

# Glimpses of Managerial Challenges and Strategies in the New Millennium

Dr. H.S. Cheema  
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Himalaya Publishing House

# ***Glimpses of Managerial Challenges and Strategies in the New Millennium***

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# Preface

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*"Capital isn't so important in business. Experience isn't so important. You can get both these things. What is important is ideas. If you have ideas, you have the main asset you need, and there isn't any limit to what you can do with your business and your life."*

— Havery Firestone

In the globalized world, the only thing which is constant is "Change". The management challenges of the new millennium are driven by a shifting globalized economy, increased competition, speed of innovation, customization of demand and emphasis of value-added services, the mobility and diversity of workforce and rapid advance in communication technology. The traditional barrier of doing business are broken down and replaced with vast opportunities and prospects for growth. Increasingly, corporate around the world are in the race that is getting more and more difficult by every passing year, with bigger stronger and more innovative global players. We, in India, are realizing these facts and many countries are re-examining their economies, introducing economic policy reforms and opening their market to foreign investment. This period of uncertainty and opportunity is forcing business to reshape conceptions of industries, organization structure, business strategies, and the role of the stakeholders.

Marketers, around the world today, face common challenges, its difficult to balance corporate initiatives with marketing expenditure and efforts, maximizing each opportunity. The beginning of the new millennium is a story of resurgence. How can marketers sustain that resurgence? Marketers need to address many fundamental issues.

When mighty economies across the world are in shambles, GDP rate of emerging economies is on the downside, the policymakers, heads of leading businesses and organizations are turning to cutting edge managerial strategies that might offer them some ray of hope in these bleak circumstances. It is adversity that compels man to leverage every possible strategy at his disposal.

In a lot of forums, workshops and seminars and conferences around the world, intellectual churning is taking place in order to get out of this unfortunate mess of our own making. This is what we all are witnessing at the moment as intellectuals around the globe are putting their heads together their in order to resolve this crisis.

These very circumstances are at root of the evolution of all the sciences we have developed and management education is no exception to this rule. Management, or any other field for that matter, is prone to change and this is a universal rule. For the past few decade management field has been a witness to a lot intellectual churning that ultimately writes great thought which ultimately take the form of time-proven theories. That's how all the great management gurus right from Peter Ducker to C.K. Pralhad have contribution universally accepted management thoughts and they are followed the world over. Human kind has always moved from one stage to another and in the bargain has achieved spectacular progress. We have always been better than yesterday in many areas but we may not have progressed at all, as it is evident from facts, in some fields. All this intellectual interaction happening on different

platforms are great opportunities for all of us to get the first hand information of all that is happening at the moment and people who get to hear them get new perspectives, ideas and strategies that finally help them to put the problems on hand in their proper context.

In such testing times, we need to consult thinking minds that can show us a ray of hope to find a solution to this challenge. In this context, it makes sense what these people have to offer. Viewing against this promising scenario and the challenges in this globalized world, the publication of **"Glimpses of Managerial Challenges and Strategies in the New Millennium"** has a unique significance as it provides intellectual capital in the form of a wide spectrum of research papers that present a treasure of data.

In short, "Glimpses of Managerial Challenges and Strategies in the New Millennium" serves the most important purpose of dissemination of knowledge and what else can be the better way than publishing quality proceedings of conference in the book form. Part A of the book deals with the effects of globalization and its effects. Many of the research papers highlight the effects of the globalization and it aptly takes into account how globalization is impacting the business scenario around the globe. It adds so much to the understanding of the very crucial phenomenon in the present world.

Part B tackles educational issues we are all facing in today's society. As we all know it is the education that really differentiates a nation from the rest. We have been trying to adapt ourselves with the changing circumstances. In order to be able reap the benefits of the globalization, we need to be flexible and resilient so that we keep ourselves abreast of the fast changing world. The prosperity of the nation will surely depend on our quality of education in future.

Part C of the book is a very crucial part as it deals with financial integration, investment and economic growth. As the business world is expanding very rapidly, we need to have strategies to integrate our finances. We cannot move ahead unless we have a robust domestic investment. Today, we find that investment is happening on various fronts. The giant organizations around the world are waiting to invest in India. This is very crucial for us. At the end of the day, we need huge funds for infrastructural development. The research papers in this part throw light on myriad issues related to financial integration, investment and economic growth. All these are closely interrelated.

Part D is one more important chapter in the book. We will have many HR challenges to face in this new millennium. There will be a lot of new strategies to cope with these challenges. HR is very crucial for the long-term survival of every organization. We know very well that sustainability of any business venture depends on how well human resources are managed. There are research papers which deal with emotional intelligence, effect of family support to working women, socio-economic study of the families below poverty line and the programs of the government to alleviate poverty in the country.

In short, this book presents a kaleidoscopic view of managerial challenges and strategies in the new millennium. I am sure the valuable information contained in this book will go a long way to enhance the knowledge base of our young generation. I wish you all a very great reading time!

— Dr. H.S. Cheema

CEO & Dean,  
Institute for Future Education Entrepreneurship and Leadership.

# Foreword

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No other period in the history of management science has been so challenging and critical as it is today. On one hand, we find business expansion in every direction on unprecedented scale and on the other we find mighty economies across the world in shambles, GDP rate of emerging economies on the downside and prospering economies in Europe are collapsing one after the other. All these once prosperous economies are trying very hard to emerge out of this grave crisis, especially the emerging economies famously referred as BRICS, which were surging ahead with great expectations to lift their millions out of the abyss of poverty.

