

INNOVATION PROCESS, INNOVATION OUTCOME AND FIRM'S  
PERFORMANCE IN THE MALAYSIAN ELECTRICAL AND ELECTRONICS  
INDUSTRY

By

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## ASBTRACT

Innovation is vital in enhancing a firm's performance and competitiveness. This study investigates the relationship between the antecedent variables (leadership, managerial levers and business processes), the innovation process and the firm's performance. In addition, the study also examines the mediating effect of an innovation outcome on the relationship between the innovation process and firm's performance. A total of 234 Malaysian electrical and electronics companies which are listed in the Federation of Malaysian Manufacturers 2012 were selected for this study. The data collection was obtained from the questionnaire surveys. The association between the variables was measured by depending on the extent of each company's perception on innovation through the use of interval rating scale instruments. The Rasch Measurement Model was used for analysis and the data was then processed through the use of the Winstep Software. The results revealed that there were positive relationships between the antecedent variables and the innovation process, the innovation outcome and the firm's performance. Further analysis through Rasch Measurement Model indicated a positive level of relationships between all three types of antecedents, innovation process, innovation outcome and the firm's performance. The role of the innovation outcome as a mediating variable was then established. A higher probability of success in implementing the innovation process will result a higher ability level of innovation outcome. In addition, a higher ability level of innovation outcome will yield a higher firm performance. The results also revealed that the three groups of companies have performed according to their ability level (excellent, moderate and poor) when implementing innovation. Thus, companies with high ability will deliver high probability of successes in implementing innovation. The findings of this study will assist the companies in measuring their ability level when implementing a systematic innovation process in their respective organisations.

**Keywords:** innovation, innovation process, innovation outcome and firm's performance

## ABSTRAK

Inovasi adalah penting dalam meningkatkan prestasi dan daya saing. Kajian ini bertujuan untuk mengkaji hubungan antara pemboleh ubah *antecedents* (keimpinan, *managerial levers* dan proses perniagaan), proses inovasi dan prestasi firma. Di samping itu, kajian ini juga mengkaji kesan pengantara daripada hasil inovasi kepada hubungan antara proses inovasi dan prestasi firma. Sebanyak 234 syarikat elektrik dan elektronik di Malaysia yang tersenarai dalam Persekutuan Pengilang – Pengilang Malaysia 2012 telah dipilih untuk kajian ini. Pengumpulan data telah diperolehi daripada kaedah soal selidik. Hubungan antara pemboleh ubah diukur melalui tahap persepsi setiap syarikat terhadap inovasi dengan menggunakan instrumen skala interval. Model Pengukurann *Rasch* digunakan untuk menganalisis data dan ia telah diproses melalui Perisian Winstep. Hasil kajian menunjukkan bahawa terdapat hubungan yang positif antara pemboleh ubah *antecedents*, proses inovasi, hasil inovasi dan prestasi firma. Seterusnya, analisis melalui Model Pengukuran *Rasch* menunjukkan tahap hubungan yang positif antara ketiga-tiga jenis pemboleh ubah *antecedents*, proses inovasi, hasil inovasi dan prestasi firma. Peranan hasil inovasi sebagai pemboleh ubah pengantara telah dibangunkan. Kebarangkalian kejayaan yang lebih tinggi dalam melaksanakan proses inovasi memberikan tahap keupayaan hasil inovasi yang lebih tinggi. Oleh itu, melalui tahap keupayaan hasil inovasi yang tinggi akan meningkatkan prestasi firma. Kajian ini juga telah mengenal pasti tiga kumpulan syarikat mengikut tahap keupayaan (tahap cemerlang, sederhana dan lemah) dalam melaksanakan inovasi. Oleh itu, syarikat yang mempunyai keupayaan tinggi akan menyumbang kebarangkalian kejayaan yang tinggi dalam melaksanakan inovasi. Hasil kajian ini akan dapat membantu syarikat-syarikat dalam mengukur tahap keupayaan mereka apabila melaksanakan proses inovasi yang sistematik dalam organisasi masing-masing.

**Kata kunci:** inovasi, proses inovasi, hasil inovasi dan prestasi firma

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## LIST OF ABBREVIATIONS

AIM	Malaysia Innovation Agency
APO	Asia Productivity Organization
BP	Business Process
EPU	Economic Planning Unit
FMM	Federation of Malaysian Manufacturers
FR	Firm Performance
GCC	Group Characteristic Curve
GDP	Gross Domestic Product
ICC	Individual Characteristic Curve
IP	Innovation Process
IO	Innovation Outcome
IRT	Item Response Theory
LD	Leadership
MASTIC	Malaysian Science and Technology Information Centre
MATRADE	Malaysia External Trade Development Corporation
MITI	Ministry of International Trade and Industry
ML	Managerial Levers
MNCs	Multinational Corporations
MNSQ	Mean square
MOSTI	Ministry of Science, Technology and Innovation
MPC	Malaysia Productivity Corporation
NEAC	National Economic Advisory Council
NKEAs	National Key Economic Areas
NSRC	National Science and Research Council
OECD	Organization for Economic Co-operation and Development
PEMANDU	Performance Management and Delivery Unit
PIDM	Person Item Distribution Map
PTMEA CORR	Point measure correlation
SMEs	Small Medium Enterprises
ZSTD	Z-standard

# CHAPTER 1

## INTRODUCTION

### 1.0 Background of Study

In the era of 21<sup>st</sup> century, productivity and quality are not the only drivers that promote organisation survival. This is due to the state of change in business environment which has become more competitive. In this context, innovation has been identified as another layer of excellence, played major role in enhancing and sustaining high performance of firms in building competitiveness (Gopalakrishnan & Damanpour, 1997). Innovation is referred to the implementation of new or improved product (good or services), process, marketing method or organisational method in the organisation (OECD, 2005). Moreover, innovation is one of the main key forces stimulates growth of new products, creating new markets and transform industries to confront global competitiveness (Sood & Tellis, 2009).

At the international level, innovation is greatly highlighted in relation to the nation economic performance such as Global Innovation Index and World Competitiveness Yearbook (APO, 2009). According to a survey on investing innovation for year 2010 indicated that 40 to 70 percent of the firms in many countries invested in innovation lead to higher sales and productivity (OECD, 2010a). In light of this, it is crucial for organisation to innovate as a necessary requisite in order to obtain high performance levels. This has given indication that industries need to harness the

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