

INTER-FIRM RELATIONS  
AND  
THEIR IMPLICATIONS ON INDUSTRIAL DEVELOPMENT:  
A CASE STUDY OF THE INDIAN SOFTWARE INDUSTRY

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A CASE STUDY OF THE INDIAN SOFTWARE INDUSTRY

*Dissertation submitted in the partial fulfillment of the requirements for the degree of Master  
of Philosophy in Applied Economics of the Jawaharlal Nehru University*

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M.Phil. Programme in Applied Economics

2002-2004

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June, 2004


I hereby affirm that the work for the dissertation, **INTER-FIRM RELATIONS AND THEIR IMPLICATIONS ON INDUSTRIAL DEVELOPMENT: A CASE STUDY OF THE INDIAN SOFTWARE INDUSTRY**, being submitted as a part of the requirements of the M.Phil. Programme in Applied Economics of the Jawaharlal Nehru University, was carried out entirely by myself and has not formed part of any other Programme and not submitted to no other institution/University for the award of any Degree or Programme of Study.

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Certified that this study is the bona fide work of Francis Xavier R, carried out under our supervision at the Centre for Development Studies.



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*To my parents*

*and*

*Sisters*

**INTER-FIRM RELATIONS AND THEIR IMPLICATIONS ON INDUSTRIAL DEVELOPMENT:  
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M.Phil. Programme in Applied Economics, Jawaharlal Nehru University,  
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*Our study endeavors to analyze the impediments to inter-firm contractual relations, existing formal and informal ways of getting around them, especially the role of reputation and trust in mitigating the conflict of interest between the firms and their implications on IT industry. The nature of the product in IT industry is complex and the transactions are such that contracting out is prevalent but hazardous. Since contracting is hazardous, channeling information, protecting property rights and creating positive expectations about the security of the rights of long-term investments, become important in coordinating inter-firm outsourcing relations. Hence the importance of legal infrastructure, reputation and trust mechanism in facilitating inter-firm relations are shown to be piercing, it may hint at a distinct view of the determinants of industrial growth.*

*TCE, downplaying the importance of reputation and trust, exaggerates the fear of opportunism and the need for contractual safeguards. Trust reduces the cost of drafting because it lowers the fear of opportunism and gives relation more flexibility. Thus firms with better reputation, by assuring its trustworthiness, tend to get more Time and Material (T&M) contracts and as reputation breeds mutual trust, firms with better reputation tend to economize on the cost of writing detailed contracts.*

*We specify that contract design is a function of reputation (Age, repeated contracts and quality certification), asset specificity, complexity and uncertainty to empirically test how reputation helps firms get T&M contracts and economize on writing costly and complex contracts. We collected data on BPO and ITES outsourcing contracts from IT firms located in Thiruvanthapuram in India. We use Probit model to test the likelihood of observing T&M contract given the level of asset specificity, complexity, uncertainty and firm's reputation (Age, repeated contracts and quality certification).*

*Our sample conforms our propositions that old firms and firms with either ISO or CMM certification get highly complicated and uncertain projects. Man-hours spent i.e. asset specific investments involved in the project, the most applauded determinant of inter-firm relations, does not seem to have any correlation with contract type and complexity. On the contrary to our proposition of age as the necessary condition, relation coupled with either of the other two reputation variables age and relation turn out to be significant implying that relation may be the necessary condition while either of age or certificate will suffice to minimize the cost of contracting. Our results broadly hint at the point that the firms rely more on building understanding that created through formal quality certifications to solve pre-contractual adverse selection problems and repeated contracting to solve the problems of behavioral uncertainties rather than relying on the court that is said to be time consuming and costly. It is generally felt among the respondents that a well-defined, sophisticated judicial support, especially third party arbitration by an insider association like NASSCOM would suffice to solve if any dispute arises.*

## ACKNOWLEDGEMENT

*No academic work is purely individual. As one progresses along, one incurs huge debts for those who all contributed and shaped the course of the work. I take this occasion to record all my gratitude to those who stood apart in helping me finish this project and personally made my life in CDS worth musing.*

*First of all I deeply acknowledge my guides Achin & Indrani Chakraborty, especially Achin for his untiring perseverance in providing me with incisive comments and perspective criticism to crystallize my logic all along. I always remember the delightful discussions I had with him, where he gave me enough room to think and act independently. His overly enthusiasm and integral view on research and his mission for providing theoretical rigor, I would say, has carved a deep impression on me. I acknowledge Indrani for thoughtful comments that helped shaping the issue and for her constant support through out the study.*

*"Data! data! data!" quoth I fretfully, "I can't make bricks without clay". True. The construction, now in your hands, would have been virtually impossible without the help of Mr. Soman Nair, Registrar, CDS. Brimming with gratitude, I wish to acknowledge his strenuous effort for getting me the appointments from those seemed completely inexorable and also his resolute shaping of my arguments from a management perspective. I heartily reminisce the incipient break through appointment that Dr. Kabir got for me, when I was pretty dejected and tired of knocking the closed doors of IT firms in the initial stages of my data collection.*

*I am profoundly grateful to Prof. K.K. Subramanian for his concern and inquiries about my progress and pondering comments on my questionnaire. This study benefited a lot from informal discussions with Dr. Beena. Her timely help of introducing me Resource Based View of the Firm that has right away changed my theoretical framework, is also profoundly acknowledged. I am grateful to Prof. Nootboom, Tilburg University, for providing me with remarkable suggestions throughout the study especially on my questionnaire and for providing me those important inaccessible articles. I heartily acknowledge Dr. Vijaya Basker, faculty, MIDS, who, despite his strenuous work schedule, went through the draft of this study and imparted me with inquisitive comments. I acknowledge all the faculties in CDS, who helped shaping the research issue through seminars and informal discussions. I extend my gratitude to all the staffs in CDS library, academic office for their unparalleled service.*

*The work would not have assumed the present form, but the wholehearted cooperation extended by Technopark GM Mr. Jayakumar, and Mrs. Jayalakshmi in arranging my interviews with ever feigning busy guys around. I thank all those who provided me with data despite of their busy schedules. On the whole my survey encounters ended up to be a nice experience that had enlightened me of some of the facets of life and taught me the art of communicating the unyielding.*

*Imagination needs moodling – sometimes long happy idling, dawdling and puttering. I was blessed with it all thanks to the most important set of people (Mph02 + Dhanya) for me, who made my life at the Centre eventful and colorful. It was not only a council of chatter, but, as it was, a council to elucidate the questions that appear not intelligible to me. I would always cherish the memories of the fun we had together with prankish "forward" Aathira, my neighbor "O Darling" Ashuthosh, affectionate Gowri, my special friend, who has got the real sense of 'taste' and could hit upon a perfect balance despite of a sea of difference in our likes and dislikes (K) Hari, fun-loving TT mogul Nandana, amazing articulator of a bit thick stories Zakku and affable and ever-ready for bailing us out Dhanya. I wish them all wondrous success.*

*The other group with whom I was always comfy and happy musing over is my juniors, especially Nadhaniel for his making sense and lots of amusing nonsense, Aravindan for his technical details, Shyam for his potent one-liners, Ashis for keeping our tradition of HCU, Alice and Sejuthi for their geniality and affability, especially the latter for 'rasagullas' and Ramya Prabha for her elegance.*

*I acknowledge Rathi Bhai and Parameswaran for going through a crude draft of this study and providing me with contributive remarks, particularly Rathi Bhai who divulged the basics of research to me. My stay here is gratifying and loamy for other reason that I have learnt about minute details of doing research and much-needed politics of economic institutions from Sunny anna, who has been a constant source of inspiration for me. His relation is something I wish to carry along through out my academic life.*

*I thank all my seniors who directly or indirectly helped me especially Subrato (Dada, my neighbor), K.S.Hari, Antonitto, Rajesh P, Venket, Ranjan, Shyjan, Komath, Rudhra, and Varinder. My stay here was pleasant thanks to Surabi, Nija, Anil(a), Rajesh Puliyara, Saji, Sajitha, Lakshmi and Rakhe. I heartily acknowledge Prabhakaran for his help in taking print outs and his constant encouragement, I am so much obliged to George, who helped me aligning my thesis.*

*My relationship with Varman bags a special mention, who was a charming company and the evening chess and TT are still green with his 'proficiency' in my memory. I remember those exalted days when Jerome, the one who speaks the same language with me in almost every thing, was here.*

*I extend my gratitude to Dr. Vijay, who introduced New Institutional Economics to me and for his immutable interest shown in work and I thank Mr.Albin and all the faculties at St.Xavier's College, Economics Dept. who carved an interest in me toward Economics.*

*Away from work, my special thanks go to my best friend Mama who is an enduring spring of courage. My relationship with Irudaya Raj, one of my close friends, who is now even closer relative, is always cherished in my heart. I am indebted to him a lot for his incessant and timely support.*

*I don't want to demote the credits by formally acknowledging Sowmya, one of my longstanding, unblemished friends who stood by my side steadfastly in all ups and downs. I keep her unbounded help right from my MA days and her interest shown, both professional and personal, close to my heart.*

*I am grateful to my sisters Caro and Angel, for rendering me the sense and the value of sisterhood, who believe in my abilities more than what I could ever and in a way inflicting on me a lot of pressure to perform well. I feel a deep sense of gratitude for my father and mother who formed a part of my vision and taught me the decorous things that really matter in life and love/believe me enough to let me pick the pursuit of my own. I submit all my success to my sisters and parents.*

**Francis Xavier R**

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# Chapter I

## INTRODUCTION

### 1.1 Statement of the Problem

The pivotal motif of the thesis is to elucidate the hurdles to industrial progress. Literature propounds two strands of views on it. The dominant view of policies towards industrialization takes physical infrastructure as the most important factor, which the state should strive to build up to facilitate investment in manufacturing. Apart from physical infrastructure it has also been recognized that particular forms of organization, such as the small and medium sized industries; in particular sectors should also be promoted by various means for widespread industrial progress. Focus has also been on certain types of organizational responses from firms, such as sub-contracting, which has been identified as one of the major strategies for promoting the manufacturing industrial base in the Indian context.

Studies on the organization of production within a firm, and the firm's relationship with other firms in the Indian context have been rather limited. Broadly speaking, inter-firm relations develop as a response to the need for minimizing costs, and they also help disseminate modern technology. However, they are fraught with a number of hazards such as quality uncertainty, delay, unscrupulousness and so on. In studies on sub-contracting of Indian firms not much attention has been paid to the micro economic rationale for organizing production in a particular way i.e. sub-contracting, and its institutional prerequisites such as the legal mechanism, especially contract laws. From the policy point of view the contractual environment and the dispute settlement mechanisms are as important as physical infrastructure in promoting industries.

In this thesis we make an attempt to understand the nature of inter-firm relations in the Information Technology (IT) sector in India. In India, almost all the state governments are vying with each other to attract investment to this sector in their attempt to boost their economies. In order to understand what works at the policy level, one has to depend on research findings that can adequately justify particular policy view. We have chosen the IT sector for its uniqueness in terms of the kind of products it produces and services it renders. The IT products (broadly Information Services) have their own peculiarities, which have a bearing on the design of the contracts and settlement of disputes between firms. The existing legal framework relevant to contractual disputes may not be adequate given the specific nature of the problems that might arise in the context of inter-firm relationships in this sector.

In studying the inter-firm relationships New Institutional Economics, particularly the concept of transaction costs have much relevance. It is generally accepted that institutions matter in economic development, and institutional analysis has been increasingly gaining prominence in economics in the last two or three decades. Institutions are seen as the substratum upon which the capitalist system of production is built. Institutions constrain socially unwarranted, welfare reducing activities and pass relevant information, thus co-ordinate production activities in a free market set-up. Absolute lack of or inadequate institutional back up would result in a sub-optimal level of production due to enormous cost of transaction that would impair economic progress.

Looking into the micro details of transactions or organizational decisions to expound the existence of a number of organizational modes and broadly identify the required institutional set up for industrial progress is the prominent issue of research in contemporary Industrial Organization literature. We intended to delve into the way production is organized i.e. how organizational choices are fine-tuned, given external environment, to economize on the transaction cost associated with exchange in the face of market failure (existence of opportunism) and asymmetry of information. Further, we were to know how contracts and collective action that forged to coordinate inter-firm activities could be perceived as the logical outcome of rational individuals' utility maximization in a world of uncertainty and asymmetric information given legal mechanism of a particular level of sophistication.

The Transaction Cost Economics (TCE) approach to industrial organization, i.e. dissecting how production is organized in a transaction cost minimizing way along with conventional production costs, gained importance in the 1980's. Organization of production could be measured along a spectrum, at the one end of which lies the anonymous spot market transaction and vertical ownership on the other, yet a number of hybrid ways of coordination falling in the middle. The paradigm problem of TCE is to analyze how the parties in transaction align different governance mechanisms to minimize transaction costs, particularly when asset specificity, complexity in measuring performance and technological and behavioral uncertainty are high.

The boundary of the firm is determined by reconciling the relative costs of transacting within the firm and using the market. In other words, whether a particular production activity will be carried out within the firm's boundary or the given product, which is the outcome of that activity, will be procured from the spot market, is largely determined by transaction costs.

Firm boundaries adhere not only to technology, but also to the available organizational modes given the transactional characteristics and the external environment i.e. legal mechanism and enforceability of contracts, thinness of the market, uncertainty, idiosyncratic investments and asymmetric information. Suppose that production requires massive idiosyncratic investments<sup>1</sup>, and that detailed contracts are infeasible because of asymmetric information and enormous uncertainty. In such a world, production would generate quasi-rent that is what could be earned over and above than in its next best alternative use. The distribution of quasi-rent and haggling over it would in turn create the risk of ex post hold-ups in the future period. However, when large-scale vertical integration of productive resources is relatively uneconomical, to mitigate that risk firms may negotiate governance mechanisms, especially contracting plays a critical role, notwithstanding its inadequacies in coordinating the activities and interests of trading parties.

IT is one such industry, where large scale vertical integration is uneconomical and contracts perform a vital role in Business Process Outsourcing (BPO) and Information Technology Enabled Services (ITES) outsourcing, as the nature of the transactions encompass characteristics that cannot be coordinated by the spot markets. Information Services (IS) outsourcing relations have been taken as a case study, because they possess all transactional characteristics identified as hazards in the literature. In spite of the hazards, we hear of a deluge of outsourcing deals flowing to developing countries, where the risks are cultural, political, financial, technological, managerial and legal. This complexity of the issue at hand motivated this study.

The fountainhead of inefficiency in IS outsourcing, for that matter in any inter-firm contractual relations, is the difficulties in providing incentives and identifying the capabilities of the agents. Finding a supplier partner entails both *ex ante* screening and *ex post* adaptation costs. To safeguard against such opportunistic behavior, parties opt for organizational choices that could abate the expected total cost of consummating the transactions involved. The organizational choice that firms adopt to shield against these contractual troubles differ with respect to their adaptive performance by reasons of differences in institutional availability i.e. contract law regime and enforcement mechanisms.

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<sup>1</sup> It means that they are characteristic of the specific investor and the line of production, thus can not be profitably redeployed in alternative uses.

Albeit TCE is a spectacular successes in the developed countries' context, there are relatively few studies in the developing country context inquiring into the transactional hurdles for industrial progress that constrict certain transaction cost minimizing organizational choices leading to sub-optimal equilibria. In the developing countries context, the institutional mechanisms required for free market exchange is believed to be inadequate. Slow and inefficient judicial system, not very well-defined property right laws and lack of sophisticated financial institutions – all contribute to this presumption. The market throws up a variety of informal enforcement mechanisms, particularly the mechanisms intended to make contracts self-enforcing. In this context we probe into the role of the courts as well. Formal courts, however, do not assure solutions to all the disputes, because of asymmetries of information and bounded rationality on the part of the judges. Presumably, the major role of the courts is to be in the background, stimulating less costly out-of court settlement by the parties to a dispute. Given a nominal enforcement mechanism in the background, business agreements or contracts could be enforced in many informal ways.

In analyzing inter-firm relations, Transaction Cost Economics (TCE) emphasizes asset specificity, uncertainty, and complexity in measuring effort/performance as the major exchange hazards that necessitate strong contractual safeguards. Empirical works in TCE corroborate the predicted relationship: increases in exchange hazards demand more complex contracts. Writing a more complete contract is prohibitively costly and makes the relationship rigid to unexpected contingencies by providing straightjacket of obligations. Therefore there is a trade off between writing one such contract with a high cost and rigidities associated with it on the one hand and an incomplete contract and a high-expected cost of dispute resolution on the other.

TCE, by downplaying the importance of reputation and reputation induced trust as protective measures against contractual hazards, exaggerates the fear of opportunism and the need for contractual safeguards. In the presence of asset-specificity and uncertainty, when contracts are not rigorously enforceable, it is advantageous to both the players to invest in building reputation capital such as quality certification, age and long standing relationship, as it induces good conduct of the player and coordinates the transaction by protecting the relationship-specific assets informally. With asymmetry of information the importance of reputation in deciding to get into contracts increases tremendously.

Reputation-induced trust economizes on the cost of searching, drafting and monitoring the contracts, because trusted people are less secretive and readily provide the relevant information. It reduces the cost of drafting because it lowers the fear of opportunism. It gives the relation more flexibility, as it does not specify rigid contractual obligations, and foster adaptation to unforeseeable events. If there is a widespread adverse selection i.e. difficulties in pinning down a scrupulous agent *ex ante*, quality certification could be used as a signal to the potential clients about the agent's capabilities. Formal quality certifications, functioning as a signaling device, would solve pre-contractual adverse selection problems, whereas other reputation mechanisms like age and repeated contracting- as they produce track record of the agent- might serve to overcome the problems of moral hazard by assuring against the behavioral uncertainties i.e. hold-ups and shirking.

Thus the selection of an appropriate contract type depends on factors such as the nature of the parties involved, components transacted, uncertainties and complexities involved in contract performance and the extent to which the players are to assume the risk. We pose that in the case of a more complex and uncertain, thus risky venture, firms with better reputation and proven record are more likely to get Time and Material contracts (cost plus contracts<sup>2</sup>) and economize on the cost of writing detailed contracts. Further we propose, quality certification is a necessary condition as it obviates pre-contract quality uncertainty, age and pre-relations are sufficient for obtaining a Time and material (T&M) contact as they assure the good conduct of the firm.

## 1.2 The **Objectives** of the Study

As noted above, very few studies in Indian context looked into the micro economic rationale of organizing production in a particular way. The present study attempts to overcome the lacuna to some extent and throw some light on the institutional requirements of inter-firm transaction. The objectives of the study are the following:

1. To understand the dynamics of inter-firm relations, especially the role of reputation and trust in mitigating the conflict of interest between the trading parties and their implications on industrial development in the context of IT sector in India.
2. To know how sophisticated the supportive structure i.e. the legal mechanism and infrastructure are, in the perspectives of the users, in facilitating inter-firm transactions.

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<sup>2</sup> Time and Material contracts and cost plus contracts are used interchangeably in the literature.

### **1.3 Analytical Framework of the Study**

The study of inter-firm relations is set within a framework of facilitator role of government with respect to getting institutions right for the efficient functioning of the capitalist system of production. The firms are assumed to minimize not only conventional production costs but also transaction costs i.e. the costs of using the market. Dealings with the rest of economy, even relations within the firm, have tremendous implications on the way production is organized. The organizational forms that we observe in the real world are assumed to be, in equilibrium, rational response to transaction cost minimizing opportunities. In a developing country environment, where the institutions of capitalist system of production are said to be rudimentary, it is all the more important for the firms to device informal organizational measures to come around the relational hazards. Given this background we analyze the role of legal mechanism and the importance of informal institutions in solving disputes among the transactors.

### **1.4 Data and Methodology**

To carry out this empirical study we have drawn data from published sources as well as the field survey we conducted. Secondary sources include the Government of India Task Force Reports, IT Action Plans of both India and Kerala and various NASSCOM reports. Primary data on contractual terms and conditions, project and agent characteristics were collected from surveys of senior managers from the firms in Technopark, Thiruvananthapuram, using both structured and semi-structured questionnaire<sup>3</sup>. We have selected cases concerning complex transactions for which close relationship between partners is necessary over a considerable period of time. Some firms have developed long-term supply relations with their clients; others have spent considerable time and money customizing formal contracts. Still others appear to have done both. Using this variation in the structure of outsourcing relationships, we empirically test the relationship between formal contracts and reputation and their effects on contract performance. Tests of our hypotheses required an econometric approach that could bring out the likelihood of observing a characteristic of the dependant variable given the determinants. Therefore we use Logit model to test the likelihood of observing T&M contracts given the level of asset specificity, complexity, uncertainty and firm's reputation (age, repeated contracts and quality certification).

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<sup>3</sup> See the appendix-I for questionnaire.



## **1.5 Chapterization Scheme**

The study is organized in six chapters including Introduction, where we give a flavor of the issue studied and set out the objectives of the study. Chapter II is mainly intended for conceptual clarification of the need for institutional measures for economic progress. From there we move on to analyzing the determinants of inter-firm trade and eventually drive our theoretical propositions put forward for empirical validation. Chapter III delves into the nature of IT industry, the peculiarities of the products transacted and the resulting intricacies in contractual relations. Chapter IV is a broad inquiry of government initiatives of Kerala *vis-à-vis* that of the Indian government. Chapter V summarizes the empirical validation of the propositions set out in the earlier chapters. It brings out the need for quality certification and a third party arbitration within the industry. Chapter VI gives summary and concluding observations.

