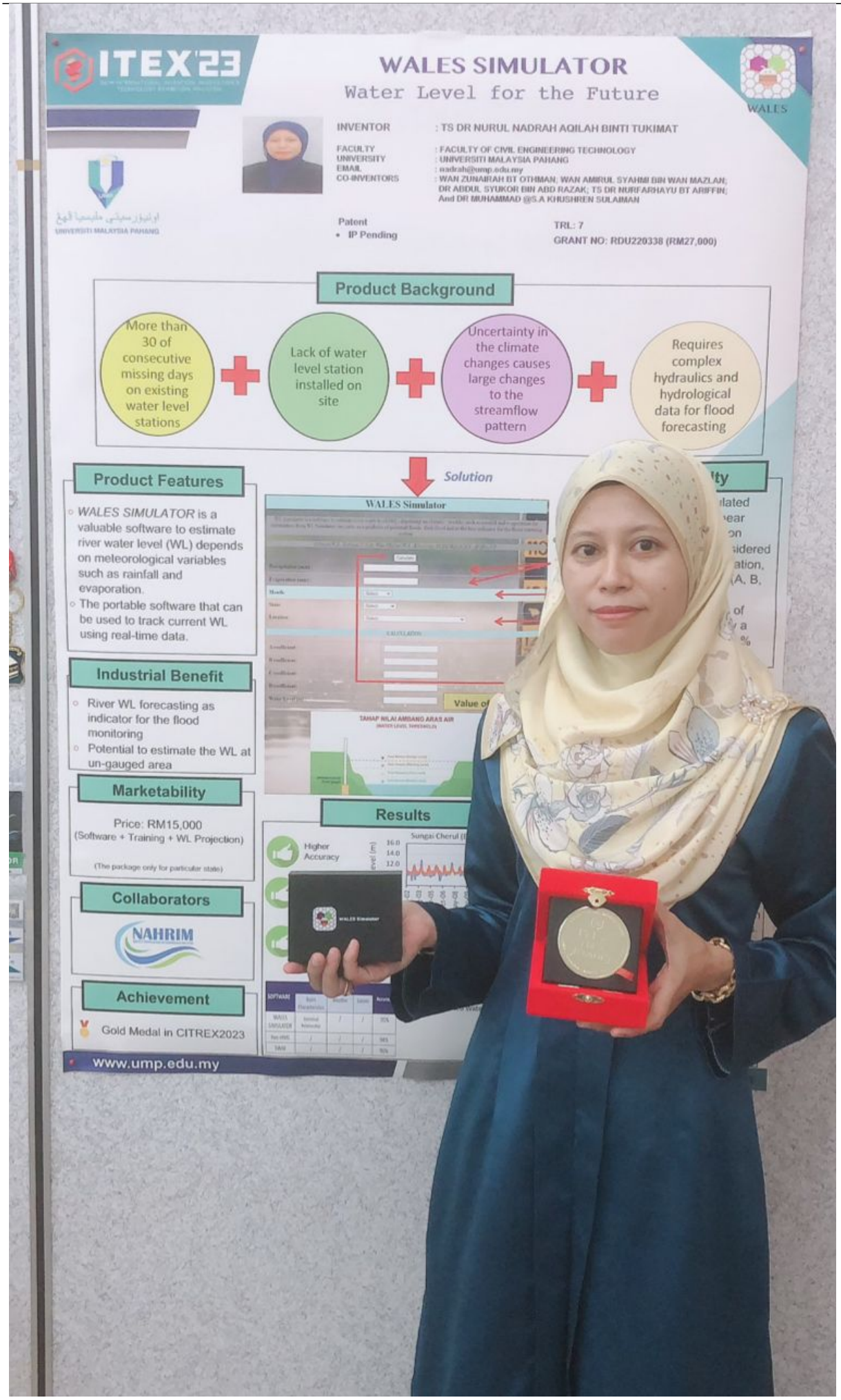

ITEX'23
WALES SIMULATOR
Water Level for the Future
WALES
INVENTOR : TS DR NURUL NADRAH AQILAH BINTI TUKIMAT
FACULTY : FACULTY OF CIVIL ENGINEERING TECHNOLOGY
UNIVERSITY : UNIVERSITI MALAYSIA PAHANG
EMAIL : nadrah@ump.edu.my
CO-INVENTORS : WAN ZUNAIRAH BT OTHMAN; WAN AMIRUL SYAHMI BIN WAN MAZLAN; DR ABDUL SYUKOR BIN ABD RAZAK; TS DR NURFARHAYU BT ARIFFIN; And DR MUHAMMAD @S.A KHUSHREN SULAIMAN
UNIVERSITI MALAYSIA PAHANG
Patent
• IP Pending
TRL: 7
GRANT NO: RDU220338 (RM27,000)
Product Background
More than 30 of consecutive missing days on existing water level stations
Lack of water level station installed on site
Uncertainty in the climate changes causes large changes to the streamflow pattern
Requires complex hydraulics and hydrological data for flood forecasting
Solution
Product Features
WALES SIMULATOR is a valuable software to estimate river water level (WL) depends on meteorological variables such as rainfall and evaporation.
