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Research paper

Personal Injury Claims (PIC) Database Modeling in Malaysia

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Abstract

Road accident often leads to claims for personal injury by aggrieved parties. In Malaysia, courts have been using multiplier-multiplicand approach. This approach seems to be outdated and unfair to the claimant. Presently, the approach excludes the claimant's personal condition in the calculation of quantum of damages. Hence, this study uses the Ogden Table as introduced in the United Kingdom as benchmarking guidelines, by taking into account of all aspect of claimant's personal condition for the purpose of such calculation. This study aim is to build upon a proposed data modeling system known as Entity Relationship Diagram (ERD) and the created process modeling known as data flow diagram (DFD). In so doing, the claimants will insert his input data, run it through the first process, and store the information in the claim injury part database. They can also edit and store to claim injury part database on their own. This will generate a report with the information in claim injury part database and can be viewed by claimant, court and lawyer as target users. It is hoped that it will facilitate the calculation of injury claim which would serve justice and accuracy of personal injury in road accidents.

Keywords: *road accident; personal injury; Ogden Table; claims; ERD; DFD.*

1. Introduction

Currently, in Malaysia, an accident that is related to the different type of vehicles keep increasing. The statistics were recorded 400,788 road accidents nationwide between January and September last year [1]. As the road accident increase, the rate of the claimant to claim their claim also increase. Thus, the claimant needs a new process or procedure that can make the process of claim more efficient.

Unfortunately, presently there is lack of present application system to calculate that claim quickly. The common approach known as Multiplier-Multiplicand approach used in Malaysia showed the approach does not corresponding with the current update and became incompatible overtime [2]. For example, the government have changed the retirement age to 60 years old. Regarding to this approach, the compensation does not consider the personal issues such as the status of occupations, ages and part on injury [3]. Thus, it becomes unfair since the quantum of damages does not coincide with the claimant situation.

Basically most of the research in Malaysia, focused on claims model instead of claims application system. For instance, in [4] has proposed a model for healthcare which is focus on claimed model that eliminate middle agents role in the relation between the insurance agency and clients. Meanwhile, in [5] has introduced applied regression analysis, back propagation neural network (BPNN) and adaptive neuro-fuzzy inference system (ANFIS) method as a learning tool for motor insurance claims in predictive modeling. The resulted showed that BPNN model is successful in modeling the Malaysian motor insurance claims.

In order to overcome this problem, this study is built upon a proposed data modeling system known as Entity Relationship Diagram (ERD) and the created process modeling known as data flow diagram (DFD). The data of the claimants will be provided by the claimants itself themselves to calculate the quantum of damages. Thus the data will be stored in the database. The users can edit their input in case there are any changes occur. Therefore, this will generate a report with the information according to their injury claims part database. This report can be viewed by target users consist of claimant, the court and lawyer.

They can also edit the calculated claim and store to claim injury part database on their own. This will generate a report with the information in claim injury part database. The report can be viewed by claimant, court and lawyer as target users. This system is used in personal injury claim system application to store the database information.

The significance of this research is it will facilitate the calculation of injury claim which would serve justice and accuracy of personal injury especially in road accidents

2. Methodology

System Development Method widely known as System Development Life Cycle (SDLC) is an essential instrument that aids toward having an effective and efficient Information system. One of the example SDLC is waterfall model. This study employs a waterfall model in developing PIC System that proposed by W. Royce in 1970 as mentioned in a study by [6].

The SDLC approach typically consists of several phases such as System planning, System analysis, System design and System implementation [7]. During the system planning phase, the nature and scope of the business opportunity or problem will be identified using preliminary investigation, often called a feasibility study. The preliminary investigation is a critical step because the outcomes will affect the entire development process. Meanwhile, the purpose of the system analysis phase is to understand business requirements and build a logical model of the new system. In this phase, the analyst determines the business requirements for the new system and models the requirements. One of the models is to draw a set of data flow diagrams.