## Chapter II

### CONCEPTUAL ISSUES AND ANALYTICAL FRAMEWORK

*“Good fences make good neighbors”*

This chapter discusses the theoretical basis for our hypotheses that we posited at the outset. Transactional hazards necessitate costly, complex contracts and a good reputation along with a sophisticated legal system would economize on the cost of contracting by circumventing the need for complex contracts. Thereby informal institutional measures like reputation and formal institutions like Court would augment trade opportunities thus lead to economic progress. We first present a broad view of the role of institutions, with specific emphasis on legal mechanisms in facilitating voluntary exchange, which in turn promotes economic growth. We then proceed to analyze the micro functions of formal and informal institutions in providing assurance and information and ensuring better outcomes in voluntary exchanges.

As far as economic growth is concerned, one can make a distinction between two broad approaches towards institutions – the ‘top-down’ and ‘bottom-up’ approaches. The former deals with the broader macro institutions for economic growth, whereas the latter delves into the micro institutions that help reduce transaction costs (Williamson, 1993). Subsequently, following Williamson, we move on to analyzing the determinants of organizational design i.e. the choice among alternative modes of organization available (e.g. vertical integration, sub-contracting, joint ventures, spot market purchasing and so on), in a micro perspective employing the transaction cost framework. The framework would essentially be based on the idea that when transactional hazards deter industrial progress, the parties in transaction would invent various organizational alternatives to circumvent them using both formal and informal institutions. We draw on the extensive literature to derive our propositions and examine them in the light of the empirical evidence we have obtained from the field survey. The survey results indicate some relations between the institutional environment i.e. legal system and other reputational measures and organizational choices i.e. contract design.

#### **2.1 Economics of Institutions**

The major aim of neoclassical General Equilibrium Theories was to establish the logical possibility of the existence of an equilibrium price vector clearing all the markets simultaneously. The decentralized decision making process in a market environment was

shown to be an efficient and self-enforcing system, and the theories could predict the changes in outcomes as the underlying constraints or conditions change. The logical implications of the general equilibrium theory could be actualized, at least theoretically, only if it was costless to transact, where there were no barriers to voluntary market exchange – full information available, no externalities present and the property rights were unambiguously defined.

If transactions are nearly impossible or rather costly because of the thinness of the market, asymmetry of information or uncertain future contingencies, then transaction-cost-abating institutions, which coordinate the expectations of the parties and enforce agreed upon future obligations, become significant. Many of the precursors of GE emphasized the importance of supra individual institutions – rules of the games for production and reproduction, enforcement mechanisms and organizations endorsing market transactions – for efficient functioning of the capitalist system (Arrow, 1998; Pasinetti, 1994)<sup>1</sup>. New Institutional Economics (NIE) logically extends the neoclassical theory by relaxing certain assumptions – the type of situational constraints, information available, and the type of interaction among the agents, in the ‘protective belt’<sup>2</sup> of Neoclassical research program by introducing information and transaction cost and constraints of property rights into the analysis (Lakatos, 1970; Kundsén, 1986; Eggertsson, 1990).

Institutions may be defined as that “... consist of formal rules, informal constraints – norms of behavior, conventions and self-imposed codes of conduct – and their enforcement characteristics (North, 1990)<sup>3</sup>. Institutions are in general subdivided into formal and informal institutions. Formal institutions comprise of laws and constitutions. These are all resolutely created well-defined official rules of a society with a high degree of legitimacy endorsed by explicit punishment by the civil authorities, especially a judicial system. Whereas informal institutions are the rules, norms and cultural conducts that evolved over time and specific to the societal and geographical conditions. Institutions in general, by channeling information forge new market opportunities and allocate the productive resources of the society to the

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<sup>1</sup> Arrow (1998) classifies the important deviations of real world from GE’s conception into three broad categories: (1) asymmetry of information, (2) market failure and (3) the possibilities of social gains through coordination in the presence of externalities and increasing returns.

<sup>2</sup> A scientific research program, according to Lakatos (1970), consists of hard core, protective belt, and positive heuristics. The *hard core* consists of propositions that are taken to be unfalsifiable as a matter of principle. All the predictions made using the propositions in the *hard core* involves a host of auxiliary hypotheses and assumptions that constitute the *protective belt*. It is the theories or the assumptions of the protective belt that are modified and metamorphosed or even overthrown in order to explain the paradoxes.

<sup>3</sup> Despite numerous conflicting definitions proposed, we stick to North (1990) that appears to have been accepted as the consensus definition in New Institutional Economics literature.

most valuable uses; by protecting property rights impart incentives to the agents; create positive expectations about the security of the rights to these resources, especially when long-term investments are involved; curtail uncertainty by constraining socially sub-optimal strategies, thus entail the capitalist society function efficaciously (Lin & Nugent 1995; North, 1990, Matthews, 1986). Precisely, they are humanly devised customary arrangements constraining absurd human behavior to bring in predictability in inter-personal interactions (Pejovich, 1995).

New Institutional Economists, who employ Transaction Cost as the key concept, broadly adopt two stands in broadening the orthodox neoclassical theory further to unravel our understanding of the capitalist system of production and social interaction<sup>4</sup>. New Institutional Economic historians like North and others lay stress on macro institutions as the *sine qua non* for economic progress, which outline the rules of the game, enforce them and channelize the relevant information, create confidence in the system, and thus bring the agents together for trade. On the other hand, Coase and Williamson subscribe to a ‘bottom-up’ approach emphasizing on micro institutions like firms, hierarchies and business etiquette etc., the bedrock on which the macro institutions are built up. They argue that alternative arrangements of governance can be seen as rational responses to the constraints faced due to the existence or lack of certain macro institutions and information available. Macro institutions will entail different sets of incentives, possibilities of control, credible investment conditions to the agents, which will have a bearing upon the behavior of the agents and further development of the system.

In sum, institutions are the bedrock on which the capitalist system of production is constructed and sustained. In the next section, we will explore the link between the institutions for economic progress and empirical evidence from the literature.

## **2.2 Institutions and Economic Development**

There is no dearth of empirical evidence on institutions that circumvent the problems of market failures i.e. deviation from ideal perfect market situation due to asymmetry of information, transaction costs and the dilemmas of collective action. For analytical simplicity, as conveniently done in the literature, we assume that Pareto improvement leads to economic

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<sup>4</sup> North, 1990; Coase. 1937; Stiglitz 1986, 1989; Williamson, 1979, 1985,2000 to mention a few. See Rutherford (1994) for a comprehensive account of Old Institutionalists (i.e. Veblen, Commons, Mitchell and Ayres), who are not been discussed here.

growth (Matthew, 1986) loosely defined as the increment in national income. We, in this subsection, attempt to summarize the arguments for the need for institutions in economic development i.e. those protect property rights and thus create an ambience for secure trade and those foster exchange by lowering transaction costs and encouraging trust. We also discuss the empirical evidence. We specifically explore the importance of formal legal structure and the need for appreciation of the informal institutions to bring about economic progress.

The New Institutional Economic approach to economic development highlights broadly three major hurdles to development i.e. asymmetry of information, transaction costs and dilemmas of collective action. Transaction cost is so broad a term that it includes all the costs involved in taking part in exchange such as the cost of searching, negotiating and enforcing the contracts. Hazards related to sharing of the *quasi* rent and the assurance problems associated with collective action arising due to asymmetry of information would lead to a sub-optimal equilibrium outcome. Conditions for economic growth in this context consist of correcting market imperfections and facilitating trade. In sum, NIE helps identify the nature of the problems and potential institutional solutions in the presence of market imperfections and failures, especially incentive problems associated with state activities or collective actions and transaction costs involved in private exchanges. NIE suggests that the institutional solutions for these problems are well-defined property rights and efficient judicial systems formally, and cultivating business ethics/culture and associations informally.

Institutions that facilitate exchange evolve, as the society grows complex. The factors behind the rise of the Western world, as North puts it, were successful formalization of private contract enforcement rules into The Common Laws enforced by the nation-state (North, 1990). In the small primitive communities where the relevant information was costlessly available, multilevel contractual enforcement was workable when they entered into face-to-face interactions. Thus social order – ‘utilitarianism of small groups’ – was established and maintained. In short, they closely resemble the required market conditions for the existence of a self-ordering market system i.e. almost full information, near perfect monitoring and enforcement mechanisms and so on. Later, when trade and market opportunities expanded specialized interdependence of the players and complicated exchanges emerged. Coupled with technological progress, specialization and division of labor increased the possibilities of enhancing productivity and economic well being, but at the same time heightened the cost of

transacting, especially in the contingent market, as the system became more of impersonal as against densely networked primitive societies (North, 1989)<sup>5</sup>.

When communities do not exist or are heterogeneous or too big to costlessly bring in coordination among the members, simple community-based enforcement mechanism to check cheating, shirking and opportunism would be inadequate due to lack of or asymmetry of information. Hence norms are institutionalized into formal laws; community credit system into formal financial institutions. Market transactions are advantageously replaced by intra and inter firm relationships i.e. hierarchies, business associations and business families<sup>6</sup>. Given the existing conditions and technological capabilities of an economy, devising specific institutions may not be feasible for various reasons, such as; the cost of devising might be higher than the gains appropriated or enforcement costs are simply overwhelming. But when the relative prices change, which in turn leads to change in the available technology, the benefits may exceed the cost of devising the rules, and institutions may come to exist. North and Thomas capture the idea saying, “ economic growth will occur if property rights make it worthwhile to undertake socially productive activity. The creating, specifying and evaluating of such property rights are costly... As the potential grows for private gains to exceed transaction costs, efforts will be made to establish such property rights” (North and Thomas, 1973).

The existence of favorable supportive institutional environment (macro institutions), especially the security of properties and the enforcement of contracts, is critical for investment, trade and economic growth<sup>7</sup> (Meier & Stiglitz 2001; Montesquieu, 1748; North,

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<sup>5</sup> 16<sup>th</sup> century English philosopher Thomas Hobbes notes that when two parties enter into a contract, “he that performeth first has no assurance the other will perform after because the bonds of words are too weak to bridle men’s ambitions, avarice, anger, and other passions without the fear of some coercive power” (Hobbes 1651, quoted in Messick, 1999).

<sup>6</sup> The nineteenth-century German economist List observes, “However industrious, thrifty, inventive and intelligent individual citizens might be, they could not make for the lack of institutions. History also teaches that the individuals derive the greater part of their productive power from the social institutions and conditions under which they are placed” (List, 1885, quoted in Chang, 2002)

<sup>7</sup> Aron (2000) shows how institutions can be introduced in the basic Solow growth model.

1981; Smith, 1776; Stiglitz 1986, 1989)<sup>8</sup>. Extensive theoretical and empirical literature contrived in the last decade ascertains a cogent basis for the claim that a successful economy requires appropriate institutions (Aron, 2000; Collier *et al*, 1999; Knack and Keefer, 1995; Kaufmann, *et al* 1999; North, 1981; World Bank, 2001). However the significance of the degree of institutional quality is not much explored until recently. Cross country studies (Knack and Keefer, 1995) bear out the importance of well functioning institutions and their interplay in facilitating economic growth and established causal relationships between the quality of institutions and economic development.

The methodological problems are acute, notes Aron (2000) while identifying the proxies for institutional measurement. The problems include the nature of the data collected on institutions, the methodology adopted, the underestimation and omission of variables, and finally the inherent problems involved in cross-country regression itself<sup>9</sup>. Notwithstanding the constraints, some progress is being made in substantiating the interdependency between "institutional quality" and economic development, let alone gauging the quality of institutions. However vague the measures of institutions<sup>10</sup> are, a positive relationship between market friendly institutions – judiciary and financial institutions – and economic growth has been established<sup>11</sup>. The empirical developments in the past decade managed to identify a set of "good institutions" required for economic development, especially for the developing countries within the broader institution of democracy, a well-defined property rights structure with an independent judiciary to enforce it and institutions ensuring good corporate governance and financial institutions to facilitate it<sup>12</sup> (Chang, 2002).

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<sup>8</sup> Altogether from a different perspective development economists have driven home the same point. First generation development economists (Hirschman, 1958; Lewis, 1954; Myrdal, 1968; Nurkse, 1952; Prebisch, 1950; Rosenstein-Rodan, 1943) characterized less developed economies by pervasive market failures and advocated coordination of resources through central planning for fostering equitable growth. Later in the 70s apparently frustrated with no 'development' in the developing economies, the second generation development economists blamed it all to the governments who supposedly distorted the prices and the structure of incentives that goes with them (Krueger, 1979; Lal, 2000; Bagwathi, 1985). In the 90s, a confluence of development theories and NIE, identified the 'New Market Failures' due to incomplete market, informational constraints and transaction cost where the policy advice is to 'get the institutions right' with transparent government intervention (Stiglitz, 1989; World Bank, 2001).

<sup>9</sup> See Temple (1999) for the survey.

<sup>10</sup> See Kaufmann, *et al* (1999) for a detailed discussion on the proxies of institutional measures.

<sup>11</sup> Nonetheless, while this basic correlation seems to be established, correlation does not mean causation. Chang (2002) cogently puts that none of the now developed countries, when they were growing had any of the "good" institutions now imposed on the developing countries and suggests causality runs in the opposite direction. Still the question of understanding the role of institutions is open because the challenge for development planners is the vicious circle, in which low growth leads to weak institutions which in turn causes low growth.

<sup>12</sup> But the contenders argue that there is no consensus on the optimal degree of sophistication of the institutions (Chang, 2002) and some of the institutions may be unnecessary or unbearably costly to the developing countries e.g. anti-trust laws and strong property right laws.

From the forgoing discussion, we draw the importance of government in building institutional environment to facilitate economic growth. The institutional environment for voluntary exchange is as important as physical capital and infrastructure. Our analysis emphasizes on the former that embodies in both formal and informal relations among the people in a society i.e. judicial system, culture, norm, which constrain the agents' behavior and more or less ensure secure trade.

It is believed that a sophisticated legal system is a prerequisite for economic growth in general (Sherwood 1995), and for industrial progress in particular. Williamson (1995) puts it that more contractual relations between the firms characterize a "high-performance economy", where a strong judicial system backs up the relations. When a strong judicial system is absent, the choice of a number of rational organizational possibilities are hindered, thus production is predominantly organized in the extreme forms either spot market or done under one roof (Messick, 1999). The unavailability of a production cost minimizing organizational choice due to towering transaction costs i.e. costs of coordinating and enforcing individually when judicial system is absent will lead to a "low-performance economy." The rationale in arguing for a better legal system is to make the economy more market friendly i.e. investor friendly in the sense that augmenting the investor confidence by providing assurance of legal backing of contractual relations and enforcement of the agreements. Further it encompasses bankruptcy, commercial and labor laws, which further induces or make investment less risky to the investors (Dakolias 1996; Shihata 1995).

Whereas in economic theorizing, it is conventional to assume that courts as institutions secure property and enforce contracts costlessly (Coase, 1960), but later developments in the literature uphold that the courts, like many other institutions, work better in countries that have richer and more educated population (North, 1981). Especially in the developing countries context, where the cost of establishing a sophisticated legal mechanism is unaffordable, it implores to see how informally the agents are coordinated. A number of studies, e.g. Fafchamps (1996) study of supply of timber in Ghana, Dakolias (1996) about the informal business ties in Peru, Pinheiro (1998) judicial efficiency in Brazil, show that lack of or slow and ineffectual judicial mechanism increases the transaction cost and influences the way business is done (Messick, 1999)<sup>13</sup>.

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<sup>13</sup> See Knack and Keefer (1995), and Mauro (1995) for cross-country regression analysis to test the role of strong judicial system in coordinating economic activity. See Pinheiro (1998) for a review.



A number of studies examine formal and informal mechanisms that aim at reducing transaction costs in the developing country context. In these countries the institutions of capitalist society are not well developed i.e. slow and inefficient judicial system, not very well-defined property right laws, lack of sophisticated financial institutions etc. (Banerjee *et al.* 2000; Djankov *et al.*, 2003). In an open economy environment, technology flows faster but the legal environment in which it flourishes in a foreign country is understood rather slowly in the developing countries. It is of interest to see how transactors coordinate and devise some private orderings to mitigate the contractual hazards in the hi-tech industries, when legal environment is not well developed. Given the slow ineffectual judicial systems in developing countries, transaction-cost-reducing institutions are expected to evolve. Banerjee *et al.* (2000) tried to quantify the effects of legal mechanism and reputation on facilitating inter-firm relations thus spurring industrial progress. The claim is that if the importance of legal infrastructure, reputation and trust mechanism in facilitating inter-firm relations are shown to be piercing, it may hint at a distinct theory of the determinants of industrial growth along with the conventional growth determinants such as labor, physical and human capital. (Aron, 2000; Banerjee *et al.*, 2000).

In sum, we have provided the theoretical and empirical evidence for the need for institutions in facilitating economic progress. When trade becomes impersonal and risky due to future contingencies, there is a need for institutions, which provide the players with information, constrain their behavior and thus render some sort of credibility in the course of actions of other members in the exchange and enforces what is mutually agreed if any dispute arises. These social capitals i.e. formal and informal institutions, facilitate and promote trade and help economic progress. In the following chapter we further discuss the micro level functions of institutions in facilitating trade by reducing the cost of exchange.

### **2.3 Transaction Cost Minimizing Institutions**

In contrast to the macro approach to the need for institutions, a micro approach would start from the theory of firm to explain how institutions influence their organizational choice. This section discusses how production is organized i.e. how organizational choices are aligned with different external environment to economize on the transaction cost associated with exchange in the face of market failure (existence of opportunism) and asymmetry of information.

Modern analysis of market and internal organization of governance arrangements pioneered by Coase and further articulated by Williamson, focuses on the micro-analytic aspects of individual transactions within and between firms, and on the specific attributes these transactions possess to define the boundaries of the firm<sup>14</sup>. They pose the question of the significance of the existence of the firm and the determinants of the boundaries of the firms and call for an inquiry into internal organization of firms in the General Equilibrium set up<sup>15</sup>. As comparative governance structures could be appraised in the light of different degrees of transaction costs, Transaction Cost Economics (TCE) has emerged as a dominant framework for analyzing inter-firm relationships<sup>16</sup>. The aim is to see how contracts and collective action can be seen as the logical outcome of rational individuals' utility maximization in a world of uncertainty and asymmetric information. Firms do exist if it pays to organize the production instead of using the price mechanism. In an uncertain world where the players are only boundedly rational and the information is incomplete, there will obviously be impediments to frictionless transactions. The cost involved in gathering and processing the information, searching, negotiating, writing and enforcing the ongoing relation is called transaction cost i.e. the cost of coordinating the system (Arrow 1969). In short, transaction cost refers to the cost of providing some good or service through the market rather than having it provided from within the firm. It internalizes the effects of transactional characteristics or resultant transaction cost on the choice of organizational structure and on the incentives of economic behavior. Transaction costs, in times, are so huge that they might completely block the formation of the market. The resulting sub-optimal equilibrium could be improved if transactions cost reducing mechanisms are devised. In a capitalist society, social institutions both formal as well as informal such as judiciary, customs and norms and the hierarchical governance structures facilitate transactions (Williamson, 1985, 1998).

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<sup>14</sup> Kreps (1990) writes, "the [orthodox] firm is like individual agents in textbook economics (Debreu, 1959). Agents have utility function, firms have a profit motive; agents have a consumption set, firms have production possibility sets. But in transaction-cost economics, firms are more like markets – both are arenas within which individuals can transact."

<sup>15</sup> "The time has surely gone in which economists could analyze in great detail two individuals exchanging nuts for berries... The process of contracting needs to be studied in a real world setting. We would then learn of the problems that are encountered and of how they are overcome, and we would certainly become aware of the richness of the institutional alternatives between which we have to choose", said Coase (1992) in his Nobel lecture.

<sup>16</sup> The fundamental difference between production and transaction cost is that the latter is the cost of *ex post* and *ex ante* negotiating and execution of contracts, while the former is the material cost of production (Matthews, 1986). In TCE, "transaction is considered as the unit of analysis as against price and output in the orthodox economics and the aim is to minimize both production and transaction costs by aligning alternative modes of governance. Adaptation rather than equilibration is what considered" (Williamson, 1996).

The paradigm problem of TCE is to contemplate how the parties align different governance mechanisms to mitigate exchange hazards, particularly when asset specificity, complexity in measuring performance, or technological and behavioral uncertainties are high (Williamson, 1979, 1985). The orthodoxy is that the Price System is the most cost-effective way of coordinating transactions in a frictionless world. Firm that organizes production through a hierarchical governance structure, is an alternative to price mechanism where there are impediments to free transactions i.e. there involves cost of utilizing the market opportunities. There are copious ways of arranging the governance of transactions i.e. within the firm or inter-firm, but the pertinent choice depends on the particular characteristics of the transaction in question.

If the component is fairly standard, price mechanism provides the agents with the information to grab the profit opportunities. Relevant conditions are seldom naturally found in modern societies. However, they are often artificially stimulated by governmental institutions e.g. warranty laws, public approval of medical products, safety and quality standards. On the other hand if the component production requires asset-specific investment or the component is custom made i.e. has little value outside the contract, then the *ex post* hold-up problems and coordination failures will lead to under-investment, thus reduce the gains from the trade. So in the case of specialized or custom made components transaction, if transaction cost is so pervasive then vertical integration is the best choice as contracts are vulnerable to potential hold-ups<sup>17</sup>. When large-scale vertical integration is relatively uneconomical even in the presence of asset-specific investment, contracting will be Pareto improving. To check exchange hazards, parties may work out detailed contracts that define the course of action for all foreseeable contingencies and specify processes for resolving unforeseeable outcomes, while constraining strategic manipulations and wasteful expenditures on redistribution of the existing surplus of the trade.

