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A METHOD AND SYSTEM FOR TRACKING MOVEMENT OF AT LEAST ONE HUMAN ENTITY

FIELD OF INVENTION

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This invention relates to the field of tracking movement of at least one human entity, primarily in relation to a method and a system for carrying out the tracking of the movement of at least one human entity.

10 BACKGROUND

It is typically useful for a variety of reasons to possess information in relation to both the presence, movements of participants at some events as well as personal information of the participants. This is because having the
15 information not only helps in administrative matters pertaining to the events, it may mean the difference between life and death of the participants. Some instances will be provided in subsequent paragraphs to illustrate the importance of possessing the information.

20 A first illustrative instance would be during trips to particular places to either commemorate particular occasions or to fulfill religious obligations (pilgrimages). Such trips typically involve large numbers of people and it would be helpful for organizers of these trips to possess information in relation to the presence and/or movement of participants in their care and also
25 personal information of the participants in case emergencies crop up during the trips. For example, information relating to blood type and drug allergies of the participants would be highly advantageous when administering to the participants during the aforementioned emergencies.

30 Another illustrative instance would be during sporting events which involve a large number of participants. Such sporting events may include, for example, marathons, triathlons, orienteering sessions, nature expeditions, and the like. It would also be helpful for organizers of these sporting events to possess information in relation to the presence and/or movement of participants and



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also personal information of the participants in case emergencies crop up during the events. This is especially so as it is common for participants of such sporting events to be without their mobile phones while taking part in the events, and this consequently causes communication between participants and emergency service providers to be inconvenient. In such an instance, information relating to existing medical conditions and drug allergies of the participants would be highly advantageous when administering to the participants during the aforementioned emergencies.

Yet another illustrative instance would be during multi-interest events at a single venue. Such events may include, for example, a family-theme event where there are different sections for parents and children, a vehicle-theme event where there are different sections for cars, motorcycles, and bicycles, and so forth. In this particular instance, it would be helpful for organizers of these multi-interest events to possess information in relation to the presence and/or movement of attendees for control of crowd numbers at the different sections, and also personal information of the attendees in case of overcrowding emergencies during the events. For example, sections with an excessive number of attendees would be cordoned off to prevent overcrowding such that an attendees' experience at the event is not diminished.

Based on the aforementioned illustrations, it should be evident that a method and system for tracking movements of at least one human entity would be advantageous for a variety of reasons.

SUMMARY

In a first aspect, there is provided a method for tracking movement of at least one human entity. The method includes providing the at least one human entity with a data storage apparatus, the data storage apparatus being able to be read using a data reader; loading data into the data storage apparatus, the data being information associated with the at least one human entity; reading the data at the data reader, the data being stored at a data storage

facility; and processing the data stored at the data storage facility to mine the information associated with the at least one human entity. It is advantageous that mining the information enables both a position of the at least one human entity to be determined, and an availability of the information of the at least one human entity to authorized parties.

The authorized parties may be provided with access rights to obtain the available information. It is preferable that the data storage apparatus uses either RFID induction or any proprietary wireless data transfer technology. Processing of the data may also include organizing the information. Advantageously, a composition of a pool of the at least one human entity may also be determined from mining the information.

Preferably, the information associated with the at least one human entity may be selected from, for example, name, passport number, nationality, religion, emergency contact details, blood type, drug allergies, existing medical conditions, employment details, purpose of travel, accommodation details, data storage apparatus identification details, any combination of the aforementioned and so forth. It is advantageous that the availability of the information of the at least one human entity allows either localized or remote access to the information. The remote access to the information may be via a data network.

The position of the at least one human entity may be determined from a location of the data reader with the data reader being either portable or located at a fixed position. The data reader may include a positioning module for providing the location of the data reader. It should be noted that the position of the at least one human entity may be either current or at a particular instance. The data reader may be of a type such as, for example, direct contact, contactless, a hybrid of the aforementioned and so forth.

The data storage facility may be either at a localized location or a remote location. The data storage facility may be accessible either by a wired connection or a wireless connection.