A DFD is a tool that uses various symbols to show how data moves through an information system but does not show program logic or processing steps [8]. A set of DFDs provides a logical model of what a system does. During system design phase, designer identifies all necessary outputs, inputs, interfaces and processes. Finally, the new system is constructed in system implementation phase.

The aim of this paper is to broaden the understanding of concepts in process modeling and database modeling.

3. Proposed Model

3.1. Business Process in Personal Injury Claims

Personal injury claims on road accidents means the injury or illness is caused by the negligence party. Basically road accidents involve a person who is a driver, pedestrian, cyclist, motorcyclist or passenger of vehicle. When the accident happened, the first thing to do is police report and findings on the alleged accident. The claimants should understand the basic laws governing personal injury and filling a complaint. Then, the claimant should hire lawyer to handle the case. Besides, the medical report form completed by doctor needed as evidence. Next is attempting to settle and if necessary the case will go for trial [9].

3.2. Process Modeling

System models have an effective place in any system development project. A model is a representation of reality [10]. System analyst use models to document system requirements. The process model is a formal way of representing how a business system operates [11]. It shows the processes or activities that are performed in a system and how data moves. Therefore, DFD is needed to reveal relationships among and between the various components in a system. DFD symbols consist of four symbols which are processes, data flows, data stores and external entities [8]. A process is an activity that is performed for some specific business reason. A data flow is a logical collection of several pieces of information. A data store is a collection of data that is stored in some way. An external entity is a person, organization or system that is external to the system but interacts with it [10]. Figure 1 shows the standard symbol for DFD.

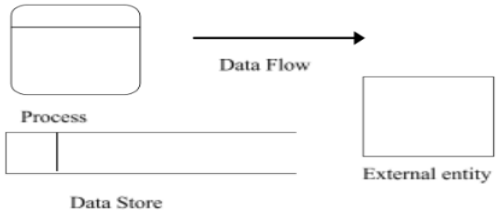

Fig. 1: Data Flow Diagram symbol

In process modeling, the highest level of DFD is known as the context diagram. The context diagram represents the overall business process as just one process and shows the data flow to and from external entities. To understand and get the expected system requirement, proper application of process modeling was studied.

Figure 2 shows the Personal Injury Claim (PIC) context diagram. There are four external entities which are claimant, court, lawyer and admin. Input data to the system comes from claimant, court and lawyer. Meanwhile, output goes to entity court, lawyer, admin and claimant itself. The function of admin to verify the user information and the claim report. The claimant will insert data about claimant and injury detail into the system. Also, court and lawyer will insert data about them. All the data are stored in the data store.

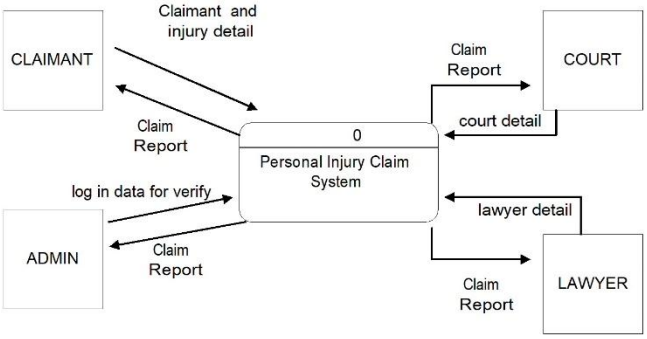

Fig. 2: Personal injury claim (PIC) context diagram

Figure 3 represents the first level DFD of PIC system. There are three main processes which are inserted and verify claim data, edit and generate a report. The function of the insert and verify process is to verify all the data that was inserted by the claimant, court and lawyer. Admin verifies all the data that was inserted by the users. The user able to update or make changes of information using edit process. All the data are stored in claim database. Meanwhile, the function of generating report process is to produce claim report. In order to generate claim report, claim injury data and claimant information needed from claim database.

