Emerald International Journal of Physical Distribution & Logistics Management

Responsiveness, the primary reason behind re-shoring manufacturing activities to the UK: an Indian industry perspective

Journal:	*International Journal of Physical Distribution & Logistics Management*
Manuscript ID	IJPDLM-06-2015-0149.R5
Manuscript Type:	Research Paper
Keywords:	Re-shoring, Off-shoring, Responsiveness , Location Decisions

Responsiveness, the primary reason behind re-shoring manufacturing activities to the UK: an Indian industry perspective

Purpose: Due to today's volatile business environment companies have started to establish a better understanding of the total risk/benefit-balance concerning manufacturing location decisions of their component supply. The focus is now much more on comprehensive and strategic supply chain issues rather than simply relying on piece part cost analysis. This has led to an emerging trend called re-shoring. The aim of this paper is to understand the primary motivation behind the re-shoring strategy in the UK and investigate the factors that influence this decision from Indian industries perspectives.

Design/methodology/approach: The analysis of the paper is based on interviews conducted in the UK and India (State of Tamil Nadu) in various industries including automotive, industrial goods, textile, and marine. For this purpose an interview framework based on key enablers identified from the literature, being IT solutions, manufacturing equipment and human factors. This provided an assessment of the capability of the companies for being responsive to western demand.

Findings: The findings indicate that re-shoring to the UK is the result of inadequacy in responsiveness and long production lead-times of the Indian suppliers. The outcome of this paper indicates that the top factors behind this inadequacy in responsiveness are logistics and transportation, electricity shortage, excessive paperwork and working attitude.

Originality/value: This paper aims to fill the gap in the re-shoring literature by providing a clear picture behind the reason for re-shoring in the UK and identify the drivers behind this shortcoming in the component supply from India.

Key Words

Re-shoring, Off-shoring, Responsiveness, Location Decisions

Introduction

In today's manufacturing environment location decisions for both OEMs and suppliers is considered to be core to business strategy. Companies are required to have a supply chain and business intelligence strategy designed to make the best total value decision (Tate *et al*. 2014). For over two decades, developed countries have been offshoring their manufacturing activities to the low cost countries such as China and India (Lewin and Peeters 2006). Initially the migration of these industries was solely with the purpose of reducing production costs in order to gain competitive advantage. This often overlooked what could be considered secondary level factors such as supply chain reliability issues in respect of time and quality (Fratocchi *et al*. 2014; Harrington 2011; Arlbjørn and Lüthje 2012). Despite the scale of offshoring strategies implemented every year, results from surveys showed lower success rates than what was expected initially (Herath and Kishore 2009). As a result in recent years, there has been a decline in offshoring (Bals *et al*. 2013) and it is evident that some multi-national companies have decided to re-shore parts of their manufacturing activities to their home countries (Bailey and De Propris 2014). According to Koh *et al*. (2007), "the globalization and intensive world-wide competition along with the technological advancements create an entirely new business environment for the manufacturing organizations". In addition to this, the intensity of the global competition for customer satisfaction has made the customer-supplier relationship management more important than ever before (Choy *et al*. 2003). Tate (2014) suggests that the proximity to the emerging population of customer can be the motives behind the "shoring" decision. These indications have led to emergence of new trend called "re-shoring" in countries such as Germany, France, UK and USA (Bailey and De Propris 2014; Ellram *et al*. 2013; Fratocchi *et al*. 2013; Kinkel and Maloca 2009; Gray *et al*. 2013).

The re-shoring trend has received considerable attention in the UK with the Prime Minister of the UK calling the UK the "re-shoring nation" at the world economic forum in Davos Switzerland (Groom and Parker 2014). In order for the government to adopt the same horizon to support the new movement in terms of policymaking, energy cost and supply of skills, re-shore UK was established. This was launched in a collaboration between the UK Trade and Investment (UKTI) and the Manufacturing Advisory Service (MAS) resulting in a one-stop-shop service to help industries to return their production back to the UK (Gov.Uk 2014). This indicates the significance of re-shoring and how UK is supporting its industries to bring back their manufacturing activities. According to the report published by Business Birmingham (2013), 41% of the respondent studied in this investigation, has stated that the UK has become a more attractive option for manufacturing companies in comparison with other locations. This is further supported by the UK government report indicating that one in six companies has re-shored parts of their production back to the UK since 2011 (EEF 2014; Gov.UK 2014). However despite the significance of re-shoring in the UK and the momentum in research related to macroeconomic analysis of re-shoring, challenges associated with the operational aspect still remain sparse.