In a second aspect, there is provided a system for tracking movement of at least one human entity. The system includes at least one data storage apparatus, the at least one data storage apparatus being for storing data, the data being information associated with the at least one human entity; at least one data reader, each of the data readers being able to read the data from the data storage apparatus; and at least one data storage facility, the at least one data storage facility being for both storage and processing of data read by the at least one data reader, the processing of data being the mining of information associated with the at least one human entity. Advantageously, mining the information enables both a position of the at least one human entity to be determined, and an availability of the information of the at least one human entity to authorized parties.

The authorized parties may be provided with access rights to obtain the available information. It is preferable that the data storage apparatus uses either RFID induction or any proprietary wireless data transfer technology. Processing of the data may also include organizing the information. Advantageously, a composition of a pool of the at least one human entity may also be determined from mining the information.

Preferably, the information associated with the at least one human entity may be selected from, for example, name, passport number, nationality, religion, emergency contact details, blood type, drug allergies, existing medical conditions, employment details, purpose of travel, accommodation details, data storage apparatus identification details, any combination of the aforementioned and so forth. It is advantageous that the availability of the information of the at least one human entity allows either localized or remote access to the information. The remote access to the information may be via a data network.

The position of the at least one human entity may be determined from a location of the data reader with the data reader being either portable or located at a fixed position. The data reader may include a positioning module

for providing the location of the data reader. It should be noted that the position of the at least one human entity may be either current or at a particular instance. The data reader may be of a type such as, for example, direct contact, contactless, a hybrid of the aforementioned and so forth.

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The data storage facility may be either at a localized location or a remote location. The data storage facility may be accessible either by a wired connection or a wireless connection.

10 **DESCRIPTION OF DRAWINGS**

In order that the present invention may be fully understood and readily put into practical effect, there shall now be described by way of non-limitative example only preferred embodiments of the present invention, the description being
15 with reference to the accompanying illustrative drawings.

Figure 1 shows a process flow for a method of the present invention.

Figure 2 shows a schematic diagram for a system of the present invention.

20 **DESCRIPTION OF PREFERRED EMBODIMENTS**

In a first aspect, with reference to Figure 1, there is provided a process flow for a method 20 for tracking movement of at least one human entity. In addition, Figure 2 shows a system 40 for tracking movement of at least one
25 human entity. It should be appreciated that the system 40 relates to the hardware which enables the method 20. It should be noted that reference will be made to elements found in Figure 2 when describing the method 20 to aid in the description of the method 20. Advantages of employing the method 20 and the system 40 for tracking movement of at least one human entity will
30 become evident in the course of the subsequent paragraphs.

The method 20 includes providing the at least one human entity with a data storage apparatus 42 (22). In Figure 2, the data storage apparatus 42 is represented by a tag-like device, but it should be appreciated that the data

storage apparatus 42 need not adhere to such a physical form. For example, the data storage apparatus 42 may be in a form of, for example, an adhesive sticker, a wallet-sized card, incorporated within an item worn/held by the at least one human entity, and so forth. Multiple data storage apparatus 42(a), 42(b) and 42(c) are shown in Figure 2 to more accurately depict actual usage scenarios of the system 40. The data storage apparatus 42 may use either RFID induction or any proprietary wireless data transfer technology for input and output of data. The data from the data storage apparatus 42 may be able to be read using a contactless data reader 44. More details pertaining to the contactless data reader 44 will be provided in subsequent sections of the description.

Subsequently, data is loaded into the data storage apparatus 42 (24), with the data being information associated with the at least one human entity. The loading of data into the data storage apparatus 42 may be via either RFID induction or any proprietary wireless data transfer technology. The information associated with the at least one human entity may include, for example, name, passport number, nationality, religion, emergency contact details, blood type, drug allergies, existing medical conditions, employment details, purpose of travel, accommodation details, data storage apparatus identification details, any combination of the aforementioned and so forth.