It is exactly for this reason there is so much debate on how to tackle these issues of all kinds, using the best of managerial strategies for running a business venture successfully during these trying times. Heads of the business organizations, heads of states, policymakers, professionals and academia across the globe are actively involved in finding out the issues that managers are struggling to find answers to so that they can run their businesses smoothly and achieve the pinnacle of success in their respective fields. Managerial strategies are all-pervasive and cover all the areas of management, be it marketing, HR, finance, operations or IT.

We all are a witness to a new economic world order emerging. Once labeled as third world countries, a derogatory term used to refer to the poverty-stricken countries with huge population in Asia, are almost on the verge of becoming world's greatest promising economies. At macro level, all these countries have different sets of ethos that render them exclusive because of cultural, regional, ethical and behavioural differences but the process of globalization is working as catalyst to bring unity in the diversity. Given this framework, now it is real challenge for research institutes across the world to find the best solutions to the managerial issues while running businesses in these diversified contexts.

Such trying times are a true test of our resilience, all the wisdom and theories we have gathered so far. I feel the publication of "***Glimpses of Managerial Challenges and Strategies in the New Millennium***" very well coincides with the present turbulent times as it is time for us to reinvent ourselves, to carefully test our theories and strategies to tackle the situation. Prudent measures, frugal policies, courageous decisions and new perspectives will definitely bail us out of these trying circumstances. This is what makes me very delighted to see such a valuable research reaching the huge readership across the country.

The research papers deal with myriad issues which are quite relevant in today's context. The world is changing fast and so are the business environments. Globalization and liberalization have created great opportunities for business expansion but at the same time, it has completely overhauled the context of doing business. Though these new forces have squeezed the world into a very small place, the challenges have grown manifold. This new scenario is throwing people of varied cultures, regions, ethos and behavioural patterns together. A lot of this research addresses the current issues.

The book very well reflects how this phenomenon has rendered doing business a challenging proposition. Added to this are the mergers and acquisitions happening, the amalgamation of various businesses across the world are really creating challenges for the people at the helm of affairs. The competition is steep, customer base is very volatile, with increased purchasing power people's tastes are changing, standard of living is improving, every day new technology is introduced, new issues, new strategies are being written about, every moment we are flooded with data, skill sets are getting obsolete very fast so on and so forth.

Just imagine a manager sitting exposed to all these forces working simultaneously against him and he being at the epicenter of all these heterogeneous forces, he has to be a wise man from Arabian Nights to know the panacea on all ills. In such a scenario, he is always expected to be on his toes because he has to meet expectations of the people above as well as the people below. He has to strike a golden mean so that he is able to maintain his equilibrium. At the present age, it is a tight rope walking. He needs to have all the weapons in his repertoire to devise strategies and meet challenges.

Research has become the hallmark of all the academic activities at IFEEL and it has left its indelible print on the research map of the country. Henceforward, the academic clout of an institute will always be judged as per its contribution to research. This is a matter of great pride for a management institute that is coming up very fast and for other institutes a great lesson that needs to be emulated. This unflinching commitment to research will, undoubtedly, see this institute into a different league altogether a few years down the line. Research always inspires more research as this book will be reaching every nook and corner of the country. We need more and more people from young generation to jump on the bandwagon so that we can fast recover the research deficit. The hope has always come from the academia from educational schools, institutes, colleges and universities. These are the incubating centers of new ideas and it is new ideas that will be our saviors!

Coursing through the book has been an extremely satisfying experience for me. I felt delighted as it made me aware of the fine nuances of managerial skill sets required for everyone associated to business and industry in order to ride over this lean and bleak phase of economic slowdown.

I wholeheartedly appreciate the hard and passionate work Dr. H.S.Cheema, CEO and Dean, at IFEEL has done along with his team. I am sure the present book is one of the excellent books that he has contributed to the field of research. I give him my heartfelt congratulations and wish him to bring to light much more research in the coming future. This kind of an intellectual enterprise involves a lot of patience and labor and must give its due credit to its creator, Dr. Cheema.

Himalaya Publishing House Pvt. Ltd. has earned itself a rare distinction of being the staunch supporter of knowledge dissemination. This book is an esthetic delight to the lovers of knowledge. They, too, deserve all the praise for such wonderful academic creation.

I am sure this wonderful book will receive a very warm response from research scholars in particular and academia at large in general.

— **Dr. Uday Salunkhe**

Group Director,  
Welingkar Institute of Management and Research

# ***Acknowledgements***

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Expressing gratitude to those who lend us helping hand in successfully carrying out an activity is our cherished tradition. It makes our hearts feel light and at the same time fills the hearts of the people with satisfaction for having contributed to a worthwhile cause.

Editing a book and that too related to challenges and strategies in the New Millennium is a stupendous task. The scrutiny of research papers, relevant to theme involves painful labour of many as it demands pouring over the soft copies for correcting errors in order to render research papers flawless in expressing their content. It is just one type of job and there many such works to be performed and so it aptly referred to a a teamwork.

