TRAckERS: Transfusion-Related Adverse Events Reporting System

M. Masrin, Toh Shi Yin[1], Bong C.H. [1], Lee N.K.[2], & M. Hamdi M.[3]

Blood Bank, Sarawak General Hospital (SGH), Jalan Hospital, 93586 Kuching Sarawak.
[1]Universiti Malaysia Sarawak (UNIMAS), Faculty of Information Technology (FIT).
[2]Universiti Malaysia Sarawak (UNIMAS), Faculty of Cognitive Science & Human Development (FCSHD).
[3]Universiti Malaysia Sarawak (UNIMAS), Faculty of Medicine & Health Sciences (FMHS).

INTRODUCTION

This study examine the efficiency and effectiveness of the procedure of reporting the transfusion-related adverse events. Blood transfusion is a process of receiving blood through an intravenous (IV) line from patient's blood vessels. It is considered as a safe and common procedure as most of the blood transfusion goes well. However, there are still some minor or severe problems developed occasionally. These transfusion-related adverse events need to be investigated to find out the cause of adverse reaction during or after the blood transfusion. In Malaysia, although there is a procedure of reporting the adverse event that need to be follow strictly by the medical staff, there are some issues happens such as unattended cases, lack of detail, incomplete report and so on.

OBJECTIVE

The aims of this study were to demonstrate a web-based application to manage the process of reporting transfusion-related adverse event for investigation. The main objectives for this study was to ensure the procedure is followed by medical staff and track the progress of investigation on the cases.

METHODS

Figure 1: Rapid Prototyping Methodology (a-b). The approach comprises of two phases, firstly information gathering from the target user by interviewing them & available literature study; and secondly the prototype design based on the requirements gathered previously. In this present project, the prototype of web system for reporting the blood-transfusion related adverse events is build using Justinmind Prototyper.

At present there are three available systems with their strength and weakness as follows:

- SABRE Online Reporting System: United Kingdom

Features reviewed	Description
Strength	• Users able to read and/or modify their reports
Weakness	• Inefficient Log In / Log Out mechanism, users account may need re-validation by SABRE team.

- Transfusion Transmitted Injuries Surveillance System (TTISS-ON): Canada

Features reviewed	Description
Strength	• Dual database platform system availability, namely TTISS-ON and REDCAP enable back up to data loss mishaps.
Weakness	• Risk of compromised confidentiality due to users full access to the data.

- Serious Transfusion Incident Reporting System (STIR): Australia

Features reviewed	Description
Strength	• Panel verification of an incident by through STIR criterion.
Weakness	• No automatic notification, heavily relying on email communication between users and STIR panel/ organization.

Proposed system :

- [redacted]

Requirements:
Microsoft Visual Studio, Microsoft SQL Server and Bootstrap.

RESULTS

a) b)

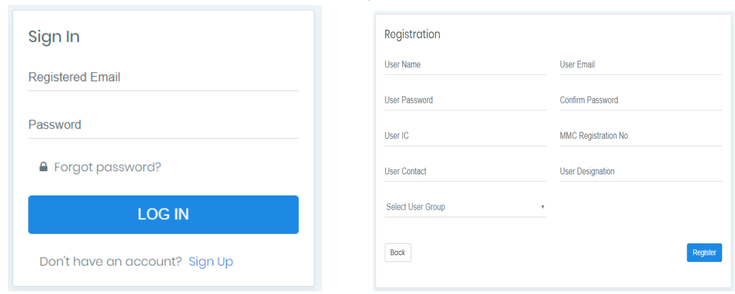

Figure 2*: Interface of Log In and Registration Page respectively (a-b).* *Note that there are selective log In User Group options as either Ward staff, or Blood bank staff (Medical Officer/ Transfusion Medicine Specialist). Users are verified by MMC Registration and Designation. This provide security and controlled of access to specific information in the system.*

