

THE TRANSMISSION DYNAMIC OF THE COVID 19 OUTBREAK: A PREDICTIVE DASHBOARD



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PRODUCT BACKGROUND

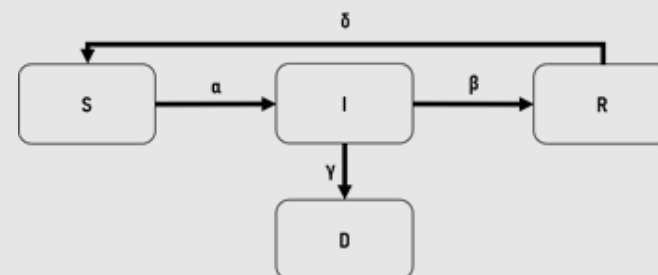
01 Predictive model of the susceptible, infectious, death and recovery cases based on the control measures of MCO in Malaysia.

02 Markov Chain Monte Carlo (MCMC) estimation code for epidemiological parameters and basic reproduction number, R_0 .

03 The Predictive Dashboard interface consists of:

- Prediction of the active, recovered and death cases under three scenario of MCO control measures:
 - Loose MCO (Recovered MCO)
 - Strict MCO (Conditional MCO)
 - Alternate MCO (Not implemented in Malaysia)
- Prediction of the infectious rate and basic reproduction number based on the user input date.

STATE OF THE ART/ METHODS



$$\frac{dS}{dt} = -\frac{\alpha IS}{N} + \delta R$$

$$\frac{dI}{dt} = \frac{\alpha IS}{N} - \beta I - \gamma I$$

$$\frac{dR}{dt} = \beta I - \delta R$$

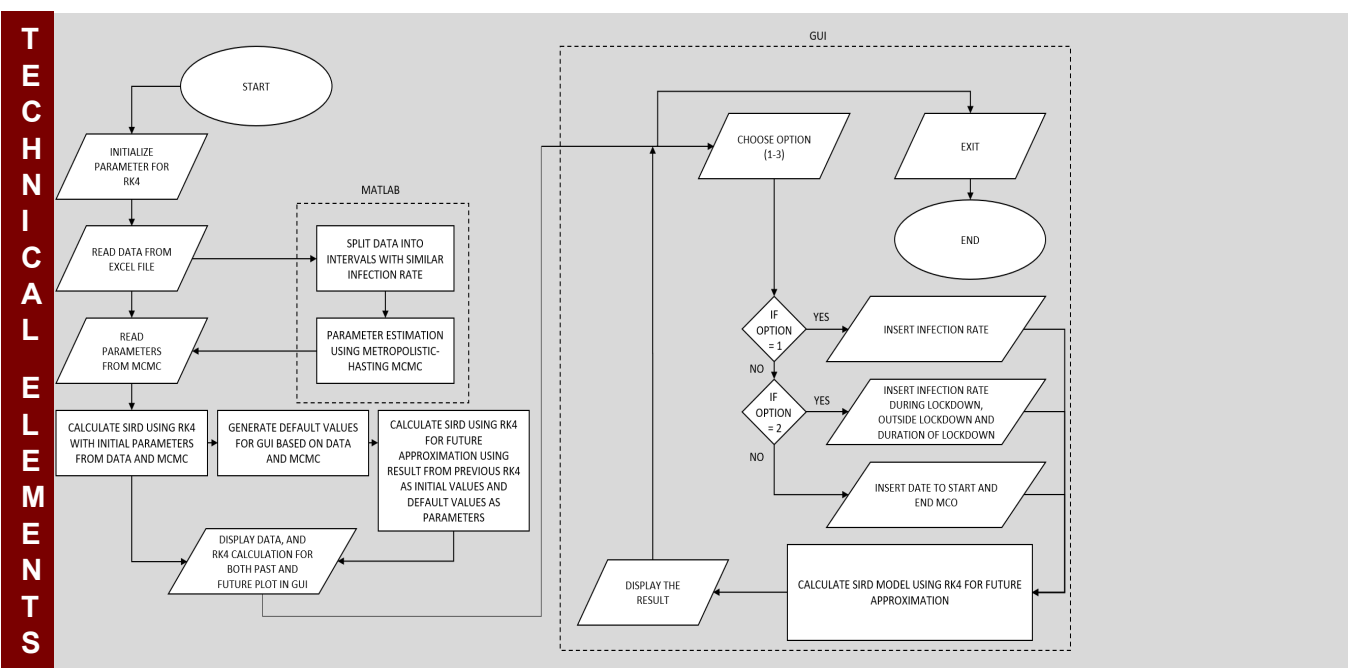
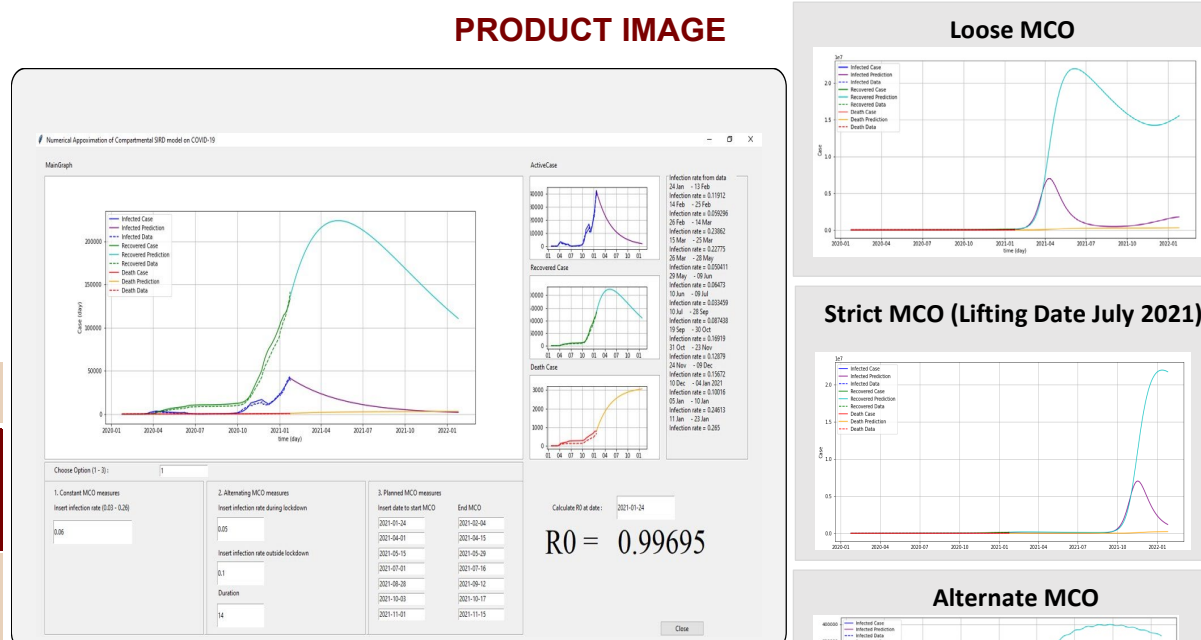
$$\frac{dD}{dt} = \gamma I$$