First in the list is our benefactors is the management of IFEEL, Institute for Future Education, Entrepreneurship and Leadership, who have been very encouraging and always lend us unconditional support to engage ourselves in this research related cause. We owe many thanks to them and we would prefer to be in their debt as this sense of gratitude would enable us in future to deliver the best.

Himalaya Publishing House Pvt. Ltd. has a great sense of commitment to the dissemination of knowledge by bringing to light quality research work. It is this inspirational attitude that boosted our confidence in editing this valuable book. We gratefully acknowledge their help and million thanks to them, especially honourable Mr. K.N. Pandey for accepting our proposal and bringing it out in a delightful and aesthetically designed format.

We were supported by an able team of our colleagues, Ms. Sayali Vartak, Ms. Shrutika Dharap and Nikhil Rane from the administrative department in making the necessary corrections in the soft copies, arranging and preserving the soft and hard copies, contacting the researchers in case of doubt. We thank them for their patient hard work.

— Editors

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**PART-A**

**Effect of Globalization  
and it's Impact**



	<b>Identify Strategic Technical Partners: Align the Capabilities, Enhance the Product and Create Value</b>
<b>Ajay Palkar</b>	

## **Abstract**

The new generations of Vehicles-Passenger, Commercial and Military have seen an exponential development in on-board electronic systems, which control increasingly wide spectrum of the functionality. Electronics, Electrical systems and Software which form the nodal element of Embedded Systems are indeed becoming more integral to development. To cope with increasing customer demands, organizations are re-defining their value offers and collaborative efforts with technical partners to create distinctive competitive advantages. Hence, for the survival and growth of the organizations, value on supply chains and effective management has become critical.

This paper restricts its scope, describing an agenda to align and enhance the Inherent Technical Capability in the field of Vehicle Electronics, Embedded and Software by initiating Technical alliance with established Experts/Companies and an agenda for changing how we design and operate supply chains to create value for the business. This paper finishes with the framework and business models (engineering and integrated) established by the study can be used in future research or applied to actual practices.

**Keywords:** Dynamic capabilities, collaborative network, collaborative effort, value proposition, value creation, supply chain, business model.

## **INTRODUCTION**

The intense globalization, communication and integration of markets have made customers aware and demanding. Two decades ago, the businesses were competing on price, quality or service. Hyper competition in knowledge and economy is inevitable in the era of 21st century. The product life cycle is becoming shorter and the competitive advantages of companies and their existence is on stake, thus resulting in competitions that become increasingly dynamic and unpredictable. It is therefore worth exploring the subject of debate on how high technology companies adopt dynamic capabilities at different stages, collaborative technical network and business model in the fast growing environment of the industry.

India has already started catching up on the high end engineering product offering extensively for global Automotive, Aerospace, Defense and Hi-tech electronics companies. The major business groups are well diversifying their products and offering to support the continuously increasing challenging customer demands.

Embedded systems today, form the backbone of every major field of activity. Increasing integration of communication methodology and processes and the relentless digitization of data continues to expand the scope and complexity of embedded systems. Even with detailed technical knowledge in a specific technology area that make up the Embedded systems, a good system design would require understanding of the design trade-offs across choice of technologies that make up the total solution.

Therefore, the fundamental understanding of the choice of technologies, universal applicability and functional complexity makes the embedded systems a definitive must. Complex Embedded Systems that are involved in Automotive, Aerospace, Defense, Consumer Electronics, Telecommunication and Industrial Automation require a higher level of technology which include safety, criticality, advanced control and high reliability.

The Capability analysis and identification must therefore be applied, and emphasis may be placed on the capability in new knowledge enhancement, acquisition and adoption, while competitive advantages are obtained through early market entry. Alternatively strategic alliances should be formed with other companies to create a network organization, thus expanding and accelerating the acquisition of critical resources and capabilities, in order to sustain competitive advantages on the market.

To cope with ever increasing customer demands, organizations are re-defining their value offers and collaborative efforts with technical network to create competitive advantages. Hence, managing value on supply chains has become critical for survival and growth of the organizations.

### **BUSINESS DRIVERS: AN ANALYSIS**

High technology instigates to use fundamental science knowledge to fast develop the products and services by the companies/firms, characterized by, Product technology standard, Fast growing technology and acceptance, Integration of technologies and Value chain relationships.

According to analyst's projections, 90 percent of all future innovations in VehiclesPassenger, Commercial and Defense will be supported by Hi-tech electronics, 80 percent of which will be derived from embedded hardware and software. Electronics, electrical systems and software are becoming more integral to development.

Electrical systems and electronics will experience the greatest growth as more electronics are incorporated into engine management, communications, fire power and safety. A large number of embedded systems are in use, and the number continues to increase.

The complexity of both hardware and software is also on the increase. Big aerospace and military applications represent the extreme end of embedded-systems complexity. Software is increasingly finding its way into vehicles and is becoming a common standard for defining guaranteed product quality. Military War-fare systems now depend on software more than

ever before to ensure command and control, safety and efficiency. Information technology, computers, software are the keys to the future.

### Key Capabilities: Electrical, Electronics and Software

Companies need to put more efforts to enhance Design and Development capabilities supporting following two major areas,

1. Electrical and Electronic Integration
2. Embedded Design — Hardware and Software

### Electrical and Electronic Integration

All sub-systems are either designed in-house or bought out, having their hard wired interconnections supporting the stand alone functionality. Important to have these subsystems function efficiently in the integrated way under vehicle domain.