This paper starts by addressing an initial research question that aims to understand the primary reasons behind re-shoring phenomenon in the UK. A review of current literature and statistics published in government reports was then further enhanced through interviews of six organisations which include an Indian owned British OEM in the automotive sector, two governmental organizations promoting re-shoring in the UK, two consultancy services that have been closely involved in consulting re-shoring projects in the UK and an educational organisation which hosted the 2015 UK National Manufacturing Debate with the theme of re-shoring. This provided both an informative setting on the areas where the UK supply chain could enhance the supply capabilities in support of re-shoring companies. These interviews, together with the understanding developed form the literature formed the basis for the direction of research developed in this paper.

India is one of the most important low-cost countries where western supply chains have migrated to. Once the key factors for re-shoring had been identified in the UK, this was then used as a basis for the investigation among Indian industries. Thus the second research question was to investigate the factors behind re-shoring, found from research question 1, from an Indian industry perspective. In other words the second part of this research focuses on what the short comings in the supply chain are in Indian industries that lead to re-shoring in the UK. The data collection for this part was carried out during the author's visit in India and collaboration with Coimbatore Institute of Technology (CIT) in the state of Tamil Nadu, India. The outcome of this paper is based on interviews conducted within 11 Indian industries in various sectors.

Re-shoring

Investigation into the concept of re-shoring has gained considerable momentum in recent years (Kinkel and Maloca 2009). A number of scholars have explored this phenomenon in different countries including USA, Germany and UK. A study conducted by Tate *et al*. (2014) states that 40% of 319 US based companies who had already been involved in offshoring activities, perceived a trend towards re-shoring in their industries. It is evident that previously businesses have looked at their location decisions in too static a manner: generally ignoring the possibility of the long-term changes such as the rise in labour and fuel costs and change in customer demand (Tate *et al*. 2014). According to Wilburn and Wilburn (2011) the offshoring decisions were made based on piece-part cost reduction whilst assuming the competitive advantage would remain the same in future. It was identified that this could lead to risk of long term misjudgement in respect of manufacturing location decisions (Kinkel 2012). As a result the re-shoring phenomenon has emerged which Gray *et al*. (2013) defined as "bringing manufacturing back home". However due to the immaturity of the concept, several other names have been applied in the existing literature such as "on-shoring", "back-shoring, "home-shoring", "re-distributed manufacturing" and "repatriating manufacturing" (Kinkel and Maloca 2009; Fratocchi *et al*. 2013; Foerstl *et al.* 2016). A more comprehensive definition for re-shoring was given by Fratocchi *et al*. (2014) which defines it as "A voluntary corporate strategy regarding the home country's partial or total relocation of (in-sourced or out-sourced) production to serve the local, regional or global demand".

It is evident in the literature that reversing the offshoring decisions is not necessarily a new phenomenon. There have been number of studies conducted under various titles such as de-internationalization and international divestment. Benito and Welch (1997) define de-internationalization as any activities, voluntary or compulsory, that decrease a company's engagement in present cross-border activities. The notion of international divestment emphasized the reduction in level of ownership on a company's direct foreign investment regardless of how voluntary these decisions were (Boddewyn 1979). However these concepts of de-internationalization and international divestment, lack some of the key features of re-shoring such as outsourced production. In addition these studies do not particularly consider the relocation of facilities back to the home country.

An alternative term used to refer to re-shoring is "back-shoring" which was coined by Kinkel and Maloca (2009). In this study "back-shoring" is defined as process of returning full or part of the production from fully owned facilities in foreign location or a foreign supplier to the company's domestic site. Unlike studies completed by other scholars, Kinkel and Maloca (2009) believe "back-shoring activities are predominantly a short-term correction of prior misjudgement in offshoring decisions rather than long-term adjustment to changing conditions at the foreign location". This investigation was carried out based on the data gathered from German Manufacturing Survey 2006 (Fraunhofer Institute of System and Innovation Research). The study did not specify whether the re-shoring strategies were forced by external commercial circumstances and were thus "involuntary" strategies or whether they were voluntary decisions taken proactively to optimise commercial opportunities. To address this shortcoming in the re-shoring definition, Fratocchi *et al*. (2014) proposed a more complete definition in which re-shoring/back-reshoring is defined as "a voluntary corporate strategy regarding the home-country's partial or total re- location of (in-sourced or out-sourced) production to serve the local, regional or global demands".

