

## **Offshore IT Outsourcing between India and New Zealand: A Systemic Analysis**

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### **Paper Submitted to:**

ANZAM 2011

### **Date:**

21 July 2011

### **Preferred Stream:**

Technology, Innovation and Supply Chain Management

## OFFSHORE IT OUTSOURCING BETWEEN INDIA AND NEW ZEALAND: A SYSTEMIC ANALYSIS

### ABSTRACT

*Although both India and New Zealand recognise trade between the two countries as important for their respective economies, the current and past trade in information technology between the two nations has been very low. This research seeks to analyse this problem situation systemically to understand the complexities underlying this uneven profile of India's outsourcing. While most of the literature on IT offshore outsourcing is based on client perspectives, this study takes a service provider perspective. A causal loop model is developed to explain the underlying structure related to this problem situation. Finally, strategies to improve the problem situation are discussed using an analysis of the feedback loops captured in the model.*

Keywords: Operations improvement, operations management, information technology, offshoring, outsourcing

### 1. INTRODUCTION

International trade in services exhibited significant growth during the recent past in India and New Zealand. India's import of services grew from US\$ 16,392 million during 2000-2001 to US\$ 37,523 million during 2005-2006. During the same period, export of services grew from US\$ 18,870 million to US\$ 61,404 million (CECA 2009). A similar growth trend is visible in services trade in New Zealand, where import of services grew from US\$ 4,409 million in 2002 to US \$8,281 million in 2007 and that in exports grew from US\$ 4,777 million to US\$ 8,655 million during the same period (CECA 2009). New Zealand's developed economy has about 71% contribution from services. As a developing economy, India's services contributed about 69% of the overall average of its growth in the GDP during the five years from 2002-2003 to 2006-2007 (Statistics New Zealand 2011). The intent of both the nations in enhancing cross border trade is evident in the initiation of New Zealand-India free trade negotiations during early 2010.

Although both India and New Zealand recognize trade between the two countries as important for their respective economies, the current and past trade in IT services between the two nations has been surprisingly low. New Zealand's import of Computer and Information Services from India in the financial year ending in June 2010 was US\$ 5.52 million which accounts for just 2% of New Zealand's total import of the same service (see Appendix 1). During the fiscal year ending in March 2010, Indian IT industry's total export was about US\$ 49 billion (Figure 1) which points to the very low level of trade in IT services

between the two countries. In this context, the report of the Joint Study Group (JSG) constituted by the Ministry of Commerce in India and the Ministry of Trade in New Zealand has recognized information technology and telecommunications as important sectors for trade. This argument is based on India's competence in IT and New Zealand's competence in telecom which also matches well with India's large telecom market.

India's growing IT and IT enabled Services (ITeS) industry has received international recognition over the past one and a half decades (Bhattacharya and Vickery 2010). India's IT industry provides services to a large number of Fortune 500 companies with a portfolio of service lines covering application development, system integration, infrastructure management and IT consulting (Arora et al. 2001; Bhattacharya and Vickery 2010). Offshore IT outsourcing contributes 66% of the industry's revenues. Indian IT industry has also been characterized by an uneven profile with respect to its industry focus and geographic concentration (Heeks 1998; CRISINFAC 2009). A major part of the revenues flows from a few industry sectors such as Banking, Financial Services and Insurance (BFSI), Telecom and manufacturing (NASSCOM 2009). In addition, the US contributes about 60% of the revenues followed by Europe 31% (CRISINFAC 2009) resulting in a geographical concentration of client organizations.

[Insert Figure 1: India's IT export in the New Zealand context about here]

Although several studies by government and industry bodies have reported low concentration of trade in IT services between India and New Zealand, academic research examining the reasons for such low engagement has been scarce. A large body of literature in IT outsourcing addresses firm levels issues pertaining to clients (Aundhe and Mathew, 2009; Dibbern et al. 2004). A previous review of research literature in the area has reported major issues addressed by various scholars as outsourcing motivation, scope, performance, in-sourcing or outsourcing, contract and partnership (Lee et al. 2000). However scholarly attention on outsourcing issues pertaining to service providers has been less, and much less systemic studies have focused on IT service provider's issues pertaining to geographical concentration. In this context, our research seeks to understand: (i) what are the factors that affect the Indian IT service

providers to choose or not to choose clients based in New Zealand (ii) how can a systems model help in understanding the complex inter-firm relationships in offshore IT outsourcing between India and New Zealand and (iii) how can the system model support IT service providers in the formulation of a service strategy.