Looking into the micro details of transactions or organizational decisions to explain the existence of a number of organizational modes and economic growth is the prominent issue of research in TCE. Nagaraj (1989), however did not use TCE framework, tried to shed light on the importance of understanding the micro aspects of industrial organization especially inter-firm relations to explain the broader question of industrial development, in his case to explain

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<sup>17</sup> Klein, 1988; Klein, Crawford, Alchian, 1978; Monteverde and Teece, 1982; Masten, 1984.

See Sheleski *et al* (1995); Masten *et al* (2002) and Boerner *et al* (2001) for comprehensive surveys of empirical literature on the topic.

industrial stagnation in the Indian context. He argues that the relative stagnation of organized manufacturing in the 70s in India might be due to more and more of contracting out of otherwise internally produced components by the machine tool industry. This seems to be a rational micro organizational response of the agents to the changing policy structure and market opportunities, as Indian government tried to promote ancillarization around big firms that helped diffuse the modern technology available to the big firms to the Small Scale Industries (SSIs). If done with due care, this rationalizes the cost of production and ensures more employment as works subcontracted to SSIs tend to be more labor intensive. Nagaraj substantiates his thesis with the case study of HMT, Bangalore, where he found an increase in contracting out to unorganized small-scale firms in the 1970s and 1980s. But a study on Bhilai steel plant and its ancillaries by Madhury (1998), using TCE framework found the external environments i.e. government policy initiatives influence the organizational choices and contested the microeconomic rationale of ancillarization policy.

The dominant motif of today's industrial economy is the intricate network of complementary production, where there is a strong need for achieving scale efficiency in the face of intense international competition. Subcontracting or outsourcing, an inevitable organizational response of the day, helps industry as a whole, as it minimizes excess capacity and reduces the cost of production. By diffusing the technology to the SSIs, it increases the productivity in SSI units and broadens the industrial base. As subcontracting is a subtle phase of industrial growth, government may enhance the possibilities further by setting the institutions aiming at maintaining quality standards, establishing technology clusters and industrial estates, channeling financial resources to SSIs, drawing memorandum of understanding (MoU) with the big firms to increase subcontracting and diffusion of technology to lower strata and finally facilitating these relations with a strong legal structure. Apart from that, there is always scope for government involvement in providing the agents with relevant information about the available opportunities. Inter-firm relations, however cost effective, are fraught with a number of hazards such as quality uncertainty, delay, unscrupulousness and so on.

We, following the lines of the studies cited above, probe into the internal dynamics of the inter-firm ventures to understand the inherent obstacles and how significant the physical and legal infrastructure is in mitigating them. As the importance of physical infrastructure is well established, we particularly emphasize the need for legal infrastructure. The role of formal courts, however, is limited in providing solutions to all the disputes. Business agreements or contracts could be enforced in many informal ways. Credit rating institutes and auditing firms

bring out important information about the firms. These all help firms build their reputation. Reputation, in the face of immense relational hazards, help mitigate transaction costs. In the subsequent analysis we will systematically analyze the contractual hazards and their consequences on organizational choice.

#### **2.4 The Determinants of Formal Contracts**

In TCE, there are four major exchange hazards that necessitate contractual safeguards with a particular type of organization: asset specificity, bounded rationality, complexity in measuring effort/performance, and uncertainty (Williamson, 1979). Organizational design could be conceived<sup>18</sup> as consisting of both organization type and the degree e.g. both type and complexity of the contract in the case of outsourcing. Scores of studies have looked into the choice of organization type that is deciding among the alternatives of market, vertical integration and long-term contracts.

Following Williamson (1985), asset-specificity is considered to play the central role in organizational choice. Asset specific investments are those investments that would have not been made otherwise and do not carry the same value outside the relationship, e.g. software developed specifically for a buyer. The man-hours sunk in developing the software is what is referred to as asset specific. Monteverde and Teece (1982), the first ever systematic attempt to quantify the factors influencing vertical integration, examined the effects of asset-specificity of the components, measured by required “applications engineering efforts” to be put in, on the likelihood of observing a more integrated organizational structure. Other studies like Masten (1984) have observed similar results supporting the propositions of TCE, while Masten *et al* (1989) and Klein (1988) looked at human capital-specificity and Joskow (1985) considered site-specificity as determinants of organizational choice. Joskow tried to identify and empirically verify the determining factors of supply relationship between the coal miners and coal burning electricity generators. Through threats of termination of the relationship, one or both contractual parties may seek to appropriate an undue share in the quasi-rent from these specialized investments (Klein, 1988). The optimal investment will be realized only if those relationship specific investments are protected by a formal contract.

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<sup>18</sup> If choice is assumed to be continuous over a spectrum of organizational alternatives, a contract is taken to be more complex if it tends to be closer to vertical integration and incomplete if closer to spot market.

Complexity in measuring the performance/efforts of exchange partners may give incentives to limit their efforts towards fulfilling the contracted obligations (Monteverde and Teece, 1982). The parties by specifying a few standard clauses of conduct like regular meetings, disclosure of documents, incentives for better performance and so on could overcome the problem. When measurement is more difficult, one could expect the agents to develop more complex contracts that obviate unexpected behavioral twists in the relationship by providing a straightjacket of obligations.

Uncertainty, one of the potential hazards, is of two types: behavioral and quality uncertainty and uncertainty of business environment (Nooteboom, 1999). This requires the parties to adapt to problems raised from unforeseen events. Contracts by specifying the clauses and procedures of conduct facilitate negotiations that arise from technological and behavioral uncertainties. In sum the exchange hazards discussed above encourage more complex contracts, which check behaviors that could jeopardize the performance of a buyer-supplier exchange.

The other set of studies probe into the determinants of the degree of complexity of a particular contractual choice. Allen and Lueck (1992), in a study on farmland leasing, examined the use of more formal contracts vis-a-vis informal, oral ones. They have found that the agents adopted a more formal contract if the land required some investment in irrigation and maintenance, otherwise, informal or oral agreements would govern the relationship. Lyons (1994), using UK engineering component contracts between the sub-contractors and their clients, confirms TCE predictions that if the component is buyer-specific and/or requires investment specific to the transaction then the transactors adopt a formal contract. Leffer and Rucker (1991) studied the types of contracts and their implications. Using a sample of 188 timber contracts they found that per-unit pricing required an intense monitoring for better performance, while fixed-price contracts needed a thorough pre-contract investigation. Empirical works in TCE (Joskow, 1988; Klein, Crawford, and Alchian, 1978; 1980; Masten, 1996) corroborate the predicted relationship:

**Proposition 1:** Increase in exchange hazards such as asset specificity, complexity and uncertainty of the project, encourages more complex contracts.

To summarize the foregoing analysis, it is well argued in the literature that outsourcing relations possess characteristics that necessitate contractual safeguard. And the allocation of

risk and sharing of the quasi rent created by the relation need contractual stipulations already devised to guide a course of action in the future unexpected contingencies.

The main sources of inefficiency in inter-firm relations are the problems of identifying capabilities (e.g. Nelson & Winter, 1982; Nooteboom, 1999) and rendering incentives to fulfill contractual obligations (e.g. Williamson, 1985; Hart, 1987). In technical terms, they are known as the problems of moral hazard and adverse selection, respectively. To safeguard against exchange hazards in the absence of full information the trading parties have to incur some amount of real expenditure in making out the unscrupulous players from the more credible ones and also on searching for favorable terms and conditions in all foreseeable contingencies. Technological uncertainties along with behavioral uncertainties exacerbate the problems even further. When the project is subjected to uncertainty, a complex contract rendering straightjacket of obligations might turn to be sub-optimal in some of the future contingencies and it makes the relationship inflexible to new opportunities. As writing a more complete contract is prohibitively costly for the reasons discussed above, there is a trade-off between writing one such contract, with high costs and rigidities associated with it on the one hand, and an incomplete contract and a high expected cost of dispute resolution, on the other.

Many scholars, including transaction cost economists, have observed that the governance of inter-organizational exchanges involves more than formal contracts (Bernheim & Whinston, 1998; Dyer & Singh, 1998). The critics argue that TEC, being skeptical about "trust" as a safeguard, over-emphasizes opportunism and the need for integration or contractual safeguards. Trust<sup>19</sup>- some sort of belief in the goodwill of others, given the opaqueness of other's intentions and calculations- should be produced and sustained for running the system. For sustaining a cooperative equilibrium devices to foster reliance on fellow members of the society are needed (Arrow, 1974). Such trust-governed exchanges promote norms of flexibility, solidarity, and information exchange in the relation. Trust economizes on search costs and the costs of drafting and monitoring the contracts, because trusting people are less secretive and readily provide the relevant information<sup>20</sup>. It reduces the cost of drafting contracts because it lowers the fear of opportunism. It gives more flexibility to the relation, as it does not specify rigid contractual obligations and therefore facilitates adaptation to unforeseeable events. Solidarity promotes a bilateral approach to problem solving, creating a

<sup>19</sup> We shall use the term trust to denote any reason an actor may have for believing that his transaction partner will not act opportunistically against him, even though he may be hurt by the other's behavior (Gambetta, 1988). A number of such mechanisms have been presented in the literature.

<sup>20</sup> See appendix- 2.1 for a schematic presentation on the role of trust in inter-firm relation.

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commitment to joint action through mutual adjustment (Poppo, 2002). Good reputation sets the floor for mutual trust, helps identify scrupulous partner and mitigates the conflict of interest<sup>21</sup>. A good reputation could be gained through the personal characteristics such as family, kinship, religion, and so on or through institutional measures like quality certification, producer associations or it could be gained even through repeated interaction and understanding developed over a period of time.

**Proposition 2:** Good reputation reduces the cost of writing complex contracts.

As it was argued earlier, managing a relationship involves both *ex ante* screening and *ex post* adaptations. Formal quality certifications, functioning as a signaling device, would solve pre-contractual adverse selection problem, whereas other reputation mechanisms like age and repeated contracting might serve to overcome the problem of moral hazard by assuring against the behavioral uncertainties i.e. hold-ups and shirking.

In line with Banerjee *et al* (2000) and Arora *et al* (1999) we take quality certification as a measure of reputation since it is formal and widely used in the Indian context<sup>22</sup>. Certification may be defined as a process whereby an unobservable quality level of some product is made known to the consumer through some labeling system, usually issued by a third independent party<sup>23</sup> (Auriol *et al* 2003). Credit rating institutions, market analysis shows, testing laboratories render some useful information about the current financial state of the firm, their past behavior and so on. Quality certification is a sort of signaling that the agent sends to his potential clients about his “type”, which, apart from reducing the search cost from the client’s perspective, triggers the negotiation for remuneration to his “type” of agents. Thus quality certification can be taken as a device serving the purpose of identifying technologically capable partners.

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<sup>21</sup> The conventional wisdom that reputation enhances commitment power has its theoretical foundation in the game theoretic approach to reputation effect pioneered by Kreps and Wilson (1989). The general message in the literature is that reputation effects leave the agents at least as well-off as he would be in the complete absence of external incentives, but typically raise long-run pay offs, often to the agent’s first best level.

<sup>22</sup> Among the 800 and odd firms that are listed in NASSCOM, there are 225 firms with ISO9000 certification, 48 firms with CMM5, 45 with CMM3 or 4 in India (NASSCOM, 2003).

<sup>23</sup> There are varieties of quality certifications available for a IS outsourcing firm such as ISO 9000:2000, Capability Maturity Model (CMM), People Capability Maturity Model (PCMM) emphasizing the product and process quality or labor quality. But they all generate some information about the service provider, thus serve the purpose of a signaling device. So we do not treat quality certificates differently as they are assumed to serve the same purpose as far as the problem under consideration.



If there is a widespread adverse selection problem i.e. there are quite a few players who are unscrupulous or there is no way to identify a credible agent *ex ante*, agents in the earlier periods of their “career”, will face hardship imposed by less in-built incentive contracts. As relatively new firms will not have any track record of their behavioral and technological credibilities and are more likely the client would device a contract that would obviate any possibility of cheating, shirking and so on. In the long run *age* serves the function of reputation as only credible players stay in the market. Older firms would tend to get more incentive in-built contract vis-à-vis their younger counterparts, as their credibility is proven. Thus age seems to be a measure of identifying a scrupulous partner. The duration of time that the parties have worked together – termed as *pre-relation* – helps the parties develop some relational norms and understanding (Macneil, 1978) that assures the other parties’ behavioral credibility and technological capabilities. Thus repeated contracts are taken as a measure of reputation.

The other typical problem in outsourcing is to decide on the allocation of risk among the agents and distribution of gains from trade. These interdependent problems addressed while striking the contract, actually influence the contract type as the supplier would expect a higher share of return if he were to bear a huge portion of risk associated. Whereas the typical case would turn out to be where the supplier is a small firm, and therefore likely to be risk averse and would pay a premium to pass the risk to the buyer. Time and Material contracts have excellent adaptability, but it does not check the problem of moral hazard, whereas a fixed-price<sup>24</sup> contract is rigid enough to check the problem but places the entire risk on the supplier, which is not desirable when the project is complex and highly uncertain from supplier’s point of view. Given the complexity and uncertainties associated with the projects, firms would like to get a T&M contract rather than a fixed-price contract.

We propose that quality certifications are necessary as a signal to separate high ability firms from the low ability firms, but it is not sufficient to identify between the scrupulous and non-scrupulous players. Thus a Time and Material (T&M) contract that exposes the client to moral hazards problem, implore other reputation measures to identify the conscientious partner and reward him/her with the contract that is less riskier and adaptable to unexpected contingencies. The age of the firm the duration of time it had worked together with clients

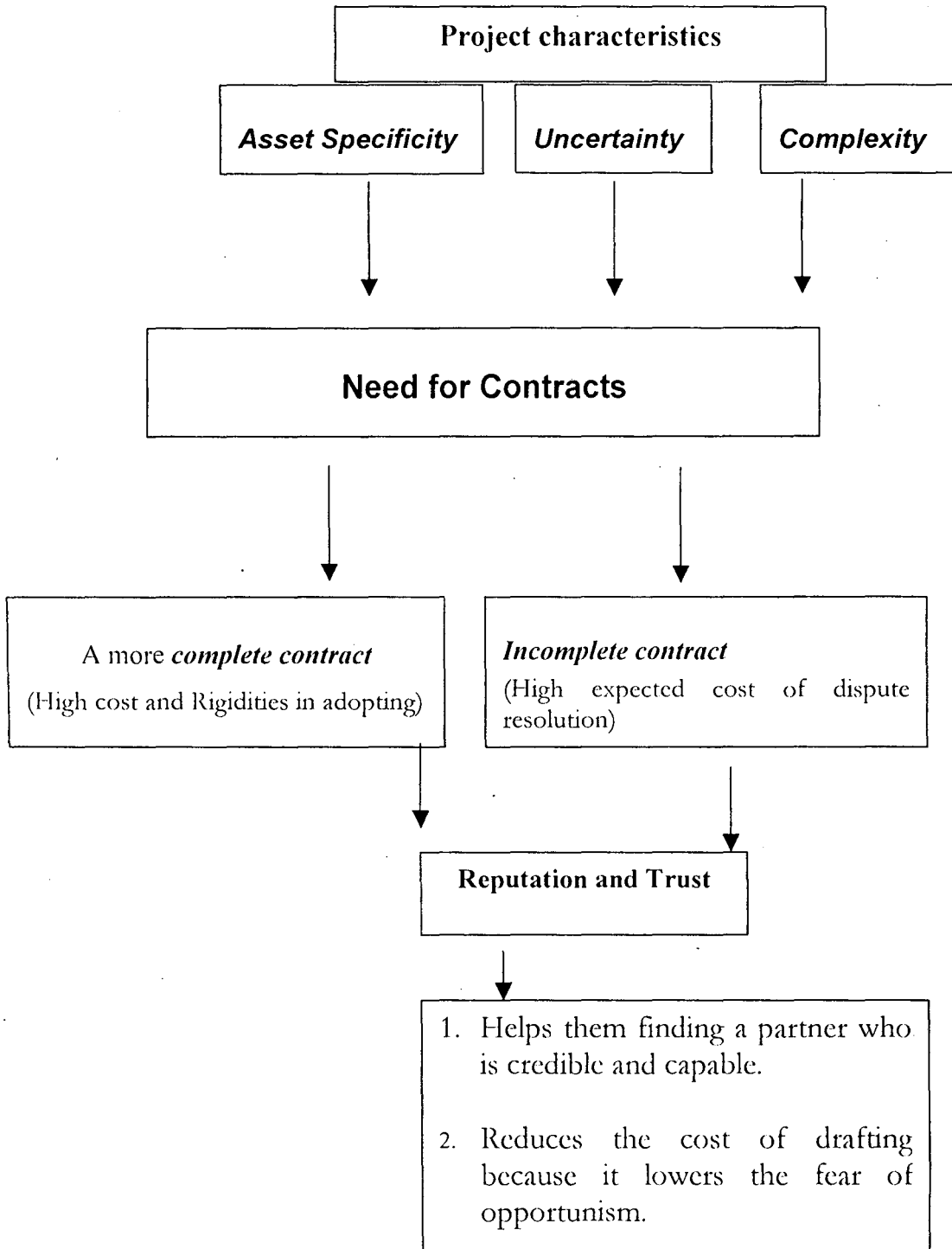
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<sup>24</sup> In a fixed-price contract, the product as well as the deadline for the project is decided. The contract may include penalty clauses for late delivery and for poor quality. In a Time-and-Materials contract, the client pays on a man-hour basis. Conventional wisdom is that fixed price contracts are best at low risk and cost plus as risk (complexity and uncertainty) increases.

would vouch for its credibility and technological capabilities. Thus the age and pre-relation would guard against the moral hazard problem, whereas quality certification would solve the problem of adverse selection.

**Proposition 3:** Quality certification is a necessary condition as it obviates pre-contract quality uncertainty, age and pre-relations are sufficient for obtaining a T&M contract as they assure the good conduct of the firm.

## Role of Reputation and Trust



## Chapter III

### OUTSOURCING RELATIONSHIP IN IT INDUSTRY

*One of the objectives of transactors seeking joint maximization of profits should be to create conditions, which allow them to achieve the joint maximization result of the zero transaction cost model (North, 1990).*

#### 3.1 Introduction

This chapter attempts to describe the underlying contractual hazards and their determinants in information services (IS) outsourcing relations. The chapter is organized as follows. After summarizing the transactional characteristics of IS outsourcing relations and the resulting organizational choices, we look into the available modes of organizing production, especially placing more emphasis on informal reputation measures, that are devised in the industry to get around the hazards.

In the recent years, outsourcing<sup>1</sup> - 'vertical disintegration' in Stigler's terms (1951) - of information services<sup>2</sup> (IS) is very frequent, particularly at the producer level where large-scale vertical integration of productive resources is relatively uneconomical and unattractive for various reasons (Abraham and Taylor, 1996). In the face of ever intensifying international competition, it is indispensable to the firms to seize upon the opportunities of trimming cost through placing non-core supportive activities to the specialists outside the firm to exploit external specialized knowledge and squeeze on cost savings due to economies of scale<sup>3</sup> (Dyer & Singh, 1998; Quinn and Hilmer, 1994).

International IS outsourcing has been expanding at a fast pace and is counted upon to arrive at a sum of \$136 billion by 2005 (IDC, 2001). The major propelling factors behind outsourcing are intensified international competitive pressures, the pressure to enhance asset utilization and realize proficiency in complex process technologies to center on core competencies,

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<sup>1</sup>Throughout the study we use the terms outsourcing and sub-contracting interchangeably. Ross Perot, a businessman from Texas, coined the term outsourcing in the 1950s.

<sup>2</sup> 'Information Services' is a broad term that includes all the IT services. IT service is defined as any service which results from the use of any IT software over a system of IT products for realizing value addition. IT software means any representation of instructions, data, sound or image, including source code and object code, recorded in a machine readable form, and capable of being manipulated or providing interactivity to a user, by means of an automatic data processing machine. The term IT Industry shall cover development, production and services related to IT Products.

<sup>3</sup> See The Economist (1991) for an overview of trends toward greater outsourcing in manufacturing.

which encompass research and development, sales and marketing. A good number of firms outsource for cost savings (Laabs, J. 1993); others to appropriate skills and resources lacking internally (Elmuti *et al*, 1998); still others outsource in the prospect of gaining a strategic edge over competition. We can, therefore, sum up specific reasons that propel companies to outsource: financial and technical capabilities, business expertise, and operational specialization (Earl, 1996). The financial reason essentially comprises of cost savings due to cut-rate labor and economies of scale that could be achieved by the expertise. The client can have access to the technological advantage without adding significant overheads to the IT infrastructure while concentrating mainly on their much needed core competency. And a specialized supplier may be able to provide better services due to their ability to adapt technical evolution quickly. Although there is a lot of hype on the role of outsourcing, especially bringing the developing countries to the mainstream of international trade, it is not free of hazards.