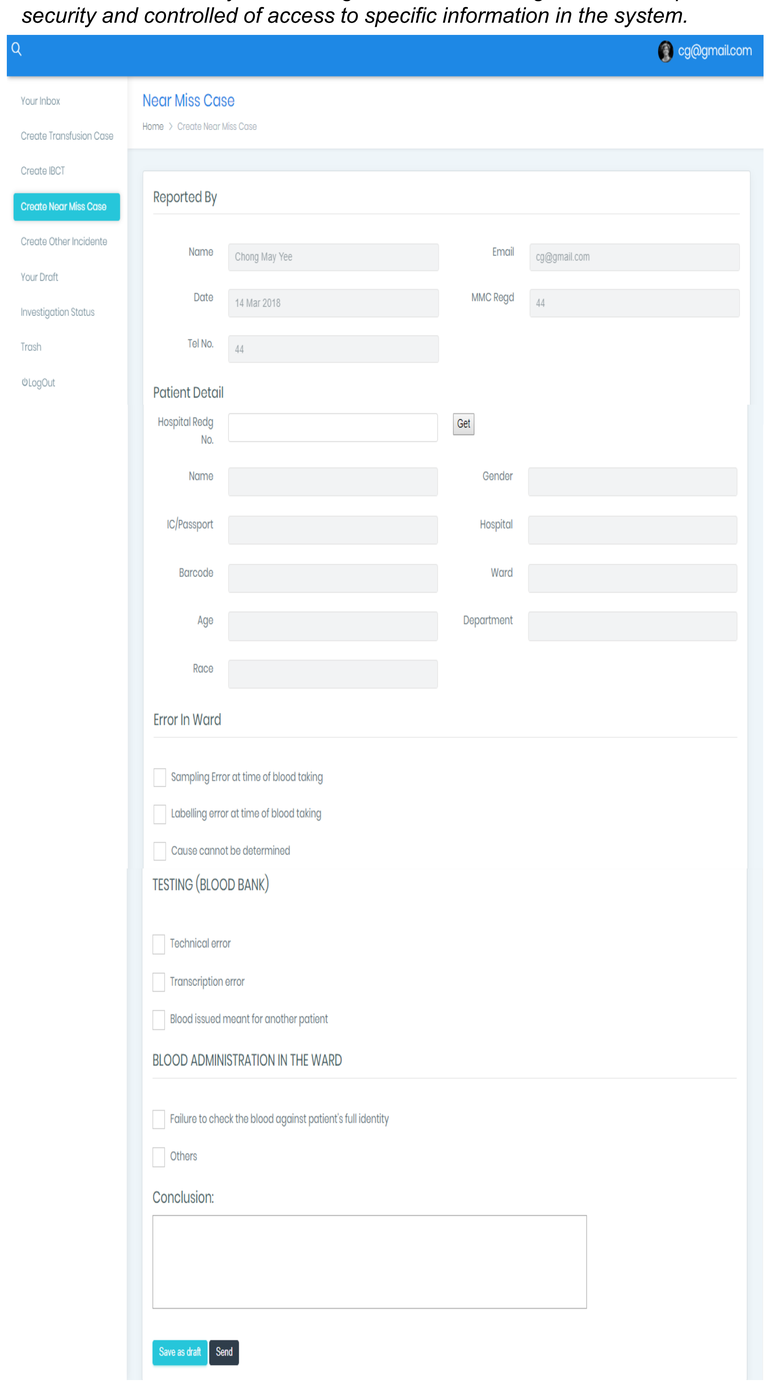

Figure 3*: Interface of Medical staff and Draft.* *In addition, Medical staffs either Blood bank or Ward, able to notify adverse effect, request -laboratory investigation or -test results report. Furthermore, near miss cases will be also captured in this present TRAckERS system. This feature is not available in SABRE, TTISS or STIR system. Thus, empowers Ward staff for prompt reporting any types of transfusion related adverse events including near miss cases as early as possible.*

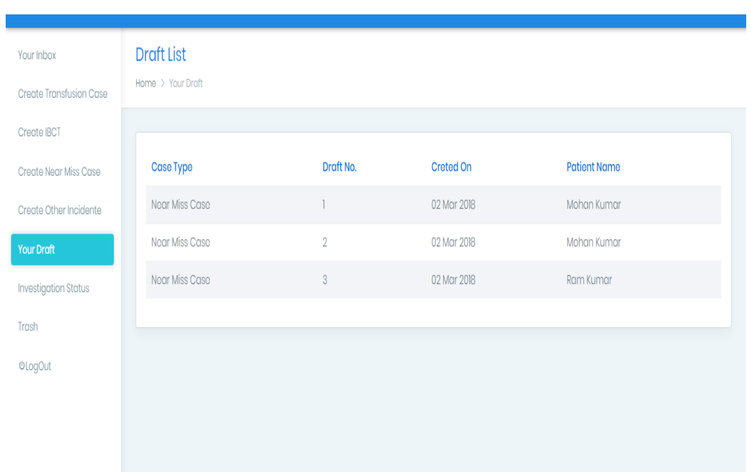

Figure 4*: Interface of Medical staff reporting.* *Note that Ward staff can update information in the report by saving the report as draft. After the report is sent, it is not allow to edit. This reporting feature allows Ward staff to be certain for any of their issued report.*