This study will take the specific context of Indo-New Zealand offshore IT outsourcing and develop a system model that explain the causes of low degree of outsourcing in IT between India and New Zealand. Our study focus on India based IT service providers who are independent vendors in IT services having international clients. The remaining part of this paper is organized as follows: section 2 provides a theoretical background based on survey of literature, section 3 describes the methodological framework, section 4 describes how the problem situation was structured systemically, section 5 presents a causal loop model and its analysis and section 6 concludes the work covering contributions and future research.

## 2. LITERATURE REVIEW

Offshore outsourcing of information technology developed as a dominant sourcing model in IT following economic liberalization; drop in communication costs due to major advancements in information and communication technologies, labour arbitrage and availability of skilled IT labour force in offshore nations fostered its adoption (Friedman 2005; Carmel and Tjia 2005). These conditions acted as enabling factors for firms which sought to achieve cost efficiency, improve time to market, access global markets and attain benefits of offshore outsourcing (Lacity and Willcocks, 1998; Manning *et al.*, 2008). Among the manifold benefits of outsourcing of information technology services, cost efficiency has been identified as a major motivation for offshore IT outsourcing in the past ten years (Lacity and Willcocks 1998; Manning *et al.* 2008) and has been highlighted as the strongest factor in the decisions of most CIOs looking to shift IT work offshore (Escanlar 2011).

From a service provider's perspective, the early history of outsourcing and offshoring of IT appears to have been dependant on outsourcing firms' IT management strategy than on any service strategy formulated by vendor firms. Loh and Venkatraman (1992) empirically analyzed IT outsourcing contracts pertaining to US and identified the perceived success of Eastman Kodak's IT outsourcing in

1989 (the *Kodak effect*) as a critical event (Gurbaxani 1990) that further triggered the early adoption of IT outsourcing by client firms. Carmel and Agarwal (2002) examined US firms outsourcing IT and reported different stages of maturity among these firms ranging from firms that did not outsource at all through offshore experimenters and proactively cost focused firms to firms with a strategic focus on outsourcing. In a similar study focusing on global IT outsourcing, Willcocks et al. (2007) described four levels of maturity in the outsourcing learning curve: that dominated by hype and fear, early adopters who focus only on costs, more matured firms who focus on quality and firms which have institutionalized IT outsourcing to derive more value through transformational outsourcing. Transformational IT outsourcing has been described by various scholars as outsourcing engagements characterized by high degree of maturity which requires client and service providers to work in a partnership mode (Linder 2004; Gottfredson 2005).

Despite the maturation of IT outsourcing leading to economic and strategic benefits, several firms did not choose to adopt offshore outsourcing as a way to manage their IT (Carmel and Agarwal 2002; Willcocks et al. 2006). Early studies have reported domestic mindset, inexperience in managing from a distance and inexperience in managing geographically dispersed projects as reasons given by a few offshore bystanders for not considering offshore IT outsourcing. However a systemic enquiry into the causes of low level of offshoring at a country level has been scarce. Barthelemy and Geyer (2005) empirically investigated the factors that influenced quasi outsourcing practice followed by firms in France and Germany and found that asset-specific IT activity, IT department size, IT internal organization, institutional environment and IT-intensive sector as having significant impact on the outsourcing vs. quasi outsourcing decision by client firms. However, to the best of our knowledge such studies have not been extended to other geographies.

Offshore outsourcing of IT services has resulted in the growth of a global IT services industry. IT service providers also moved from periphery to the core in terms of the value of services they offered to client firms (Gottfredson 2005). Following value chain principles proposed by Porter (1985), Khan et al. (2002) classified the level of “value” offered by Indian IT services providers to UK firms into 5 tiers of

body shopping, offshore development and body shopping, establishing standards, consultancy and designing the IT architecture and design and product development. However, studies addressing service provider strategy formulation, factors that influence the choice of geography, service line and industry sectors have not received due attention in outsourcing research. Several scholars have examined the issue of country selection for client firms intending to outsource and suggested selection process and criteria that suits clients' desired objectives (Graf and Mudami 2005; Palvia 2004; Carmel and Tjia, 2005). On the other hand, studies addressing service provider firms' country strategy formulation process has been much less in extant literature.