The portable software that can be used to track current WL using real-time data.
WALES Simulator
Industrial Benefit
River WL forecasting as indicator for the flood monitoring
Potential to estimate the WL at un-gauged area
Marketability
Price: RM15,000
(Software + Training + WL Projection)
(The package only for particular state)
Results
Higher Accuracy
Collaborators
NAHRIM
Achievement
Gold Medal in CITREX2023
www.ump.edu.my

General

Ts. Dr. Nurul Nadrah Aqilah created software to predict river water levels to identify flood areas

4 March 2024

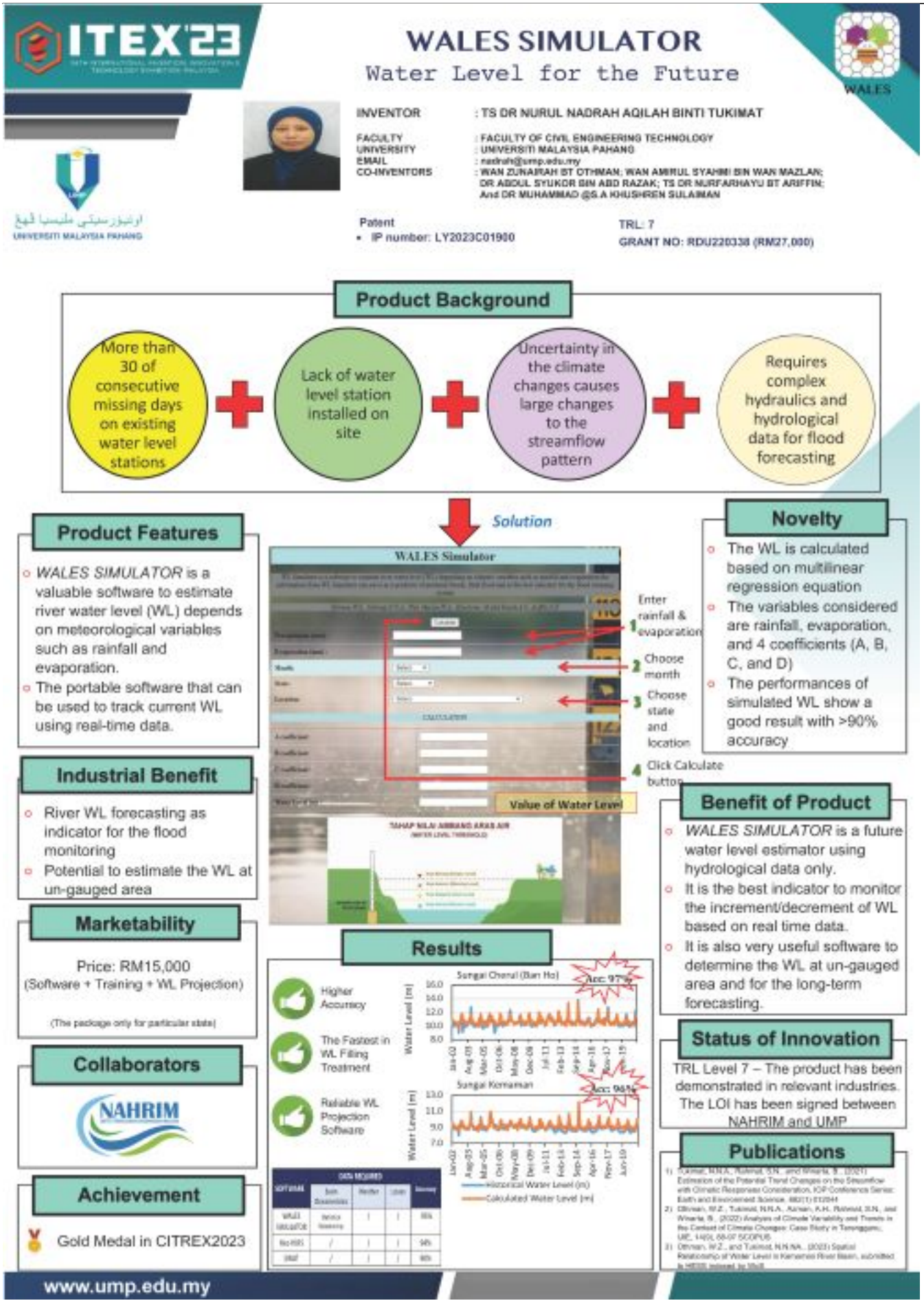
PEKAN, 1 January 2024 – Difficulty in analysing water level data which is important data for identifying flood areas sparked an idea to a researcher and lecturer of the Faculty of Civil Engineering Technology (FTKA), Ts. Dr. Nurul Nadrah Aqilah Tukimat, 38 to create WALES Simulator, a software that can predict river water levels based on meteorological variables such as rain and evaporation.