The integration incorporates the use of Series or Parallel connections based on the operational requirements.

The Electronic sub-systems communicate with each other/with the master controller by sharing data as information/control using network protocols.

The figure 1 shows the desirable Integration activities to be performed.

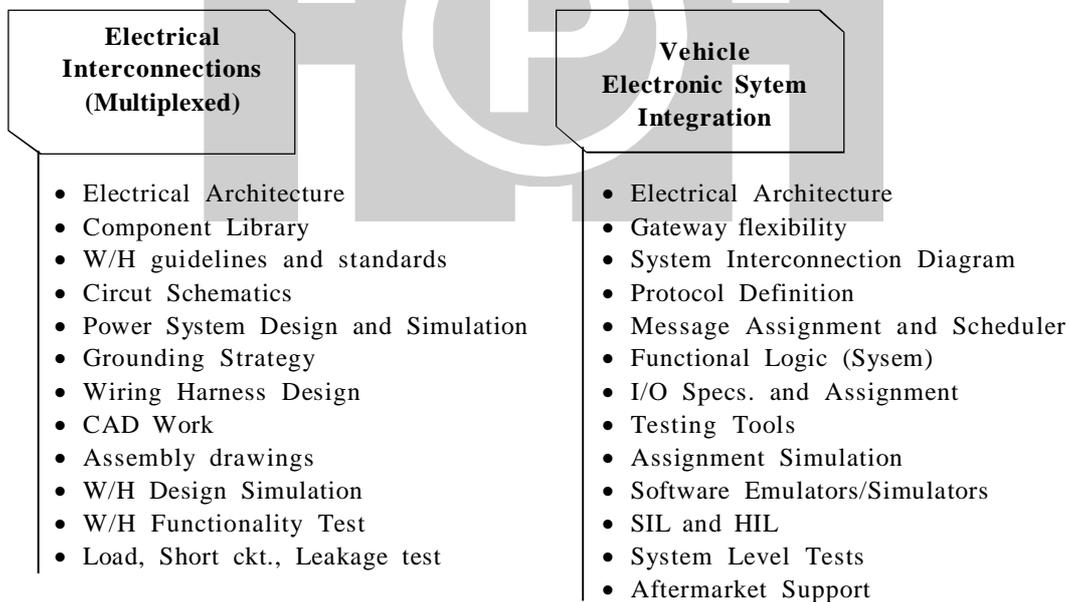


Fig. 1: Integration Activities

Embedded Design — Hardware and Software Electronic vehicle design incorporates semiconductor, FPGA, PCB, Mechatronic, and embedded software design to create cost-effective and reliable systems. Integrating all aspects of electronics requires careful attention

to component design and system interactions to reduce warranty costs, meet performance specifications, and enhance reliability under constantly changing environmental and operational conditions.

The figure 2 shows the desirable Embedded Hardware and Software Design activities to be performed.



**Fig. 2: Embedded Design – Hardware and Software**

### Key Challenges Involved

- Increase component, software, and system reliability
- Respond to changing requirements in safety, infotainment, fuel efficiency, and performance
- Decrease design cycle time with virtual prototyping and verification tools that speed time-to-market
- Design and verify electronic/mechatronic systems power-train, safety, engine controls, fuel and emissions management, navigation, infotainment, etc.
- Develop and verify embedded software before silicon is available using virtual platforms and FPGA prototyping
- Verify component and system interaction across multiple physical domains (electrical, mechanical, hydraulic, magnetic, thermal)
- Address mechatronic complexity using Robust Design/DFSS methodologies
- Develop high-performance, technology-independent FPGAs and prototype ASICs to optimize speed, cost, and area
- Decrease IC manufacturing costs and improve production and yield predictability

## **Embedded Software Development and Verification/Validation**

Embedded systems and algorithm development allows automotive companies to quickly adopt new electronic functions while lowering costs and development time. However, software can be the source of reliability issues that are difficult to diagnose prior to hardware implementation.

## **Mechatronic Systems – Robust Design Methodologies**

Mechatronic systems combine mechanical, electrical, hydraulic, and software disciplines to efficiently drive and control complex vehicle operations. Reliable mechatronic performance requires that systems be immune to the effects of operational, environmental, and manufacturing variations through such methodologies as Robust Design.

## **PCB Design and Verification**

PCB design integrates various electrical functions into more advanced systems and is crucial in the supply chain. Companies can partner with leading multilayer and high-speed PCB design tool providers to incorporate chips and FPGAs into PCB systems.

## **Key Capabilities: Value Proposition**

The value proposition is defined as an implicit promise a company makes to customers to deliver a particular combination of values. Each proposition resembles to the unique value that can be delivered to a selective market. Not only Customers but the Suppliers also are very important while defining the theory of value propositions. This can be achieved by establishing reciprocal relationship between the organizations and stakeholders in a collaborative network.

The value propositions directly impact business strategies; e.g. competing markets, enhancement of core competencies and capabilities, selection of stake holders of the supply chain and the financial priorities. The value propositions also impact operations, e.g. market research, new product development, supplier relationships, production processes, customer relationship and delivery systems. In other words the value propositions model the ambitious plans and instigates the decisions that companies make. Hence, the concept of value proposition is of rising interest to academics, researchers and practitioners from different fields particularly from operations, supply chain, strategy and performance management.