In summary, most studies in IT outsourcing literature address client issues in outsourcing. Country selection, which is a very important issue in the context offshore outsourcing has been addressed from client firms' perspective and suggested country selection process and criteria that suits clients' desired objectives. However research studies addressing service provider's country strategy has been much less in extant literature. Although the geographic concentration of IT outsourcing in North America and Europe has been widely reported, a systemic enquiry into the causes of low level of offshoring at a country level has been scarce. There have been some studies which sought to understand the determinants of quasi vs. full outsourcing in France and Germany. However, to the best of our knowledge a study to understand factors that influence the choice of offshore outsourcing in the New Zealand-India context is not found in literature.

### **3. METHODOLOGICAL FRAMEWORK**

The methodology used in this study is based on systems thinking (e.g. Senge 1990). According to management literature systems thinking approaches can be characterised as hard (e.g. Forrester 1961), soft (e.g. Checkland 1981), critical (e.g. Ulrich 1987), and multi-methodology (e.g. Brocklesby 1993). In hard systems approaches models are considered as abstractions of reality, while soft systems approaches uses models for generating debate and insight about the real world. Critical systems approach tries to reveal the normative content of actual and proposed systems designs by critiquing the boundary judgements. Multi methodology involves combining different systems methodologies within hard, soft

and critical approaches. This study used a hard systems approach based on the system dynamics methodology since this research project is based on a positivistic paradigm.

System dynamics was developed in the second half of the 1950s by Jay Forrester and his seminal book, *Industrial Dynamics*, continues to be a significant statement of philosophy and methodology in this field. System dynamics is a methodology for studying and managing complex systems involving multiple relationships, interdependencies and feedback, such as one finds in business and other social systems, through the development of representational models that can be used to reflect aspects of reality. System dynamics has been applied to issues ranging from corporate strategy to the dynamics of diabetes, from the cold war arms race between USSR and US, to the “combat” between HIV and the human immune system (Sterman 2000). Specifically, this study was limited to qualitative modeling based on systems dynamics (Maani and Cavana 2007).

The methodological framework used in this study consists of two phases. First, an attempt was made to structure the problem systemically. Second, a causal loop model was developed to capture the underlying feedback loops so as to explain the behaviour of the system. The two phases used in this study, and the associated steps are shown in Table 1.

[Insert Table 1: Methodological Framework about here]

Interviews were used as the primary method for collecting data. Twenty interviews with an approximate duration of forty five minutes were conducted in total during September 2010 –March 2011. A combination of structured and open ended questions was used during our interviews with service provider executives. A typical interview structure with service provider executives involved enquiries such as elements of the company’s strategy on geography and service lines, factors that determine the choice of a country in strategy and reasons for having or not having clients in New Zealand. These questions triggered more elaborations on the company’s experience with clients in New Zealand and other parts of the world. We used both face to face and telephonic interviews in data collection. Extensive notes were taken during the interview process which were finally summarised and read to the respondent for verification.

### *Data sources*

Table 2 exhibits the characteristics of the organisations and respondents chosen for conducting interviews. We adopted the following criteria in the selection of sites: (i) the organisation has been in IT outsourcing relations with a foreign partner for at least 5 years; (ii) the organisation has clients in New Zealand/Australia or is actively considering New Zealand as a country to do business (iii) the organisation was willing to give access to one or more key informants in their senior management.

[Insert Table 2: Characteristics of respondents and their organisations about here]

We also ensured key informant validity of those who responded to our questions on behalf of the organisations they belonged to. Following the guidelines provided by Kumar, Stern and Anderson (1993), the respondents selected for interviews were having (i) adequate experience in IT outsourcing engagements and had (ii) active involvement in strategic decision making process of offshore outsourcing (Table 2). In our sample of 13 IT companies, 12 were either Indian born companies or companies head quartered abroad but having a major presence in India. In addition, we also interviewed the executive of the Internal IT department of a major New Zealand bank. Our sample had a good mix of large (7), medium (3) and small sized companies (3). Further, 8 out of the 12 firms had clients in New Zealand, and other four firms were considering New Zealand as a prospective location in near future.

