

**UNIVERSITI TEKNOLOGI MARA
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**ADVANCED FIRE EVACUATION MODEL
(EsCHUTE23)**

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Innovation project report submitted in partial fulfilment
of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this innovation project report was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and it is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This topic has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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ABSTRACT

The rapid construction of high-rise buildings contributed to the increasing risk of fire hazard. Fire evacuation plan shall provide means of escape during emergency but however, it may cause difficulties in case of obstruction and hindrance. Due to cost limitations, several alternatives are unapplicable. Therefore, there is a need to propose fire evacuation model to accommodate existing evacuation plan. The solution should prove beneficial to pregnant woman, disabled individuals and senior citizen that have difficulties to escape using staircase due to the physical constraints. Thus, the study is scaled down to high-rise residential buildings such as apartments, condominiums, penthouse etc. The paper aims to study the reachability, availability and reliability issues in the existing evacuation model in order to propose a new concept design for alternative model. This study also systematically reviews the data for its marketability potential in commercializing the product. A combination of quantitative and qualitative approaches was used in the data analysis such as field observation and reviewing legitimate researches. Besides, a three-dimensional simulation is visualized, integrating design and operation of EsCHUTE23 together with in-depth analysis of market potential through online survey. The results of this study indicate that emergency staircase is not reachable and reliable in certain situation in which alternative plan shall be available. It is provided that EsCHUTE23 has the largest set of significant performance through comparative analysis. Another important finding was that EsCHUTE23 has high marketability value based on residents and professionals' assessment. The findings should make an important contribution to the development of alternative fire evacuation model. It assists high-risk group of occupants to escape during emergency. It is expected to reduce the Fatal Accident Rate (FAR) by reducing number of deaths and injuries in high-rise buildings. In short, the study stimulates innovation of Risk Management and Disaster Development industry.