The benefits of Business Process Outsourcing (BPO) are myriad, but then so are the menaces (An, 2001). The risks of frequent component price and quality fluctuations, component complexities and shortages are significant in outsourcing relationship. Poor outsourcer performance, lack of business process knowledge and vertical industry knowledge and loss of control are just a few other factors that impede outsourcing (Palvia, 1995). Thus there is a trade off in shifting certain activities to the outside vendors as there involves a huge cost in identifying a scrupulous partner (Barthelemy, 2001), monitoring (Apte *et al*, 1997), and getting the incentives right in the interfaces of supplier/buyer relations and the benefits of outsourcing. The likely competitive advantage and the degree of strategic vulnerability are two sides in an outsourcing relationship that should be paid attention to while deciding on outsourcing.

Outsourcing, one of hybrid forms falling in the middle of the spectrum of market and hierarchy has only recently received ample academic attention in Economics, Sociology and Managerial Science<sup>4</sup>. In the lines of Williamson, economists analyzing outsourcing relationship particularly emphasize expected relational hazards, such as, behavioral uncertainties like opportunism and shirking and expected stream of benefits out of the

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<sup>4</sup> Outsourcing gained momentum after the landmark IS outsourcing decision by Kodak (1989) to outsource its IS needs to IBM.

relationship, whereas trust, business ethics and relational ties etc. are taken as the driving force of an outsourcing relationship by sociologists and management scholars. We seek to address this chasm in the spirit of a holistic approach amalgamating Transaction Cost Theory (Ang & Straub, 1998; Cheon *et al*, 1995) and Resource Based View (Cheon *et al*, 1995) of the firm to get a distinct view of the determinants of sourcing relationship.

### **3.2 What is Outsourcing?**

Outsourcing<sup>5</sup> is transferring day-to-day management and the operation of a business process to an external service provider. The supplier is expected to produce/provide a service or solution that performs a distinct business function that fits into the customer's overall business operations. Outsourcing has moved up the value chain to include an ever expanding set of activities, ranging from R&D to product design, from component production to logistics, marketing, distribution, and after-sales service, as against the low-value, low technology services such as in-house photocopy machines, messengers, food services and janitorial operations.

Outsourcing<sup>6</sup> IS activities refer to transferring the non-core operations and day-to-day management of software services such as Business Process Outsourcing (BPO<sup>7</sup>) and Information Technology Enabled Services (ITES). Business process, a sequence of defined steps necessary to carry through a business objective, can constitute any business operation including product design, accounting, billing, component manufacturing, customer relationship management, finance, internal audit, logistics, marketing, sales, supply chain management and other special business relationships to an external service provider.

In a typical outsourcing relation, a software service vendor may develop/customize software or provide data management services<sup>8</sup> that may accomplish any of the above mentioned

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<sup>5</sup> There are two principal types: traditional outsourcing and Greenfield outsourcing. In traditional outsourcing, a service provider and the tasks to be performed are identified and the service provider normally hires the employees and capital required. In Greenfield outsourcing, a new startup company itself is hired to provide the new service required.

<sup>6</sup> Outsourcing, apart from one short contracting, encompasses other hybrid varieties of inter-organizational relations such as joint ventures, long-term alliances, and other forms of relational contracting.

<sup>7</sup> BPO includes internal, "back-office" functions such as internal audit, finance, billing, accounting and other support operations. and BPO "front office" functions include customer relationship management, sales, call centers and fulfillment services. See the appendix-3.1 for a tabulation of activities/services done in BPO/ITES outsourcing.

<sup>8</sup> See appendix-3.1 for further classification.

requirements of the client as per the contractual terms (Kopetz, 1995). The term software here refers to any computer program, a set of instructions that enable the computer hardware to work. There are two principal types of software: system software (operating systems), which control the workings of the computer (e.g., Windows 95, MacOS), and application software such as word processing programs, spreadsheets, and databases that provide specific functionality such as payroll, billing, logistics etc. Customizing software means developing a system or application software that is applicable for the specific needs of the clients in their routine operations and management (Pressman, 1997).

Software development can be broadly categorized into custom developed software and packages or generic software products. Software companies providing customized software concentrate on particular vertical market segments or domain areas, like retail, banking, and manufacturing. Software products may be targeted to a vertical segment or may cut across segments, but rarely to a specific user. Information technology consultants, such as Anderson Consulting, provide “solutions”, which may involve some combination of custom developed software and commercial off-the-shelf software and hardware products.

Software development involves a number of stages: Conceptualization, requirement analysis, high-level design, low-level design, coding, testing and support. These stages roughly correspond to stages described in the waterfall model of software development<sup>9</sup>. The value added is typically greater in earlier stages of development – namely requirement analysis and high level design. As we discuss Indian software firms largely provide services rather than products. Further, Indian software exports consist largely of low-level design, coding, and maintenance services.

### **3.3 The Economics of Outsourcing**

Outsourcing i.e. geographical division of labor is not a new-sprung phenomenon as Smith (1776) hinted upon long ago that it embellishes localized expertise development and also fuels further economic progress (Foss, 1997). Outsourcing has been an established age-old practice for many years and yet it has only been over the last few years or so that economists

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<sup>9</sup> Waterfall model software life-cycle or product life-cycle model, described by W. W. Royce in 1970, in which development is supposed to proceed linearly through the phases of requirements analysis, design, implementation, testing (validation), integration and maintenance.

redirected their attention to it as a distinct form of organization. But ironically it was one of the vague areas in the neo-classical theory of the firm where the market is modeled in a simplistic way that transactions are facilely coordinated by “invisible hand”. As informational, contractual and behavioral hazards of transactions are disdained, especially in inter-firm relations, the questions of the choice of organizational design i.e. the size and the scope of the firms remained baffling.

In the 1970s came a turn around in the theory of the firm ensuing the path embarked by Coase (1937)- taken as tendentious for long- a new strand of research outputs probing into various features of the firm, mainly the question of the boundaries i.e. size and the scope of the firm and later on to a number of other hybrid organizational forms<sup>10</sup>. Contra to the neo-classical orthodoxy, novel developments in the theory of the firm contend that the firm that organizes production through a hierarchical governance structure, is an alternative to price mechanism where there are impediments to free transactions i.e. there involves cost of trying out the market. The cost involved in gathering and processing of information, searching, negotiating, writing and enforcing the ongoing relation is called the transaction cost i.e. the cost of coordinating the system. For example, before entering into an outsourcing relation with a firm, the client needs to incur some real expenditure, both time and money, on gathering information to come upon the appropriate partner and then negotiate the terms and conditions. In offshoring<sup>11</sup>, these costs may be even larger.

There are numerous ways of arranging the governance of transactions e.g. within the firm or contracting out component production or even using the market; but the appropriate one depends on the particular characteristics of the transaction. Precisely, to realize the production of final output, raw materials and the intermediate inputs could be procured in the conventional spot markets, produced in-house or even contracted out in the case of custom components. Transaction costs are the results of the nature of the transaction, the component transacted, the nature of the parties involved and the trade environment. But IS activities have peculiar character, viz. they are hi-tech, fast changing technology infested activities, but still may not be in the core of the production process of the client. Thus having an integrated IS facility increases the cost substantially, and learning, as the industry grows, is almost nil. But

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<sup>10</sup> Williamson (1971, 1975); Klein et al (1978); Hamel (1991)

<sup>11</sup> Offshoring is the term used in the industry to denote outsourcing the activities off the shore.



outsourcing that utilizes the best breed of suppliers available in the industry, smoothes out workload, fetches higher level of experience, which calls for a serious consideration in favor of outsourcing.

On the other hand contracting out engender transaction costs such as searching for a scrupulous and capable supplier, negotiating the terms and conditions and re-contracting in the face of unexpected contingencies as the project progresses. Moreover the buyers face the risk of price, quality fluctuations and time uncertainties. All outsourcing relations suffer these hazards. As the services provided are complicated and highly uncertain, quality fluctuations are inevitable. Moreover in offshoring the firm grown in a particular culture often confronts a different culture, different language and so on. In short, asset specificity, which leads to potential hold-up problems as it locks up the buyer and the supplier, complexity and pervasive uncertainty, which demands more costly and vigilant monitoring for consistent quality are the attributes leading to vertical integration. Otherwise stringent contractual terms are needed to constrain the unwarranted, joint surplus reducing unproductive activities. In the light of foregoing discussion, it is evident that outsourcing is an activity that requires interface between the parties to facilitate efficient contracting and coordination for mutual benefit.

### **3.4 The Importance of Contracts in Outsourcing**

Outsourcing or sub-contracting, one of the hybrid varieties of organizing production is on the surge and has become inevitable in today's business. As discussed earlier, outsourcing relationship requires that the firms risk some investment in the relation. These investments are to be protected by the contracts. Why after all do the trading parties need contractual safeguard, or why do they want to have formal written agreement with each other? There are various important reasons offered in the literature.

The final outputs of IS contracts – mainly custom or specialized goods and services – involve mostly the future provision of goods and services, and are highly buyer-specific as the contracts are designed according to the specific needs of the buyer. It is typically the case that the client wants an IS service for the future, and the supplier firm has to supply the good or service, giving rise to the mutual desirability of a contract as the relationship needs mutual

assurance of continuing the relationship till the good or service is transacted. If the firm<sup>12</sup> has to make some asset specific investment, that is the investment, which would have not been made otherwise and does not carry the same value outside the relationship, e.g. man-hours sunk in developing software specifically to a buyer. Consider a hypothetical case: there are two players for a software product, the client and the seller. There are two periods: in the first period the firm needs to make some asset specific investments and in the second period the transaction will take place. As it requires investment specific to the buyer in the first period, the seller is in a disadvantageous end because he is vulnerable and might be held-up in the future and will have little or no alternative value outside the relationship. If holdup occurs i.e. the buyer bargains opportunistically about the price of a transaction or supplier escalates the price deliberately, it would abate the value of the contract altogether and may result in under-investment. The efficient level of investment will be brought about only if there are no externalities, i.e. if his relationship specific investments are protected by a formal contract. So searching, negotiating over and writing a contract on sharing the quasi rents becomes necessary in the presence of asset specific investments and informational asymmetry. Another reason for contracting is that the risk-neutral agent mutually and beneficially covers the risk-averse agent against the risk involved in the project by assuring him the minimal return.

In the following, we shall consider what a client could do in the interface with the seller to protect against the hazards of shirking and cheating. The main sources of inefficiency in the relationship are the problems of adverse selection and moral hazard. The client could exercise a few protective measures guarding against behavioral uncertainties i.e. moral hazard to make the seller fulfill his obligations as per the mutually agreed upon stipulations of the contract. What Williamson advocates is that the safeguards are essentially 'hard' control mechanisms or restrictions and the first and foremost protective measure<sup>13</sup> is to post mutual hostages that would help impose sanctions and give a retaliatory power if one of the parties breaches the contract. In many of the IS outsourcing relations mutual hostage is not possible. In most of the cases, since the supplier firm is the smaller one, coercive contractual agreements prevail in the industry. Thus formal control simply means exercising power mechanisms (Blau 1964), where one of the parties can give a threat of 'exit' or prosecution. Given a strong and

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<sup>12</sup> Through out the study we denote the agent by "firm" and the principal by "client".

<sup>13</sup> Almost any contribution concerned with protection against opportunistic behavior refers to this protective mechanism at some point or another.

unstinted judicial structure, the parties can rely upon the third party enforcement of the contract i.e. the court for protecting the interest of the parties.

Economists and organizational theorists studying contractual behavior differ on the first and most basic question: Why contract? Contracts<sup>14</sup>, in TCE, are viewed as a device to coordinate future transactions structuring ex post adjustments, while constraining strategic manipulations and wasteful expenditures on redistribution of the existing surplus of the trade (Williamson, 1979; Klein *et al*, 1978). Management scholars and theorists of Resource Based View place importance on providing guidelines on the course of action rather than corrective measures emphasized by other theorists (Nooteboom 1996; foss 1998). But agency theorists emphasize on incentive alignment and risk transfer (Hart and Holmström, 1987). We consider contracts as a formal document containing the clauses on above discussed protective measures and legally enforceable to protect against the relational hazards. But we propose to see difference in the contractual stipulations given the nature of the firms, for contracts are essentially to protect asset specific investments. But the cost of contracting, which depends on the level of contract complexity, could be altered by mutual trust.

A typical contract of an outsourcing relationship may involve contractual terms and stipulations on technicalities<sup>15</sup> and safeguards against relational hazards<sup>16</sup>. We differentiate between contracts considering its depth in protecting against the hazards. The first type of classification is based on the price or remuneration clause of the contract. The types of contracts used in the Indian software industry are Fixed-price, Time-and-Material (T&M), and Mixed contracts<sup>17</sup>. One of the important issues to be tackled while entering into a contract is to align the risk associated with the project to get the incentives right, especially in regard to rendering the required quality.

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<sup>14</sup> "Contract... mean[s] a specification of the *actions* that named parties are supposed to take at various times, generally as a function of the *conditions* those hold. The actions typically pertain to delivery of goods, performance of services, and payments of money, and the conditions include uncertain contingencies, past actions of parties, and messages sent by them" (Shavell, 2003).

<sup>15</sup> Such as hardware to be used, a base software license, custom development, training, modifications, implementation, additional product components as they become available, upgrades, and annual support services.

<sup>16</sup> This will include incentive, control, end of the contract, Price and punishment clauses.

<sup>17</sup> See appendix-3.2 for a comparison between fixed price and T&M contract.

A fixed price contract places a huge risk on the supplier in the face of uncertainty even though it gets around nominal price uncertainty. But when relative market prices change either of the parties might be subjected to pecuniary losses and adaptation costs. It stringently expects the firm a complete performance of the services in accordance with the contract terms at a price decided upon at the commencement of the project. A T&M contract provides more space for the parties as it provides the materials required within the decided time span. A Mixed contract, as the name suggests, is a combination of Fixed-price and T&M contracts. The second type of classification is the complexity of the contract. A complex contract is defined to be more stringent and covering the clauses on a wide range of future contingencies. Contractual complexity, in our study, is measured through subjective evaluation i.e. the level of agreement, the length of the contract (in pages) and the number of contractual clauses included in the contract.

In contract literature the popular lore of the properties of different types of contracts is that a Fixed-price contract gives more incentives to the agent; whereas a T&M gives incentives to the client to perform optimally, provided that both are risk neutral. This is true when the extent and type of project requirements can be reasonably well specified; the cost can be reasonably estimated; quality is efficacious; effort/performance is unambiguously observed, as is generally the case for standard commercial products and services (e.g. Y2K, CAD and simple web designing etc.). But, given uncertainty, complexity and huge investment at stake, as in the case of IS outsourcing contracts, a risk averse agent would like to get a T&M contract that gives more space to try his hand in risky ventures<sup>18</sup>. From the clients perspective, however, a T&M contract is perilous in the sense that it gives the way to the agent to shirk and blame it all to external disturbances. As long as the client is assured that the agent is scrupulous, trusted and tested, she will not settle for a T&M contract. Thus the selection of an appropriate contract type depends on factors such as the nature of the parties involved, components transacted, the uncertainties and complexities involved in contract performance and the extent to which the players are to assume the risk.

The second attribute of contract we consider is contract complexity. A contract is said to be complex if it tends to include all the stipulations and conditions of actions to be taken for as

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<sup>18</sup> As it is the convention, we also use “she” to denote the principal and “he” to the agent.

many of the expected contingencies. The scope of the contract is defined by the number of clauses included in the contract such as duration, incentive, control, end of the contract, price and punishment clauses, price escalation and contract termination. Including many clauses in the contract and collecting relevant information regarding that involves cost. Each outsourcing involves several steps. They consist of competitive bidding procedure, including requests for proposals, evaluation of bids according to selected criteria and clarification and comparison of bids, negotiations, including a letter of intent and usually a term sheet, renegotiations or termination. For example, first of all, all prospective suppliers are formally asked to provide general information on his capabilities and their overall business. Then they are asked to bid for the contract through a formal project proposal that is a simple guess of expected cost or material requirement of the project.

TCE contends that contracts are to be complex if it is meant to check the hazardous behavior in the case of complex and highly uncertain projects. If a huge investment is risked in the relation a stronger safeguard through complex contracts is needed, which tries to state the course of action unambiguously. But there is a trade off between writing a complex contract and the cost associated with it.

### **3.5 Contract Enforcement**

Mainstream economists tend to assume that courts costlessly enforce contracts. Legal counsel can facilitate the parties by helping them to get the term and conditions unambiguously, thereby reduces contractual risk and determines the scope, negotiates the contractual terms and conditions and ensures implementation. But the more recent progresses in the literature discern that relying on legal institutions for resolving the problems involved in transactions entails real expenditure (Pinheiro, 1998).

Despite complexity and appropriateness of the type of contract, there are impediments to safeguarding the interest of the parties. If the transaction is too complex for a third party to understand, e.g. in the face of a dispute, if there is no way for a third party to understand whether the buyer did not specify his requirements clearly or the seller did not put in enough effort to understand and develop the product, then third party litigation will not be possible. Moreover the judicial systems in many of the developing countries are slow and not entirely

relied upon as far as settlement of disputes is concerned. The incompleteness of contracts, because they fail to specify the obligations and the sharing rules for all the future contingencies with low probability (since the expected cost of excluding it is negligible, while on the contrary the cost of including it would be certain), makes the life difficult for the court. If an unforeseen contingency arises the third party litigation is difficult, as the contract is silent about that particular contingency. Contracts are inherently incomplete because the cost of including (cost of anticipating possible contingencies, describing them adequately, searching favorable information and negotiating the sharing rules) and identifying (due to uncertainty and bounded rationality) all contingencies is enormous. Another reason for their incompleteness is that attributes like effort are unverifiable and there is asymmetry of information even between the courts and the parties.

In order to get around these problems the parties often rely on private adjudicators such as trade associations or they themselves resolve through informal measures. This may be more efficient in some of the cases as the arbitrator may also be an insider to the industry who may be having specific knowledge of the contractual context, even better if the parties themselves have some informal ways. This would save contractual enforcement expenses. Informal mechanism, especially reputation could help solve the problem costlessly. Although reputation can help reduce costs of enforcement of contracts, it will generally be an imperfect substitute for courts, both because it is usually a crude substitute and a less effective one. Nevertheless, reputation is often a cheaper means of enforcement of contracts. Indeed, in many contexts, litigation costs are high enough to make court proceedings not worthwhile, so that it is only reputation that can function to enforce contracts. It is a commonplace that the fear of harm to reputation can serve to induce parties to adhere to contracts.

It is advantageous to both the players to invest in building reputation capital over time, as it assures the good conduct of the player and coordinates the transaction by protecting the relationship-specific assets informally. Klein (1988) argues that the agents put in effort to build reputation capital that defines the “self-enforcing range” of contracts or what Williamson calls “hazard equilibration”, inasmuch the cost of contract default or hold-up (through community enforced litigation or competition) is greater than what it pays otherwise. Banerjee et al (2000) argues that firms invest in building reputation capital, which signals the nature of the firm to the potential buyer and helps in getting more favorable contracts i.e. a

T&M contract. Once asymmetry of information, i.e. the nature of the partner is not known ex ante or it is costly to put in efforts to distinguish a more credible partner from unscrupulous ones, is introduced, then the importance of reputation in deciding to get into a contract increases tremendously.

### **3.6 Reputational Measures**

Given the nature of the transaction in the IT sector the major concern is quality of the services outsourced. Formal quality certifications like ISO 2000 and industry specific certifications like Capability Maturity Model (CMM) and People Capability Maturity Model (PCMM) would solve the problem of adverse selection. As the clients would normally look for these precautions against the quality uncertainty, certificates would help passing the information on. Indian software firms to acquire international credibility willfully go for quality assurance certifications like ISO 9000 and CMMs. Worldwide ISO 9001 and CMM are accepted as standards of a credible service provider. Especially ISO 9001 has become a major quality assurance certification across the industries, particularly in developing countries like India and China where the firms are under the pressure to signal and stand out to show their quality to the international client to fetch business. In India, there are 225 firms with ISO9000 certification, 48 firms with CMM5, 45 with CMM3 or 4. (NASSCOM, 2003).

The fact that the firm's past casts a shadow on current governance options and possibilities as it provides the information on the capabilities and scrupulousness of the firm. Thus age of the firm can serve the function of providing pre-contractual information to base upon the decision to the partner firm. The duration of time that the parties have worked together helps the parties develop some relational norms and understanding (Macneil, 1978) that assures the other parties behavioral credibility and technological capabilities. Assuring behavioral credibilities would help them minimize the cost of contract, as the parties have worked together or as the suppliers have proven credibility record. Thus repeated contracts are taken as a measure of reputation. From the foregoing discussion one would expect that:

- In the case of a more complex and uncertain, thus risky venture, firms with better reputation and proven record are more likely to get T&M contracts.
- Good reputation reduces the cost of writing complex contracts.
- Quality certification is a necessary condition for obtaining a T&M contract as it obviates pre-contract quality uncertainty, age and pre-relations are sufficient for obtaining a T&M contract as they assure the good conduct of the firm.



