In-Depth Investigations on the Sequences of Accidents of Powered Two Wheelers Based on Police Crash Reports of Medan, North Sumatera Province Indonesia, Using Decision Aiding Processes

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Abstract : This paper seeks the incoherencies in cognitive process during an accident of Powered Two Wheelers (PTW) by understanding the factual sequences of events and causal relations for each case of accident. The principle of this approach is undertaking in-depth investigations on case per case of PTW accidents based on elaborate data acquisitions on accident sites that officially stamped in Police Crash Report (PCRs) 2012 of Medan with criteria, involved at least one PTW and resulted in serious injury and fatalities. The analysis takes into account four modules: accident chronologies, perpetrator, and victims, injury surveillance, vehicles and road infrastructures, comprising of traffic facilities, road geometry, road alignments and weather. The proposal for improvement could have provided a favorable influence on the chain of functional processes and events leading to collision. Decision Aiding Processes (DAP) assists in structuring different entities at different decisional levels, as each of these entities has its own objectives and constraints. The entities (A) are classified into 6 groups of accidents: solo PTW accidents; PTW vs. PTW; PTW vs. pedestrian; PTW vs. motor-trishaw; and PTW vs. other vehicles and consecutive crashes. The entities are also distinguished into 4 decisional levels: level of road users and street systems; operational level (crash-attended police officers or CAPO and road engineers), tactical level (Regional Traffic Police, Department of Transportation, and Department of Public Work), and strategic level (Traffic Police Headquarters (TCPHI)), parliament, Ministry of Transportation and Ministry of Public Work). These classifications will lead to conceptualization of Problem Situations (P) and Problem Formulations (I) in DAP context. The DAP concerns the sequences process of the incidents until the time the accident occurs, which can be modelled in terms of five activities of procedural rationality: identification on initial human features (IHF), investigation on proponents attributes (PrAT), on Injury Surveillance (IS), on the interaction between IHF and PrAt and IS (intercorrelation), then unravel the sequences of incidents; filtering and disclosure, which include: what needs to activate, modify or change or remove, what is new and what is priority. These can relate to the activation or modification or new establishment of law. The PrAt encompasses the problems of environmental, road infrastructure, road and traffic facilities, and road geometry. The evaluation model (MP) is generated to bridge P and I since MP is produced by the intercorrelations among IHF, PrAT and IS extracted from the PCRs 2012 of Medan. There are 7 findings of incoherences: lack of knowledge and awareness on the traffic regulations and the risks of accidents, especially when riding between $0 < x < 10$ km from house, riding between 22 p.m.–05.30 a.m.; lack of engagements on procurement of IHF Data by CAPO; lack of competency of CAPO on data procurement in accident-sites; no intercorrelation among IHF and PrAt and IS in the database systems of PCRs; lack of maintenance and supervision on the availabilities and the capacities of traffic facilities and road infrastructure; instrumental bias with wash-back impacts towards the TCPHI; technical robustness with wash-back impacts towards the CAPO and TCPHI.

Keywords : decision aiding processes, evaluation model, PTW accidents, police crash reports