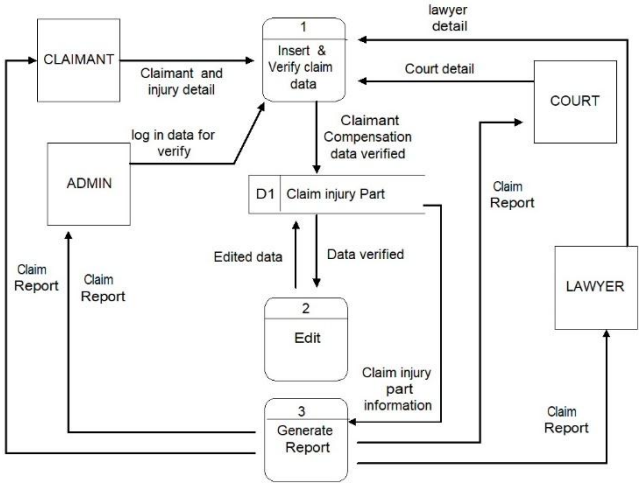

Fig. 3: First level Data Flow Diagram (DFD) of Personal Injury Claims (PIC) system

3.2. Database Modeling

Data modeling is a technique for organizing and documenting a system's data. Sometimes it is called as database modeling. A data model is a conceptual representation of the data structures that are required by a database, example ERD. An entity is something about which a business needs to store data example persons, places or things. A relationship is an association between one or more entities.

Figure 4 shows the ERD of the system. It is capable in personal injury claim system application to store the information from claimant, admin, lawyer, court and injury part. All the entities were normalized before representing in an entity relationship diagram.

According to the Figure 4, each claimant may have several parts of injury during the accident and each part can be claimed by more than one claimant. The court may view many claims information

and lawyer also may view more than one claim information. However, each claim information only can be view by one court and one lawyer.

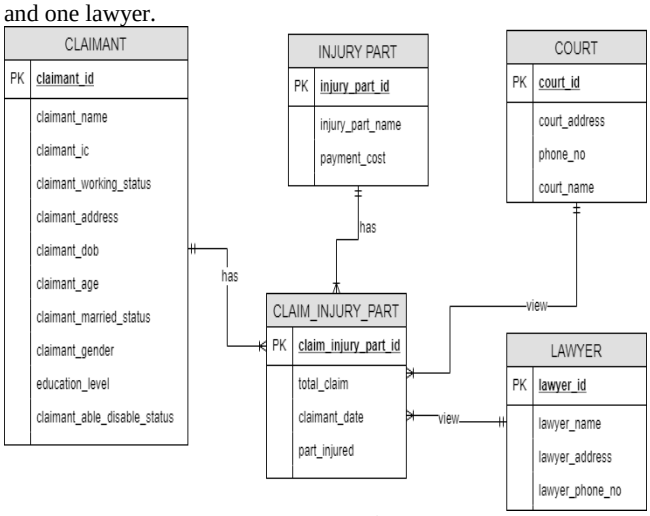

Fig. 4: Entity Relationship Diagram, ERD for personal injury claim system

3.3. Use Case Diagram

Use case diagram is a graphic depiction of the interactions among the elements of the system. Figure 5 shows Use Case diagram of personal injury claim system. The user for this application is admin, lawyer, court and claimant. Admin can verify the users that are newly registered to the system. For the first time using the system, lawyer, court and claimant can register to the system and wait for an admin to verify it. Then after being verified, the claimant can make claim calculation to identify the amount of claim. That calculation will be stored in the database and will be displayed in claim history page. Then all the users which are admin, court, lawyer and claimant can access that page to see the history of that calculated claim. After view, the history users can click on the button in that history page to view the detailed about that history claim.