## Appendix – 3.1

### Information Technology and Business Process Outsourcing Services:

<b>1. INFORMATION TECHNOLOGY SERVICES (COMPUTER AND RELATED SERVICES)</b> Software Development and Implementation Services, Data processing and Database Services, IT Support Services, Application Development & Maintenance, Business Intelligence & Data Warehousing, Content Management, E-procurement and B2B Marketplaces, Enterprise Security, Package Implementation, System Integration, SCM, Enterprise Application Integration, Total Infrastructure Outsourcing, Web Services (Internet Content Preparation etc.), Web-hosting and Application Service Providers (ASPs)	
<b>2. BUSINESS PROCESS OUTSOURCING</b>	
CUSTOMER INTERACTION SERVICES	Sales Support, Membership Management, Claims, Reservations for Airlines and Hotels, Subscription Renewal, Customer Services Helpline, Handling Credit and Billing Problems, etc. Telemarketing and Marketing Research Services
BACK-OFFICE OPERATIONS	Data entry and handling, Data processing and database Services, Medical Transcription, Payment Services, Financial Processing (financial information and data processing / handling), Human Resource Processing Services, Payroll Services, Warehousing, Logistics, Inventory, Supply Chain Services, Ticketing, Insurance Claims Adjudication, Mortgage Processing
MORE INDEPENDENT PROFESSIONAL OR BUSINESS SERVICES	Human Resource Services (Hiring, Benefit Planning and Payroll, etc.), Finance & Accounting Services (including Auditing, Book-keeping, Taxation Services, etc.), Marketing Services, Product Design and Development

Sources: Mattoo and Wunsch (2004)

## Appendix- 3.2

### Comparing Fixed-price contract with T&M contract:

	Fixed-price	T&M contract
Risk allocation	Supplier	Buyer
Incentives	Less	More
Good to minimize	Costs	Schedule
Documentation effect	More	Less
Adaptability to unforeseen contingencies	Less	More
Adversarial relationship	More	Less

Source: Ibbs *et al* (1986); cited in Bajari *et al* (2001)

## Chapter IV

### IT SECTOR IN INDIA

#### 4.1 Introduction

The outgrowth of the IT sector<sup>1</sup> in the past decades has been recognized as a crucial development around the globe (World bank, 1992). Our aim is to understand, within the specific context of the IT sector, the importance of institutions, i.e. legal mechanism and others that facilitate voluntary exchange, for economic growth. This chapter is organized in the following way. Starting with a brief overview of the industry we summarize the initiatives taken by government both on infrastructure front and legal front. Subsequently we place Kerala's IT sector in the larger context of Indian IT sector, and sum up the initiatives of Kerala government in wooing private entrepreneurs to start business in the state.

India, now the powerhouse back office for international majors, gained the edge thanks to its skilled English-speaking workforce, beefed up infrastructure and favorable policy environment, and is now looked upon as an investment destination for IT requirements of global firms. Apart from the obvious wage gap between Indian software professionals and their counterparts in developed countries, the reason for the unprecedented performance of Indian software industry is the industry's labor-intensity of production and low international entry deterrents that set forth an opportunity to the developing countries. In addition, hyper-competitive world business environment makes outsourcing imperative for very survival of the firms all over the world. Apart from India's cost advantage, sensible government intervention in providing infrastructure such as telecommunication infrastructure and legal support especially Cyber Laws, and quality orientation of the Indian firms and India's unique geographical location played key role in building confidence among buyers.

Today, global interest in offshoring is at an all-time high and there is a hefty deluge of outsourcing to India in the last decade. Global technology giants, between 1990 and 1995, had looked out for cost cutbacks due to market pressures and turned to India to speed up product development that helped Indian companies like Wipro. In this phase body shopping was the

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<sup>1</sup> IT sector comprises of both Software and Services Industry and hardware. Software and Services Industry include development and production of IT products, Network Consulting, CAD, Custom Outsourcing, IT Enabled Services, Deployment and Support and IT Education and Training. IT Hardware includes Digital Electronic Equipment and its intermediate products, specified Telecom products and Electronic Components. IT Hardware related Services includes System Integration services, IT Hardware Designing, Repair and Support Services and consultancy (NASSCOM, 2003; GOI Action Plan- II, undated).

major form of outsourced activities done, where tasks to be performed are identified and the service provider hires the employees to bring about the task with the client. This was followed by the Y2K fright and fixing of bugs during 1995 to 2000 that gave a boost to enterprise application. While the former was done mainly onsite the latter was done offshore, which increased profitability that was passed on to the clients through further cost reduction. But it was still at the low end of value chain.

Indian software exports consist largely of low-level design, coding, and maintenance services, whereas earlier stages of development i.e. conceptualization, analysis and designing are considered to be high value added (Heeks, 1996). Indian service providers are increasingly climbing up the value chain vertically in the same domain engaging in more critical services or horizontally flourishing into more complicated domains that call for lining up of high-skill professionals (Dataquest, 2001).

#### 4.2 Indian IT Sector

Even though India had a head start as early as in the late 1970s, it gained a respectable world share of 2.8% only in the late 1990s (NASSCOM, 2003). According to the estimates of NASSCOM the turnover of the Indian Software and Services Industry from a modest \$10 million – a mere 0.3% of GDP – in the mid 1980s it has grown to be a \$16 billion industry accounting for 3.15 % of GDP in 2002-03 and is likely to grow by about 54 per cent in 2003-04. However, the growth rate of the industry sagged sharply in 2001-02 and showed resurgence later on.

Table 1: Indian IT sector:

	97-98	98-99	99-00	00-01	01-02	02-03E
Indian IT sector ('000 Cr. Rs.)	5021	6014	8357	12410	13783	16494
Growth rates (%)	-	9.93	23.43	40.53	13.73	27.11
Share of GDP (%)	1.22	1.45	1.87	2.66	2.87	3.15

Source: NASSCOM (2003)

Indian software exports, a major component of India's IT sector, touched \$10.4 billion in the year 2003, growing at a rate of 30 percent over the previous year<sup>2</sup>. Of the total software and service exports, estimated ITES-BPO to be \$2.3 billion in 2002-03 and India's offshore

<sup>2</sup> See the appendix-4.1 for export growth rates over years.

services contributed \$5.4 billion to the country's export revenue during the same period. Despite of fabulous export growth performance of 50% per year over the last decade, it is still a tiny fraction of the estimated world software market of over \$300-500 billion. Indian software firms have been dependant mainly on the export market, as domestic demand growth was barely significant. The domestic IT market grew by over 18 per cent in 2002-03 to reach \$5.8 billion.

Table 3: Indian Software Industry 1995-2000

(US \$ million)

	1995-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03E
Domestic software Market	490	670	920	1250	1700	2450	3647	3575
Software Exports	734	1085	1759	2600	3962	6217	7647	9875
Indian Software Industry	1224	1755	2670	3900	5700	8750	11294	13450

Source: Various NASSCOM Reports.

#### 4.3 Promotion of IT sector: Governmental Incentives

Exception to Indian Industrial Policy, which was fundamentally statist, inward-looking and protectionist until the 1990s, Indian software industry was exposed to moderate neo-liberal policies of 'free markets' - a good deal of liberalization in the 1970s, then again in the 1990s after a short reversal in the mid 1980s (Heeks, 1996). With the aim of achieving the full potential of the Indian IT sector, Government of India (GOI) has taken a major step towards promoting the sector with the formation of a new ministry for IT and taken policy initiative to overcome the constraints for further development of the sector. Despite moderate neo-liberal policies towards the sector, Government of India took a prominent role in providing information, market access and basic infrastructure and venture capital requirements of the sector through its comprehensive policies<sup>3</sup> (Heeks, 1995, 1996; Lateef, 1997). Facilitating industrial growth encompasses augmenting both physical and legal infrastructure. With a series of recent initiatives like Technology Clusters and IT Act 2000, telecommunication regulation and tax rationalization, GOI has set a road path for further growth of the sector.

<sup>3</sup> See the appendix-4.2 for various policy initiatives of GOI.

#### **4.4 Trade and Infrastructure Policies**

Government's initiatives were required both in restructuring the trade policies to promote the sector and providing the requisite physical and legal infrastructure for IT outsourcing. The Ministry of Information and Communication Technology is active in promoting the infrastructure that bolsters the outgrowth of the sector. Apart from providing incentives to the sector, a relatively advanced communication infrastructure and laws governing contracts and particularly software trade contracts are contemplated as indispensable for the growth of the sector. Government was also expected to facilitate the supply of required manpower and educate new programmers through academic and training programmes that enhance their employability, grant fiscal incentives and financial assistance for the promotion of the sector.

The Government of India and different state governments took several initiatives to boost IT investments across the country and promote the sector as a prime mover of the economy. Stimulating policy changes initiated in the 1990s, especially satellites and import liberalization as a part of new economic policy, laid open an avenue of growth as a distinct service provider rather than a mere body-shopping. Taxes and tariffs policies like no customs duty on import of software and no import duty made offshoring more profitable and spurred the software and services industry in India. These policy reforms had important implications, as Indian firms were able to take up the complete programming job so as to move up in the value chain slightly. Moreover it made India grow as a world outsourcing hub of knowledge services.

While the basic infrastructure requirement for IT sector is telecom, power and transport, the most critical of all is information and communication infrastructure, which encompasses high-speed broadband communication backbone, access network, nodes and so on. Communication infrastructure in India was considered to be unsophisticated and expensive. Along with the new economic policy came a few initial reforms, and later the telecom infrastructure (see Table 4) was declared as a priority area, with the view to promoting it to world class. Government created suitable infrastructure facilities, especially optic fibre submarine cables and networks, Satcom networks and wireless networks for faster Internet connectivity.

Action plans of Government of India envisaged to extend the fibre optic route kilometers at 30 percent per annum and a lot of emphasis is placed on developing hardware industry through fiscal measures and rationalizing import and export policies to push up the growth

rate of software industry further (GOI, undated). Moreover it effectively provides a long-term policy framework for sustaining the growth rate of yesteryears, especially emphasizing the need for augmenting the confidence of the clients by securing quality certificates from seller's part and by an active role in implementing cyber laws. Furthermore setting up of NASSCOM provides an institutional setup for dissemination of information regarding the opportunities, and it has now become a collective voice of the industry.

Venture capital reforms have brought down the hardship faced by Indian firms that were seeking financial assistance. State governments, with the assistance of the Centre, have promoted technology clusters called Software Technology Parks (STPs). Kerala initiated by setting forth the first ever technopoly in India in 1994. Apart from providing the required infrastructure, state governments have given various incentives to the firms set up in the STPs, such as duty-free capital goods movement and so on.

#### **4.5 Cyber Laws**

Government's role in providing a strong legal and robust institutional basis for sectoral progress attracted attention only recently. Recent developments in the literature maintain that the institutional and legal structures in effect reduces the costs to the individuals to freely enter into transactions that are mutually beneficial, as the government guarantees that the contract's terms are enforced. Indian contract law still adheres to 'The Indian Contract Act' 1872, which provides the institutional basis for individual transactions in the capitalist set up like ours. Generally, Indian law is reckoned to be directing the type of contracts, or terms and conditions to be included, rather than leaving it to the transactors, and enforces it if someone reneges on the contract (Basu, 1996). Indian legal system, however, was often accused for being corrupt and slow.

Modern developments in Information and Communication technology require slightly different set of rules to govern electronic transactions. Cyber law governs the legal issues of cyberspace<sup>4</sup>. Cyber law encompasses laws relating to Electronic and Digital Signatures, Computer Crime, Intellectual Property, Data Protection and Privacy, Telecommunications Laws. To provide security to the transactions executed electronically, Indian Parliament enacted the Information IT Act, 2000, which includes a strong Copyright Law with strong

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<sup>4</sup> The term cyberspace is not restricted to the Internet. It is a very wide term that includes computers, computer networks, the Internet data, software etc.

punishment for copyright infringement. It recognizes electronic communication and storage of information for transactions and accepts electronic filing of documents for arbitrating contractual rights.

#### **4.6 IT Sector in Kerala**

Kerala, one of the best performing states of India in terms of Quality of Life Index, is thriving to make use of its advantage of superior human capital and social capital to develop itself as a destination of IT sector. A state that attained 100% literacy but distraught with a huge number of educated unemployed, IT sector seems to be the obvious choice to generate employment opportunities in an environment friendly way. There is a huge array of studies highlighting the state's somewhat perfunctory attitude to the reform process to revitalize the economy. Subrahmanian & Azeez (2000) call for a new vision and strategy to utilize the human resources to accelerate income and employment growth. Even though the general trend in industrial growth of Kerala is not too encouraging as it is seen less investor friendly location for manufacturing<sup>5</sup>, Kerala Government, apprehending the enormous potential of the IT sector, seems to have recognized the importance of improving the state's infrastructure base and the need for state support.

Kerala, aiming to cash in on its vast pool of high skilled labor force, is one of the early states who have initiated a policy framework for better coordination of all deciding forces such as government agencies, trade unions and so on in the society to bring in a new paradigm to promote the sector of high potential. The new industrial policy, proposed in 2001, aims at facilitating investment in infrastructure that would in turn expedite the growth of industries and services, and proposed to rationalize the labor policy to make an investor friendly ambience. The state has set up Special Economic Zones and industrial parks with better infrastructure to promote the upcoming thrust areas like IT and biotechnology, and proposed to bring out a separate policy proposal to facilitate them.

The new IT policy (2001), formulated recently with the view to placing Kerala as a global center for excellence, aims at fashioning a pro-business, pro-enterprise legal, regulatory and commercial framework to expedite speedy growth of the sector. Initiatives in IT encompasses

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<sup>5</sup> Harilal & Joseph, 2000; Rammohan, 2000; Subrahmanian & Azeez, 2000



five broad areas of consideration namely telecom, infrastructure, hardware and software industry, human resources development and e-governance (GOK, 2004).

#### 4.7 Software Exports from Kerala:

Despite its early effort like setting the first ever Technopolis of India, Kerala's performance so far is dismal vis-a-vis her neighbors. The total software exports from the state worth Rs. 185 Crores and the hardware turnover was around Rs.130 Crs. for the year 2002-03.

Table 6: Software and Hardware Exports from Kerala:

Financial Year	Software Exports			Hardware Exports (Rs. Crores)
	STPI Units	Units in CEPZ	Total (Rs. Crores)	
1999 - 2000	66.4	1.63	68.27	120.81
2000 - 2001	112.37	5.38	117.75	157.75
2001 - 2002	150.00	12.84	162.84	113.43
2002-2003	165.00	20.00	185.00	130.00

Source: Economic Review, 2004, State Planning Board, Kerala.

The recent initiatives have led to the requisite infrastructure to some extent and resulted in a considerable increase in the number of units in the industrial parks and special zones. The distinctive feature of the industry is the huge number of hardware assemblers employing more than 20,000 people, and therefore shows the employment creation potential of the sector in a state racked by a very high unemployment rate.

Table 7: IT sector in Kerala 2003

IT Companies	No. of Industrial units	Employment (Persons)	Domestic Turnover (Rs. crores)	Export Turnover (Rs. crores)
STPI Companies	267	2350	1.4	165.00
Technopark	55	6000	270	-
SEZ Total	30	3000	-	150.00
Hardware Assembly / Vendors	2750	20000	550	-
Software Developers	350	4000	40	-
Grand total-IT Industries	3425	35350	591.4	

Source: Economic Review, 2004, State Planning Board, Kerala.

Kerala's share in total software production of South India is still too small for the state to be reckoned as a major player. While Kerala is yet to be counted as a grown-up IT major like Karnataka, Andhra Pradesh and Tamil Nadu (see table 8), studies on software industry reveal that there is much room for optimism as the state seems to catch up in growth rates compared to earlier years (Kiran, 2002).

#### **4.8 State Initiatives to Promote Information Infrastructure**

In its recent policy statements the state government has identified IT Software and ITES industries as a thrust area for economic development of the state. The recent initiatives include a comprehensive fiscal package of incentives for firms to move up towards better and higher value, more employment creation and enterprise excellence. Feigning her neighboring states, Kerala has declared quite a few incentives for the firms with export orientation like early bird incentives and so on to counter the negative perception about manufacturing in the state. In the phase of intense vying between States to attract investment, labour inputs are supposed to be 'flexible', which has probably motivated the state to announce flextime operation along with many other relaxations.

Kerala Information Technology Industry Incentive Scheme (2001-03) is announced to be in effect for four years from 2001. It grants 20% Standard Investment Subsidy (SIS) to firms with more than Rs. 25 Lakh Fixed Capital Investment (FCI) on software, hardware and ITES. Firms that employ minimum 50 employees in software be entitled to an additional 7.5% investment subsidy over the Standard Investment Subsidy (SIS) and firms with minimum 100 employees will bag a net subsidy of 30% and firms with minimum 250 employees will obtain an additional 10% investment subsidy that is up to 40% of total FCI. Special incentive schemes are announced to promote Kerala based IT companies. Kerala government with a high quality orientation provides a Rs. 5 lakhs incentive package to the firm that obtains quality certification such as CMM. IITM-K, an IT management institute was set up to train people for high-end emerging technologies required to enhance the state's future needs of hi-tech professionals.

Apart from fiscal incentives the state has put in huge effort to bring the infrastructure facilities in the state to world class. It has set up high-speed broad band, optic fibre submarine cables, SEA-ME-WE-3 and SAFE converge for faster international connectivity. Adding to this beefed up infrastructure and fiscal incentives, investments technology clusters in the state,

especially in TECHNOPARK, Thiruvananthapuram, had boosted state's exports of software services. Government of Kerala has launched Investment Promotion and Management Cell (IPMC) to communicate investment opportunities and incentives offered by the government to the firms.

Table 9: IT infrastructure:

Infrastructure created		Upto March 2003
Thiruvananthapuram	Land (acres)	182
	Build up area (Million Sq. ft.)	1.5
	Investment (Rs. Cr.)	145.00
Kerala Total*	Land (acres)	452
	Build up area (Million Sq. ft.)	1.82
	Investment (Rs. Cr.)	215.000
OFT infrastructure created upto 2003 (Rs. Cr.)**		3000

\* Total includes the infrastructure created in Kochi and Malappuram also.

\*\* Source: IT department.

Source: Economic Review, 2004, State Planning Board, Kerala.

#### 4.9 Technopark

Technopark (Technology Park), set up in Thiruvanthapuram with 1.5 million sq. ft. of built-up space in 156 acres, was one of the several attempts in the country to provide the firms with better communication infrastructure, power, data connectivity and transport – an environment as close as the world class. At present Technopark hosts over 55 firms both foreign and domestic including five CMM Level 5, two CMM Level 3 and several ISO 9001 certified companies. It is employing over 6000 professionals, exporting worth Rs 208 Crs. Technopark has initiated an institutional measure to enhance the number of certified firms by creating Software Engineering Competency Centre that apart from spreading awareness about the importance of certification, assists the firms in understanding the practical methodological hurdles in obtaining the certificate.

Table 10: Turnover of companies in Technopark:

Particulars	Foreign turnover	NRI turnover	Domestic turnover	Total turnover
Software/IT turnover	83.25	77.00	27.95	188.20
Hardware	20.00	-	-	20.00
Total	103.25	77.00	27.95	208.20

Source: Technopark.

Kerala Industrial Infrastructure Development Corporation (KINFRA) has promoted two IT parks i.e. KINFRA Information Technology & Electronics Park (KITEL) at Kakkanad, Cochin Malappuram and Calicut with the view to improving infrastructure and resource endowment, thus enhancing the growth potential of each area and generating employment.

## Appendix – 4.1

Table 2: Software growth rates

Year	Software Exports (US \$m)	Export Growth (%)
1980	4	-
1981	6.8	70%
1982	13.5	99%
1983	18.2	35%
1984	25.3	39%
1985	27.7	9%
1986	38.9	40%
1987	54.1	38%
1988/89	69.7	-29%
1989/90	105.4	51%
1990/91	131.2	24%
1991/92	173.9	33%
1992/93	219.8	26%
1993/94	314	43%
1994/95	480.9	53%
1995/96	668	39%
1996/97	997	49%
1997/98	1650	65%
1998/99	2180	32%
1999/2000	3600	65%
2000/01	5300	47%
2001/02	6200	17%
2002/03	7800 (est.)	24(%)

Source: NASSCOM reports (various years).

Table 4: State-wise Software Exports through STPI (During 1998-99 to 2001-02)

(Rs. in Crore)

States	1998-1999	1999-2000	2000-2001	2001-2002
Andhra Pradesh	574	1059	2017	2805
Delhi	475	795	1100	1750
Karnataka	2888	4321	7475	9904
Kerala	44	67	141	159
Maharashtra	529	1534	2570	4603
Tamil Nadu	748	1874	2954	5016
Haryana	180	405	1450	2140
Uttar Pradesh	674	1220	1660	2000
India	6300	11607	20051	29523

Abbr.: STPI : Software Technology Parks of India.

Source : Rajya Sabha Unstarred Question No. 1630, dated on 01.08.2002. Retrieved from www.indiastat.com on 10/02/04.

Table 5  
State-wise Number of Units Registered under STPI (During 1998-99 to 2001-02)

States/UTs	1998-99	1999-2000	2000-01	2001-02
Andhra Pradesh	192	977	1206	1345
Karnataka	276	746	932	1033
Kerala	50	188	208	231
Tamil Nadu	122	535	670	746
India	1204	5628	6673	7202

Abbr.: STPI : Software Technology Parks of India.

Source : Rajya Sabha Unstarred Question No. 1177, dated 14.03.2002 & Rajya Sabha Unstarred Question No. 1630, dated 01.08.2002. Retrieved from www.indiastat.com on 10/02/04.