## **4. PROBLEM STRUCTURING**

To gain a systemic understanding of the problem situation, a problem structuring exercise was conducted in the first phase of this study. As mentioned in Table 1, three steps were used in structuring the problem situation, collection of preliminary information and data, developing a behaviour over time chart and collection of detailed information.

To gain a broad understanding about the problem, data about New Zealand's information technology imports available from year 2006 to 2010 was collected from the web site of Statistics New Zealand (Table 3). All the financial figures given in NZ\$ were converted to US\$ by using exchange rates of the corresponding year. India's IT export data was collected from the website of NASSCOM, an industry body for the promotion of Indian IT industry.



[Insert Table 3: India's contribution to New Zealand's IT about here]

To structure the problem further a 'Behaviour over Time (BOT)' graph was developed. BOT graph or 'reference mode behaviour' is a tool used in systems thinking to show the patterns of the main variables in a system over an extended period of time, typically several months to several years. This pattern can indicate the variations and trends in the variable of interest, for example growth, decline, oscillations or a combination thereof. The important elements of a BOT are the overall directions and variations, not the numerical value of the variable. Therefore, BOT graphs are usually drawn in a rough sense without exact numerical values attached (Maani and Cavana 2007).

In this study, a BOT graph was drawn using the trends of three variables related to the problem situation. These variables were total IT exports from India, total IT imports to New Zealand, and IT exports from India to New Zealand. Figure 2 presents this behaviour, showing an increasing trend of IT exports from India. It also shows that IT imports to New Zealand is increasing, however, it shows that IT exports from India to New Zealand is not showing a corresponding increase and have not really picked up momentum.

[Insert Figure 2: Behaviour Over Time about here]

We employed the interview method for collecting detailed information. Following the guidelines provided by Sterman (2000) the interview data was analysed to identify variables in the system. An inductive approach was predominantly followed in data collection and analysis (Strauss and Corbin 1990). During the course of the interviews different concepts on service provider's perspective on country selection and why or why not New Zealand questions were re-framed to draw more insights on the concepts. The text of interview summaries was analysed to identify factors that played a role in country selection as highlighted by the respondents. Variables (concepts) were labelled mostly based on the semantics of items drawn from the data.

[Insert Table 4: Variables and their categories about here]

## 5. CAUSAL LOOP MODELLING

The variables extracted from the interview data were used to develop a causal loop model to capture the underlying structure of the problem. Causal loop models are visual representations of cause-effect relationships among elements of a system forming structures of feedback loops (Mohapatra et al. 1994). The causal loop model developed in this study is presented in Figure 3.

[Insert Figure 3: Causal loop Model about here]

An analysis of the casual loop model was done by identifying the different feedback loops formed in the model. Systems thinking literature classifies feedback loops as reinforcing or balancing. Reinforcing loops are positive feedback systems while balancing feedback loops are negative feedback systems. Reinforcing loops represent growing or declining actions and balancing loops seek stability or return to control (Sterman 2000).

Six main feedback loops were identified in the model. Out of this, four were reinforcing while the remaining two were balancing loops. The analysis of these six feedback loops are discussed below.

#### *Loop 1: US Influence loop ( $R_1$ )*

A possible starting point to this causal loop analysis is the variable US firms interested in IT offshore outsourcing (ITOO) to India. According to 'US influence loop', when US firms interested in IT offshore outsourcing increases, there will be more Indian service providers initiated by these US clients. Those service providers will bring in more US connections and their history will be connected to their US clients. These US connections in turn increase Indian IT exports to US. When Indian IT exports to US increases expertise in serving US clients and in turn the quality of service to US clients improves. Such quality of services results in an increasing number of US firms interested in IT offshore outsourcing to India, thus completing a reinforcing feedback loop (Figure 3).

