The Study for the Healthcare Management Educational Technology –
A Case Study: Solving Emergency Department Crowding in
Emergency Medical Service System

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Abstract:
This proposal intends to establish an emergency medicine service (EMS)
simulation system for solving the problem of the emergency department crowding for
the healthcare management education. An EMS of a medical center in central Taiwan
is as an object of the study. The research objective is to build a simulation system
based on current status of the EMS, to teach the students of healthcare management to
obtain the optimal parameters’ setting (the optimal combination of improvement
methods) in the EMS system, and to find improvement strategies according to the
sensitivity analysis based on the optimal parameters’ setting for each performance in
order to solve the emergency department crowding (EDC) problem.

EDC occurs when the demand of EMS is larger than the supply of EMS. The
reasons behind it are complicated, including the incorrect attitude and view of the
general public toward emergency treatment, a shortage of manpower at the emergency
department (ED), limited space at the ED, shortage of sickbeds, etc. These
interlocking factors also further increase the level of busyness at the ED and the over-
workload at the ED, which then cause an impact on the patients' waiting time.
Moreover, insufficient time or space to attend patients in need always lead to medical
errors, worsening the situation of EDC.

The contribution of this study lies in that the study will teach the students of
healthcare management how to apply the dynamic Taguchi method to the EMS and to
provide solutions for the EDC in Taiwan. Also, the concept of the optimal parameters’
setting and performances will be emphasized in the research field of hospital
management.