Table 8: Growth rates of IT sector in South Indian States:

State	1999-2000	2000-2001	% share in South Indian Export
Andhra Pradesh	77.64	69.73	16
Karnataka	58.18	52.36	55
Kerala	37.26	53.94	1
Tamil Nadu	48.62	52.65	28

Source: Kiran, 2002

## Appendix – 4.2

### Indian Software Industry Policies:

1972	Software Export Scheme	Hardware imports were permitted for the purposes of software development.
1976	Further liberalization of policies related to the software industry	Hardware import duties reduced from over 100 per cent to 40 per cent. Faster clearance of software export applications; Export incentives like EPZs;
1981	Stricter controls on imports	Import duties on hardware were raised but software exporters could also import "loaned" computers.
1984	New Computer Policy	Import procedures for hardware and software simplified; Import duties for hardware and software reduced from 135 per cent to 60 per cent for hardware and 100 per cent to 60 per cent for software; Licensing procedures were simplified; Improved access to foreign exchange for software firms; Income tax exemption on net export earnings was reduced from 100 per cent to 50 per cent.
1986	Computer Software Export, Software Development and Training Policy	Imports of hardware and software were further deregulated, anyone could import software at 60 per cent duty. 100 per cent export oriented software production units were permitted to import hardware duty free.
1988	Software Technology Parks of India Scheme	Creation of software technology parks for the production of software for export.
1991	The Economy-wide Liberalization Program	Devaluation of the Rupee; Reduction in telecommunications charges for satellite links; duty-free and obligation-free imports of telecommunications equipment in the STPs; Reduction of import duties on software in 1994 to 20 per cent for applications software and 65 per cent for systems software and in 1995 to 10 per cent for both; Liberalization of hardware import duties and loans for importing hardware given certain export obligations.
1992	Rationalizing Tax Policies	Software exports brought under the Income Tax Act exempting exporters from income tax; Income tax exemption offered to EPZs and 100 per cent export oriented units was extended to software exports from companies taking part in these schemes which were established in or after 1993.
1995	Major changes in Indian Copy Rights Act 1957	Clearly explains the rights of the holder, user's right to have a back up copy and the punishments and fines for infringement.
1998	National Taskforce on IT	The Prime Minister of India formed a National Taskforce on Information Technology and Software Development to formulate a long term National IT policy

1999	New Telecom Policy	Long Distance and Basic Telephone services have been opened up for free competition. Internet telephony and revenue sharing have been permitted and BSNL has been set up.
1999	Recent Tax, Tariff and Exim policies.	There is no custom duty on IT imports, educational CD-ROMs and no license needed for importing 'software licenses'. No license needed for any software import from 1999 (Exim Policy 1999). Duty free imports of capital goods are allowed. Profits from software exports are exempted from Income Tax.
2000	Information Technology Act 2000 Cyber Laws	Aimed to provide a legal infrastructure for IT industry. Gives legal validity to digital signature and e-mail correspondence as a legal form of communication; provides a legal background for e-commerce; punishments and fines for infringement.
2000	The Communication Convergence Bill 2000	Establishes a regulatory framework and facilitates the infra-structural needs of IT industry.
	Recent govt. initiatives.	Domestic Tariff Area; Special Economic Zones (SEZs); Export Processing Zones (EPZ); 100 % Export Oriented Units (EOU); Software Technology Parks (STPs).

Sources: adapted from Heeks, 1996; Evans, 1992; Lateef, 1997; NASSCOM Strategic review (2003).



## Chapter V

### DETERMINANTS OF CONTRACT DESIGN

#### 5.1 Introduction

This chapter constitutes the core of the thesis as it delves into the survey data to examine how well the theoretical propositions posited earlier capture the real world hazards involved in inter-firm relations, identify and analyze the existing mechanisms in use to circumvent the hazards. From the foregoing chapters we have established that inter-firm relationship entails specific investments, and hence dependence and risk of 'hold-up'. What is needed therefore is a mechanism directing a course of action for the relation in the case of future contingencies. A mechanism simply means an organizational choice that gives enough incentives to both parties to work for joint surplus maximization and constrains undesirable practices that reduce the total surplus and just reallocate the existing surplus in favor of the one of the parties. In the case of specialized or custom-made components transaction, where vertical integration is uneconomical, a well-specified contract will be Pareto improving. The questions arise are:

- How complex a contract should be or what are the determining factors of contract complexity?
- How are the quasi rent created in the relation and the associated risk shared among the parties and what are its implication on the contract design i.e. contract complexity and type?

From the discussions in the previous chapters we expect that the agents would decide upon a particular type and the level of complexity of contract contingent on the characteristics of the agents, the project characteristics and the external environment. In other words, in the case of more complex and uncertain projects, which involve huge asset specific investments too, reputed firms are more likely to get T&M contract and economize on the cost of contracting. To examine this we have first looked into the descriptive evidence from the data obtained about 48 contracts from 30 firms in Technopark to identify the nature of the agents, projects and the contracts they device. We have further explored the variables by cross-tabulating them to contrast how the choice of contract type and complexity of contract varied depending on project characteristics to identify trends and relationships between them. Finally we have used a Logit model to estimate parameters of the determinants followed by peroration that recapitulates what is been corroborated and what is not by the data available to us. To start

with, we explore the survey data using descriptive and inferential statistics to bring out the basic features of the data and present the summary measures.

## 5.2 Firm Characteristics

Firm characteristics, project characteristics and the external environment in which the firms are operating are the determining factors of organizational choice. These factors have significant influence on organizational choice because they affect the outcome of the relation. Williamson (1993) says each set of these attributes has to be aligned with an organizational mode in a discriminating way to minimize the transaction cost. Firm characteristics encompass their technical capabilities, scrupulousness and willingness to bear risk and so on. For example, willingness to bear risk is one of the major factors in deciding the type of the contract i.e. whether fixed price or cost-plus contract and scrupulousness and proven capabilities will influence the partner selection and the complexity of the contract. We will summarize the important characteristics of the firms that we observed in the following.

Descriptive evidence from the survey is presented in table-I. Even though the majority of the firms are fairly young – founded between 1989 and 2002 – we have a considerable number of old firms also in the sample. However the population seems to consist largely of younger firms.

Table I: Firm characteristics:

	Mean	Mode	Std. deviation
Firm founded	1997.27	2000	3.79
Subsidiary	0.35	0	0.48
Legal Adviser	0.74	1	0.44
Legal Review	0.89	1	0.31
Had any employee with the client	0.19	0	0.39
Modes of obtaining the projects	2.48	3	0.85
Quality Certification	0.33	0	0.48

Quite a few of them are back offices of foreign firms concentrating mainly on voice-based projects such as medical, business and legal transcriptions. In our sample, business and medical transcriptions account for around 30% of total contract observed. The rest includes networking, web designing and a range of varied miscellaneous services. These are all considered to be low value-added, standardized projects that involve less uncertainty and learning from the supplier's point of view. One of the notable features of Indian software industry is its human capital. Many of the local entrepreneurs have some work experience

abroad and run the business with the help of their past contacts. However this feature was not adequately represented in our sample as only 20% of the firms observed had somebody with this exposure. Having quality certification is the rule of the industry, however the majority of the firms in the sample seem to not have one. But many of them have reported that they have applied for or have plans to acquire quality certification in the near future.

One of the interesting features to be noted from the sample data is that across size, age and specialization, firms have their own legal advisers and more than 80% of them seek legal assistance in reviewing the contract. This shows the importance of contracts and the legal requirements for better relational management in IS outsourcing<sup>1</sup>. The modes of obtaining the contracts are also more or less the same for the firms as they all mainly depend on direct contact for obtaining the contracts rather than having offshore development centers or advertisements.

### **5.3 Project Characteristics**

Project characteristics or transactional characteristics are the major concerns in Transaction Cost Economics, as transactions are considered to be the unit of analysis. In TCE, there are four major exchange hazards which are thought to necessitate contractual safeguards: asset specificity, bounded rationality, complexity in measuring effort/performance, and uncertainty (Williamson, 1979). Organizational choice, to a large extent, is influenced by them. Through threats to terminate the relationship, in the face of asset specific investments, one or both the parties may seek to appropriate an undue share as quasi-rent from these specialized investments (Klein, 1988). Uncertainty and complexity will further exacerbate the problem as they make the relation vulnerable to unexpected contingencies. Optimal investment will be realized only if his relationship specific investments are protected by a formal contract. These attributes have significant implications on the design of the contracts i.e. both complexity and type of the contract.

Firm-specific assets are defined as human assets, physical assets, and organizational knowledge that are not redeployable to alternative uses (Williamson, 1985). Since human capital is a critical component of BPO and ITES outsourcing services, our measurement focuses primarily on specialized human assets, such as man-hours sunk in the project specific

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<sup>1</sup> One of the respondents said, "everything looks great on papers, but the ground realities are different. Having a well-specified contract is the starting point of the relation. Legal assistance is a must".

to the client. It is highly varied<sup>2</sup>, but the mode being modest 620 man-hours the average firm in the sample mostly gets short duration projects.

Table II: Project characteristics:

	Mean	Mode	Std. Deviation
Man-hours Spent	1874.46	400	3109.15
Complexity*	1.17	3	0.78
Uncertainty*	0.77	2	0.78
final output well defined*	1.52	2	0.55
process well defined*	1.46	1**	0.58
familiarity with the project*	1.60	2	0.57
Familiarity with the Platform*	1.75	2	0.53

Note: \* all are categorical variables labeled low (1), medium (2) and high (3).

\*\* Multiple modes exist. The smallest value is shown.

Both complexity and uncertainty, empirically captured by subjective evaluations of the respondents, give a slightly different picture. The contracts in the sample tend to be more of complex nature rather than uncertain, as the mode indicates that projects are highly complex as against uncertainty that is very little in the observed cases. The respondents were asked to express their subjective evaluation of these attributes in a six-point scale. High complexity of the project indicates that the contracts devised to protect against opportunism, to specify rules of sharing the risk and quasi rent from the project, should be complicated and highly customized to encounter all possible contingencies. We observe that a high proportion of contracts is of high complexity. However, we do not observe many reporting high uncertainty.

As they are young and emerging, they mostly get projects that are simple and well defined and in which they are well acquainted and have well established past success record. Projects that require substantial change in the configuration of hardware, software and skills required in the course of execution are infrequent in the region. This, in turn, indicates that the projects observed are more or less standard. A more standard project can be managed with a less complicated, fixed price contracts, as standard projects are well understood by both parties and there is less probability of unwanted denouement (Williamson, 1979).

To summarize, the descriptive statistics provide a mixed result supporting the need for highly complex contracts, as there are more number of complex projects are observed. On the other hand, as the firms are young and the majority does not have quality certification one would expect them to get less complex Fixed price contracts. We further explore the nature of the contracts observed in what to come.

<sup>2</sup> This much high variation is due to medical and business transcription contracts, as they are continuous projects.

## 5.4 Contract Characteristics

A software project is a mutually agreed upon set of related tasks executed to achieve a specific objective in a given time limit by the service vendor for the interest of the client. A typical software development project includes, as the popular text books in the subject suggest (Pressman, 2000), the process of execution such as project specification, analysis, design, programming, test and implementation of the software and also a broad definition of the scope of the software intended to be produced etc. Irrespective of the type of the project, software service vendors have to give a project proposal specifying broadly an estimate of the cost and time requirements. As the time limit, cost budget and quality requirements are considered to be the major hurdles in achieving the project's objectives, a software proposal is expected to give a broadly expected future course of action on these fronts.

Table III: Contract characteristics:

	Mean	Mode	Std. Deviation
Total man-hour spent on contracting*	106.71	1**	123.39
% spent on contracting to total man-hour spent*	0.12	1**	0.11
How detailed the contract was*	0.90	2	0.66
No of pages in the contract	5.77	5	2.20
Contract complexity*	0.58	2	0.50
Compensation package (type)*	0.48	1	0.50
Contract execution:			
Approx. cost savings [%]	33.64	30	12.64
Cost revision	4.06	0	6.58
Man-days revised	6.63	0	10.26
Approximate total revision	5.34	0	8.42

Note: \* all are categorical variables labeled low (1), medium (2) and high (3).

\*\* Multiple modes exist. The smallest value is shown.

Total expenditure on contracting encompasses man-hour spent on writing the proposal, specifications and drafting the contract. Expenditure on contracting ranging from zero to 400 man-hours that constitute more than 10% of total man-hours spent in majority of the cases implying the importance of the importance of the magnitude of project specification and devising contracts. All three of the above mentioned costs are included in our measure of contract complexity<sup>3</sup>. Majority of the respondents felt that the contracts were, if not highly customized and complex, fairly complex and the average contract length were 5 pages.

The common compensation package or the contract types used in the industry are Fixed-price contract, Time and Material contract (cost plus), and a mix of these two. A fixed price

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unlike the other one-shot software development projects.

contract places a huge risk on the supplier in the face of uncertainty even though it gets rid of the nominal price uncertainty. But when relative market prices change, either of the parties may suffer pecuniary losses and face adaptation costs. It stringently expects from the firm a complete performance of the services in accordance with the contract terms at a price decided upon at the commencement of the project. A T&M contract provides more space for the parties as it provides the materials required within the decided time span. A mixed contract, as the name suggests, is a combination of Fixed-price and T&M contracts. We observed that the firms got more of Fixed-price contracts than T&M.

Despite careful specifications, cost overruns<sup>4</sup> are highly frequent in the industry as the projects are of high complexity and ever changing requirements. One of the major aims of contracting is to devise a course of action to share the future costs and benefits of the relation. If at all any dispute arises, even though none reported any dispute in the sample, it will be of sharing the overrun. In more than 50% of the cases the stipulations regarding either man-hour or costs were revised and the mean revision is about 5% of total expenditure<sup>5</sup>. Overruns are not uncommon in the industry. But the respondents were very reluctant to disclose any information on who bore the cost overrun and how it was determined. To further our understanding of what determines the type of contracts or level of contract complexity the subsequent analysis will be of help.

### **5.5 Determinants of contract type and complexity**

Perhaps one of the simplest inferential tests is to compare the average performance of two groups on a single measure to see if there exists statistically significant difference. Aiming to see whether the independent variables i.e. project characteristics differ on the outcome measure from the dependant variables i.e. contract type and complexity, we used inferential statistics to make judgements of the probability that an observed difference between groups is a likely one or one that might have happened by chance in the sample.

A typical contract of an outsourcing relationship may involve contractual terms and stipulations on technicalities such as hardware to be used, a base software license, custom development, training, modifications, implementation, additional product components as they

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<sup>3</sup> See appendix-5.2 for the description of measurement of the variables included in the analysis.

<sup>4</sup> Overruns are defined as the difference between the estimated and actual costs.

<sup>5</sup> What is more important in inter-firm relation is how these disputes over cost overruns are solved and ultimately who bears the cost. But many of our respondents were very reluctant to give any information on cost overrun sharing and disputes associated with it.

become available, upgrades, and annual support services. And safeguard measures against relational hazards will include incentive, control, end of the contract<sup>6</sup>, price and punishment clauses. We differentiate between contracts considering their depth in protecting against the hazards i.e. in terms of complexity of contracts and the types of remuneration.

The first type of classification is based on the price or remuneration clause of the contract. The types of contracts used in the Indian software industry, as mentioned earlier, are Fixed-price, Time-and-Material (T&M) and mixed contracts. One of the important issues tackled by contract type is to align the risk associated with the project to get the incentives right, especially in regard to rendering the required quality.

Table IV captures distributions of our target variables viz. contract type and complexity according to project characteristics. Simple cross tabulation itself confirms our proposition that highly uncertain and complex projects are secured by T&M contracts. As simple and well defined projects like web designing pose little threat of unexpected future contingencies, and the terms and conditions, man-hours required could more or less be unambiguously stated at the commencement of the project itself, a Fixed price contract would be adequate. But, given uncertainty, complexity and huge investment (man-hour) at stake, a risk averse agent would like to get a T&M contract that gives more space to try his/her hands on risky ventures.

On the other hand, a T&M contract, from the client's perspective, is perilous in the sense that it gives chances to the agent to shirk and blame it all to external disturbances. As long as the client is assured that the agent is scrupulous, trusted and tested, she will not settle for a T&M contract. Thus highly complex and uncertain projects are, as suggested in the literature, vastly reserved for reputed, well-established firms. Man-hours spent i.e. asset specific investments involved in the project, one of the determinants of inter-firm relations, does not seem to have any correlation with contract type and complexity.

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<sup>6</sup> End of the contract clause specifies the contract period.

Table IV: Distribution of project characteristics across package type and complexity of contracts:

		Package		Complexity of the contract	
		Fixed	T&M	low	high
Uncertainty	low	14 67%	7 33%	15 71.4%	6 28.6%
	high	11 41%	16 59%	5 18.5%	22 81.5%
Complexity	low	22 76%	7 24%	17 58.6%	12 41.4%
	high	3 16%	16 84%	3 15.8%	16 84.2%
Man hour	low	18 58%	13 42%	17 54.8%	14 45.2%
	high	7 41%	10 59%	3 17.6%	14 82.4%

The second kind of classification of contracts is according to the complexity of the terms and stipulations used in the contracts. Writing a complex contract is costly, but given uncertainty and complexity of the projects, contracts have to be complex i.e. complete enough to include all the relevant conditions and rules of sharing unambiguously. As expected, higher the complexity of the project, higher the uncertainty and man-hour sunk in the relation, more complex the contracts tend to be.

One of the informal ways of economizing on the cost of writing a complex contract is to develop some understanding or gather relevant information about the partner's technological and behavioral traits. Creating and nurturing reputation is one among them. Reputation economizes on search costs and the costs of drafting and monitoring the contracts, because reputed firms have no reason to go for short-term gains based on opportunistic behaviour. It thus lowers the fear of opportunism and gives more flexibility to the relation. Good reputation sets the floor for mutual trust, helps identify scrupulous partner and mitigates the conflict of interest.

Reputation is measured in terms of their age, quality certifications, and previous relations with the client and NASSCOM membership. NASSCOM membership is not considered seriously in the study, as we did not have a considerable number of firms with membership, whereas quite a few of them have acquired ISO and CMM to enhance their relations with their clients.



Table V: Reputational variables:

	Mean	Mode	Std. Deviation
Quality Certification*	0.33	0	0.48
NASSCOM Membership*	0.08	0	0.28
Age	1997	2000	0.38
No. of previous projects	0.83	0	1.28
How old your relationship [years]	0.63	0	0.79

Note: \* Both are categorical variables labeled no (1), yes (2)

Thus the selection of an appropriate contract type depends on factors such as the characteristics of the parties involved, components transacted, the uncertainties and complexities involved in contract performance and the extent to which the players are to assume the risk. Given the nature of the transaction in the IT sector the major concern is quality of the services outsourced. A client would normally look for these precautions. Indian software companies relentlessly aspire to acquire the credibility in the international market through highest standards of quality assurance certifications like ISO 9000 and CMMs, thereby gaining an advantage as a credible service provider.

Our sample supports this, as older firms and firms with either ISO or CMM certification get highly complicated and uncertain projects wherein they often experiment as they proceed.

Table VI: Distribution by reputation across package type and complexity of contracts:

		package		complexity of the contract	
		Fixed	T&M	low	high
previous relations with the client	New client	14 70%	6 30%	7 35.0%	13 65.0%
	Old client	11 39%	17 61%	13 46.4%	15 53.6%
Quality Certification	no certificate	22 69%	10 31%	17 53.1%	15 46.9%
	ISO 9001/CMM	3 19%	13 81%	3 18.8%	13 81.3%
YEAR	new	20 80%	5 20%	14 56.0%	11 44.0%
	old	5 22%	18 78%	6 26.1%	17 73.9%

We observed from the discussions with the senior project managers of these firms that they did place importance on quality certifications in communicating their quality to their clients as first hand information. However, it is costly. It does seem to work, as the ISO/CMM firms get more of T&M contracts, although our data do not show that ISO/CMM firms manage to

reduce the cost of writing complicated contracts. But a mere quality certification assures the capabilities and leaves the behavioral uncertainties untackled. We propose quality certification as a necessary condition for economizing on contract complexity and getting T&M contracts as it assures the capabilities. But age and previous relations with the client assuring the behavioral credibilities suffice. Age as a reputation measure indicates that older firms, which are supposed to have their proven record, fetch T&M contracts and help them economize on the cost of contracting. Previous relationship with the clients seems to be the most important factor in fetching T&M contracts and helps them economize on the cost of contracting.

## 5.6 Regression Results

The problem at hand could quite satisfactorily be tackled by Logit regression models that estimate the likelihood of observing a particular character of the dependant variable given the response variables. We have, in our survey data, the *man-hour spent*, *complexity* and *uncertainty* associated with the project and reputation variables measured as *age*, *quality certificate* and *pre-relation* for each contract. The *man-hour spent*, *complexity* and *uncertainty* have been taken as categorical variables with two possible responses “high” and “low”. *Age* is categorized as high if the firm was founded before 1997 and low if it was after. *Quality certifications* include both CMM and ISO certifications. *Pre-relation* with the client is measured in two ways, the number of projects done with the client and years of relations with them. The problem is to see what enhances the probability of a firm striking a less complex contract.