[Insert Figure 3: US Influence loop about here]

#### *Loops 2 and 3: New Zealand Opportunities loops ( $R_2$ and $R_3$ )*

The second and third loops explain the opportunities for NZ as an IT offshore location. When IT exports from India to US increase beyond a point, the perception of job losses within US increases. Such perceptions about job losses will encourage some US politicians to fight against IT offshore outsourcing

to India. This situation will force Indian service providers to look for destinations other than the US and New Zealand's chances as one such destination increases. At this point, most professional service providers will conduct an opportunity and risk analysis for the different alternative locations available to them. Such an opportunity analysis will highlight the attractiveness of New Zealand with acute skill shortage. It will also highlight the attractiveness of English as the common language. Both these factors will increase the attractiveness of New Zealand as a location, thereby improving the chances of New Zealand as an option for Indian service providers to engage in IT offshore outsourcing. Technically, both these loops (R2 and R3) are reinforcing feedback loops (Figure 4).

*Loops 4 and 5: Inherent Weaknesses of New Zealand loop (B<sub>1</sub> and B<sub>2</sub>)*

As explained in the previous section, when Indian service providers consider New Zealand as a destination for IT offshore outsourcing, they will conduct both opportunity and risk analyses. The loops associated with opportunity analysis were explained using loops R<sub>2</sub> and R<sub>3</sub> while the effect of risk analysis is explained using loops B<sub>1</sub> and B<sub>2</sub>. A risk analysis of New Zealand as a location will highlight the perception of its small size as a risk. It will also show distance and connectivity as risks. Such perceptions will reduce the attractiveness of New Zealand as a location for Indian service providers, thereby affecting India's IT exports to New Zealand negatively. This situation will reduce the chances of New Zealand as an option, thus completing the two balancing loops B<sub>1</sub> and B<sub>2</sub> (Figure 3).

*Loop 6: Attitude of New Zealanders loop (B<sub>3</sub>)*

This loop explains the experience of some Indian service providers who went to New Zealand. According to this loop, when the chances of New Zealand as a destination for IT offshore outsourcing improved, some Indian service providers ventured out to New Zealand. An analysis of our interviews with them showed that many of them had bad experiences due to cultural issues and differences, thereby reducing the number of success stories of Indian service providers in New Zealand. This situation reduced the attractiveness of New Zealand as a location for Indian service providers, and decreased the potential for India's IT exports to New Zealand. In turn, it reduced the chances of New Zealand as an option, completing another balancing loop (B<sub>3</sub>).

Loop 7: Service Quality loop ( $R_4$ )

When New Zealand becomes less attractive as a location for Indian service providers, it was revealed in some of their interviews that they stopped deploying good staff to New Zealand. This reduced Indian service provider's quality of service to New Zealand clients and any possible success stories that might have been created. Such a situation will further reduce the location attractiveness of New Zealand, thus completing the fourth reinforcing loop.

## 6. CONCLUSIONS

The structure of the system, as captured by the casual loop diagram (Figure 3) and the feedback loops in it, dictates the behaviour as shown in the BOT (Figure 2). To induce long term changes in this behaviour, short term quick fixes in the structure might not be helpful (Senge, 1990). Instead, long term structural changes need to be devised to change the behaviour of the system.

In this respect, some of the service providers involved in this study, discussed the implications of the model and then surfaced a few strategic initiatives to change the structure of the system. We discuss two such initiatives in this section. The first initiative suggested by a majority of service providers involved in this study related to strengthening the US influence loop ( $R_1$ ). Most of the Indian service providers were interested in '*following their US clients*' if they started some activities in New Zealand. Strategic initiatives from New Zealand government to encourage such US companies to start their branches and other activities in New Zealand will bring more Indian service providers to New Zealand. This will also result in more expertise in serving clients based in New Zealand and improved quality of service to them. The second strategic initiative tries to address the Attitude of New Zealanders loop ( $B_2$ ) and Service Quality loop ( $R_4$ ). In June 2011 the New Zealander Prime Minister visited India to negotiate a free trade agreement between India and New Zealand. As a part of this negotiation if New Zealand government can open up some large public IT projects for open international bidding, and encourage some of the top Indian IT service providers to compete in this bidding, it will result in a strong presence of a few quality Indian companies in New Zealand. Such a presence of top Indian IT service providers will lead to success stories about them. This will encourage these service providers to continue deploying good staff in New

Zealand projects, thereby improving their quality of service. It will also improve the attractiveness of New Zealand as an IT destination. In turn, this will increase IT exports from India to New Zealand.

