

METHOD, SYSTEM AND APPARATUS FOR ASSESSING WORKPLACE SAFETY

TECHNICAL FIELD

5

The present invention relates to methods, systems and apparatus for assessing safety and in particular for assessing workplace safety.

BACKGROUND ART

10

Many workplace sites, including construction and manufacturing sites, oil drilling rigs and so on involve the use of equipment, tools and machinery to be operated by several workplace personnel, or “workers”. Such workplace environments involve potential safety issues relating to correct use of equipment, tools and machinery by workers, and correct equipment maintenance, to prevent injury to workers.

15

Several companies have devised systems to assess and audit the safety of workplaces to prevent accidents and injury to workers. An example of one system is the “Safety Training Observation Program”, or “STOPTM” by E. I. du Pont de Nemours and Company (DuPont). STOPTM involves training workers to carry out daily audits of their workplace using a standard “observation checklist” questionnaire which may be filled out by a worker. By answering the questions, the worker carries out a safety audit of the workplace. The questions may be adapted to suit the specific equipment and environment of the workplace in question, however they include questions relating to reactions of people to specified situations, use of specified personal protective equipment, positions/locations of workers in relation to machinery, whether tools and equipment being used for a particular purpose are appropriate for that purpose, whether correct procedures are being followed, etc. The results of questionnaires filled out by several workers are then collated for later reporting and, where applicable, action for improving workplace safety.

20

25

30

SUMMARY OF THE INVENTION

According to a first aspect of the invention there is provided a method for assessing workplace safety comprising the steps of:

- 5 identifying a personality-type of an assessor making the assessment;
carrying out a worker safety assessment step comprising the steps of observing and recording, in association with the identified personality-type, information indicative of whether a worker adheres to at least one predetermined worker safety procedure, the worker safety assessment step being performed separately to at least
10 one other workplace safety assessment step.

Optionally, the at least one other assessment step comprises assessing whether one or more items of workplace equipment adhere to one or more predetermined equipment safety parameters.

- Optionally, the at least one other workplace safety assessment step comprises
15 the steps of observing and recording, in association with the identified personality-type, information indicative of whether the one or more workplace equipment items adheres to the predetermined equipment safety parameters.

- It has been recognised that the general population can generally be divided into two personality-types – people who are predominantly task-focussed and people
20 who are predominantly people-focussed. Furthermore, whether a person is task-focussed or people-focussed will influence him in assessing a workplace for potential safety issues. For instance, people who are predominantly task-focussed tend to concentrate on issues related to equipment, while people who are predominantly people-focussed tend to concentrate on issues related to workers and how they are
25 performing their work. The invention therefore addresses this issue by separating the assessment of workplace safety by providing a method where equipment safety is assessed separately to people safety. The applicant has found that this approach may help to reduce bias in workplace safety assessment. This is by ensuring people of either said focus apply balance between people safety issues and equipment safety
30 issues when assessing workplace safety.

Optionally, the information related to the worker safety assessment step is recorded on a first data recorder and information related to the at least one other workplace safety assessment step is recorded on one or more second data recorders.

Optionally, prior to the assessment steps, the method comprises the step of
5 assessing personality-type of at least one of the one or more workers and/or a worker performing the method.

Optionally, the method comprises the step of providing indicia to the worker, the indicia being visibly locatable on and relating to the worker's personality-type.

In accordance with another aspect, the present invention provides a system for
10 assessing workplace safety comprising:

a system for assessing workplace safety comprising:

a first data recorder configured to record results of a worker safety assessment comprising the steps of assessing whether a worker adheres to one or more predetermined safety procedures, the results being recorded in association with a
15 personality-type of an assessor making the assessment; and

a second data recorder configured to record results of assessments made by the assessor in respect of other workplace safety information.

Optionally, the step of assessing worker safety comprises recording on the first data recorder one or more indicia regarding the personality-type of a worker carrying
20 out the worker safety assessment step. The step of assessing equipment safety comprises recording on the second data recorder one or more indicia regarding the personality-type of the assessor carrying out the equipment safety assessment step. Optionally, the step of assessing worker safety comprises recording on the first data recorder one or more indicia regarding the personality-type of one or more of the
25 workers whose procedural safety is being assessed. The method may further comprise the step of processing the acquired worker safety data to determine whether a set of workers having the same or similar personality-type work more or less safely than a set of workers having a different personality-type.

