurality of docking stations further comprises:
a plurality of peripheral device ports to communicate with one or more peripheral devices;
and
a processor to identify the one or more peripheral devices currently communicating with the docking station and generate peripheral identifications indicating identities of the one or more peripheral devices.

24. The system of claim 23, wherein the processor of each docking station is configured to identify the one or more peripheral devices by:
monitoring power profiles from the one or more peripheral devices;
determine whether a match exists between the monitored power profiles and a model power profile; and
when the match exists, identify a peripheral device associated with the model power profile.

25. The system of claim 23, wherein the system computer and each docking station is configured to generate a log of the one or more identified peripheral devices communicating with each docking station.

26. The system of claim 1, wherein the system computer is configured to enable remote software installation, software uninstallation, and software updating of the computer device of the corresponding workstation and other connected devices.

27. The system of claim 1, wherein the system computer is configured to enable remote resetting of each docking station.

28. The system of claim 1, wherein the system computer is configured to enable remote resetting of the computer device of the corresponding workstation.

29. The system of claim 1, wherein each docking station is configured to identify the computer device of the corresponding workstation.

30. The system of claim 1, wherein each docking station and the system computer are configured to monitor and record user operation of the computer device of the corresponding workstation.

31. The system of claim 1, wherein the network interface of each docking station is configured to enable each docking station to communicate with others of the plurality of docking stations through a mesh network, wherein a portion of communications between some of the plurality of docking stations and the system computer is communicated through the mesh network.

32. The system of claim 31, wherein a preselected docking station of the plurality of docking stations is configured to communicate directly with the system computer to relay communications between the system computer and others of the plurality of docking stations.