The key value propositions are Product Leaders, Operational Excellence and Customer Intimacy. Further, these are subdivided to highlight with six value propositions: Innovators, Brand Managers, Price Definition, Simplifiers, Technological Integrators and Socialisers, aligning the key operational elements that the company has to build to offer a particular type of value that fulfils the customer expectations of a specific market segment.

The scope of this paper focuses Innovators and Technology Integrators out of the six value propositions.

### **Innovators**

In this case the customers get new products, which they have never seen before, with unique and special characteristics. Companies need to focus on building strong design skills,

work within short product lifecycles, make obsolete their own products and continuously introduce new products. The strategic objective of 'innovators' is to provide breakthrough through new designs and product generations within technological basis.

### **Technological Integrators**

Customers get total solutions from tailor made products and services. In order to support this proposition, these organizations need to support their customer processes, helping them to identify and provide new solutions; hence, personalized attention such as product delivery, pre- and post-purchasing service, installation and maintenance, are some of the attributes of their product/service. The strategic objective is to create long-term relationship supporting customize specific and continuous solutions for carefully selected customers.

## **BUSINESS MODELS**

Business model describes how companies and firms transmit their values to customers in one or several market segments. Such values are jointly created, marketed and transmitted with their network partners, which eventually generate profit for the business and sustain its existence. Innovation is key to business profit and survival.

Business model is a combination of strategies at various levels, such as the company as a whole, business and functional, that firms adopt to create customer values, generate profit and sustain its operation to compete in the industry or market.

In respect of the Electronics, Electrical systems and Software, when a new manufacturer enters the competitive environment of the industry, how it achieves optimal efficiency, quality, innovation and customer response, thus sustaining its competitive advantages and profit generating ability, will depend on how it orientates itself, and whether its business focus is in one or several domains; or, according to the general competitive strategies, its selection of strategies regarding cost leadership, differentiation and focus or strategies at functional level.

To compete, grow fast and sustain, there can be three Business Models, Business Groups can think off, Business Model 1: Merger and Acquisition (Fig. 3)

Mergers and acquisitions refers to the aspect of corporate strategy, corporate finance and management dealing with the buying, selling, dividing and combining of different companies and similar entities that can help an enterprise grow rapidly in its sector or location of origin, or a new field or new location, without creating a subsidiary, other child entity or using a joint venture.

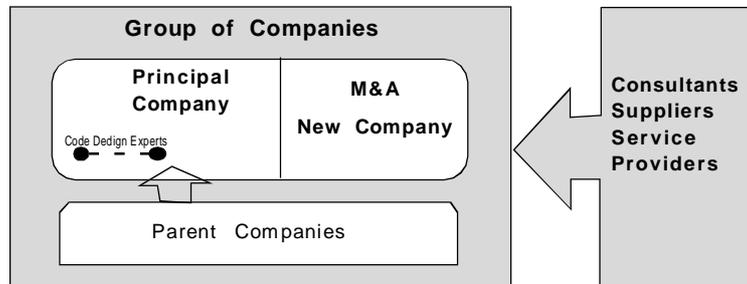


Fig. 3: Merger and Acquisition

**Business Model 2: Joint Venture (Fig. 4)**

A joint venture is a business agreement in which parties agree to develop, for a finite time, a new entity and new assets by contributing equity. They exercise control over the enterprise and consequently share revenues, expenses and assets. A joint venture takes place when two parties come together to take on one program either short term or long term. In a joint venture, both parties are equally invested in the project in terms of money, time, and effort to build on the original concept. Major corporations also use this method in order to diversify, allows both parties to share the burden of the programs, as well as the resulting profits.

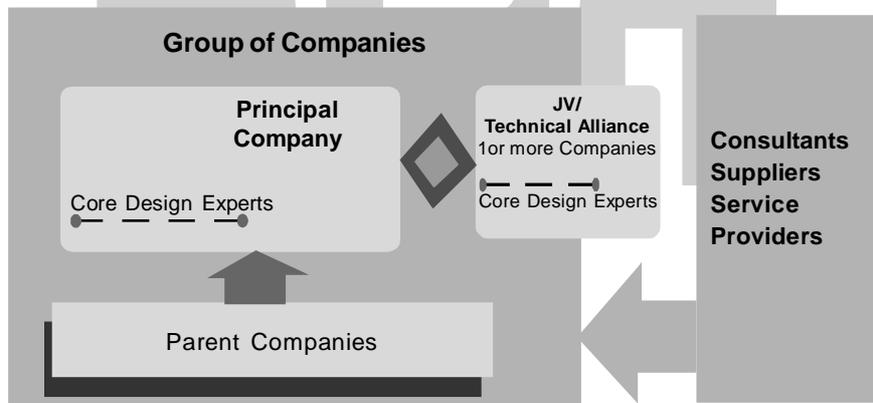
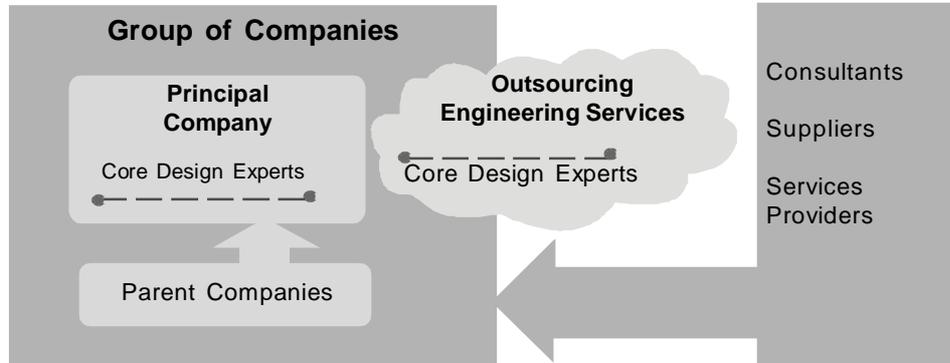