The first and second data recorders may be machine readable. Optionally, the
30 method comprises the step of acquiring data from the first and second data recorders for processing by a computer processing device.

Optionally, the method is performed by a plurality of workers, each worker recording data relating to worker safety assessment on a respective one of the first data recorder and recording data relating to equipment safety assessment on a respective one of the second data recorder. The method may further comprise the step
5 of processing the acquired data to provide results weighted by one or more of the personality-types of the workers who recorded the data.

Optionally, the personality-types may include one or more task orientated worker personality-types and one or more people orientated worker personality-types.

By assessing whether workers are task-focussed or people-focussed, the data
10 collected by the person in question can be assessed in light of this knowledge to further reduce any bias from the person collecting the data toward equipment safety issues or people safety issues.

Optionally, the worker personality-types may include one or more task orientated worker personality-types and one or more people orientated worker
15 personality-types. The task orientated worker personality-types may include director personality-type and conscientious personality-type and the people orientated personality types include influencer personality-type and steady personality-type.

The personality-type data may also be used to determine whether workers of one personality-type are more or less likely not to follow correct workplace safety
20 procedures than workers of a different personality-type. This may help in training of workers, where workers of one particular personality-type are trained differently, with different emphasis on determined workplace safety procedural matters than workers of a different personality-type. This may further reduce incidences of breaches of workplace safety.

25 According to another aspect of the invention there is provided a system for assessing workplace safety comprising:

a first data recorder configured for recording results of whether one or more workers adhere to predetermined safety procedures; and

a second data recorder configured for recording results of assessing other
30 workplace safety information.

The system may comprise features embodying the optionally and preferred features of the above described method aspect.

The system may further comprise a computer processing device configured to acquire data from the first and second data recorders for processing. The computer
5 processing device may comprise a scanner for scanning the first and second data recorders. A computer processing device may also be configured to process the acquired data to provide results weighted by one or more of the personality-types of the workers who recorded the data. The computer processing device may be configured to process the acquired worker safety data from a plurality of first data
10 recorders to compare the worker safety data of a first set of workers having the same or similar personality-type with the worker safety data of a second set of workers having a personality-type different to the first set of workers.

The first and second data recorders may comprise respective data cards for manually recording data.

15 According to another aspect of the invention there is provided a set of workplace safety data recorders comprising:

at least one first data recorder configured to record data relating to the assessment of whether one or more workers adhere to predetermined safety procedures in association with a personality-type of a respective assessor making the
20 assessment; and

at least one second data recorder configured to record data relating to another workplace safety assessment made by the respective assessor(s).

The second data recorder may be configured for recording data relating to the assessment of whether one or more items of workplace equipment adhere to one or
25 more predetermined equipment safety parameters. The first and second data recorders may be machine readable. Optionally, the first and second data recorders may be respective first and second cards configured for the manual recording of information thereon.

According to another aspect of the invention there is provided a computer
30 program or a computer program product, stored on a computer readable medium, configured to cause a computer to process and/or analyse the information recorded on

the first and/or second data recorders referred to above in relation to the above described method aspect.

BRIEF DESCRIPTION OF THE DRAWINGS

5

Preferred embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figures 1a to 1c are flow diagrams of steps of an embodiment;

Figures 2a and 2b are schematic diagrams of an embodiment of data cards; and

10 Figure 3 is a schematic diagram of an embodiment of a computer system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A preferred embodiment comprises a method and system for assessing
15 workplace safety for helping an organisation reduce or prevent workplace accidents and injury, and downtime associated therewith. The method and system is particularly useful in work environments where heavy machinery is operated, such as in a manufacturing plant or on an oil platform, and where there are several workers who may or may not work in shifts. It is important and good workplace practice in
20 such environments to ensure a formalised safety assessment program is in place to reduce and prevent workplace injury and accidents. The preferred embodiments make use of the above mentioned inventive realisation that workplace safety can be better assessed and managed if different personalities of workers are acknowledged and utilised in assessing workplace safety and in using the assessment results to
25 improve workplace safety.