Next, the data on the data storage apparatus 42 is read at the contactless data reader 44 (26), where the data being read is stored at a data storage facility 46. More details pertaining to the data storage facility 46 will be provided in subsequent sections of the description. The contactless data reader 44 may be either portable or located at a fixed position. The contactless data reader 44 may be portable in instances where there are difficulties (for example, lack of infrastructure, lack of security, and so forth) in locating the contactless data reader 44 at the fixed position. In addition, the contactless data reader 44 may preferably be portable during instances when there's a need to "report" to a person in possession of the contactless data reader 44, while the contactless data reader 44 may preferably be at a fixed position during instances when there's a need to "report" to a particular place

where the contactless data reader 44 is installed. The contactless data reader 44 may include a positioning module 45 for providing the location of the contactless data reader 44. The positioning module 45 may preferably be usable both outdoors, and indoors. While Figure 2 shows the positioning
5 module 45 being externally coupled to the contactless data reader 44, the positioning module 45 may be incorporated into the contactless data reader 44. It is envisaged that contactless data readers will be employed in a widespread manner given that it has already proven to be robust and reliable in their current iterations. However, it should be appreciated that data readers
10 which require contact may also effectively replace the contactless data reader 44 in the method 20. Furthermore, it is also envisaged that hybrid data readers which allow both contactless and direct contact data transfer may also be effectively employed in the method 20.

15 The method 20 also includes processing the data stored at the data storage facility 46 to mine the information associated with the at least one human entity (28). Processing the data may include organizing the information associated with the at least one human entity. Organizing the information may include grouping various types of information into their respective categories
20 such that statistical information may be collated from the organized information. For instance, it may be possible to determine the number of persons of a particular nationality, it may be possible to determine the number of persons of a particular employer, and so forth. In addition, having the statistical information may aid in segregating groups of human entities in any
25 desired manner.

The data storage facility 46 may be either a storage server or an apparatus with both data processing and data storage facilities. The data storage facility 46 may be either at a localized location or a remote location. The data storage
30 facility 46 may be located at a localized location together with the contactless data reader 44 that is located at a fixed position. Alternatively, the data storage facility 46 may be located at a remote location away from the contactless data reader 44. The data storage facility 46 may be accessible either by a wired connection or a wireless connection.

It should be appreciated that mining the information enables both a position of the at least one human entity to be determined (30), and an availability of the information of the at least one human entity to authorized parties (32). The position of the at least one human entity (30) may be determined from a location of the contactless data reader 44, more specifically, based on readings from the positioning module 45. The position of the at least one human entity may be either current or at a particular instance. This is possible as a date and time stamp may be provided when the data storage apparatus 42 is read by the contactless data reader 44, and thus, the position of the at least one human entity according to the date and time stamp is known.

In addition, the availability of the information of the at least one human entity allows either localized or remote access to the information. The information may be viewed from a display 47 of the contactless data reader 44, or remote access to the information may be enabled using a data network. The remote access to the information may be through use of a communications enabled apparatus, for example, a personal computer 48(a), a notebook 48(b), a mobile phone 48(c), and so forth. The authorized parties may be provided with access rights (for example, a log-in ID and password) to obtain the available information using the aforementioned communications enabled apparatus. The access rights may allow access to a website which provides tracking information of the at least one human entity. One instance where there may be a need to track movements of the at least one human entity may be during instances where there are different stages of a trip/event with next of kin of the at least one human entity being curious/concerned in relation to a progress of the at least one human entity at the trip/event.

Possible applications of the method 20 will now be discussed in view that the method 20 has been clearly described in the preceding paragraphs.

A first application would be during trips to particular places to either commemorate particular occasions or to fulfill religious obligations (pilgrimages). The method 20 would allow organizers of these trips to possess

information in relation to the presence and/or movement of participants in their care and also personal information of the participants in case emergencies crop up during the trips. For example, information relating to blood type and drug allergies of the participants would be readily available when
5 administering to the participants during the aforementioned emergencies. In addition, the participants may also be categorized in groupings such as, for example, pilgrims, vendors, trip administrators, and so forth. The categorization of the groupings aids in providing insights in relation to a composition of a pool of participants. The composition may be in relation to an
10 intended purpose of the participants during the trip. These insights may be useful to ensure safety and pleasure of participants in subsequent years.