Methodology

Scholars have traditionally adopted quantitative approach such as mathematical modelling and surveys to investigate issues related to supply chain management (Golicic and Davis 2012; Sachan and Datta 2005). In recent times, qualitative research has received more attention by European researchers (Taylor and Taylor 2009; Spens and Kovács 2006; Tachizawa and Thomsen 2007; Koste *et al*. 2004). However there still remains a lack of qualitative studies on the manufacturing aspects of the re-shoring phenomenon. Due to the immaturity of the subject within the academic context and limited practical application of re-shoring at the industrial level, it was recognised by the authors that an in-depth approach was required, from a selected population of interviewees, to facilitate access to reliable information. Since the underlying dynamic of re-shoring phenomenon in the UK is still not well understood, qualitative research methods were selected to fill the gap in the literature. According to Golicic and Davis (2012) in situations where the phenomenon of interest in new, dynamic and complex and a detailed description of the problem is required, qualitative research is a preferred method.

For the purpose of this study, semi-structured interview were conducted in various industries. The investigation started by identifying data sources that were in the forefront of the re-shoring topic in the UK, mainly the study of UK government reports (EEF 2014). As a result of this, six organisations in the UK were identified that were at the core of the re-shoring movement. After establishing contacts, six interviews were performed with the purpose of determining the main motivational reasons, from a manufacturing point of view, for UK industries to re-shore their production activities from low labour cost countries back to the UK. These organisations include an Indian owned British OEM in automotive sector, two governmental organizations promoting re-shoring in the UK, two consultancy services that have been closely involved in consulting re-shoring projects in the UK and an educational organisation which hosted the 2015 UK National Manufacturing Debate with the main subject of re-shoring

Following the initial investigation in the UK the focus of research was transferred to India. The selected sample for the second part of this investigation consisted of Indian manufacturers involved in supplying parts to Europe. The investigation involved focusing on the bottlenecks in the responsiveness of the Indian suppliers. For this purpose the chosen sectors were the industries operating in a high demand uncertainty environment where lead-time plays an important role. Once the target companies were identified, contacts were made through the Coimbatore Institute of Technology. As a result 11 interviews were performed in 11 different companies each taking between 1-1:30 hours. The analysis was carried out through manual coding and thematic analysis in order to identify the most repetitive patterns within their operations.

The companies were 1st and 2nd tier suppliers in mainly automotive, textile, industrial machinery and marine industries. The profile of the companies interviewed is listed in Table 1. For this data collection a highly ranked informant was selected who has an in-depth knowledge of supply chain management and issues related to overseas supplies. Each informant was contacted separately prior to the interview date, provided with the range of questions that needed to be answered. Once they were confidence in answering them, the interview appointments were arranged. The data collection from both UK and India were conducted separately in 2014-2015 and were all in English. The next section of this paper provides the details about the framework of the interviews.

Please Insert Table 1 About Here

Supply chain responsiveness

When interviewing the organisations in the UK, the main objective was to identify the most important supply chain issues that UK industries experienced when collaborating with Indian suppliers which influenced their decision to re-shore. Table 2 provides a summary of the findings from the interviews and presents a series of bullet points to provide an indicative summary of the overall motivations behind re-shoring to the UK.

The primary factor that emerged from the interviews concerned responsiveness. This mainly emphasised lead-time reduction since it appeared repeatedly as one of the top reasons behind re-shoring in each individual interview. However other factors such as quality improvement, logistics cost reduction, customer satisfaction and better communication in the supply chain were among the other reasons behind re-shoring. Findings also showed the proximity to the end customers, faster delivery, and shorter lead times are the vital elements for the businesses serving the domestic market in the UK. This is also aligned with the findings from the report published by EEF (2014) which indicated that 93% of companies felt that as the time passes the responsiveness to customer demand is becoming the major challenge in their businesses. Depending on the demand characteristics, firms competing in a market where customer demands are highly unpredictable need to be more responsive to the these changes and to collaborate more closely with other supply chain members.