Referring to Figures 1a to 1c, the preferred method comprises three main stages, each shown schematically joined in Figures 1a to 1c by dotted lines. Firstly, referring to Figure 1a, at least some and preferably all workers are assessed **100** for their personality-type using a personality indicator test. Personality indicator tests
30 which could be used with the preferred method include such tests as those based on, or influenced by, either wholly or in part, known Jungian personality types (“thinking,

feeling, sensing and intuiting”). One example of such tests includes the applicant’s “E-Colours” personality test which attempts to predict a person’s behaviour depending on different situations. The test is used to determine the weighting of an individual’s personality in terms of four personality traits: *director* – doer, direct
5 communicator who is task orientated; *influencer* – talker, sociable and people orientated; *supportive* – guardian, team player and people orientated; and *analytical* – thinker, detailed and task orientated. The applicant has determined that most people will have a dominant pair of personality traits, typically being either the pair of
10 director and analytical (indicating a “task-orientated” personality), and the pair of influencer and supportive (indicating a “people-orientated” personality). Each of the assessed workers is given indicia in the form of a marked label to locate visibly on their person, such as on their hardhat, or shoulder, so that their co-workers can see the label. In this embodiment, the markings on the label include two colours: a first colour to indicate the worker’s predominant personality trait; and a second colour to
15 indicate the worker’s second dominant personality trait. For most, if not all workers, their label will include colours indicating either the pair of task-based personality traits or colours indicating the pair of people-based personality traits. As will become more evident in the following description, this embodiment utilises the knowledge of the worker’s personality traits and the indicators in assessing and improving
20 workplace safety. Also, as will be understood, in an alternative embodiment, indicia other than colour may be used to indicate personality traits, for example, unique symbols, alphanumeric symbols, etc may be used. Also, alternatively, in place of two colours, the label may only comprise one colour (or other indicia) to indicate the worker is task-orientated and one colour (or other indicia) to indicate the worker is
25 people-orientated.

Once workers have been assessed for their personality traits, they are trained
102 in how to use the method of the present embodiment. Referring to Figures 2a and 2b, this involves training workers how to use a first data recorder in the form of a first data card 104 for recording data regarding worker safety in terms of workers’
30 adherence to safety procedures, and how to use a second data recorder in the form of a second data card 106 for recording data regarding equipment safety. In this

embodiment, the first data card **104** is arranged in three sections: a first section **108** relating to the worker carrying out the assessment; a second section **110** regarding the personality of the primary worker being assessed; and a third section **112** with questions relating to predetermined worker safety procedures. The first section **108**

5 includes data recording space for the assessing worker to record details such as their name, personality type (in the form of their two predominant colours), location and the time of day. The second section **110** provides space for recording the personality of the primary of their co-workers they are assessing (for example, a group of co-workers may be performing a task: only one or a representative one of the group will

10 be considered in completing the card **104**). As each worker wears a visible label on their person indicating their personality-type, this facilitates the recording of the primary worker's personality-type on the first data card **104**. In this embodiment, the four letters in the second section **110** relate to colours which indicate the above four mentioned personality types. "R" represents red, as an indicator of the "Director"

15 personality type. "Y" represents yellow, as an indicator of the "Influencer" personality type. "B" represents blue, as an indicator of the "Supportive" personality type. "G" represents green, as an indicator of the "Analytical" personality type. The third section **112** comprises several questions regarding how the workers being observed could get hurt, depending on their current work practice. For those

20 questions provided in the third section **112** which require a positive response, the worker assessing the worker safety marks the relevant circle to indicate there is a safety problem or potential safety problem. As will be understood, more or fewer questions may be included on the first data card **104**. In this embodiment, the second data card **106** comprises an equivalent first section **114** to the first section **108** on the

25 first data card **104** and a second section **116** comprising questions relating to the safety or otherwise of equipment and tools. In the embodiment illustrated in Figure 2b, eight questions are provided (four actual questions are provided in the illustrated example, with symbols ">>>>" given to illustrate space for four additional questions) for a worker assessing worker safety to record the safety or otherwise of either items

of equipment or tools. As will be understood, more or fewer questions may be provided in the second section **116** of the card **106**.