A second application would be during sporting events which involve a large number of participants. Such sporting events may include, for example,
15 marathons, triathlons, orienteering sessions, nature expeditions, and the like. The method 20 would allow organizers of these sporting events to possess information in relation to the presence and/or movement of participants and also personal information of the participants in case emergencies crop up during the events. In such an instance, information relating to existing medical
20 conditions and drug allergies of the participants would be readily available during the aforementioned emergencies once emergency service providers reach the affected participants.

A third application would be during multi-interest events at a single venue.
25 Such events may include, for example, a family-theme event where there are different sections for parents and children, a vehicle-theme event where there are different sections for cars, motorcycles, and bicycles, and so forth. The method 20 would allow organizers of these multi-interest events to possess information in relation to the presence and/or movement of attendees for
30 control of crowd numbers at the different sections, and also personal information of the attendees in case of overcrowding emergencies during the events. For example, sections with an excessive number of attendees would be known and measures will be taken by the organizers such that an attendees' experience at the event is not diminished.

It should be appreciated that the aforementioned applications are purely for illustrative purposes and not meant to be limited to these applications in any form.

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In a second aspect, with reference to Figure 2, there is provided a system 40 for tracking movement of at least one human entity. As mentioned in a preceding paragraph, the system 40 enables the aforementioned method 20. The advantages of employing the system 40 will become evident in the course of the subsequent paragraphs.

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The system 40 includes at least one data storage apparatus 42. In Figure 2, the data storage apparatus 42 is represented by a tag-like device, but it should be appreciated that the data storage apparatus 42 need not adhere to such a physical form. For example, the data storage apparatus 42 may be in a form of, for example, an adhesive sticker, a wallet-sized card, incorporated within an item worn/held by the at least one human entity, and so forth. Multiple data storage apparatus 42(a), 42(b) and 42(c) are shown in Figure 2 to more accurately depict actual usage scenarios of the system 40. The data storage apparatus 42 may use either RFID induction or any proprietary wireless data transfer technology for input and output of data. The data from the data storage apparatus 42 may be able to be read using a contactless data reader 44.

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The at least one data storage apparatus 42 may be for storing data, the data being information associated with the at least one human entity. The loading of data into the data storage apparatus 42 may be via either RFID induction or any proprietary wireless data transfer technology. The information associated with the at least one human entity may include, for example, name, passport number, nationality, religion, emergency contact details, blood type, drug allergies, existing medical conditions, employment details, purpose of travel, accommodation details, data storage apparatus identification details, any combination of the aforementioned and so forth.

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The system 40 also includes at least one contactless data reader 44, with each of the contactless data readers 44 being able to read the data from the data storage apparatus 42. The contactless data reader 44 may be either portable or located at a fixed position. The contactless data reader 44 may be portable in instances where there are difficulties (for example, lack of infrastructure, lack of security, and so forth) in locating the contactless data reader 44 at the fixed position. In addition, the contactless data reader 44 may preferably be portable during instances when there's a need to "report" to a person in possession of the contactless data reader 44, while the contactless data reader 44 may preferably be at a fixed position during instances when there's a need to "report" to a particular place where the contactless data reader 44 is installed. The contactless data reader 44 may include a positioning module 45 for providing the location of the contactless data reader 44. The positioning module 45 may preferably be usable both outdoors, and indoors. While Figure 2 shows the positioning module 45 being externally coupled to the contactless data reader 44, the positioning module 45 may be incorporated into the contactless data reader 44. It is envisaged that contactless data readers will be employed in a widespread manner given that it has already proven to be robust and reliable in their current iterations. However, it should be appreciated that data readers which require contact may also effectively replace the contactless data reader 44 in the system 40. Furthermore, it is also envisaged that hybrid data readers which allow both contactless and direct contact data transfer may also be effectively employed in the system 40.

In addition, the system 40 includes at least one data storage facility 46, the at least one data storage facility 46 being for both storage and processing of data read by the at least one contactless data reader 44, the processing of data being the mining of information associated with the at least one human entity. The data storage facility 46 may be either a storage server or an apparatus with both data processing and data storage facilities. The data storage facility 46 may be either at a localized location or a remote location. The data storage facility 46 may be located at a localized location together with the contactless data reader 44 that is located at a fixed position.