Please Insert Table 2 About Here

These findings from UK companies also aligned with the literature. It is recognised that companies are no longer competing on an individual bases but require to be fully integrated with their supply chain to fulfil a mutual goal (Lambert and Cooper 2000). The research on supply chain responsiveness has been going on for more than a decade (Holweg 2005; Li *et al*. 2006). Since the early 1990s, companies have come to realise the significance of aligning their business strategies with their upstream and downstream activities (Kumar *et al*. 2006). It is evident that the capability to react to changes in customer demand is an important determinant of competitive advantage (Squire *et al*. 2009).

Research in India

After conducting the literature review on the concept of supply chain responsiveness and the first series of interviews in the UK, the framework for the interview in India was developed. It focussed on investigating the three factors that were considered to be the key enablers of responsiveness in the companies namely information technology solutions, manufacturing equipment and human factors. The interview guide was structured around these three factors. The insight gained from the interviews is expressed in Figure 1 which indicates that the responsiveness can be achieved by utilization and integration of these three strongly linked factors. In the context of these three key enablers the Indian companies were interviewed to capture the overall picture of the issue on supply chain and assess their capability for being responsive towards the demand in western countries. The next section provides a brief explanation on how these three factors can help companies to be more responsive.

Please Insert Figure 1 About Here

IT solutions

Today the influence of IT solutions on supply chain management is unprecedented. This is evident in the way that the data exchanges among companies are carried out. The linkage between them has been transformed in comparison to how it was done traditionally (Plamer and Griffith 1998; Arlbjørn and Lüthje 2012). IT can be utilized to establish partnerships for more effective and efficient supply chain systems (Choy *et al*. 2003; Waller and Fawcett 2013). The IT solutions can be in various forms ranging from mobile telephone communications and emails to electronic data interchange (EDI), customer relationship management (CRM), intranet and extranet, and direct links-up with suppliers (Quayle 2002). These technologies facilitate the collaborative planning among the suppliers and allows real-time information sharing such as demand forecasts and production schedule for supply chain decision making (Kumar *et al*. 2006). As it is shown in Figure 1, the absence of IT as one of the three enablers of responsiveness can lead to poor communication and lack of integration and transparency. According to Choy *et al*. (2003) "the rapid advance in IT is now deployed not only to improve existing operational effectiveness of a business, but also to build the new capability to meet today's business environment and complexity". Once the IT tools are in place the paper transactions are significantly reduced and it also leads to shorter order cycle times and decrease in inventory level (Prajogo and Olhager 2012; Quayle 2002).

Human factors

According to Kumar *et al*. (2006) the first phase in achieving manufacturing flexibility and becoming more responsive to customer demand relies on the responsibility of the senior management in identifying the specific aspects of responsiveness and focusing on the areas that can improve the competitiveness in terms of product range and speed. The absence of this factor can result in lack of right management support and skilled workforce which can ultimately reduce the company's responsiveness. Hence human factors can be divided into two parts. The first part is in relation to the responsibilities of the management team in the company. One of the critical aspects of management strategies towards responsiveness is provision of training and educating the workforce (Backhouse and Burns 1999). Hopp and Oyen (2004) believe that "cross-training can enable shorter lead time quotes and more reliable delivery by reducing the mean and variance of the cycle time (and hence lead time) to produce a product or service". In other words the adjustment and reconfiguration of the operations to achieve responsive production will only be feasible if there is right culture within which the workforce operates (Duclos *et al*. 2003). Hence training multi-skilled workforce can have a significant influence on the operation performance (Sawhney 2013). The second part of the human factor is about the availability of the workforce (Duclos *et al*. 2003; Sawhney 2013). This can consist of the shop floor operators with basic skills to engineers and personnel with specific expertise. According to Bailey and De Propris (2014) lack of skills in the UK is considered to be one of the limitations that the re-shoring companies are currently facing.

Manufacturing Equipment

The last factor to be considered is the re-configurability of the manufacturing equipment to meet the customer demand and shorten production lead-time. The manufacturing system can

be seen as an enabler to meet the emerging customer trends by reconfiguration of assets and operations (Duclos *et al*. 2003). Mehrabi *et al*. (2000) draw a line between re-configurability and agility of the production in which re-configurability does not deal with the entire organisation and instead it focuses on the production system and objective of manufacturing responsiveness. They suggest that the manufacturing systems should be able to be designed rapidly and be adjustable towards production of new products, at the same time its capacity should be modifiable and allow easy integration of new technologies in order to manufacture variety of products with unpredictable demands (Mehrabi *et al*. 2000). The flexibility of the machines is defined as the range of operations that a machine can complete without any major modifications in setup and the operation flexibility is the extent to which a part can be manufactured using different processes (Stevenson and Spring 2007).