In identifying parameters and producing long-term water level equations, this research was conducted with Universiti Tun Hussein Onn Malaysia (UTHM) lecturer, Associate Professor Dr. Siti Nazahiyah Rahmat and two master students, Wan Zunairah Othman and Wan Amirul Syahmi Wan Mazlan.

In addition, several FTKA lecturers, Associate Professor Dr. Abdul Syukor Abd. Razak, Dr. Nur Farhayu Ariffin and Dr. Muhammad Khusyren Sulaiman also contributed ideas regarding this software.

According to Ts. Dr. Nurul Nadrah Aqilah, in current practice, water level stations are located in certain locations to detect changes in river water levels (WL).

“Information from WL is the best indicator for flood warning systems and forecasts of potential floods, flash floods and droughts.



"However, the lack of WL stations installed on site, particularly in locations prone to flooding, creates challenges and problems in hydrological modelling, particularly for long-term monitoring and

estimating the effects of climate change.

“Furthermore, the problem of missing data on existing WL stations due to network miscommunication also leads to biased results in hydrological modelling work,” she said.

Therefore, she said WALES Simulator is the best software to solve the problem of filling in the missing WL, estimating the WL especially in uncontrolled areas and predicting the long-term changes of the WL.

The research, which began in 2021, was also collaborated by the National Water Research Institute of Malaysia (NAHRIM), which is one of the agencies that will adopt the software.

She explained that users can use this software by entering the amount of rainfall and evaporation per month including entering the information month and location and then the calculation section will perform calculations to estimate water levels.

For now, the price of the software is for one state only with a minimum cost of at least RM15,000 which includes the software, training and user guide.

However, the price changes depending on the location and number of stations required.

She also intends to expand the use of WALES Simulator to the relevant government agencies such as the Department of Irrigation and Drainage (DID), Tenaga Nasional Berhad (TNB) and others.

Previously, she created IIUVIA Converter – The Rainfall Solution software.

This product bagged a gold medal in the 2022 Creation, Innovation, Technology & Research Exposition (CITREx).

The research also won a gold medal at the International Invention, Innovation and Technology Exhibition (ITEX) 2023 which took place at the Kuala Lumpur Convention Centre (KLCC) on 11 and 12 May 2023.

By: Nur Hartini Mohd Hatta, Centre For Corporate Communications

Translation By: Dr. Rozaimi Abu Samah, Faculty Of Chemical And Process Engineering Technology

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