NOVELTY	INVENTIVENESS
Algorithm of RK4 and MCMC RK4 and MCMC Python code Predictive Dashboard of the COVID 19 Outbreak	Predictive dashboard – able to predict the future outbreak and basic reproduction number based on the historical data and MCO control measure.

COMPARISON WITH AVAILABLE PRODUCTS IN MARKET

COVID 19 MALAYSIA DATA DASHBOARD	THE PROPOSED PREDICTIVE DASHBOARD
Reported data – It is not predictive dashboard.	It is predictive: Reported cases of active, recovered and death. The prediction cases based on the control measure of MCO.
No estimated value of reproduction number	Estimation of the reproduction number and epidemiological parameter (infectious, recovered, death and immune lost rate) based on the specify date and historical data
No estimated value of the infectious rate	



PRODUCT DEVELOPMENT



TRL LEVEL – TRL 4 (Tehcnology Development)

Status of Finished Product – Ready to be used

APPLICABILITY

- The product is relevant and important to country or specifically to any organization which can be used to manage and plan for future.
- The quality of the product is considered compatible and better from the existing dashboard, which could give prediction for future.

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MARKETABILITY



SOCIAL BENEFIT

Simulation the COVID 19 transmission based on the prior data is expected to provide the required information for academic sectors. If the outbreak is longer than expected and MCO need to be extended, actions to ensure the readiness of the academicians and students for virtual learning have to be taken.

Provide a better understanding to the society about the virus and get ready mentally and physically if the MCO needs to be extended and take longer time than expected.

Government/NGO could prepare early prevention to help the society in term of other social issues for example violence in household, child abuse, and others.

USEFULNESS

Help government/ company/ institution to plan prevention, set guideline, develop policies, create strategy more efficiently. Alternate MCO is the promising strategy under the unavailability of vaccine.

PUBLICATION: The Transmission Dynamic of the COVID 19 Outbreak Model: A Predictive Dashboard, Submitted to Bulletin of Mathematical Biology (ISI Journal)