Findings

Responsiveness in Indian industries

According to ATKearney (2014) report, India still remains the first offshoring destination for westerns companies among the other low cost countries. This indicates that India is still increasingly being considered as an attractive option and plays an important role in manufacturing location decision. Selecting South India (Tamil Nadu) as a point of data collection offers a range of benefits concerning its influence in global supply chain. The capital of Tamil Nadu, Chennai is known as the biggest industrial and commercial centre in South India and currently is considered as one of the largest suppliers of components to the European automotive sector. Hence it provides a platform to establish better understanding of quantity, quality and range of products that are being supplied to western industries. According to Make in India (2015) the Indian government is currently taking several initiatives to further support foreign investment, foster innovation, protect intellectual properties and build best-in-class manufacturing infrastructure.

In the preliminary part of the interviews, the interviewees were first introduced to the concepts of re-shoring and responsiveness (focusing on lead-time) and the objectives of the study were clearly defined. The language of some of the questions was simplified in order to make them easier to understand. Having considered the motives behind re-shoring movement in the UK published by EEF (2014), the companies were first asked about some of the potential reasons why western companies are re-shoring their manufacturing. The two factors that were most evident among the rest were the dramatic increase in labour and transportation costs in India which has initiated the steady reorientation of production activities towards the West. This is in line with reasons found in the literature (Fratocchi *et al*. 2013; Ellram *et al*. 2013; Gray *et al*. 2013).

Information technology (IT) is considered to be an important facilitator for communications and data exchange between Indian firms and their customers in Europe. This was also evident when the majority of the participant claimed that they are investing heavily in IT to enhance their abilities to manage their information and knowledge in the supply chain. However according to Fawcett *et al*. (2007) the only possible way to utilize IT solutions, is if both

parties are willing to share required information whereas without supporting this, large investments in IT can fail. Therefore this requires firms to communicate their strategic supply chain information and not just transactional data e.g. materials or product orders (Fawcett *et al*. 2007). Such level of communication will require great level of trust between the companies. The risk of intellectual properties being exposed to foreign market has been increasingly taken into account when making offshoring decisions (Tate *et al*. 2014; Lewin and Volberda 2011; Casson 2013). Despite having laws to protect the intellectual property in India, confidential data about innovative and new products is still vulnerable to being misappropriated (Ellram *et al*. 2013; Zimmerman 2013).

One of the main bottlenecks in utilization of IT solutions was companies mostly focusing on the technological side of the IT and paying less attention to the organisational culture. This can make the companies unsatisfied with the return on the investment (Soo *et al*. 2002). Hence this raises the issue on the human factors in the organisations. The participants were asked about their approach for training the workforce and providing education for their staff. According to Davis *et al*. (2012) "manufacturing workforce with substantially more advanced training and skills will not only be fundamental but will also be the key competitive advantage as dynamic management and operation of demand-driven product profiles increase and as innovation and faster time-to-market for new products becomes a key economic driver". The results from the data gathered showed that in recent time much attention has been given in providing right training and introducing educational channels in the Indian companies. All the companies interviewed claimed to adopt some sort of training for their personnel. This ranged from providing simple shop floor skills such as working with the machinery, using internal resources to more advanced engineering skills for quality assurance, lean and agile principles, customer relation management (CRM) and technical support for design. Some of the companies had also a close collaboration with their customers in Europe where they would send staff abroad for training purposes every year. Furthermore, contracts were made with the local universities to provide part time education for the people willing to advance their engineering knowledge.

The education of the workforce and familiarisation with the latest technologies and IT systems also indicates that the implementation time and overall cost of IT will also be reduced by substantial amount as a result of reduction in disruption time and clarification of the long-term benefits (Gaimon *et al*. 2011). Consequently over a course of time this will create an effective and efficient organisational culture which in turn will affect the working attitude of the workforce. The responsiveness of a firm can also depend on availability of the skilled labour in the case of emergencies. This was also raised as one of the issues that the Indian manufacturers were facing in recent years. Depending on the geographical location of the firm, the access to pool of manpower varied. For instance the availability of engineers in South India is not an issue however conversely there is a shortage of skilled manpower for tasks such as shop floor machining and assembly operations. It should be noted that the big companies capitalise on their strong brand image and international reputation, therefore they face fewer difficulties in finding skilled workers than small and medium size (SMEs)

companies. The reason behind such issues is the level of automation utilised in large manufacturing companies that requires less manual work.