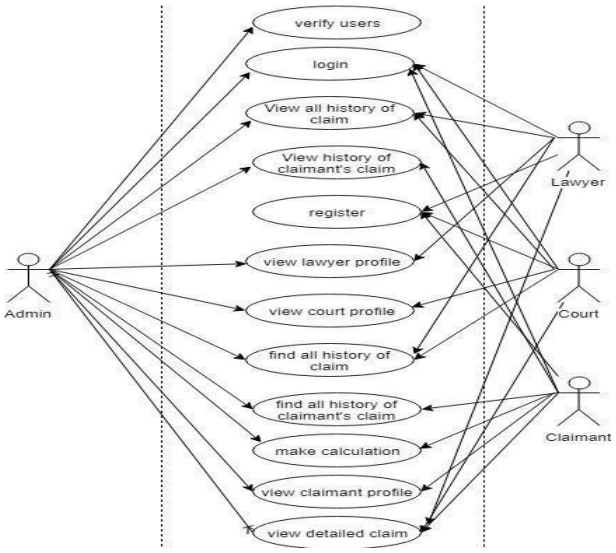

Fig. 5: Use Case Diagram

3.3.1. Use Case Description

This part explaining more detail about the function of the use case diagram.

Table 1: Use Case Register

Title	Register
Description	Register by filling the form
Primary actor	Claimant, court, lawyer
Precondition	Must install the application into the mobile phone
Action	● The user must fill the information into the form ● Click register button after done filling the information
Postcondition	The user can log in to the application after registration.

Table 2: Use Case Verify Users

Title	Verify Users
Description	Verify the users that have been registered into the system.
Primary actor	Admin
Precondition	Users must register into the system
Action	● Admin must open the user's page ● Admin must click on the verify button
Postcondition	Users can use the application after the account have been verified.

Table 3: Use Case Login

Title	Log in
Description	Log in to the application
Primary actor	Claimant, court, lawyer
Precondition	Users need to register and get the verification from admin
Action	● Users must insert username and password ● Users must click on the login button
Postcondition	Users will be redirected to the main menu of the application.

Table 4: Use Case View History of the Claim

Title	View History of the Claim
Description	View all the claimant made claim compensation amount
Primary actor	Lawyer, admin and court
Precondition	Users must log in into the system
Action	● Click on the view history in navigation bar menu
Postcondition	Users can view all the claimant made claim compensation amount.

Table 5: Use Case View History of Claimant's Claim

Title	View History of Claimant's Claim
Description	View the claim compensation amount
Primary actor	Claimant
Precondition	Users must log in into the system
Action	● Users must click on the view history in navigation bar menu
Postcondition	Users can view all the claim compensation amount and delete the history.

Table 6: Use Case Find All History of the Claim

Title	Find All History of the Claim
Description	The history of claim compensation that has been made by the claimant
Primary actor	Lawyer, admin and court
Precondition	Users must log in into the system
Action	● Users must click on the view history page ● Then click on the magnifying lens logo at the top ● Then fill the name to be found
Postcondition	Users successfully find all the certain claim that wanted.

Table 7: Use Case Find All History of Claimant's Claim

Title	Find All History of Claimant's Claim
Description	The history of claim compensation that has been made by the claimant
Primary actor	Claimant
Precondition	Users must log in into the system
Action	● Users must click on the view history page ● Then click on the magnifying lens logo at the top then fill the name to be found
Postcondition	User successfully finds all the certain claim that wanted.

Table 8: Use Case View Profile

Title	View Profile
Description	View Claimant, admin, lawyer and court profile
Primary actor	Claimant, admin, lawyer and court
Precondition	Users must log in into the system
Action	• Users must click on the profile at navigation bar menu
Postcondition	Users successfully view their profile.

4. Conclusion

Overall, this study focus on proposed data modeling system known as Entity Relationship Diagram (ERD) and the created process modeling known as data flow diagram (DFD). In order to achieve the objective of this model, the target user consist of claimant, court and lawyer will insert the details information of the case or claim. Next, the system will run and stored the information as database. Our aim is to ensure that each cases reported will stored and recorded as reference for the target users. Besides, it is relevant to extend for future research which is to develop new claims system regarding to this proposed model. Thus, hopefully the model will appropriate and facilitate to calculate personal injury claims in road of accidents.

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