Referring to Figure 1b, a worker equipped with a set of first and second data cards **104**, **106**, who is also trained **102** in how to use the cards, can assess, separately,
5 the workplace safety of their co-workers in terms of how they are carrying out predetermined worker safety procedures and in terms of whether equipment and/or tools meet predetermined safety parameter requirements. The assessment is carried out by the worker in question by observing **118** worker workplace practice and following and recording **120** responses to the questions on the first data card **104**.
10 Once the worker has responded to as many questions on the first card **104** as relevant, he then observes **122** the workplace equipment and tools and, following the questions on the second data card **106**, records **124** relevant data on the second data card. As will be understood, the worker may observe either the worker workplace practice **118** prior to observing equipment safety **122**, or vice versa.
15 By having separate first and second data cards **104**, **106**, the worker performing the workplace safety assessment is forced to separate his consideration of worker adherence to safety procedures and of safety of equipment. As explained above, given the natural bias of task-orientated people toward consideration of equipment safety and of people-orientated people toward the way people perform
20 their work, this separation helps to reduce bias by workers when performing workplace safety assessments.

Once observations are made on either equipment **118** and/or people **122**, the observer using either the first data card **104** or the second data card **106** may have a safety conversation **125** with the co-worker(s) being observed in relation to the first
25 data card **104** to discuss both safe and unsafe observations, or he may have a safety conversation **126** with co-workers responsible for the equipment which is the subject of the second data card **106**.

Once the worker has completed his assessment of worker workplace practice and equipment safety, he gives **127**, **128** his completed cards **104**, **106** to a designated
30 authorised co-worker. As will be understood, more than one or all workers in a given

workplace may perform the above described method at regular or ad hoc time intervals, as determined by the employer of the workers.

The collected cards are singly or batch scanned **130** by a standard optical scanning device **132a,b,c** (which see Figure 3) to a computer **134a,b,c**. Software on
5 the computer **134** determines responses to the questions, since the cards **104, 106** are in a format wherein a software program, written with the cards **104, 106** and question format in mind, determines the responses to the questions. In one embodiment, optical character recognition (OCR) software is also used to determine the respective worker's names and personality types written on the cards **104, 106**. An image of
10 each card is held in the computer's memory for later recollection. The data determined by the software, after the scanning of the cards, is then uploaded **136** via a network, such as a local area network (LAN), wide area network (WAN), the internet **137**, or other network to a central server **138**. In an embodiment where the first and second cards **104, 106** are double sided, the scanner may be configured to scan both
15 sides of the cards at once to reduce manual input and time taken to scan the cards.

As will be understood, the above described method and system may be implemented at several workplace locations of an organisation. Therefore, it may be useful to be able to upload the data determined from the scanning process to a central server or computer **138** belonging to the organisation to centrally assess the
20 workplace safety of their organisation as a whole, or workplace by workplace, for example.

Referring to Figure 1c, the uploaded data is then processed **140** by the central computer **138**. The processing provided by software includes the providing of collected responses to each question, which may then be provided to a user, such as a
25 manager of the organisation, in the form of a table or graph, as desired. From this, the user can review **142** the data relating to the workplace safety of his workers based on procedural adherence by workers and on equipment. Furthermore, the software is configured to allow the user to review portions of the data, such as the compiled data recorded by all workers having the same personality-type. In this way, the user can
30 identify if one personality-type group is more aware of some workplace safety issues

than their co-workers. Also, the software is configured to allow the user to review collated equipment data and collated worker procedural safety data for each location to determine whether one location has more or less potential for an accident or worker injury in terms of equipment safety and/or worker procedural safety. Once the data has been reviewed **142** by the user, feedback **144** can be given to one or more or each location of the organisation for improving the safety at those locations, and improvements noted for action and tracked for implementation **145**. As will be understood, the steps exemplified in Figure 1b will continue to take place independently of the steps exemplified in Figures 1a and 1c. Once feedback **144** has been implemented, it will then be possible for the user to monitor the impact of the feedback or of the actioned improvements through the processing **140** and review **142** of data collected through the steps in Figure 1b after feedback implementation.