As proposed in the literature we first estimated the determinants of contract complexity given the project characteristics such as *man-hour spent*, *complexity* and *uncertainty*. It seems to corroborate the result that asset specificity, complexity and uncertainty require highly pre-emptive, complex contracts, as the final outcome of the relation could not be precisely known at the beginning of the project. Our results are consistent with the empirical findings of earlier studies. However *man-hour spent* turns out to be insignificant in the model we tried estimating a new model without the variable and the results showed some improvement. However, it does not seem to influence the decision of contract intricacy.

Table VII: Determinants of contract complexity:

MODEL S	CONST ANT	UNCRE TAINTY	COMPL XITY	MAN HOUR	PRE- RELATI ON	YEAR	CETRIFI CATE	RELATIO N*YEAR	RELATION* CETRIFICAT E	-2LL	CS R <sup>2</sup>
1	1.18*	3.37*	1.38	2.03**	-1.67	2.50**	1.02	-	-	33.38	0.48
2	0.91**	2.64*	2.56*	1.03	-	-	-	-	-	39.92	0.41
3	0.92**	2.66*	2.69*	0.93	-0.82	-	-	-	-	38.89	0.42
4	0.98**	2.73*	1.81**	1.64	-	1.68**	-	-	-	37.12	0.44
5	1.10*	3.34*	0.83	1.15	-	-	2.55	-	-	37.75	0.44
6	1.21*	2.92*	2.78*	1.18	-	-	-	-2.30	-	38.35	0.43
7	0.94**	2.67*	2.59*	1.12	-	-	-	-	-0.55	39.81	0.41

\* Correlation is significant at the 0.05 level or better.

\*\* Correlation is significant at the 0.10 level.

-2LL is -2 Log likelihood

CS R<sup>2</sup> is Cox & Snell R<sup>2</sup>

Our second proposition is that the firms with high reputation measured by *age*, *quality certificate* and *relation*, given the project characteristics, tend to economize on writing a stringent, intricate contract vis-à-vis non-reputed firms as reputation forms the basis for trust in the relation. Thus we have introduced reputation variables in the model to quantify the importance of reputation and mutual trust in the relation in minimizing the cost of contracting. But the results of our prime model hardly extend any support to our propositions put forward as *age* and *certificate* have wrong sign while all three of them including *pre-relation* turn out to be statistically insignificant even at higher levels of significance. Suspecting multicollinearity among the reputation variables we tried to quantify the impact of each of them separately on contract complexity given the project characteristics. Here too except *pre-relation* the other two have negative signs and none seem to be statistically significant. When we introduced the interactive term of reputation variables, especially *relation* by *age* and *pre-relation* by *certificate*, we got the right sign and the model fit considerably improved, indicating the importance of *pre-relation* coupled with either of the other two reputation variables. This could mean that *pre-relation* was the necessary condition, while either *age* or *certificate* would suffice to minimize the cost of contracting.

It is well articulated in the literature that reputed firms are more likely to get T&M contracts that render more congeniality to the relation and adaptability to unexpected contingencies. Apart from the initial, simple interpretations of significance level and the expected sign of the coefficients, we further looked into the odds of the occurrence of dependant variable. Our

interest here is to observe the likelihood of getting T&M contract given *age*, *quality certificate* and *pre-relation*. The odds of having T&M contract for a firm with a new client<sup>7</sup> is 0.3 implying that there are 30 firm who have T&M contract with a new client for every 100 firm do not have T&M with their new clients (see appendix-5.1 for tabulation). With an old client the odds are 1.54 indicating the higher possibility of a firm to have T&M contract with their old clients. The odds for an ISO/CMM certified firm to get T&M are 4.30 and for an old firm are 3.60. The simple odds of observing T&M confirm the importance of any form of reputation. In a bivariate logistic regression odds ratio measures the change in the likelihood of observing a characteristic or simply the changes in the odds about a change in an independent variable. One could use this to compare the relative importance of reputation measures. But the odds ratio of 1 for all the reputation variables in the sample indicates that moving from one reputation measure to another does not increase the likelihood of T&M.

Table VIII: Determinants of contract type:

MODEL S	CONST ANT	UNCRE TAINTY	COMPL XITY	MAN HOUR	PRE- RELATI ON	YEAR	CETRIF ICATE	RELATI ON*YE AR	RELATI ON* CETRIF ICATE	-2LL	CS R <sup>2</sup>
1	0.22	1.67	1.14	1.22	1.53	2.66**	1.17	-	-	33.74	0.49
2	0.15	1.30**	2.93*	-0.21	-	-	-	-	-	45.83	0.35
3	0.07	1.54**	3.02*	-0.15	1.57**	-	-	-	-	41.80	0.40
4	0.26	1.41	1.90*	1.32	-	3.11*	-	-	-	36.07	0.47
5	0.07	1.55**	2.14**	-0.22**	-	-	1.10	-	-	39.46	0.43
6	0.30	1.49**	3.10*	-0.26	-	-	-	-2.24		43.84	0.38
7	0.21	1.45**	3.15*	0.08	-	-	-	-	-2.49	43.41	0.38

\* Correlation is significant at the 0.05 level or better.

\*\* Correlation is significant at the 0.10 level.

-2LL is -2 Log likelihood

CS R<sup>2</sup> is Cox & Snell R<sup>2</sup>

The results of the model that include all reputation variables and project characteristics are not statistically significant. But when introduced individually in the model given project characteristics reputation seems to influence the type of the contract that the firm gets. Firms that are old (*age*), with *certification* and *pre-relation* are 22 times, 12 times and 5 times more likely to get T&M contract comparing to non-reputed firms respectively. On the contrary to

<sup>7</sup>  $O_{\text{new client}} = 6/20 = 0.3$ ;  $O_{\text{old client}} = 17/11 = 1.54$

$O_{\text{no ISO}} = 10/22 = 0.45$ ;  $O_{\text{ISO}} = 13/3 = 4.3$

$O_{\text{new}} = 5/20 = 0.5$ ;  $O_{\text{old}} = 18/5 = 3.6$

the models of contract complexity determinants, here when the interactive terms of reputation variables are introduced, there is no notable improvement in the model fit.

From our interview with the project managers, through a semi-structured questionnaire, we have informally observed that majority of them felt that however trite a contract appears, it is the key to a BPO endeavor. However, writing a contract does not ensure the smooth relationship. As the projects are subject to too many exogenous shocks, there is a need for some informal arrangements for measuring and tracking the performance against project milestones. The first part of managing the relationship is contracts that stipulate what the provider promises to do and measures progress toward this objective on a regular basis and the second is to hold them accountable. Accountability seems to be the key issue. From the analysis of the characteristics of the transaction, the environment and the control strategy adopted, i.e. the strategies to keep the supplier accountable, it appears that the pattern of control is trust based, rather than market based or bureaucratic hierarchy based.

The relationship is managed by social controls developing over time, and through the development of trust, particularly goodwill trust. But dispute among the firms is something inevitable as the projects involve huge uncertainty and complexity. However, a few of them felt that they rely on the clients' country contract laws, as the client feels comfortable with the relatively more sophisticated laws than Indian Contract Laws. Still a few of them wanted an insider from the industry as the third party arbitrator e.g. NASSCOM would be of much use in the sense that it is relatively simpler for an insider to understand the complication in the projects than a judge who is not an expert in technology.

### **5.7 Summary of the Findings**

We aimed to empirically test the determining factors of contract design governing inter-firm relations. The results fairly support the propositions put forward in the previous sections. Firms in the sample tend to have quality certification or at least have plans to acquire it in the near future. Mostly they are all young firms getting less uncertain contracts, but complexity of the projects seems to be high.

The question was to understand what determines the type of contracts or level of contract complexity. The types of contracts we observed were Fixed-price, Time-and-Material (T&M) and mixed contracts. Cross tabulation results confirm that highly uncertain and complex

projects are protected by T&M contracts and further high complexity, uncertainty and man-hour sunk in the relation tend to get more complex the contracts.

Complex contracts restricts adaptation and costly too. Firms with high reputation, given the project characteristics, tend to economize on writing a stringent, complex contract and get T&M contracts that insure the supplier against risk. The results confirm the significance of all the reputation variables in influencing contract design, but the relative importance of reputation measures is not clear from the sample. It indicates that even without quality certification a firm can economize on cost of contracting and get T&M contract if it has long understanding with its clients and even the vice versa holds. But the measures seem to work together. When interactive terms of reputation variables introduced the model fit considerably improved with right sign for the variables. *Pre-relation* seem to have taller effects along with either of the other two variables indicating its importance in outsourcing relations.

## Appendix 5.1

### Variables list

			Frequency
Dependant variables	package	fixed	25
		T&M	23
	complexity of the contract	low	20
		high	28
Project characteristics	Man-hour	low	31
		high	17
	complexity	low	29
		high	19
	uncertainty	low	21
		high	27
Reputation variables	Quality Certification	no certificate	32
		ISO 9001/CMM	16
	Age	new	25
		old	23
	previous relations with the client	New client	20
		Old client	28

### Odds of observing T&M by reputation:

		package			complexity of the contract		
		Fixed	T&M	Odds	low	high	Odds
Relations	New client	14	6	0.43	7	13	0.54
	Old client	11	17	1.55	13	15	0.87
Certification	no certificate	22	10	0.45	17	15	1.13
	ISO/CMM	3	13	4.33	3	13	0.23
Age	new	20	5	0.25	14	11	1.27
	old	5	18	3.60	6	17	0.35

## Appendix-5.2

### Measurement of Variables

Questionnaire items, unless stated otherwise, are measured using a 6-point scale in which "1" represents "low degree" and "6" represents "high degree".

*Asset Specificity:* Firm-specific assets are defined by human assets, physical assets, and company-specific routines and knowledge that are not redeployable to alternative uses (Williamson, 1985). Since human capital is a critical component of BPO and ITES outsourcing services, our measurement focuses primarily on specialized human assets, such as man-hours sunk.

Both *complexity* and *uncertainty* are measured in a six-point scale by asking respondents to give their subjective evaluation. We measure the degree of change in both skills and technology using two items: 1) to what degree are the underlying skills associated with this IS function rapidly changing? and 2) To what degree is the optimal configuration of hardware and software required to perform this function rapidly changing?

*Contractual Complexity:* Following Macneil (1978), Poppo (2002), we measure the degree to which the parties created a complex contract by asking respondents to indicate their level of agreement (1=strongly disagree, 6=strongly agree) with the following statement: the formal contract is highly customized and required considerable legal work. Our survey also requests respondents to indicate the length of the contract (in pages), which previous works have shown as an indicator of contractual complexity (Joskow, 1988). The third measure of contractual complexity is the number of contractual clauses included in the contract (Saussier, 1998).

*Reputation:* A key determinant of relational governance is measured as a composite index of age, repeated contracts and quality certification. As history of trade is necessary for the development of relational norms (Macneil, 1978, 1980), the duration of time that the two parties have worked with one another is measured by asking how old their relationship is and how many projects they have done with the same client. The respondents are asked whether they are ISO or CMM certified.



## Chapter VI

### SUMMARY AND CONCLUSIONS

The major findings of the study are summarized and the implications are discussed below. We attempted to analyze the dynamics of the inter-firm relations, the barriers to exchange relations in the context of Indian IT sector. Our objective was to substantiate the conceptual framework put forward by Foss, Noteboom and others. It is a mix of Transaction Cost Economics framework and Resources Based View of the firm that draws attention to the importance of the organizational structure in minimizing transaction cost using both formal (judicial mechanism) and informal (reputation and trust) institutional mechanisms. Understanding the relation between organizational design i.e. contract type and the determinants of organizational choice put forward in the literature i.e. project and agent characteristics and external institutional environment is a necessary step in understanding why and how contracting occurs, and how it is enforced. We systematically examined actual contracts to empirically examine these theoretical conjectures by collecting contracts from the IT industry.

We also analyzed inter-firm relations in the background of the broader question of the role of the state in industrial progress. In the context of Indian IT industry we also tried to examine the state's initiatives in providing infrastructure and institutional requirements for faster growth, placing more emphasis on the latter. The general feeling in the industry, as brought out in the study, was that the state should help promote the institutional arrangements to solve the disputes more informally. The much talked institutional measures for economic progress i.e. a well-developed judicial system especially the contract law and enforcement mechanisms seem to be useful as only the last resort if disputes cannot be solved with minimum cost by the players, or cannot even be arbitrated by an insider within the industry.

Studies in industrial organization in India seem to have paid little attention to the institutional requirements of market exchange and the extent to which these institutions or the lack of them could facilitate/constrain trade between firms. Institutional inadequacies lead to high transaction costs, which might restrict the choice among alternative modes of organization, and the market potential would not be realized. TCE provides the floor for analyzing the existing formal and informal rules of the games i.e. institutions and their implications on inter-firm transactions.

We have looked into the contracts struck by the IT firms to understand how much they rely on formal judicial mechanism, or to put it differently, what the agents expected the courts to do in facilitating inter-firm relations. We also interacted with the project managers who were responsible for devising contracts and managing the relations, to understand their informal relations with their clients.

The proposition that we put forward was that asset specificity, complexity of the project and uncertainty involved in the project make the relation more complicated. Thus they require more complex contracts that meticulously deal with all the conceivable future contingencies and rely heavily on the formal legal mechanism for enforcing it. As it is put forward in the literature, we have found in the survey that highly complex and uncertain projects are more likely to be dealt by a complex contract. Asset specificity does not seem to be influencing the nature of the contracts. This corroborates the theoretical proposition that complex and uncertain projects are more likely to be protected by more complex contracts.

Different incentives implicit in those contract forms (Time and Material contract or Fixed Price contract), both to the buyer and to the service provider, suggest that the key contractual differences have economic rationale. To the extent that those differences have economic consequences in terms of the coordination efficiencies by minimizing the expected costs of relational hazards, a study probing into the determinants of contracts is important. We have found in the survey that there were differences in contract design that could be attributed to both the project type and agent type. An agent seems to device time and material contracts with only those with whom the agent has less asymmetry of information. Thus deciding on the contract type (whether Time and Material contract or Fixed price contract) requires a thorough analysis from the buyer's part about seller's quality.

The problem could be classified into as it was explained in the text earlier i.e. the problem of identifying a capable partner and providing incentives to maximize the total output. Identifying the right partner could be facilitated by quality certification that signals the capability of the seller. But the problem seems to be more acute when it comes to the question of right incentives. Time and material contracts give enough breathing space to the supplier to try his hand on risky complex ventures, and at the same time it exposes the buyer to post-contractual opportunistic behaviour.

For example a more complex and uncertain project that also requires asset specific investment is better served by a time and material contract (cost plus contract), because before the project starts it is almost impossible to decide upon the cost of the project effectively so as to base the contractual terms on it. When there is a high probability that the project cannot be so accurately defined, because of its complex nature and when disputes over the stipulations in the face of unexpected contingencies would be costly, time and material contract gives a breathing space for the parties to accommodate the unexpected events. As the name suggests, time and material contract would cover all the resources spent on the project plus a nominal profit. But the difficulty in striking a time and material contract is that it gives simply too much space to the supplier, who might escalate the cost to capitalize on the unexpected contingencies as happened in the most famous contract debacle of GM-Fisher's. But given the complexity and uncertainty of the project, it is of interest for both the parties to have a time and material contract as it provides space for adapting to unexpected contingencies. This is where informal understanding between the firms plays an important role.

Courts too play a vital role. Being in the background judicial system facilitates the inter-firm relations by rendering the threat of execution in the case of default. But it is costly to rely on the court to enforce the contracts perfectly because of the court's imperfect information regarding the specificities of the contractual relationship including the technical issues. It is more so in the case of developing countries where the judicial system is slow and inadequate and the judicial process itself imposes additional costs on the parties. So it is mutually advantageous for both the parties if they could devise some informal mechanism that would make the contract self-imposing at a lower cost.

TCE takes rather cynical view of human interaction while analyzing inter-firm transaction as a meticulously designed transaction cost minimizing game. This extreme stand leads to a conclusion that given the third party arbitration, firms feign cooperation while constantly searching for a situation to capitalize on the weakness of the partner to maximize their benefits out of the relation. But management theorists and sociologists do believe in that business relations involve much more than a simple calculation of discounted pecuniary benefits in a repeated game set up. Reputation and informal elements in a relation play a crucial role in deciding on the type of contract. Reputation is gained through long-standing relationship with the client, age of the firm and formal quality certifications. All these turned out to be the factors influencing the contract design in the study.

Our study provides some empirical evidence this analytical approach to analyzing inter-firm relations. Our approach combines insights drawn from TCE and its other variants that focus on reputation or trust as the key elements in a contractual relation.

The scenario of complex and uncertain projects safeguarded by complex contracts found in the survey changes dramatically when reputation of the agents, the source of trust, was introduced in the model. Reputation and trust seem to reduce the complexity of the contract and reduce the need for spending resources on restricting other party from unethically taking advantage of an unexpected contingency.

However, our study has not looked into the learning aspect of IS outsourcing relationships. It was found in the survey that firms in our sample get projects where they have proven expertise and learning possibilities are mediocre. But a study of wider scope that includes firms, which execute even hi-end projects, would be more appropriate if we wanted to look into the learning aspect of the relation. When a relationship involves new learning i.e. dissemination of new technological knowledge and tacit transactional knowledge, the problem becomes even more complicated and the need for more well specified contracts to direct the course of action increases tremendously.

## REFERENCES

- Abraham, Katharine G. and Taylor, Susan K. (1996), "Firm's Use of Outside Contractors: Theory and Evidence," *Journal of Labor Economics*, 14, 394-424.
- Allen, D. W. and D. Lueck (1992), "Contract Choice in Modern Agriculture: Cash Rent Versus Cropshare." *Journal of Law and Economics* 35(2): 397-426.
- An, J.M. (2001) Main Issue and Success Strategy of IS Outsourcing, *Information Industry*, May-June, pp. 56-59.
- Ang, S. and Straub, D. (1998), Production and Transaction Economies and IS Outsourcing: A Study of the US Banking Industry. *MIS Quarterly*, December, 535-552.
- Apte, U. M., Sobol, M. G., Hanaoka, S., Sarrinen, T., Salmela, T., & Vepsalainen, P. J. (1997). IS outsourcing practices in the USA, Japan and Finland: A comparative study. *Journal of Information Technology*. 12.
- Aron, Janine (2000), Growth and Institutions: A Review of the Evidence *The World Bank Research Observer*, vol. 15, no. 1 (February 2000), pp. 99-135
- Arora, A. and Asundi, J., 1999, Quality Certification and the Economics of Contract Software Development: A Study of the Indian Software Service Companies, *NBER working paper 7260*, Cambridge, MA.
- Arrow, Kenneth J., (1969) "The Organization of Economic Activity: Issues Pertinent to the Choice of Market Versus Nonmarket Allocation," in *The Analysis and Evaluation of Public Expenditure: The PPB System*, vol. 1, U.S. Joint Economic Committee, 91st Congress, 1st Session, Washington, DC: U.S. Government Printing Office, 59-73.
- Arrow, Kenneth A. 1974, *The Limits of Organization*, New York: Norton.
- Arrow, Kenneth.J, (1998), The Place of Institutions in the Economy: A Theoretical Perspective, Hayami, Fujiro and Akoi, Masahiko (Eds): *The Institutional Foundations of East-Asian Economic Development*, For The International Economic Association, New York: St.Martin's Press, INC.
- Auriol Emmanuelle, Schilizzi Steven G.M, (2003), Quality Signaling through Certification Theory and an application to agricultural seed markets. <http://idei.fr/doc/wp/2003/certif5.pdf>
- Bajari, Patric., Tadelis, Steven (2001) "Incentives versus Transaction costs: A Theory of Procurement Contracts" *RAND Journal of Economics*, Vol. 32, No. 3, pp. 387-407.
- Bannerjee, A., and Duflo, E., (1999), Reputation effects and the limits of contracting: A study of the Indian software industry, *MIT Department of Economics Working Paper No. 99-14*
- Barthelemy, J. (2001) The Hidden cost of IT Outsourcing. *Sloan Management Review* 42(3), 60-69.

- Basu, Kaushik (1996) Some Legal Prerequisites of Economic Reform in India. *IRIS-India Working Paper* No. 11
- Bernheim, B.D. and Whinston, M.D, (1998), Incomplete contracts and strategic ambiguity. *American Economic Review*, 88: 902-932.
- Bhagwati, Jagdish (1985), *Essays on Development Economics*, vol. 1 Cambridge: MIT Press.
- Blau, P. (1964), *Exchange and power in social life*, New York: Wiley.
- Boerner, Christopher and Macher. J. (2001) "Transaction Cost Economics: A Review and Assessment of the Empirical Literature." *unpublished manuscript*.
- Chang, H-J. (2002), *Kicking Away the Ladder - Development Strategy in Historical Perspective*, Anthem Press
- Cheon, M. J., Grover, V., & Teng, J. T. C. (1995). Theoretical perspectives on the outsourcing of information systems. *Journal of Information Technology*, (10).
- Coase, R. H. (1937), "The Nature of the Firm." *Economica* 4 (November): 386-405.
- Coase, R. H. (1992), "The Institutional Structure of Production." *American Economic Review* 82 (September): 713-19.
- Collier, Paul. (1996), "The Role of the African State in Building Agencies of Restraint." In J. Mats Lundahl and Benno Ndulu, eds., *New Directions in Development Economics: Growth, Environmental Concerns, and Government in the 1990s*, pp. 282-98. Studies in Development Economics 3. New York: Routledge.
- Dakolias, Maria. (1996), The Judicial Sector in Latin America and the Caribbean: Elements of Reform, *Technical Paper* 319. Washington, D.C.: World Bank.
- Dataquest (2001), *The Issue: What if we don't move up the value chain?* March 28.
- Debreau, Gerard (1959), *The Theory of Value: An Axiomatic Analysis of Economic Equilibrium*, New York: John Wiley and Sons.
- Djankov S.; La Porta R.; Lopez-De-Silanes F.; Shleifer A (2003), Courts, *The Quarterly Journal of Economics* 1 May 2003, vol. 118, no.2, pp. 453-517(65)
- Dyer, J. and H. Singh. (1998), The relational view: Cooperative strategy and sources of inter-organizational competitive advantage. *Academy of Management Review*, 23: 660-679.
- Earl, M.J. (1996) The Risks of Outsourcing IT. *Sloan Management Review* 37, 26-32.
- Eggertsson, Thráinn, (1990), *Economic Behaviour and Institutions*, Cambridge University Press.
- Elmuti, D., Kathawala, Y., & Monippallil, M. (1998), Outsourcing to gain competitive advantage. *Industrial Management* 40(9), 20-24
- Evans. P. 1992. "Indian Informatics in the 1980s: The Changing Character of State Involvement". In *World Development*, Vol. 20, No. 1, pp. 1-18.

