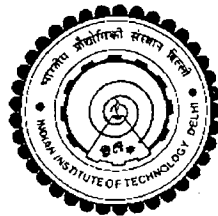


A STUDY OF E-BUSINESS READINESS OF INDIAN CAR INDUSTRY

By

SWAPAN KUMAR MAJUMDAR
Department Of Management Studies

*Thesis is Submitted
in fulfillment of the requirements for
the award of the degree of
DOCTOR OF PHILOSOPHY*



to the
INDIAN INSTITUTE OF TECHNOLOGY, DELHI
NEW DELHI - 110016, INDIA
JUNE, 2001

I. I. T. DELHI.
LIBRARY
Acc. No. TH-2841

CERTIFICATE

The thesis entitled “**A STUDY OF E-BUSINESS READINESS OF INDIAN CAR INDUSTRY**” being submitted by **MR. SWAPAN KUMAR MAJUMDAR** to the Indian Institute of Technology, Delhi, for the award of the degree of **DOCTOR OF PHILOSOPHY (Ph.D.)**, is a record of *bona fide* research work carried out by him. He has worked under my supervision, and has fulfilled the requirements for the submission of this thesis, which has attained the standard required for a Ph.D. degree of the institute. The results presented in this thesis have not been submitted elsewhere for the award of any degree or diploma.


(Dr. M.P. Gupta)

Assistant Professor
Department of Management Studies
Indian Institute of Technology
New Delhi, INDIA

ACKNOWLEDGEMENTS

I sincerely acknowledge the guidance of my research supervisor Dr. M.P. Gupta, Assistant Professor, Department of Management Studies (DMS), in carrying out this research project which is now culminating in the form of a Doctoral dissertation. I also wish to place on record that Dr. M.P. Gupta has given me the full freedom and flexibility to carry forward through this journey of knowledge acquisition.

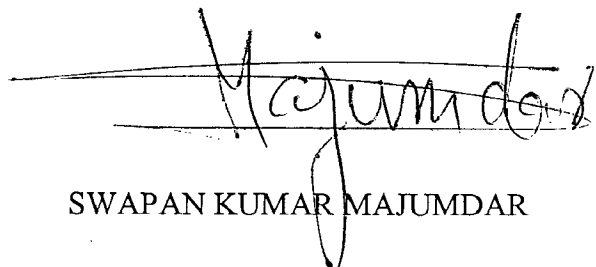
I am extremely indebted to professor Sushil for his continuous encouragement, support and timely advice for the entire life cycle of this research. I would also like to extend my gratitude to Professor D.K. Banwet and the faculty members of DMS for valuable advice and support.

I would like to convey my sincere thanks to those eBusiness experts and consultants who were kind to share their views and experiences in implementation of eBusiness technologies, which provided valuable insights of eBusiness. My special thanks go to the senior executives of car industry for their cooperation and support, without their inputs this research would not have been completed. I am thankful to many others those who directly or indirectly contributed to the completion of this research work

I am grateful to the management of MDI for allowing me to carry out this research. I acknowledge the help, cooperation and resources extended by MDI to this endeavor.

I would like to express a special word of thanks to my wife Dolly and my daughter Moon, whose sacrifices, optimism, and encouragement enabled me to complete this work in time.

6th March, 2002
New Delhi



SWAPAN KUMAR MAJUMDAR

ABSTRACT

This study presents a research work that was undertaken to understand the attitudes and exposures of Indian customers in Internet shopping, the equipping and experience of car dealers in Internet selling, and the commitments of Indian car manufacturers towards the deployment of eBusiness technology for retailing of cars.

Three-stage methodology was deployed to address various issues of the study. *First stage* was action oriented prior research – the development of a research car portal, www.phdcar.com, to feel and experience the real activities and research issues eBusiness in car industry. *Second stage* was collection of field data by conducting India-wide surveys among the prospective customers, dealers and manufacturers of car to gather factual and behavioural information about their perceptions and equipping towards the use Internet and eBusiness technology as business enabler. *Third stage* consisted of development of descriptive case studies and SAP-LAP analysis of the situation, processes and actions relationships of three-selected car companies and to suggest strategies for gaining sustainable competitive advantage.

