

and thus they cannot share information on the same subject under inspection, resulting in inefficient overall operations.

SUMMARY

According to an exemplary embodiment of the present disclosure, a customs inspection and release system is provided. The system comprises: a device layer comprising a plurality of devices for inspection and release, the plurality of devices are deployed at different types of inspection sites, at least some of the plurality of devices being configured to detect a subject and generate detection data while the subject passes through the inspection sites; an adaptor layer comprising a plurality of adaptors corresponding to the plurality of devices, respectively, each being configured to receive the detection data from its corresponding device and convert the detection data into an event in a form of a predetermined message service interface protocol; a message service layer comprising a message bus and configured to receive events from the adaptor layer and construct event messages based on the events; and a processing control layer comprising a business logic unit and configured to receive and process the event messages from the message bus, generate instructions associated with the event messages and transmit the instructions to the message service layer, wherein the business logic unit is configured to bind, to a single subject, a plurality of discrete event messages associated with the single subject, and process the bound event messages jointly, wherein the plurality of discrete event messages correspond to different events originating from different devices in the device layer while the single subject passes through the different types of the inspection sites. The message service layer constructs instruction messages based on the received instructions and transmits the instruction messages to the adaptor layer. The adaptor layer converts the instruction messages into instructions in a form suitable for the corresponding devices and transmits the instructions to the device layer. The corresponding devices in the device layer operate based on the received instructions.

In an embodiment, the processing control layer further comprises a central control unit configured to provide a user interface for monitoring operation states of the devices and a state of the subject, and in response to a user operation, generate an instruction and transmit the instruction to the message service layer.

In an embodiment, the business logic unit comprises: a binding logic module configured to bind the plurality of discrete event messages associated with the single subject to the single subject; a flow logic module configured to process the bound event messages jointly to generate an instruction corresponding to a result of the processing; a device state logic module configured to monitor states of the plurality of devices and issue a

located. The recognition result of the subject is modifiable by a user via the user interface.

5 In an embodiment, the processing control layer further comprises: an image detection unit comprising an image analysis station and a re-inspection station and allowing a user to analyze a scan image of the subject at the image analysis station to determine whether the subject is suspicious or not and re-inspect the suspicious subject at the re-inspection station.

10 In an embodiment, the processing control layer further comprises: an information management unit configured to perform one or more of maintaining user information, maintaining subject information, maintaining commuter car information, information query and statistics, and configuring system parameters.

15 In an embodiment, the message service layer is further configured to receive other events from other customs business systems for processing at the processing control layer and transmit processing results to the other customs business systems. The other customs business systems comprise a customs declaration system and/or a logistics system.

20 In an embodiment, the binding logic module in the processing control layer is further configured to bind discrete events among the other events that are associated with the same subject to the subject.

25 According to another exemplary embodiment of the present disclosure, a customs inspection and release method is provided. The method comprises: detecting, by at least some of a plurality of devices, a subject to generate detection data while the subject passes through different types of inspection sites, wherein the plurality of devices are deployed at the inspection sites; receiving, by each of a plurality of adaptors corresponding to the plurality of devices, respectively, the
30 detection data from its corresponding device and converting the detection data into an event in a form of a predetermined message service interface protocol; receiving, by a message bus, events from the adaptors and constructing event messages based on the events; and receiving and processing the event messages

from the message bus, generating instructions associated with the event messages and transmitting the instructions to the

message bus, wherein said processing the event messages comprises binding, to a single subject, a plurality of discrete event messages associated with the single subject, and processing the bound event messages jointly, the plurality of discrete event messages being corresponding to different events originating from different
5 devices in the device layer while the subject passes through the different types of inspection sites, constructing, by the message bus, instruction messages based on the received instructions and transmitting the instruction messages to the respective adaptors, converting, by the respective adaptors, the instruction messages into instructions in a form suitable for the corresponding devices and
10 transmitting the instructions to the corresponding devices, and operating, by the corresponding devices, based on the received instructions.