Alternatively, the data storage facility 46 may be located at a remote location away from the contactless data reader 44. The data storage facility 46 may be accessible either by a wired connection or a wireless connection.

5 The processing the data may include organizing the information associated with the at least one human entity. Organizing the information may include grouping various types of information into their respective categories such that statistical information may be collated from the organized information. For instance, it may be possible to determine the number of persons of a particular nationality, it may be possible to determine the number of persons of a particular employer, and so forth. In addition, having the statistical information may aid in segregating groups of human entities in any desired manner.

15 It should be appreciated that in the system 40, mining the information enables both a position of the at least one human entity to be determined, and an availability of the information of the at least one human entity to authorized parties. The position of the at least one human entity may be determined from a location of the contactless data reader 44, more specifically, based on readings from the positioning module 45. The position of the at least one human entity may be either current or at a particular instance. This is possible as a date and time stamp may be provided when the data storage apparatus 42 is read by the contactless data reader 44, and thus, the position of the at least one human entity according to the date and time stamp is known.

25 In addition, the availability of the information of the at least one human entity allows either localized or remote access to the information. The information may be viewed from a display 47 of the contactless data reader 44, or remote access to the information may be enabled using a data network. The remote access to the information may be through use of a communications enabled apparatus, for example, a personal computer 48(a), a notebook 48(b), a mobile phone 48(c), and so forth. The authorized parties may be provided with access rights (for example, a log-in ID and password) to obtain the available information using the aforementioned communications enabled

apparatus. The access rights may allow access to a website which provides tracking information of the at least one human entity. One instance where there may be a need to track movements of the at least one human entity may be during instances where there are different stages of a trip/event with next
5 of kin of the at least one human entity being curious/concerned in relation to a progress of the at least one human entity at the trip/event.

Possible applications of the system 40 will now be discussed in view that the system 40 has been clearly described in the preceding paragraphs.

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A first application would be during trips to particular places to either commemorate particular occasions or to fulfill religious obligations (pilgrimages). The system 40 would allow organizers of these trips to possess information in relation to the presence and/or movement of participants in their
15 care and also personal information of the participants in case emergencies crop up during the trips. For example, information relating to blood type and drug allergies of the participants would be readily available when administering to the participants during the aforementioned emergencies. In addition, the participants may also be categorized in groupings such as, for
20 example, pilgrims, vendors, trip administrators, and so forth. The categorization of the groupings aids in providing insights in relation to a composition of a pool of participants. The composition may be in relation to an intended purpose of the participants during the trip. These insights may be useful to ensure safety and pleasure of participants in subsequent years.

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A second application would be during sporting events which involve a large number of participants. Such sporting events may include, for example, marathons, triathlons, orienteering sessions, nature expeditions, and the like. The system 40 would allow organizers of these sporting events to possess
30 information in relation to the presence and/or movement of participants and also personal information of the participants in case emergencies crop up during the events. In such an instance, information relating to existing medical conditions and drug allergies of the participants would be readily available

during the aforementioned emergencies once emergency service providers reach the affected participants.

A third application would be during multi-interest events at a single venue.

5 Such events may include, for example, a family-theme event where there are different sections for parents and children, a vehicle-theme event where there are different sections for cars, motorcycles, and bicycles, and so forth. The system 40 would allow organizers of these multi-interest events to possess information in relation to the presence and/or movement of attendees for
10 control of crowd numbers at the different sections, and also personal information of the attendees in case of overcrowding emergencies during the events. For example, sections with an excessive number of attendees would be known and measures will be taken by the organizers such that an attendees' experience at the event is not diminished.

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It should be appreciated that the aforementioned applications are purely for illustrative purposes and not meant to be limited to these applications in any form.

20 Whilst there has been described in the foregoing description preferred embodiments of the present invention, it will be understood by those skilled in the technology concerned that many variations or modifications in details of design or construction may be made without departing from the present invention.

