

**UNIVERSITI TEKNOLOGI MARA**

**AN IMPROVED OPERATIONAL  
FRAMEWORK FOR DEFECTS  
LIABILITY MANAGEMENT SYSTEM  
IN DESIGN AND BUILD PUBLIC  
HOSPITAL PROJECTS**

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Thesis submitted in fulfillment  
of the requirements for the degree of  
**Doctor of Philosophy**

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## AUTHOR'S DECLARATION

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

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.


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## ABSTRACT

Contrary to the belief that the Design and Build (DB) procurement approach will result in better project outcomes, many DB projects, particularly public buildings are short of meeting the expectations. One of the major issues faced is the construction defects. Clients usually are at loss while trying to configure how this matter should be dealt with. Consequently, they normally end up rectifying most of the defects at their own cost. In appreciating the need to resolve this continuing problem, the government has introduced a Defects Liability Management (DLM) System by appointing a Service Provider (SP) to record and manage the defects identified during the Defects Liability Period (DLP). Realising the opportunity that can be learnt from this system in providing insights to improve the implementation of future projects, this research was mooted. The aim of this study is to develop an operational framework for improving the current DLM system practiced in DB public hospitals in Malaysia. Seven public hospitals are chosen as the case study. A mixed method approach was adopted for the research. The qualitative enquiry data was drawn from two main project documents namely Procedure Guideline Manuals (PGM) and Condition Appraisal Reports (CAR). The rationale for analysing PGM is to investigate the process of DLM System implemented and its comprehensiveness. Meanwhile, data for defects identified during the DLP were obtained by analysing CAR. The data were sorted, sieved, grouped and transferred into the SPSS software to identify the extent of the DLM System in providing insights to the problems along the project stage and hospital nature. Three statistical analyses were adopted namely (i) frequency analysis to analyse the defects pattern (ii) Two-way ANOVA to analyse the impact of work discipline and hospital towards number of defects and (iii) Chi-Square Test of Association to test on the association of the defects occurrence with the project stage and hospital nature. The second stage of the research enquiry involved a two stage semi-structured interview with the hospital project teams and industry experts. The first stage interview was conducted to determine the comprehensiveness of the current process and to solicit recommendations for improvement. Finally, the improved operational framework was feasibly validated in the second stage interview. The qualitative data were converted and transcribed into Microsoft Word format and analysed manually. The findings suggest that with a comprehensive methodology in place, defects can be effectively traced and categorised to track their root cause and stages of occurrence. It is also established that there is a significant association between the defects occurrence with the project stages and the nature of the hospitals. Therefore, clients can have better recourse to address the issue of defects and provide lessons learnt to manage future projects. Notwithstanding this, the research also highlights the importance of appointing SP to manage defects during the DLP, particularly in complex projects. The research outputs seek to facilitate a comprehensive dimension of defects liability management process and provide significant impacts to the industry.

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