The steps illustrated in Figure 1c have been briefly described in terms of a computer system including a scanner, computer and internet uplink to a central computer for processing of scanned data. Referring to Figure 3, this may be achieved in several ways. Firstly, for example where the organisation has one workplace, the scanner and computer may be stand-alone, as illustrated by scanner **132a** and computer **134a**. In this case, the computer **134a** itself will contain the software for processing **140** the scanned data for later review **142** by the user. Alternatively, as illustrated by scanners **132b,c** and computers **134b,c**, the organisation may comprise a first location with one scanner **132b** and computer **134b** combination connected through the internet **137** to a central computer **138** for data processing **140**, etc. At another location, there may be more than one scanner **132c** and associated computer **134c** connected via a LAN or WAN to a local central server computer **146** which is in turn connected via the internet **137** to a central server computer **138**. In this embodiment, the data processing **140** may be performed by one or more of the computers **134c**, the local central server computer **146** or the central server computer **138**, depending on the desired outcome of the organisation. For example, where a user at one location (such as the location served by computer **134b**) wishes to review **142** processed data for his location, it may be useful for the data to be processed at his

location. If desired, the processed data may then also be uploaded to the central computer server **138**, for review **142** by another user in the organisation. As will be understood, other known computer network configurations may be used for the process, review, upload or download of raw scanned data or processed data,
5 depending on the needs of the organisation.

In an alternative embodiment as an addition to the above described process **140** and review **142** steps, the software may be configured to weight the collated recorded data depending on the personality-type of the workers having recorded the data. In this way, more weight can be applied to equipment safety data recorded by
10 task-orientated personality-type workers, and more weight can be applied to worker procedural adherence safety data recorded by people-orientated personality-type workers.

In another embodiment as an addition to the above described process **140** and review **142** steps, the data from the first card **104** can be processed by the computer **138**
15 to determine whether workers of a particular personality-type appear to be more or less safe than their colleagues in terms of adherence to safety practices. This information can allow for the training step **102** can be tailored for each personality-type. This may help to influence workers' adherence to workplace safety practices.

Another embodiment comprises a set of first and second cards **104, 106**,
20 comprising the features described above, wherein the set is preferably containable in a card wallet. The set may be used in conjunction with the above described method and system embodiments. The card wallet is arranged to hold a plurality of the first cards **104** together and a plurality of the second cards **106** together, separately from the plurality of first cards **104**. The set is provided in a convenient size to be carried by a
25 worker at their workplace to allow for easy and at least partially protected carrying of the first and second cards **104, 106** by the worker.

The use of labels to display the personality types of workers has an added benefit in reducing adverse safety incidents in the workplace. As an optional addition to the step of training workers **102**, the workers can also be trained in how to interact
30 with their colleagues dependent on their co-workers' personality-types. This can be

particularly helpful when having the safety conversation **125** mentioned above with co-workers in relation to how they are performing their work, or when having a safety conversation **126** mentioned above with co-workers who are responsible for equipment. With knowledge of their co-worker's personality-type, they can approach
5 their co-worker in a manner that is either less likely to offend or upset their co-worker, and/or in a manner which is likely to achieve a positive result in improving their co-worker's adherence to workplace safety practice.

As will be understood, while the present embodiment is particularly useful for and described in relation to the above mentioned work environments, it is also
10 applicable to other work environments, including office work environments, storing and packing environments, and so on.

