Research

Dr. Lee Chia Kuang invents new software Dematel Digraph

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A lecturer from the Faculty of Industrial Management (FPI), Universiti Malaysia Pahang (UMP), Dr. Lee Chia Kuang, 35, created a new software called Dematel Digraph.

According to this Kedah-born researcher, Dematel Digraph is a new system and software that can produce a directed graph or digraph based on the Dematel algorithm (Decision Making Trial Evaluation Laboratory).

“It collects input from decision-makers through questionnaires (available online).

“The design of the Dematel Digraph system is based on a cloud-based system that uses Cascading Style Sheets (CSS) and HTML by Bootstrap.

“This innovation successfully combines the Dematel and Digraph algorithms (directed graph) and is capable of mapping the relationship between critical factors with the directed graph method.

Dr. Lee explained, Dematel Digraph is the first software that can produce a directed graph (digraph) and perform consistency and reliability analysis such as corrected item-total correlation analysis and Cronbach’s alpha reliability test on the collected data.

The graph produced can also separate the critical factors into causal domain and effect domain.

“The relationship between critical factors or criteria can be mapped with the directed graph method.

“The graph can be generated in PDF format and based on the factors and criteria submitted, decision-makers will make a pairwise-comparison,” he said, who received his PhD in Civil Engineering at the University of Auckland, New Zealand.

He added that this innovation enables decision-makers (professional managers), scholars and researchers to identify critical factors, critical risks and critical criteria effectively, consistently and efficiently.

“This innovation also helps solve project and industry problems that require effective methods to identify important and critical components of complex systems.

“It also allows for experiential theoretical and practical learning in the field of Decision Sciences and Project Management.

“This research started on 27 June 2019 (with research grant funding), while the idea for this product study started in mid-June 2018 when I managed to process the Dematel algorithm in Excel after reviewing high-impact research articles on Dematel analysis,” he said.

Based on the readings and studies, he found that there was no software capable of producing directed graphs and performing consistency and reliability analysis on Dematel data in an efficient manner.

“This has indirectly offered opportunities for me to innovate.

“Preliminary planning for this research includes commercialisation activities for Dematel Digraph.

“Among the opportunities to be explored include microcredential training using this innovation,” he said.

The project to develop this innovation was funded by the MTUN Commercialisation Fund.

He also hopes that this innovation can be further developed to be implemented in microcredential courses to cultivate lifelong learning among the community and project-based industries.

The product also won a silver medal at CITREx 2020, the Best Innovation Award and a gold medal at the MTE 2020 Special Edition: COVID-19 International Innovation Awards.

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