

**UNIVERSITI TEKNOLOGI MARA**

**PROFILING INTUITIVE DESIGN  
THINKING BEHAVIOUR OF NEW  
PRODUCT DEVELOPMENT  
ACTIVITY FROM MULTI-  
DISCIPLINE DESIGNER**

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**PhD**

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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 results 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

The established research and development based company (R and D) employing various expertise from different knowledge domains mainly to study, design and to develop a new product. In multi-disciplinary design organization structure is integrating such different domain teams from engineering, concept design, manufacturing, marketing, human factors, information technology and human resources. However, each domain comprises different characters of intuitive design thinking behaviour, which leads to dissimilar understanding to the fundamental issues, product functions, user problems, aesthetic value, and the problem solution, which affect the achievement of the project objective. Most of the local practice of the new product development process has unclear concern on intuitive design thinking behaviour from the multi-disciplinary organization. To this extent, this research was conducting a study to identify a specific pattern of intuitive design thinking behaviour from a different domain. The study was to approach the Design Protocol Analysis (DPA) method, to observe the participant's behaviour through the design experiment process. Totally thirty final year students participated, consist of the Engineering group (ENG), Interface Design group (ID) and Industrial Design group (IDE), which has gone through problem-solving tests through design drawings. The controlled environment laboratory is equipped with three units of a video camera from different angles, to capture the participant's behaviour. As well as four image panels, a product sample, a computer with internet and a drawing template was provided. The process starts with task briefing, design session, and interview which totally in twenty minutes duration. The data finding shows different patterns over the timestamp, observation on reference materials, behaviour action and the sketch drawing. The pattern is further mapped to some theory models; 'Design Management', 'Design thinking', and 'Knowledge Domain' to validate into particular contexts. Through the mapping of three theories, ENG is appropriate to lead the R and D division, ID focus to manage new project tasks while IDE is suitable to lead the conceptual unit. Through the analysis was proven that all group has a different level of concern factor and approach of intuitive design thinking behaviour. IDE is intuitively approached design with high aesthetic value, different from ENG group which focuses on product usability and ergonomic factor with low intuitive thinking. While the ID group moderately approached intuitive and product functions. Through clarification of intuitive design thinking character, the researcher was developing a new model of the design process to approach for multi-discipline design organization. The concept model insisted on the consistency of job tasks and the character of intuitive design thinking behaviour. Through the concept model, therefore each domain will efficiently be performed on the task given for the New Product Development organization.

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# TABLE OF CONTENT

	Page
<b>CONFIRMATION BY PANEL OF EXAMINERS</b>	<b>ii</b>
<b>AUTHOR'S DECLARATION</b>	<b>iii</b>
<b>ABSTRACT</b>	<b>iv</b>
<b>ACKNOWLEDGEMENT</b>	<b>v</b>
<b>TABLE OF CONTENT</b>	<b>vi</b>
<b>LIST OF TABLES</b>	<b>x</b>
<b>LIST OF FIGURES</b>	<b>xii</b>
<b>LIST OF ABBREVIATIONS</b>	<b>xvi</b>
<b>CHAPTER ONE: INTRODUCTION</b>	<b>1</b>
1.1 Research Background	1
1.1.1 The Issues of Multidiscipline Practice	4
1.1.2 The Need for Multidiscipline Organization	9
1.1.3 Design Working Strategies	10
1.2 Problems Statement	13
1.2.1 Design Organization and Management	13
1.2.2 Design Thinking From Different Background Designers	16
1.2.3 The Common Practice of Local Multidiscipline Organization	19
1.3 Research Aim and Objectives	21
1.4 Research Questions	23
1.5 Research Significance	25
1.6 Research Scope	25
1.7 The Thesis Structure	29
<b>CHAPTER TWO: LITERATURE REVIEW</b>	<b>35</b>
2.1 Design Process and Organization	35
2.1.1 New Product Development Process	36
2.1.2 Concept Development Process (Front End)	38
2.1.3 Form Development Process	41