Fig. 4: Joint Venture

**Business Model 3: Outsourcing Engineering Services (Fig. 5)**

The term outsourcing is used inconsistently but usually involves the contracting out of a business function to an external provider. In this sense, two organizations may enter into a contractual agreement involving an exchange of services and payments. The concept of outsourcing thereby helps the firms to perform well in their core competencies and thus mitigating rise of skill or expertise shortage in the areas where they want to outsource.



**Fig. 5: Outsourcing Engineering Services**

One business model/strategy that can help entrepreneurs to save time, money and frustration as to start and build the business is very difficult to choose considering different business factors, legal and process oriented matters, skilled, but cost-effective solutions.

## METHODOLOGY

To identify Strategic Technical Partners, it is important to understand the value created by selecting the most effective Business Model focusing Innovators and Technology Integrators.

Analysis was done through visits and meetings over a period and supported by semistructured interviews, structured questionnaires and observations as well as studying a range of companies documentation and the data has been prepared for further decision making with following major points,

1. Compare Technical and Commercial factors covering, Name of the company, Address of the company, Established on, Geographical Presence, Business Sector, Type of Company, Turn Over, Total Employees, Certification and Validity, Key Competencies, Customers, Key Projects Executed, Growth Plans for next years, Registered Technology Partners, Company Website info, Software Licenses, Hardware Platform more frequently used, Hardware Platform more frequently used, Serial Communication buses worked upon, Real time design platform used, Other applications handled.
2. Source Comparison: Embedded / Electronic Designs covers, Signal Processing (Analog, Digital), Embedded Design ( Processor Platforms, RTOS, DSP, Video, LCD, Networking, Communication), Control Applications (Time based, switching, on-off, Motor Control, Proportional Controls), Verification and Validation (Embedded Design, Automatic Test Systems, Simulators and Emulators, System Integration Testing).
3. Company Visits to Selected ones
  - (a) Visits by Technical Team
  - (b) Visits by Management Team

The aim is to analyze and propose the Strategic Business Model, equipped with Design Capabilities and Value Proposition.

## **OBSERVATIONS AND FINDINGS**

The value propositions can be applied to the whole organization or to the business units. However, research supports that, it is more appropriate to Engineering Functions as Innovation and Technology Integration.

### **Techno-commercial Analysis Shows**

- Support on Hardware and Software design is being provided directly to Private and Govt. Organizations.
- Knowledge base is Limited for the Domain Applications.
- Expertise in Product engineering with defined output.
- Strong foot in electrical and electronics applications for various domains.
- More focus on Design modifications, Product replacement, Feature upgrades.
- More focus on Test Bench design for different products used in Automotive, Aerospace, Defense applications.
- Project dependent profitability.
- Limited Collaborative Business Efforts

Considering the suitability for MandA/JV/Outsourcing models, the Technical Partners were further evaluated for Each Business Model to understand more about their Advantages and Disadvantages as below,

### **Business Model 1: Merger and Acquisition**

#### **Advantages**

- Strong Domain Knowledge
- Strong foot in Domestic Market
- Quality/Experienced Personnel available? Widening Economic Growth
- Tapping new methods, technology, approach? Building relationship with Vital contacts

#### **Disadvantages**

- Very high liability and risk
- Limited foot print in International market? Limited Product Portfolio
- Reluctance to accept new management
- Challenge to retain key resources
- Limited infrastructure for D-to-D
- Business holding may get affected
- Challenge to maintain balance on P&L

**Business Model 2: Joint Venture****Advantages**

- Strong Domain Knowledge
- Strong foot in Domestic/International Market? Quality/Experienced Personnel available? Large Product Portfolio
- Encourages management's and staff? Wide D-to-D infrastructure
- Share prices go high
- Additional financial resources available
- Sharing of economic risk with co-venturer? Widening economic scope fast
- Tapping new methods, technology, approach? Building relationship with Vital contacts

**Disadvantages**

- Limited liability and risk
- Shared profits
- Diminished control over some important matters
- Undesired outcome of the quality of product/project
- Uncontrolled or unmonitored increase in the operating cost? Challenge to maintain balance on P&L

**Business Model 3: Outsourcing****Advantages**

- Expertise in all domains.
- Strong domain network in Domestic/International Market? Quality/Experienced Personnel available
- Complete Design control through Principal Company? Low Liability and risk
- No operating cost, increased productivity
- Knowledge can remain within the group through core experts? Operational expertise
- Principal company can focus on Core Competence Areas? Wide D-to-D connectivity
- Widening economic scope fast as finance controlled through Corporate? Tapping new methods, technology, approach
- Building relationship with Vital contacts Disadvantages
- Challenge to maintain key resources
- Slightly more turn around time for major activities? Limited quality output

The Core Embedded/Electronic Design Capabilities are further evaluated considering the Technology Expertise, refer Fig. 6: Technical Analysis — Embedded Electronic Designs. The focus is on Strategic need and Product Life Cycle for Research and Development and Development/Production.