To summarise, this study has explained how a systemic analysis could be used for understanding the complex interaction of factors related to IT offshore outsourcing between India and New Zealand. As mentioned in the systems literature, it showed how causal loop models could be used as a means of describing and facilitating the analysis of complex systems (Maani and Cavana, 2007). Finally, this study lays a platform for building a system dynamics simulation model, capable of developing and evaluating different strategic options for improving IT offshore outsourcing between India and New Zealand.

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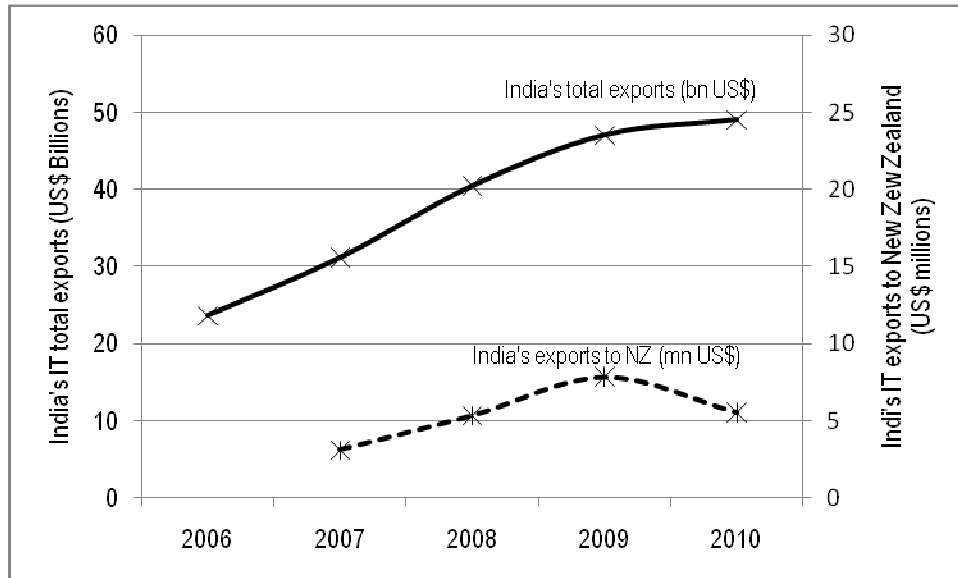
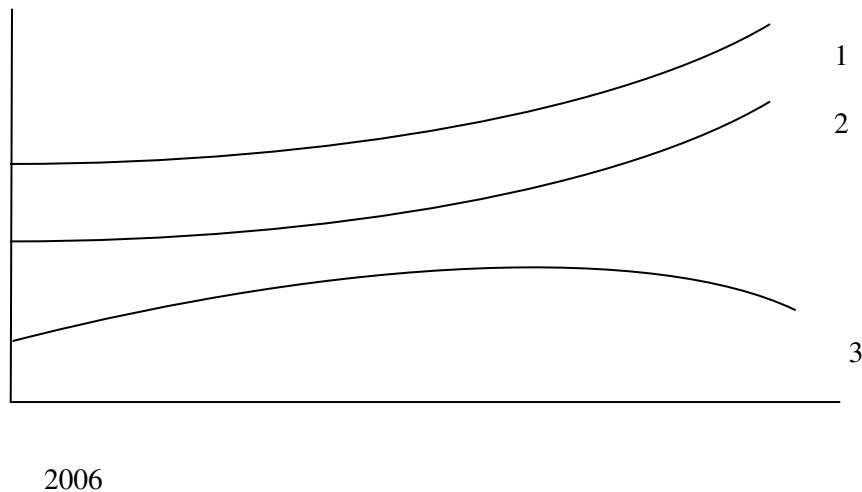


Figure 1: India's IT export in the New Zealand context (Data Sources: Statistics New Zealand & NASSCOM)



1= Total IT exports from India, 2= Total IT imports to New Zealand, 3= IT exports from India to New Zealand.