CLAIMS

1. A method for tracking movement of at least one human entity, the method including:
 - 5 providing the at least one human entity with a data storage apparatus, the data storage apparatus being able to be read using a data reader;
loading data into
the data storage apparatus, the data being information associated with the at least one human entity;
reading the data at the data
10 reader, the data being stored at a data storage facility; and
processing the data stored at the data storage facility to mine the information associated with the at least one human entity;
wherein mining the information enables both a position of the at least one human entity to be determined, and an availability of the information
15 of the at least one human entity to authorized parties.
2. The method of claim 1, wherein the information associated with the at least one human entity is selected from a group comprising: name, passport number, nationality, religion, emergency contact details, blood type, drug
20 allergies, existing medical conditions, employment details, purpose of travel, accommodation details, data storage apparatus identification details, and any combination of the aforementioned.
3. The method of claim 1, wherein the position of the at least one human
25 entity is determined from a location of the data reader.
4. The method of claim 1, wherein the data storage apparatus uses either RFID induction or any proprietary wireless data transfer technology.
- 30 5. The method of claim 3, wherein the data reader is either portable or located at a fixed position.
6. The method of claim 5, wherein the data reader includes a positioning module for providing the location of the data reader.

7. The method of claim 1, wherein processing the data includes organizing the information.
- 5 8. The method of claim 1, wherein the data storage facility is either at a localized location or a remote location.
9. The method of claim 8, wherein the data storage facility is accessible either by a wired connection or a wireless connection.
- 10 10. The method of claim 1, wherein the availability of the information of the at least one human entity allows either localized or remote access to the information.
- 15 11. The method of claim 10, wherein the remote access to the information is using a data network.
12. The method of claim 1, wherein the authorized parties are provided with access rights to obtain the available information.
- 20 13. The method of claim 1, wherein the position of the at least one human entity is either current or at a particular instance.
14. The method of claim 1, wherein a composition of a pool of the at least one human entity can also be determined from mining the information.
- 25 15. The method of claim 1, wherein the data reader is of a type selected from a group comprising: direct contact, contactless, and a hybrid of the aforementioned.
- 30 16. A system for tracking movement of at least one human entity, the system including:
at least one data storage apparatus, the at least one data storage apparatus being for storing data, the data being information associated with

the at least one human entity;

at least one data reader, each of the data readers being able to read the data from the data storage apparatus; and at least one data storage facility, the at least one data storage facility being for both storage and processing of data read by the at least one data reader, the processing of data being the mining of information associated with the at least one human entity, wherein mining the information enables both a position of the at least one human entity to be determined, and an availability of the information of the at least one human entity to authorized parties.

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17. The system of claim 16, wherein the information associated with the at least one human entity is selected from a group comprising: name, passport number, nationality, religion, emergency contact details, blood type, drug allergies, existing medical conditions, employment details, purpose of travel, accommodation details, data storage apparatus identification details, and any combination of the aforementioned.

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18. The system of claim 16, wherein the position of the at least one human entity is determined from a location of the data reader.

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19. The system of claim 16, wherein the data storage apparatus uses either RFID induction or any proprietary wireless data transfer technology.

20. The system of claim 18, wherein the data reader is either portable or located at a fixed position.

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21. The system of claim 20, wherein the data reader includes a positioning module for providing the location of the contactless data reader.

22. The system of claim 16, wherein processing the data includes organizing the information.

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23. The system of claim 16, wherein the data storage facility is either at a localized location or a remote location.

24. The system of claim 16, wherein the data storage facility is accessible either by a wired connection or a wireless connection.
- 5 25. The system of claim 16, wherein the availability of the information of the at least one human entity allows either localized or remote access to the information.
26. The system of claim 16, wherein the remote access to the information
10 is using a data network.
27. The system of claim 16, wherein the authorized parties are provided with access rights to obtain the available information.
- 15 28. The system of claim 16, wherein the position of the at least one human entity is either current or at a particular instance.
29. The system of claim 16, wherein a composition of a pool of the at least one human entity can also be determined from mining the information.
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30. The system of claim 16, wherein the data reader is of a type selected from a group comprising: direct contact, contactless, and a hybrid of the aforementioned.

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