While the invention has been described in reference to its preferred embodiments, it is to be understood that the words which have been used are words of description rather than limitation and that changes may be made to the invention
15 without departing from its scope as defined by the appended claims.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A method for assessing workplace safety comprising the steps of:
identifying a personality-type of an assessor making the assessment;
5 carrying out a worker safety assessment step comprising:
observing and recording on a first computer readable card, in
association with the identified personality-type, information indicative of
whether a worker adheres to at least one predetermined worker safety
procedure; and
10 observing and recording on a second computer readable card, in
association with the identified personality-type, information indicative of
whether one or more items of workplace equipment adhere to predefined
safety parameters;
reading the recorded information on the first and second computer
15 readable cards using a computing system and storing it on a computer readable
medium;
processing both the stored information and safety related criteria to
determine a potential for an accident or injury; and
outputting notification by the computing system of the determined
20 potential.
2. The method according to claim 1, comprising the further step of providing
indicia to the worker, the indicia being visibly locatable on the worker and relating to
the worker's personality-type(s).
25
3. The method according to claim 2, comprising the further step of identifying
personality-type of the worker from the indicia and additionally recording and
evaluating the identified worker personality-type in order to determine the potential
for accident or injury.
30

4. The method according to any one of the preceding claims, wherein the information recorded by the assessor on the first and second computer readable cards comprises answers to respective worker and equipment safety questionnaires, such that the evaluation comprises determining how well the assessor scored the worker in
5 the assessment.
5. The method according to claim 4, further comprising the step of the computing system applying different weightings to answers provided by assessors having different personality types.
10
6. The method according to claim 5, wherein a positive weighting is applied to information indicative of procedural safety by people-orientated personality types, relative to the weighting applied for task-orientated assessors.
- 15 7. The method according to claim 5 or claim 6, wherein a positive weighting is applied to information indicative of equipment safety by task-orientated personality types, relative to the weighting applied for people-orientated personality types.
8. The method of any one of the preceding claims when dependent on claim 3,
20 comprising the step of processing the recorded information for a number of workers having different personality types to determine personality types that are more likely to have an accident or injury and implementing a training regime for workers associated with those personality types.
- 25 9. The method according to any one of the preceding claims, wherein the personality-types include one or more task orientated personality-types and one or more people orientated personality-types.
10. The method of claim 9, wherein the task orientated personality-types include
30 director personality-type and conscientious personality-type and the people orientated

personality types include influencer personality-type and steady personality-type.

11. A system for assessing workplace safety comprising:

5 a first computer readable card configured to record results of a worker safety assessment comprising the step of assessing whether a worker adheres to one or more predetermined safety procedures, the results being recorded in association with a personality-type of an assessor making the assessment; and

10 a second computer readable card configured to record results of an equipment safety assessment comprising the step of assessing whether one or more items of workplace equipment adhere to predefined safety parameters, the results being recorded in association with the personality-type of the assessor;

a computing system comprising:

15 a reading module arranged to read the information recorded on the first and second computer readable cards and store it in an electronic storage module; and

a processing module arranged to process the stored data and safety related criteria to determine a potential for an accident or injury; and

output module arranged to output notification of the determined potential..

20

12. The system of claim 11, wherein the reading module is a card reader comprising an optical scanning means configured to read data written on the first and second cards.

25 13. The system of claim 11 or claim 12, wherein the results recorded by the first and second computer readable cards are answers to respective worker and equipment safety questionnaires.

30 14. The system according to claim 13, wherein the processing module is further configured to apply different weightings to answers provided by assessors having

different personality types.

15. The system according to claim 14, wherein the processing module is configured to apply a positive weighting to results associated with worker safety
5 assessments recorded by people-orientated personality types, relative to the weighting applied for task-orientated assessors.

16. The system according to claim 14 or claim 15, wherein the processing module is configured to apply a positive weighting to results associated with equipment safety
10 assessment recorded by task-orientated personality types.

17. The system according to any one of claim 11 to 16, wherein the first computer readable card is further configured to record a personality-type of the worker being assessed, relative to the weighting applied for people-orientated personality types.
15

18. The system of claim 17,, wherein the processing module is configured to process the stored data recorded by a plurality of first computer readable cards to compare worker safety data of a first set of workers having the same or similar personality-type with the worker safety data of a second set of workers having a
20 personality-type different to the first set of workers and output an indication as to the overall safety level for each compared set.

19. A computer program product, stored on a computer readable medium, configured to implement the method in accordance with any one of claims 1 to 10.
25

20. A system substantially as hereinbefore described with reference to the accompanying drawings.