ICT2108 Team Project 2020

Title of the Project
Development of SIT Safety & Health Division Risk Management Web/Mobile app

Description of the Project

NOTE: this document covers the full domain of possible work. However, teams will only be allocated specific modules and platforms. Teams will prioritize and negotiate requirements as they deem necessary.

Project objectives:

1. Design and develop an integrated online system for staff, students and contractors to access, provide and obtain safety related information in a single platform, across the organization regardless of physical locality of sites.

2. Incorporate artificial intelligence such as data driven predictive capabilities into the system to augment decision making in safety & health risk management.

The project will be a joint effort from SIT Safety & Health Division and you. SIT S&H Division will provide specialized knowledge and expertise in safety & health domain specific to universities, and all adequate expertise necessary for the development of modules that comprises of the following:

1. Administrative module
2. Risk Assessment module
3. Hazard Management module
4. Safety Inspection module
5. Incident Reporting & Investigation module

A1. Administrative module

Some key features of this module will include user permissions/authorization to different functionalities in the system, and allow the creation and maintenance of unique user profiles. Unique user profiles will allow users to include their digital signature, double password requirement for electronic document workflow processes (approval, etc.), and inclusion of their individual competency certifications and other documents. The digital signature shall appear on required documents of the digital platform and is considered legally valid. Other functions like mobile apps configurations for Android and IOS on reporting, education information and safety promotion.

A2. Risk Assessment module

The Risk Assessment module will be designed to guide users to generate a risk assessment by choosing planned work processes and work activities, and through the incorporation of artificial intelligence, it will recommend mitigation and control measures that are best industry practices, compliant to Singapore standards using expert data sets. These data sets will be provided and maintained by IDD SolutionNet as a continuously learning and legally compliant (in Singapore) knowledge master data base. The module shall generate risk assessment reports in accordance to SS506 (Singapore Standard on Occupational Safety and Health (OSH) management systems and Code of Practice on Risk Management.

The module will also allow creation of new work processes and activities when they do not exist within any of the master data bases. The system, while generating risk assessments, shall intelligently suggest appropriate checklists, associated permits and safe work procedures associated with the work processes from the master or project master to generate a complete job pack for users to facilitate site activity planning.

Other features of this risk assessment module include having unique identifiers (e.g. QR code) which can be printed in the output document, enabling users to download the entire approved risk assessments with QR scanners in their mobile devices. The system will also provide notifications via email for any actions (review/approval/pending, etc) for all users. It will also support documentation and traceability required for safety audits required of companies or projects.

A3. Hazard Management module

The Hazard Management module shall allow for the creation/ identification of new hazards and their recommended control measures to be added to the master database. The hazard management module shall include fields like hazard description, sources that can lead to the hazard occurring, type of injury it can cause, the risk ratings and recommended preventive control measures.

A4. Safety Inspection module

The Safety Inspection module shall be a mobile application that enable users to capture safety deviations, report non- conformities and trigger follow-up actions during safety inspections. The module will also allow notification of such findings to be sent directly to the registered email of the respective assigned users. This module shall include geo-tagging of locations, categorization of priority/safety deviation through machine learning, descriptions and pictures of safety deviations, and recommendations for follow up actions.

A5. Incident Reporting & Investigation module

The Incident Reporting & Investigation module will allow users to report safety incidents to internal stakeholders to trigger incident investigation and follow-up actions. The module will be mobile enabled to allow users to report incidents via hand-held devices. Through the information provided by users, the system will make use of artificial intelligence to extract relevant documents in the system to support the incident investigations. Such information are not limited to risk assessments related to the incident work activities, inspection reports for the incident site, competencies records of affected persons, etc. The system will also provide notifications via email for review, approval and closure of recommended corrective / preventive actions for affected users.

Additional Consideration: *Artificial Intelligence*

The main feature of modules lies in making use of artificial intelligence for the system to learn and put forth recommendations in risk ratings and control measures in the subjective field of safety & health risk management.

The use of artificial intelligence in existing safety management system software has been very limited, with data analytics being used mainly for simple real time reporting of trends in charts and dashboards. With the incorporation of artificial intelligence in the modules, the knowledge management capabilities of the system feature will help to minimize variations of risk appetite, knowledge and experience of the subject matter at the point of the risk assessment exercise.

Final Deliverable(s) for the Project

Either of the following:

1. Web Portal/Application
Refer to the Specification/Work-scope Requirement document for compliance. For UI design, SIT is to provide a guideline document.

2. Mobile Application (Cordova-IOS/Android)

Refer to the Specification/Work-scope Requirement document for compliance. For UI design, SIT is to provide a guideline document

Supplementary Information

Specifications/ Work Scope. Details of the requirement can be found in Section A of this document

Most of the existing digital safety management systems are subscription based where users are defined by the number of staff in the organisation. For Institutes of Higher Learning (IHLs), this user based subscription model make it difficult for IHLs to invest in digital safety management systems due to the vast numbers of users from students to staff and contractors.

Developing this project system to a subscription model that is not tied to a finite number of users will be attractive to IHLs. This project will serves as a pilot platform for the project system to be evaluated on its potential to be scaled up to support IHLs' business model.

References

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