Statistical analysis of customers' data revealed that age, occupation and sex significantly influence individuals' attitudes towards eBusiness. The number one advantage of Internet shopping is convenience and there is a significant relationship between the availability of home-Internet connectivity and Internet shopping. Younger generation and women have positive mental attitudes towards eBusiness than their older counterparts and men respectively. Dealers data indicated that there is

a positive correlation between “Construction of Dealers’ Website” and “Dealers Who Sold Goods & Services through the Internet”. Websites increase car-dealers’ capacity to attract customers through the Internet. Similarly, the collation of expert panel’s opinion indicated that car-assembling is a multi-chain-activity business and it has **high potential for eBusiness**. On the preparation front, **it was observed** that only one car manufacturer, Mahindra and Mahindra is ready to provide a full spectrum of eBusiness services, while Telco and Maruti are ready for B2B transactions and the others remain non-committal.

Three cases were developed for Maruti, Daewoo and Toyota. The case analysis reveals that carmakers that deployed eBusiness technology were quite successful to reduce time, cost and improve the quality of their processes by the application of eBusiness technology. Maruti’s Extranet for dealers reduced the cycle time, cost of vehicle delivery and enhanced the quality of services. Daewoo’s 24 hours Tele-customer servicing helped them provide better customer services at less cost.

Synthesis of the findings indicates that eBusiness does not change the basic value of the business nor its entities; it only changes the media, and operating processes of business. Thus eBusiness will make the traditional car retailing system more efficient, flexible and customer centric. Thus to gain strategic advantage it is recommended that each carmaker must plan to deploy eBusiness differently. To maximize gain, carmakers must focus and deploy eBusiness technology to such business processes, which have the power to produce maximum long-term benefits.

TABLE OF CONTENTS

	Page No.
Abstract	i
List of Figures	ix
List of Tables	xii
List of Appendices	xiv
Abbreviations	xv
CHAPTER I INTRODUCTION OF THE STUDY	1
1.1 Introduction	1
1.2 Challenges of Indian Car Manufacturing Business	2
1.3 Evolution of eBusiness	4
1.4 Objectives of the Study	6
1.5 Issues of the Study	7
1.6 Scope of the study	8
1.7 Methodology of the Study	9
1.8 Organisation of the Thesis	12
CHAPTER II LITERATURE REVIEW	15
2.1 Introduction	15
2.2 Ambit of eBusiness	15
2.3 Processes and Constituents of eBusiness	18
2.4 Characteristics of eBusiness	21
2.5 Diffusion of Internet in India	24
2.5.1 State of Telecommunication Infrastructure	25
2.5.2 PC Penetration	31
2.5.3 Penetration of Internet Services	33
2.5.4 Number of Users per Access Points	40
2.5.5 Size of Internet Subscribers' Base	41

2.6	Evolution of Indian Car Manufacturing Business	44
2.6.1	History of Indian Car Industry	44
2.6.2	Technology and Manufacturing Process	50
2.6.3	Demand Supply and Exports Scenario	52
2.6.4	Trends and Outlooks	60
2.7	E-Business Initiatives of Indian Car Manufacturers	63
2.8	Current State of Research	65
2.9	Concluding Remarks	69
CHAPTER III FRAMEWORK OF THE RESEARCH		70
3.1	Introduction	70
3.2	Conceptual Framework of the Study	70
3.3	Business Values of eBusiness	72
3.4	Frameworks of Measuring Value of eBusiness	73
3.4.1	Riggings's Framework of Electronic Commerce Value Grid	74
3.4.2	Bloch's Framework of Business Value	77
3.4.3	Porter's Framework of Competitive Advantage	78
3.4.4	Framework for Measuring Strategic Fit of eBusiness	80
3.4.5	Microsoft's Framework for Readiness Assessment	84
3.4.6	Wilson's E commerce Readiness Assessment Tool	85
3.5	Challenges of Indian Car Industry	87
3.6	Framework of the Research	90
3.7	Concluding Remarks	94
CHAPTER IV METHODOLOGY AND DESIGN OF THE RESEARCH		95
4.1	Introduction	95
4.2	Research Questions	95
4.3	Research Methodology	96
4.4	Data Collection Methods	100
4.4.1	Population Frame of the Survey	101