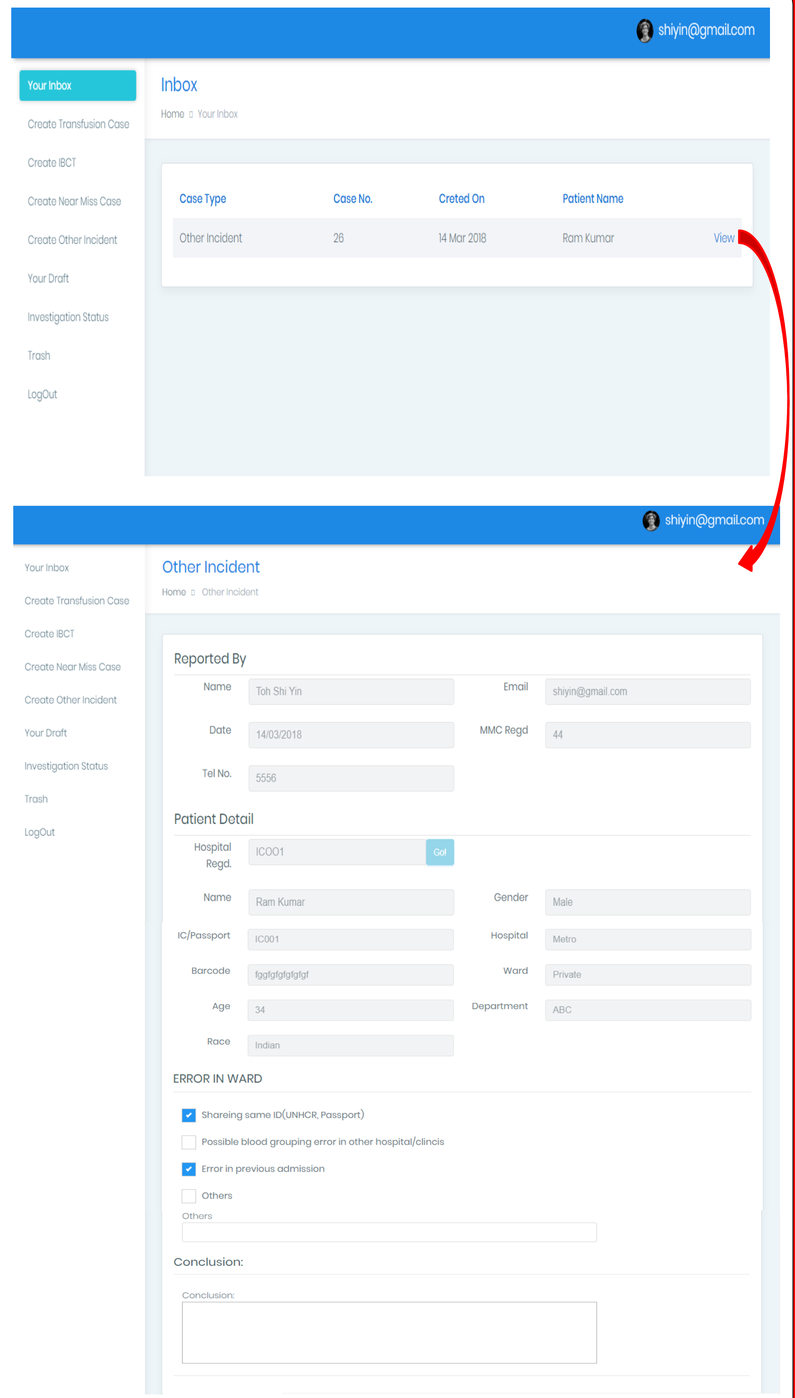

Figure 5*: Workspace diagram for Medical staffs.* *In this present TRAckERS system, Transfusion Medicine Specialist can promptly reply to reports including adverse effect notification and provide conclusion for the respective case. This option is important for clinical management of patient.*

DISCUSSION & SUMMARY

- This web system provides a better way to manage the procedure of reporting the adverse events.
- TRAckERS advantage were:
  1. Better Log In/ Log Out mechanism.
  2. Authorized personnel access to the report with local transfusion specialist verification.
  3. Towards, higher level committees verification at state transfusion committee and national level (National Blood Centre/KKM).
- The system has been reviewed by users in Blood bank and utilisable in ward for reporting.
- TRAckERS have the potential to be extended to wards with more sophisticated set up.
- This developed prototype system will be the pre-cursor of a full operating adverse event reporting system in the future.

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