Technical Partners: Embedded/Electronic Designs

IES Designs	Company 1	Company 2	Company 3	Company 4	Company 5	Company 6	Company 7	Company 8	Company 9
<b>Signal Processing</b>									
>>> Analog Designs	●		●	●	●	●	●	●	●
>>> Digital Devices	●	●	●	●	●	●	●	●	●
<b>Embedded/Electronic Designs (Hardware + Software)</b>									
>>> Processor Platforms	●	●	●	●	●	●	●	●	●
>>> REOD (Real Time Op. Sys)	●	●	●	●	●	●	●	●	●
>>> DSP (Digital Sog. Processing)		○	●	○	●	○	○	●	●
>>> Data Representation (Video, LCD etc.)	●	●	●	●	●	●	●	●	●
>>> Networking	●	●	●	●	●	●	●	●	●
>>> Communicaion			●		○	○		○	●
<b>Control Applications</b>									
>>> Time Based, Switching, On-Off	●	●	●	●	●	●	●	●	●
>>> Motor Control		●	●		●			○	
>>> Propeotional Controls			●	●	●	●	○	●	
<b>Verification &amp; Validation</b>									
>>> Embedded Designs	●	●	●	●	●	●	●	●	●
>>> Automatic Test Systems	●	●	●	●	●	●	●	●	●
>>> Simulators & Emulators	●		●	●	●		●	●	●
>>> Sys. Integrating Testing			●		●			○	

● Strong Capability ○ Limited Capability □ Outsourcing Enginewwring Services

Fig. 6: Technical Analysis - Embedded Electronic Designs

Integrating all aspects of electronics requires careful attention to component design and effective system integration to reduce warranty costs, meet performance specifications, and enhance reliability under constantly changing environmental and operational conditions. The Outsourcing Engineering Services having exceptional competitive advantages comparing with the other engineering companies for M&A/JV.

The estimated growth for the Indian Engineering Service Outsource market will exceed four times as shown in the Fig. 7: India s Engineering Service Outsource Market.

India's Engineering Service Outsource Market 2008-2020

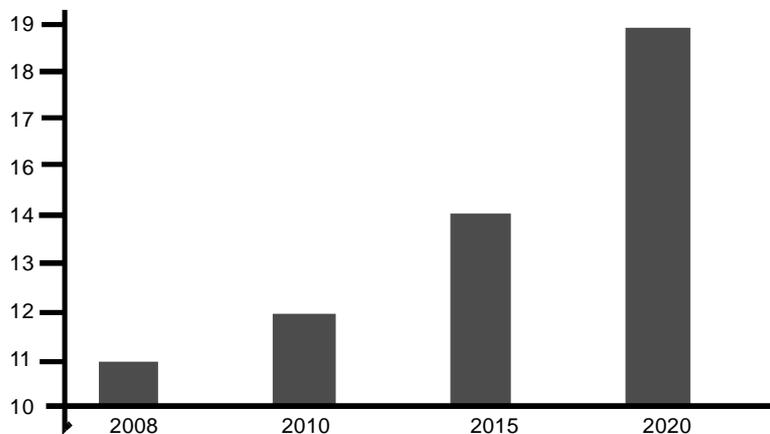


Fig. 7: India's Engineering Service Outsource Market

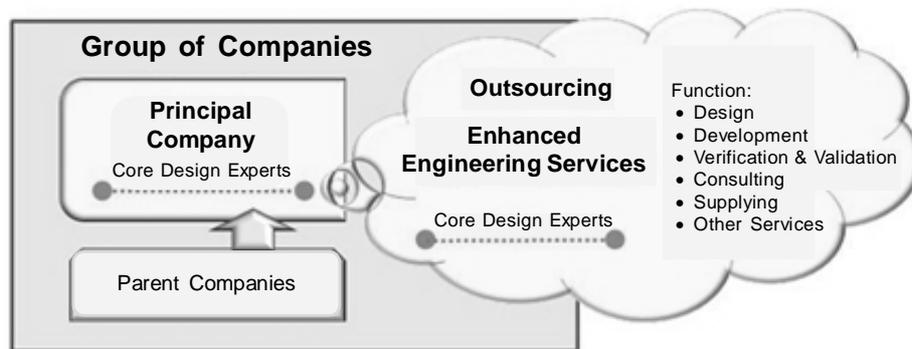
Focusing Value Proposition, three decision factors must be considered when embarking Engineering Outsourcing,

- **Capability Extension:** Specialized state of art domain expertise, proximity to rapid developing engineering markets, untapped innovation potential
- **Cost Efficiency:** Economics of scale at specialized engineering suppliers, low cost locations, higher utilization of capacity
- **Resource Flexibility:** Increase in engineering flexibility to scale up and down, parallelization of development tasks, refocusing of internal resources on core competencies and new product development, coverage of niche engineering segments

## CONCLUSIONS

As companies continue to build R&D facilities, Businesses in emerging markets, thus transferring knowledge, Indian Engineering Services will grow in multiple folds. However, the competitive pressure will continue to build up for both groups. Over the next few years, established Service providers are likely to step up their efforts to become more cost competitive and will probably continue to build up capacities in low-cost countries.