Figure 2: Behaviour Over Time

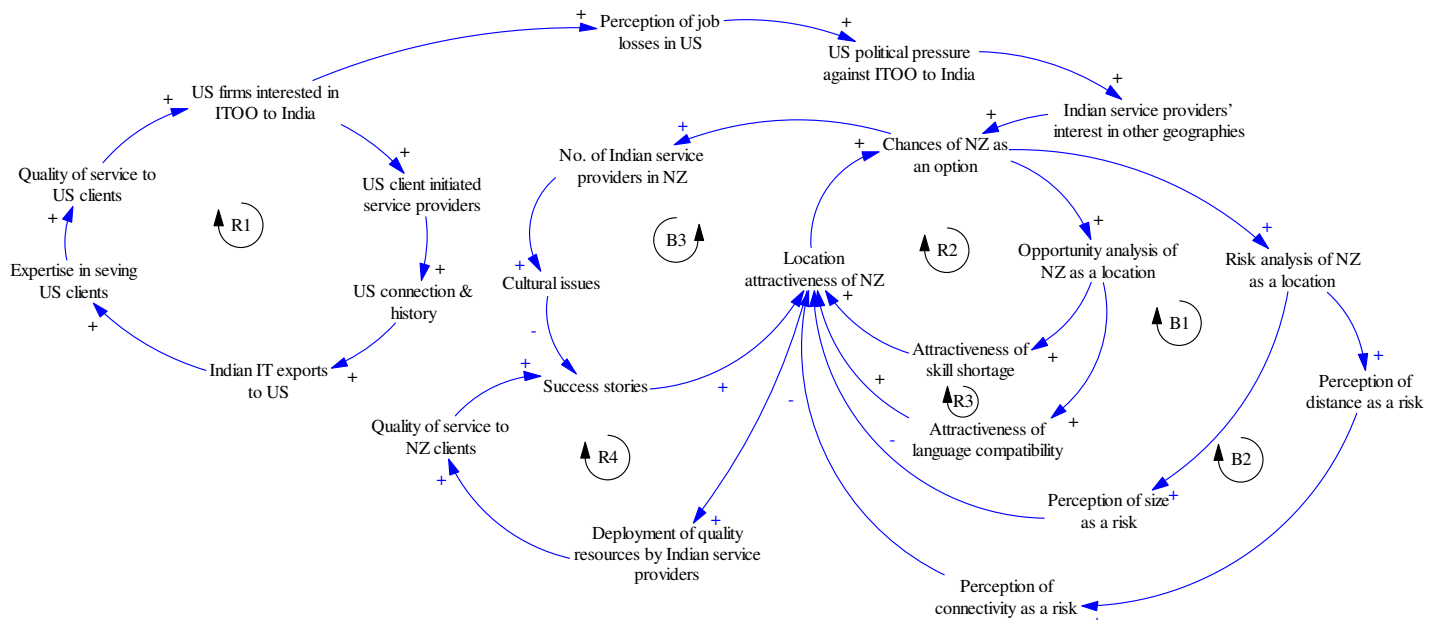


Figure 3: Causal Loop Model

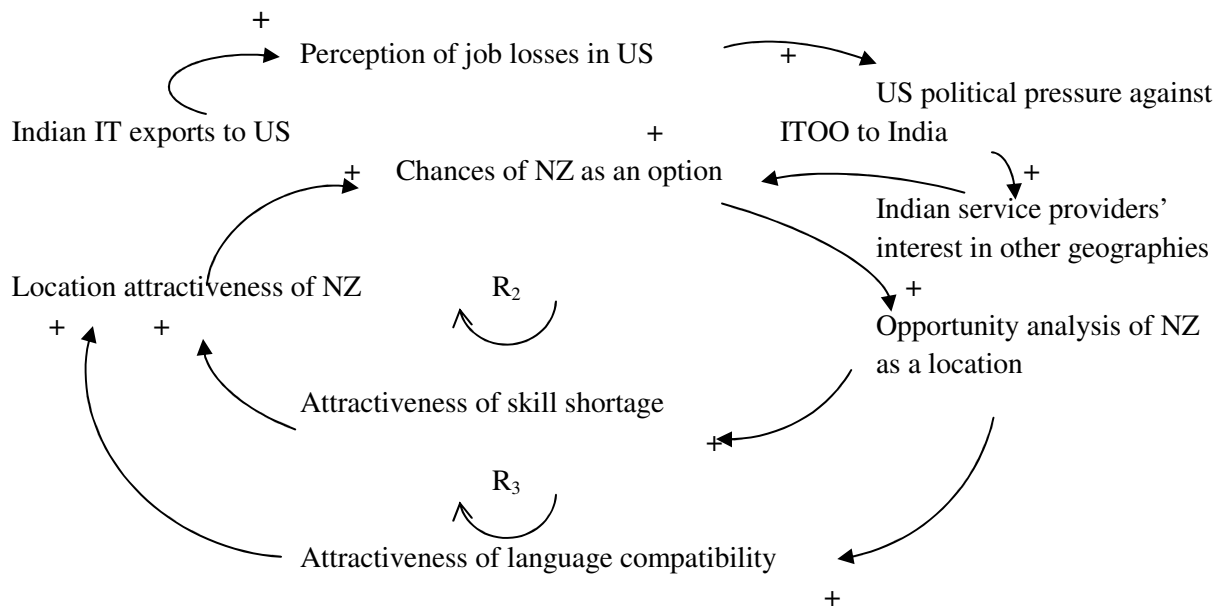


Figure 4: New Zealand Opportunities loops



Phases	Steps
Problem Structuring	Collection of preliminary information and data Behaviour over time chart development Collection of detailed information
Causal Loop Modelling	Development of the causal loop diagram Analysis of loop behaviour over time Development of intervention strategies

Table 1: Methodological Framework

Sl no	Firm and its business	Clients in New Zealand	Geographical focus	Respondents
1	Small Indian IT services company	No	USA	CEO (1)
2	Small Indian IT company, specializing in R&D	No	USA	CEO (1)
3	Medium sized French IT services firm with major presence in India	No	Europe	Principal Delivery Manager (1)
4	Large French IT services firm with major presence in India	No	Europe, USA	Director (1)
5	Large US IT services firm with major presence in India	Yes	USA/UK	Chief-Corporate Affairs (1), Senior VP (1)
6	Medium sized Indian IT services provider specializing in financial services sector	Yes	USA, Europe, Asia-Pacific	Partner Head (1), Head -Australia, New Zealand (1)
7	Large Indian IT services firm with office in New Zealand	Yes	USA, Europe	VP (1), Associate VP (1)
8	Medium sized Indian IT services firm specializing in travel, tourism and logistics sector	Yes	USA, Europe, Asia-pacific	Senior Manager (1), VP-Commercial operations (1), Head – Service Delivery (1)
9	Large Indian IT services firm	Yes	USA, Europe	Quality assurance executive in New Zealand (1), Manager (1)
10	Internal IT department of a large bank in New Zealand	Yes	-	Manager/Consultant (1)