4.4.2	Sampling Technique	102
4.4.3	Data Collection Techniques	103
4.4.4	Instruments of Data Collection	104
4.4.5	Data Recording	109
4.5	Software Tools Used for Data Analysis	111
4.6	Validity and Reliability of Data	112
4.7	Concluding Remarks	113
CHAPTER V ANALYSIS OF CUSTOMERS' DATA		114
5.1	Introduction	114
5.2	Characteristics of Data	114
5.3	Key Questions	115
5.4	Geographical Distribution of Respondents	116
5.5	Results of Customers Survey	117
5.5.1	Single Factor Frequency Tables	117
5.5.2	Statistical Analysis of Data	138
	Results of Chi-Square Test	139
	Results of Duncun's Multiple Range Test	145
	Results of t-test	150
5.5	Concluding Remarks	154
CHAPTER VI ANALYSIS OF DEALERS' DATA		156
6.1	Introduction	156
6.2	Characteristics of Data	156
6.3	Key Questions	157
6.4	Geographical Distribution of Respondents	158
6.5	Results of Dealers' Survey	159
6.5.1	Single Factor Frequency Tables	159
6.5.2	Statistical Analysis of Data	171
	Two-Factor Contingency Tables	171

Multi-Factor Correlation Analysis	173
6.6 Concluding Remarks	175
CHAPTER VII ANALYSIS OF CARMAKERS' RESPONSES	177
7.1 Introduction	177
7.2 Profiles of the Respondents' Business	177
7.2.1 Characteristics of Data	177
7.2.2 Respondents of Carmaker's Survey	179
7.2.3 Characteristics of Indian Car Market	180
7.2.4 Drivers and Contenders of Indian Car Market	182
7.2.5 Scopes of eBusiness in Car Manufacturing Business	183
7.3 Instruments of eBusiness Preparedness Assessment	185
7.3.1 Determinants of eBusiness Potentials and Readiness	186
7.3.2 Weights of the Determinants	189
7.3.3 Instruments of Assessment	191
7.4 Assessments eBusiness Potentials and Readiness	194
7.4.1 Assessment of eBusiness Potentials	194
7.4.2 Assessment of eBusiness Readiness	199
7.4.3 Potential versus Readiness	207
7.5 Concluding Remarks	210
CHAPTER VIII CASE STUDIES	211
8.1 Introduction	211
8.2 Macro-economic factors of Indian Car Market	211
8.3 E-Business Technology and Value Chain Management	215
8.4 Methodology	220
8.5 Case Study – I: Maruti Udyog Limited	223
8.5.1 Sales Performance	224
8.5.2 Marketing Strategy	226
8.5.3 Management of Supply and Retail Chain	228
8.5.4 Deployment of Internet and eBusiness Technology	229

8.5.5	SAP-LAP Analysis	233
8.6	Case Study – II: Daewoo Motors India Limited	238
8.6.1	Sales Performance	239
8.6.2	Marketing Strategy	240
8.6.3	Management of Supply and Retail Chain	241
8.6.4	Deployment of Internet and eBusiness Technology	242
8.6.5	SAP-LAP Analysis	243
8.7	Case Study – III: Toyota Kirloskar Motors Limited	248
8.7.1	Sales Performance	248
8.7.2	Marketing Strategy	249
8.7.3	Management of Supply and Retail Chain	249
8.7.4	Deployment of Internet and eBusiness Technology	250
8.7.5	SAP-LAP Analysis	251
8.8	Synthesis of Case Studies	253
8.7.1	As-Is SAP-LAP Analysis	254
8.7.2	Recommended eBusiness Strategy	256
8.9	Concluding Remarks	259
CHAPTER IX LEARNING AND CONCLUSION		260
9.1	Introduction	260
9.2	Research Summary	260
9.2.1	Summary of Univariate Analysis	261
9.2.2	Summary of Bivariate statistical Analysis	261
9.2.3	Summary of Multivariate Correlation Analysis	263
9.2.4	Summary of eBusiness Readiness Assessment	263
9.2.5	Summary of Case Analysis	265
9.3	Synthesis	265
9.3.1	Customers' eBusiness Readiness	266
9.3.2	Car Dealers' Readiness for eBusiness Services	266
9.3.3	Carmakers' eBusiness Readiness	267

9.3.4	eBusiness Readiness of Retail Chain of Indian Car Industry	268
9.4	Learning Issues	268
9.4.1	Attitudes of Internet Users	269
9.4.2	Equipping of Customers, Dealers and Carmakers	270
9.4.3	Online Transformation of Business processes	271
9.4.4	Accomplishments	271
9.4.5	Recommendations and Implications	272
9.5	Significant Contributions	274
9.6	Limitations of the Study	276
9.7	Suggestions for Future Studies	277
9.6	Concluding Remarks	278
	REFERENCES	279

CURRICULUME VITAE