The Engineering Service Providers must enhance their domain expertise fast enough; to create necessity and attract the OEMs and suppliers.



**Fig. 8: Proposed Business Model (Engineering)**

Fig. 8 shows the Proposed Business Model (Engineering) where Engineering Service Providers to enhance their capabilities to support the OEMs and Supplier in their core business activities. This requires a collaborative effort to successfully master the engineering outsourcing and create value to the customer.

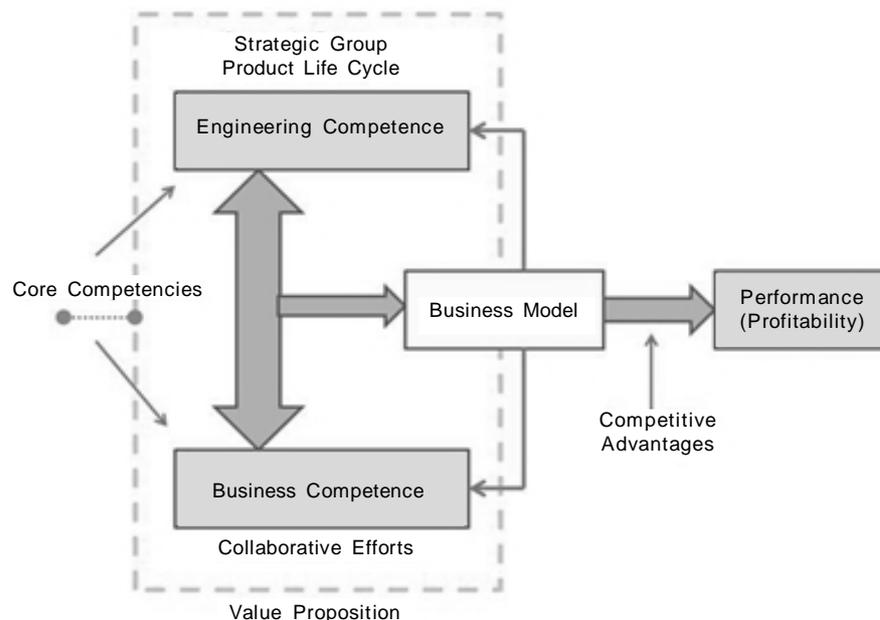
Engineering Service Providers: Strategic Approach to Outsourcing

- Establish a clear competitive advantage over other market players by fostering cutting-edge technological know-how generation in dedicated domains.
- Define a clear and comprehensive value proposition for OEMs/suppliers and a go-to-market strategy based on proven domain expertise.

- Offering OEMs competencies in a comprehensive and standardized business model, Engineering Service Providers can offer existing and future customers an easy-to-use service platform.
- Define their own global Business footprint to best serve the increasingly global demand for engineering services.
- Establish support from close proximity to OEMs as a prerequisite for engaging in long-term business relations.
- Must establish and demonstrate a solid compliance policy
- Develop a clear and sustainable cooperation model for subcontracting themselves with downstream service suppliers.
- Develop a spotless track record and domain-specific competence.
- Get a grip on excessive engineer attrition levels, to avoid loss of well trained resources and overall company productivity.
- Focus appropriate inorganic growth opportunities in order to successfully overcome the market downturn and benefit from the incorporation of needed domain expertise.

The combinations of value propositions, strategic competencies and capabilities from different members create a unique value creation process.

The correlation between the development of engineering competence and business competence is shown in the Fig. 9: Integrated Business Model.



**Fig. 9: Integrated Business Model**

**Value Proposition: A Strategic Approach**

- Strategic/key members of the supply chain are those who hold the core competencies within their own scope of the chain.
- The value propositions of strategic members of the supply chain should be aligned to enhance the value proposition of the entire supply chain.
- The value proposition of overall supply chain is fully dependent on strategic members of the supply chain.
- The collaboration with strategic members is focused on the improvement of the supply chain competencies.

The value proposition focuses on industry value chain of strategic partnerships among firms to acquire sustainable competitive advantages in the market. Dynamic technical resources and business management of enterprises are crucial determinants to their success. A strategic partnership between firms in the upstream, midstream and downstream in the business environment of hyper competition and dynamism, is one of the major factors in the successful establishment of business model of sustainable competitive advantages. Companies must continuously innovate, its business strategies at corporate level in response to market competitions in the industry or strategic groups and changes to product life cycle.

**RESEARCH LIMITATIONS AND RECOMMENDATIONS FOR FUTURE****RESEARCH**

The scope of this research focuses Innovators and Technology Integrators out of the six value propositions. This restricts to analyze the other value propositions and focus embedded electronics as emerging technology need. The other engineering domains can be further studied and modeled.

The other value propositions: Brand Managers, Price Definition, Simplifiers and Socialisers, aligning the key operational elements that the company has to build to offer a particular type of value that fulfils the customer expectations of a specific market segment to be further studied to improve the integrated business model.

Finally, the research analysis framework and business models (engineering and integrated) established by the study can be used in future research or applied to actual practices.

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