In an embodiment, the method further comprises: providing a user interface for monitoring operation states of the devices and a state of the subject, and in
15 response to a user operation, generating an instruction and transmitting the instruction to the message bus.

In an embodiment, the step of processing the event messages further comprises: processing the bound events to generate an instruction corresponding
20 to a result of the processing.

In an embodiment, the method further comprises: receiving, by the message bus, other events from other customs business systems for processing, and transmitting processing results to the other customs business systems. The other
25 customs business systems comprise a customs declaration system and/or a logistics system.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other aspects, features and advantages will become more apparent with reference to the following description taken in conjunction with the
30 figures where similar reference numerals denote the same elements, in which:

Fig. 1 is a block diagram showing a customs inspection and release system according to an exemplary embodiment of the present disclosure;

What is claimed is:

1. A customs inspection and release system, comprising:

a device layer comprising a plurality of devices for inspection and release, the
5 plurality of devices are deployed at different types of inspection sites, at least some
of the plurality of devices being configured to detect a subject and generate
detection data while the subject passes through the inspection sites;

an adaptor layer comprising a plurality of adaptors corresponding to the
plurality of devices, respectively, each being configured to receive the detection
10 data from its corresponding device and convert the detection data into an event in a
form of a predetermined message service interface protocol;

a message service layer comprising a message bus and configured to receive
events from the adaptor layer and construct event messages based on the events;
and

15 a processing control layer comprising a business logic unit and configured to
receive and process the event messages from the message bus, generate
instructions associated with the event messages and transmit the instructions to
the message service layer, wherein the business logic unit is configured to bind, to
a single subject, a plurality of discrete event messages associated with the single
20 subject, and process the bound event messages jointly, wherein the plurality of
discrete event messages correspond to different events originating from different
devices in the device layer while the single subject passes through the different
types of the inspection sites;

wherein the message service layer constructs instruction messages based on
25 the received instructions and transmits the instruction messages to the adaptor
layer,

the adaptor layer converts the instruction messages into instructions in a form
suitable for the corresponding devices and transmits the instructions to the device
layer, and

30 the corresponding devices in the device layer operate based on the received
instructions.

2. The system of claim 1, wherein the processing control layer further comprises a central control unit configured to provide a user interface for monitoring operation states of the devices and a state of the subject, and in response to a user operation, generate an instruction and transmit the instruction to
5 the message service layer.

3. The system of claim 1 or 2, wherein the business logic unit comprises:

11. The system of claim 10, wherein the binding logic module in the processing control layer is further configured to bind discrete events among the other events that are associated with the same subject to the subject.

5 12. A customs inspection and release method, comprising:

detecting, by at least some of a plurality of devices, a subject to generate detection data while the subject passes through different types of inspection sites, wherein the plurality of devices are deployed at the inspection sites;

receiving, by each of a plurality of adaptors corresponding to the plurality of
10 devices, respectively, the detection data from its corresponding device and converting the detection data into an event in a form of a predetermined message service interface protocol;

receiving, by a message bus, events from the adaptors and constructing event messages based on the events; and

15 receiving and processing the event messages from the message bus, generating instructions associated with the event messages and transmitting the instructions to the message bus, wherein said processing the event messages comprises binding, to a single subject, a plurality of discrete event messages associated with the single subject, and processing the bound event messages
20 jointly, the plurality of discrete event messages being corresponding to different events originating from different devices in the device layer while the subject passes through the different types of inspection sites;

constructing, by the message bus, instruction messages based on the received instructions and transmitting the instruction messages to the respective
25 adaptors;

converting, by the respective adaptors, the instruction messages into instructions in a form suitable for the corresponding devices and transmitting the instructions to the corresponding devices; and

operating, by the corresponding devices, based on the received instructions.

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13. The method of claim 12, further comprising: providing a user interface for monitoring operation states of the devices and a state of the subject, and in response to a user operation, generating an instruction and transmitting the instruction to the message bus.

14. The method of claim 12 or 13, wherein said processing the event messages further comprises: