



**UNIVERSITI TEKNOLOGI MARA**

**CONNECTED MULTISENSORY ROOM WITH DATA  
ANALYTICS FOR COGNITIVE IMPAIRMENT  
THERAPY**

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## **ABSTRACT**

Multisensory room (**MSR**) is a prescription of therapy sessions for stimulating senses involving patient and therapist interaction. Therapy sessions are known to take effect at different rate depending on patient's condition and response, often across a long period of time for it to be noticeable. Based on this reason, there is a need to improve data collection and analysis that will allow clinical data analytic. This project presented a multisensory room design that offers added connectivity for data storage and configuration for data analytics. The main objective is to develop effective data collection through multisensory therapy session. Second objective is to demonstrate data analytics using predictive model towards data collected from the multisensory room. Under this framework, the therapy would be divided to five sub-modules. First, when the patient meets the doctor or therapist assessment, to be given the clinical prescription. Second is therapist assessment, followed by the MSR session, then the post-MSR therapist assessment. The treatment is concluded by data analytics. MSR performed analysis to assist doctor's review of the prescribed MSR using artificial data that is incorporated into behavioural checklist and patient data. Results show that in a connected environment of a multisensory room, data analytics involving visual representation and linear regression predictive model using SAS Viya is able to produce patient response analysis. The analysis will be useful to support doctor's assessment of the patients that have undergone therapy sessions.

*Index Terms*—**Analytical Data, Cognitive Impairment Patient, Doctor, Multisensory room, and Therapist**

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# CHAPTER 1

## INTRODUCTION

### 1.1 Background Information

Multisensory environment is a devoted environment or room that attracts the memory using human's primary senses. The multisensory room is a space or room that has used several senses which giving he vision, movement, tactile and heart rate. In this project, this multisensory room design is for cognitive impairment patient that often have intellectual and developmental disabilities with imitation of movement, vision, hearing, smelling and interaction issue with sensory inputs. Cognitive impairment therapy session was founded useful when conducted in multisensory room environment.

Therapy session is known to be affect at different rates, depending on patient's condition and response. It is take a long time period to be noticeable by the doctor's reviews. This therapy session were not using any kind of drugs or support material to make the patient better. It only uses the multisensory environment elements that have been place in one room and treat the patients for a long period of time. Normally, one therapy session takes 20 to 30 minutes and it repeated for 16 weeks. For the convectional ways, during the therapy, the data has been sort out by hands and filing the data for the records.