- Fafchamps, Marcel. (1996). "The Enforcement of Commercial Contracts in Ghana." *World Development* 24:427-48.
- Foss N J (1997) "The Classical Theory of Production and the Capabilities View of the Firm", *Journal of Economic Studies* 24: 307-323.
- Foss N J. (1998). The competence-based approach: Veblenian ideas in the contemporary theory on the firm. *Cambridge Journal of Economics* 22: 479 – 496.
- Gambetta, Diego (ed.) (1988) *Trust: Making and Breaking Co-operative Relations*, Oxford: Basil Blackwell.
- Gol (2000): *Action Taken Report of the National Task Force on Information Technology and Information Technology and Software Development*, [http://it-taskforce.nic.in/Software Development](http://it-taskforce.nic.in/Software%20Development), IT Action Plan: Part II III and I.
- Government of Kerala (2004), *Economic Review 2004*, State Planning Board, Thiruvananthapuram.
- Hamel, G. (1991), Competition for competence and inter-partner learning within international strategic alliances. *Strategic Management Journal*, 12: 83-103.
- Harilal K.N and Joseph K.J (2000), 'Stagnation and Revival of Kerala Economy: An Open Economy Perspective', working paper No. 305, *Centre for Development Studies*, Thiruvananthapuram.
- Hart, O. D., Holmstrom, B. (1987), "The Theory of Contracts" In Bewley (1987), 71-156.
- Heeks, R (1995): 'Import Liberalisation and Development of Indian Computer Industry', *Economic and Political Weekly*, August 26, pp M-82 – M-93.
- Heeks, Richard (1996) *India's Software Industry: State Policy, Liberalization and Industrial Development*, Sage publications, New Delhi.
- Hirschman, Albert, (1958), *The Strategy of Economic Development* New Haven: Yale University Press.
- Hobbes, Thomas. [1651] 1962. *Leviathan*, New York: Collier Books.
- Ibbs, C.W., Wall, D.E., Hassanein, M.A., Back, W.E., Del La Garza, J.M., Twardock, R.K., Kim, J.J., and Schran, S.M. "Determining the Impact of Various Construction Contract Types and Clauses on Project Performance: Volumes I and II." Documents SD-11, Austin, Tex.: The Construction Industry Institute, 1986.
- IDC (2001), <http://www.idc.net>, May 15th.
- Joskow, P. (1985), "Vertical Integration and Long-Term Contracts: The Case of Coal-Burning Electric Generating Plants." *Journal of Law, Economics, and Organization* 1(Spring): 33-80.
- Joskow, P. L. (1988), "Asset Specificity and the Structure of Vertical Relationships: Empirical Evidence." *Journal of Law, Economics, and Organization* 4(1): 95-117.

- Kaufmann, D., Kraay, A. and Zoido-Lobaton, P., (1999), *Governance Matters*. Washington, DC: World Bank. [www.worldbank.org/wbi/gac/gac\\_pdfs/govmatrs.pdf](http://www.worldbank.org/wbi/gac/gac_pdfs/govmatrs.pdf).
- Kiran, G R. (2002) Software and IT enabled services industry in Kerala, Centre for Development Studies, M.Phil Thesis Submitted to Jawaharlal Nehru University, New Delhi, Centre for Development Studies, Thiruvanthapuram.
- Klein, B., R. A. Crawford, and A. A. Alchian (1978), "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process" *Journal of Law and Economics*, 21 (October): 297- 326.
- Klein, Benjamin. (1988). "Vertical Integration as Organized Ownership: The Fisher Body–General Motors Relationship Revisited," *Journal of Law, Economics and Organization* 4, pp. 199–213.
- Knack, Stephen, and Philip Keefer. (1995) "Institutions and Economic Performance: Cross Country Tests Using Alternative Institutional Measures." *Economics and Politics* 7:207–27.
- Kodak, (1989), Kodak hands over processing to IBM. *Computer World*, 23 July 31.
- Kopetz, H (1995): The Software Market: Emerging Trends in UNCTAD's *Advanced Technology Assessment System: Information Technology for Development*, Issue 10, Autumn, p 296, United Nations, New York and Geneva.
- Kreps, David and Robert Wilson (1982), Reputation and Imperfect Information, *Journal of Economic Theory* 27:253-279
- Kreps, David M. (1990) *A course in microeconomic theory*, New York: Harvester Wheatsheaf.
- Krueger, Anne O. (1979), The Political Economy of the Rent Seeking Society *American Economic Review* 64:291-303.
- Laabs, J. J. (1993): Why HR is turning to outsourcing. *Personell Journal*, Vol. 72. No. 9.
- Lakatos (1970), Falsification and the Methodology of Scientific Research Programmes, in Lakatos and Musgrave (eds), *Criticism and the Growth of Knowledge*, Cambridge University Press, 1970.
- Lal, Deepak (2000), *The Poverty of 'Development Economics'* OUP, New York
- Lateef, Asma, (1997): *Linking up with the Global Economy: A Case Study of the Bangalore Software Industry*, NIOP, DP/96/97, International Institute for Labour Studies, Geneva.
- Leffler, K. and R. Rucker (1991), Transaction Costs and the Efficient Organization of Production: A Study of Timber-Harvesting Contracts. *Journal of Political Economy* 99(October): 1060-1087.
- Lewis, W. Arthur, (1954), Economic Development with Unlimited Supplies of Labor, *Manchester School of Economic and Social Studies*, v 22 139-191.



- Lin, Justin Yifu and Jeffrey B. Nugent, (1995), Institutions and Economic Development, *Handbook of Development Economics, Vol III: 2303-2370*.
- List, F. (1885), *The National System of Political Economy*, Trans. Sampson Lloyd from the original German edition published in 1841. London: Longmans, Green.
- Lyons B.R., (1994), "Contract and Specific Investment: An Empirical Test of Transaction Cost Theory", *Journal of Economics and Management Strategy*, 3, pp.257-278.
- MacNeil, I. R. (1978), "Contracts: Adjustments of Long-Term Economic Relations Under Classical, Neoclassical and Relational Contract Law." *Northwestern University Law Review* 72: 854-906.
- Madhuri, S. (1998), Inter-firm Relationship in the Context of Ancillarisation: A Case Study of Bhilai Steel Plant, M.Phil Thesis Submitted to Jawaharlal Nehru University, New Delhi, *Centre for Development Studies*, Thiruvanthapuram.
- Masten, S.E. and S. Saussier. 2002. Econometrics of contracts: An assessment of developments in the empirical literature on contracting. In E. Brousseau and J.M. Glachant (eds.), *The Economics of contract: Theory and applications*, 273-292. Cambridge: Cambridge University Press
- Masten, S. E. (1984). "The Organization of Production: Evidence from the Aerospace Industry." *Journal of Law and Economics* 27: 403-417.
- Masten, Scott E., (ed) (1996), *Case Studies in Contracting and Organization*. New York: Oxford University Press.
- Masten, S.E., Meehan, W.J., and Snyder, E.A. (1989). 'Vertical Integration in the U.S. Auto Industry'. *Journal of Economic Behavior and Organization*, 12(2): 265-273.
- Matthews, R. C. O. (1986). "The Economics of Institutions and the Sources of Economic Growth." *Economic Journal* 96 (December): 903-18.
- Mattoo, Aaditya and Sacha Wunsch (2004). "Securing Openness of Cross-Border Trade in Services: A Possible Approach." <http://www.cid.harvard.edu/cidtrade/Papers/mattoo-wunsch.pdf>
- Mauro, Paolo. (1995). "Corruption and Growth." *Quarterly Journal of Economics* 110:681-721.
- Meier, M. Gerald and Stiglitz, Joseph (ed.) 2001, '*Frontiers of Development Economics: The Future in Perspective*', New York: OUP
- Messick Richard E (1999), Judicial Reform and Economic Development: A Survey of the Issues, *The World Bank Research Observer*, vol. 14, no. 1, pp. 117-36
- Montesquieu (1777), *The Spirit of the Laws, vol. I*, trans. Thomas Nugent, London: J. Nourse, pp. 221-237
- Monteverde, K. and Teece, D.J. (1982). 'Supplier Switching Costs and Vertical Integration in the Automobile Industry'. *Bell Journal of Economics*, 13(1): 206-213.

- Myrdal, Gunnar, (1968) *The Asian Drama*, Hammondswoth: Penguin Books
- Nagaraj, R. (1989), *Subcontracting in Indian Manufacturing: Bangalore Experience*, Ph.D. Thesis Submitted to Jawaharlal Nehru University, New Delhi, Centre for Development Studies, Thiruvanthapuram.
- NASSCOM (1999-2000): '*Indian IT Software and Services Directory*', New Delhi.
- NASSCOM (2001): *Nasscom Survey 2001*, at [www.nasscom.org](http://www.nasscom.org).
- NASSCOM (2003): *The IT Software and Services Industry in India: Strategic Review 2003*, National Association of Software and Service Companies, New Delhi.
- Nelson, R.R. and Winter, S.G. (1982). *An Evolutionary Theory of Economic Change*, Cambridge, MA: Harvard University Press)
- Nooteboom, B. (1996), 'Trust, opportunism and governance: A process and control model', *Organization Studies*, 17/ 6: 985-1010.
- Nooteboom, Bart. (1999). *Inter-Firm Alliances: Analysis and Design*. London: Routledge
- North, Douglas. (1981) *Structure and Change in Economic History*, New York: W.W. Norton & Company.
- North, Douglass C. and Barry R. Weingast (1989) "Constitutions and Commitment: Evolution of Institutions Governing Public Choice in Seventeenth Century England, *Journal of Economic History*, 49, 803-832.
- North, Douglass C. and Robert P. Thomas, (1973), *The Rise of the Western World: A New Economic History*, Cambridge University Press.
- North, Douglass. (1990), *Institutions, Institutional Change and Economic Performance*, Cambridge
- Nurkse, Ragnar. (1952), *Problems of Capital Formation in Underdeveloped Countries and Patterns of Trade and Development* (New York: Oxford Press).
- Palvia, (1995), A dialectic view of information systems outsourcing: Pros and cons, *Information & Management* 29, pp. 265-275.
- Pasinetti, L. (1994) 'Economic Theory and Institutions', in R. Delorme and K. Dopfer (eds), *The Political Economy of Diversity* (London: Edward Elgar) pp. 34-45.
- Pejovich, Svetozar. (1995), *Economic Analysis of Institutions and Systems*, Dordrecht: Kluwer Academic Publishers.
- Pinheiro, Castelar Armando. (1998), "Economic Costs of Judicial Inefficiency in Brazil." *Final Report to the Tinker Foundation*, Instituto de Estudos Economicos, Sociais e Politicos de São Paulo, Processed.
- Poppo, L., & Zenger, T. R. (2002), Substitutes or complements? Exploring the relationship between formal contracts and relational governance, *Strategic Management Journal*.

- Prebisch, Raul. (1950), *The Economic Development of Latin America and Its Principal Problems*, New York: United Nations, Economic Commission for Latin America.
- Pressman, R.S. (1997), *Software Engineering: A Practitioner's Approach*, 4th Ed., McGraw Hill, 1997.
- Quinn, J.B. and Hilmer, F.G. (1994) Strategic Outsourcing. *Sloan Management Review* 35, 43-55.
- Rammohan K.T (2000), Assessing Reassessment of Kerala Model, *Economic and Political Weekly*, April 8.
- Rosenstein-Rodan, Paul N. (1943) Problems of Industrialization in Eastern and South- Eastern Europe, *Economic Journal* 53:202-211.
- Rutherford, M (1994), *Institutions in Economics: the Old and the New Institutionalism*, Cambridge University Press: Cambridge, pp. xi, 225.
- Saussier S. (1998) "Contractual Completeness and Transaction costs", *Working Paper ATOM*, University of Paris-I
- Shavell, Steven (2003) Economic Analysis of Contract Law, *NBER Working Paper* 9696 <http://www.nber.org/papers/w9696>
- Shelanski, H. A. and P. G. Klein (1995), Empirical Research in Transaction Cost Economics: A Review and Assessment. *Journal of Law, Economics and Organization* 11 (October): 335-361.
- Sherwood Robert, " Judicial Systems and National Economic Performance ," Inter-American Development Bank's *Second Annual Conference on Justice and Development in Latin American and the Caribbean* , Montevideo , Uruguay , 1995
- Shihata, Ibrahim F. I. (1995) *The World Bank in a Changing World: Selected Essays and Lectures*. Vol. 2. The Hague: Martinus Nijhoff Publishers.
- Smith, Adam (1776), *An Inquiry into the Nature and Causes of the Wealth of Nations*, London: Methuen and Co., Ltd., (1904) Fifth edition.
- Stigler G.J (1951): The Division of Labor is Limited by the Extent of the Market, *Journal of Political Economy*, 59, 185-193.
- Stiglitz (1986), The New Development Economics, *World Development*, 14(2), pp. 257-265.
- Stiglitz, J (1989), Markets, Market Failures and Development, *American Economic Review*, 79(2), pp. 197-203
- Subrahmanian K.K. & E. Abdul Azeez, 2000. "Industrial growth in Kerala: Trends and explanations," Working Papers 310, *Centre for Development Studies*, Trivendrum, India
- Temple, Jonathan. (1999). "The New Growth Evidence." *Journal of Economic Literature* 37(1):112-56.

- The Economist (1991), “*The Ins and Outs of Outsourcing*,” August 31, 1991, 54-56.
- Williamson, O. E. (1975), *Markets and Hierarchies: Analysis and Antitrust Implications*, New York, The Free Press.
- Williamson, O. E. (1979), Transaction Cost Economics: The Governance of Contractual Relations. *Journal of Law and Economics*, 22 (October): 233-261.
- Williamson, O. E. (1985), *The Economic Institutions of Capitalism*, New York, NY, The Free Press.
- Williamson, O. E. (1991), Economic Institutions: Spontaneous and Intentional Governance, *Journal of Law, Economics and Organization* 7 (Special Issue): 159-87.
- Williamson, O. E. (1995), “The Institutions and Governance of Economic Development and Reform.” In Michael Bruno and Boris Pleskovic, eds., *Proceedings of the Annual World Bank Conference on Development Economics 1994*. Washington, D.C.: World Bank.
- Williamson, O. E. (1996), *The Mechanisms of Governance*. New York, NY, Oxford University Press.
- Williamson, O. E. (1998). Transaction Cost Economics: How it Works; Where is it Headed, *De Economist* 146(April): 23-58.
- Williamson, O. E. (2000). The New Institutional Economics: Taking Stock, Looking Ahead, *Journal of Economic Literature* 38: 595-613.
- World Bank (1992), *India: An Information Technology Development Strategy*, World Bank, Washington DC.
- World Bank (2001), *World Development Report 2002: Building Institutions for Markets*. New York: Oxford University Press for the World Bank.

## APPENDIX-I

### INTER-FIRM RELATIONS AND THEIR IMPLICATIONS ON INDUSTRIAL DEVELOPMENT: A CASE STUDY OF THE INDIAN SOFTWARE INDUSTRY

A study undertaken for MPhil Programme in Applied Economics of the JNU

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*This study aims to analyze how the firms communicate their quality to the potential buyers. Firms create some sort of reputation that speaks of their quality, timeliness and past success. When the legal environment is not very sophisticated to cope with the hazards of complex contractual relations, it is advantageous to both the parties to invest in building reputation capital, as it assures the good conduct and capabilities of the parties, thus strengthens the mutual trust. We hypothesize that Contract design is a function of asset specificity, complexity, uncertainty and Reputation [Age, long standing track record and quality certification].*

*The data and information obtained from you will be used purely for academic purposes only and I will handle it with absolute confidentiality. I assure that your and your company's name will not be used without your prior permission.*

Dr. Achin Chakraborty  
Coordinator, MPhil Programme

Francis Xavier R.

## Questionnaire

### I. Firm Characteristics

*This section seeks information about your company such as your specialisation, quality certification, association membership and so on.*

1	Name of the firm:	2. When was the firm founded?	
3	Name of the Interviewer	Position	
4	Is the firm ISO/CMM certified?	4.1 If yes, when?	
5	Does the firm have NASSCOM membership?		
6	Is the firm a subsidiary?	6.1 If YES, details of parent company	
7	No. of Professionals?	8. Last year's Turn-over	
9	Major Areas of specialization		
10	Does the firm have a permanent legal adviser?		
11	Does the firm go for legal advice to review the contract?		
12.	How does the firm <b>in general</b> obtain the contracts?	Few < 33%	Some 33 - 66%
	Through off shore development center		Most >66%
	Through public advertisement		
	Through direct contact.		
	Others		

## II. Project characteristics:

Please give information about *TWO* (at least one of them, a major one) of your latest, finished contracts/project. You are free to choose not to answer any of the questions, but answering all the questions will add to the quality of this study. Subjective evaluations are on ascending order low to high.

1. Project Description:						
2. Total man-hours spent						
3. Complexity of the project	LOW		MEDIUM		HIGH	
	1	2	3	4	5	6
4. Uncertainty associated with the project	1	2	3	4	5	6
4.1. Final Output well defined?	HARDLY		SOMEWHAT		CLEARLY	
	1	2	3	4	5	6
4.2. Process well defined?	1	2	3	4	5	6
5.1 Familiarity with the Project	UNFAMILIAR		FAMILIAR		WELL KNOWN	
	1	2	3	4	5	6
5.2 Familiarity with the Platform	1	2	3	4	5	6
6 How did you get this contract	DIRECT CONTACT			OFF-SHORE DEVELOPMENT CENTRES		
	ADVERTISEMENT			OTHERS		
7 Had any employee worked with the client previously?						
8 Man-hours for Project proposal						
8.1 Man-hours for specification						
8.2 Man hours for drafting the contract						
9. How detailed the contract was?	LOW		MEDIUM		HIGH	
	1	2	3	4	5	6
9.1 Length of the contract (in pages)						
9.2 Was the contract highly customized and required considerable legal work?	Strongly disagree		agree		Strongly agree	
	1	2	3	4	5	6
10. How fast the required technology changes? In terms of						
Change in skills required?	No change		Medium		Fast changing	
	1	2	3	4	5	6
Change in optimal configuration of hardware and software required?	No change		Medium		Fast changing	
	1	2	3	4	5	6
11. Tick if you had these clauses in your contract.	Control clause			Incentive clause		
	Price clause			End of the contract clause		
1. Compensation Package	T&M		Fixed		Mixed	
12. How crucial the project for you?	Insignificant		Medium		High	
12.1 In terms of Reputation	1	2	3	4	5	6
12.2 In terms of Revenue (in %)	1	2	3	4	5	6
12.3 In %terms						

### 13. The Client

13.1 Size of the client – Employment						
13.2 Size of the client – Turnover						
13.3 how old your relationship with the client						
13.4 No. of previous projects with the client						
13.4 Opinion about client credibility	LOW		MEDIUM		HIGH	
	1	2	3	4	5	6
13.5 Possible motive for outsourcing	Cost saving	Lack of Expertise	Skill sharing	others		
14. Post project business impact on the client, in terms of:						
14.1 Approx. cost savings (in %)						
14.2 Impact on Client's Revenue (%)						
14.3 How critical the project to your client	LOW		MEDIUM		HIGH	
	1	2	3	4	5	6
14. Clients over all satisfaction of the project	LOW		MEDIUM		HIGH	
	1	2	3	4	5	6

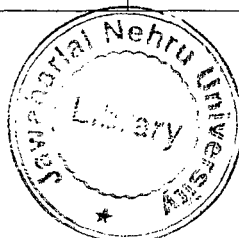
### 15. The Project in Implementation:

15.1 Cost revision (in %)				
15.2 Man hour revision				
15.2 Who bore the cost over-run	Firm		Client	
15.3 Was it according to contract	YES		NO	
15.4 If NO, and borne by Firm, why?	INTERNAL DIFFICULTY	AMBIGUITY	SAKE OF REPUTATION	OTHERS
	SPECS CHANGE	CLIENT'S DELAY	SAKE OF REPUTATION	OTHERS
15.5 If NO, and borne by Client, why?				

16. Did you have any dispute with any client on cost overruns? **YES/ NO**

If Yes,

16.1 Did you seek legal help?	16.2 Did you settle it out of court?
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