11	Small IT Service provider specializing in Billing software	Yes	Asia-pacific, Europe, USA	Head-Consulting (1), GM-Corporate Resources (1)
12	Large Indian IT services firm	Yes	USA, Europe	Head-BPO (1)
13	Large Indian IT services firm	Yes	USA, Europe, Asia pacific	Manager (1)

Table 2: Characteristics of respondents and their organisations

Year	2006	2007	2008	2009	2010
NZ total IT imports	242.3689	311.5194	338.6014	313.9299	290.8664
% IT imports from India	confidential	1%	2%	2%	2%

(Data source: Statistics New Zealand, <http://www.stats.govt.nz/>)

Table 3: India's contribution to New Zealand's IT

Category/Loop	Variable Name
US Influence	US firms interested in IT offshore outsourcing to India US client initiated service providers in India US connection and history in Indian IT offshore outsourcing Indian IT exports to US Expertise in serving US clients Quality of service to US clients Perception of job losses in US US political pressure against IT offshore outsourcing to India Indian service providers' interest in other geographies
New Zealand Opportunities	Chances of New Zealand as an option Opportunity analysis of New Zealand as a location Perceived attractiveness of language compatibility Perceived attractiveness of skill shortage Location attractiveness of New Zealand
Inherent Weaknesses of New Zealand	Risk analysis of New Zealand as a location Perception of size as a risk Perception of distance as a risk Perception of connectivity as a risk Interest of Indian companies in other geographical locations
Attitude of New Zealanders	Number of Indian service providers in New Zealand Cultural issues Success stories
Service Quality	Deployment of quality resources by Indian service providers Quality of service to New Zealand clients

Table 4: Variables and their categories