Manufacturing facilities were the next area investigated having a substantial influence in the ability to shorten the time involved in manufacture and supply of the product. Companies were questioned on the level of automation used in their production line and the future plan for further investments in manufacturing equipment. Due to the globalisation and volatile market, Indian manufacturers are experiencing a significant transformation from traditional and conventional manufacturing to more intelligent and reconfigurable systems. Results indicate that significant attention has been paid to rapid adjustment of production capacity due to fluctuation in demand in recent years. Large investments are made in flexible and generic machines to accommodate a wider range of products.

Factors affecting the responsiveness

One of the objectives of this paper is to identify the bottlenecks that prolong the supply of product to western market which has resulted in companies re-shoring production back to their home countries (Fratocchi *et al*. 2013; Gray *et al*. 2013; Fine 2013; Bailey and De Propris 2014). Figure 2 illustrates the top four factors as determined in this research affecting the responsiveness of the Indian companies supplying overseas market. The percentage next to each factor represents the proportion of instances that each individual factor was recorded in overall data collection. The percentage indicates the number of companies that mentioned these factors as their operational problem that causes delay in their delivery time. The results obtained from the interviews show that the top three factors influencing the responsiveness of Indian industry beyond the conventional views expressed in the literature. The utilization of IT and manufacturing equipment were not key determinants in improving the lead-time for the products supplied from India. The following is a detailed explanation of each of the actual key determining factors identified in the research.

Please Insert Figure 2 About Here

- Logistics and transportation: this takes the biggest portion of the overall lead time to overseas markets and shipment around the globe. On average 4-6 weeks is spent on shipping the products using sea transportation from ports in South India to Europe. Additionally, due to the enforcement of the governmental policies towards cleaner transportation using slow-steaming ocean transit, the working capital is tied up in inventory for longer periods. The following quote is an example that shows the viewpoint on transportation issues from India to Europe.

  "Of course the customers are demanding, we currently make some products in 4-5 week and some in 10-12 weeks but on top of that you need to consider the shipping

time which is normally 4-5 weeks for Europe. So they are demanding shorter lead time and expecting us to have a warehouse and manage the inventory at their own place (Manufacturer 11)"

"... sometimes customers demand for faster delivery where we need to re-route and change the port. This is a disadvantage where the people in Europe also have the same lead-time and produce in 4-5 weeks but we in here need to add shipping time and transportation on top of that. That is why we are talking to them about opening a new warehouse and have vendor management inventory in our major customers country because we want have them advantage of what the domestic manufacturers have in US and EU (Manufacturer 11)"

- Electricity shortage: This is the next factor that has a significant effect on prolonging the production processes. Inconsistent electricity supply was mentioned almost by all the interviewees except the companies that have their own power generators in place inside the organisation. However this factor is not directly under the control of manufacturers and needs to be addressed by the Indian government.

  "We don't have any problem with electricity but it is because we produce our own energy. I am sure other smaller companies are struggling with this issue every day. (Manufacturer 1)"

  "Here in India, we need our governments' support, for example in our company we suffer from inconsistent electricity supply. There are situations that we need to stop working for 3 hours during the day time (Manufacturer 4)"

- Excessive paperwork: This consists of time taken to complete the paperwork required for domestic transportation, handling the logistics and export to Europe. However this issue can be reduced to some extent by appropriate implementation of IT. Nevertheless it is another factor which does not solely depend on the firm and should be addressed by the Indian government.

  "Our work is normally moved from one office to another, sometimes there is a delay for over a week for some unknown reasons and we need to wait while our product delivery is delayed (Manufacturer 5)"

- Working attitude was also among the top four reasons behind lack of supply responsiveness of Indian suppliers. However this can be the result of insufficient management skills to motivate and engage the workforce in team works towards company's set of clearly defined goals.

> *"One thing that we normally suffer from is the working attitude. Sometimes they (workforce) tend to do the job in last minute, if there is no pressure from management the orders will not be met until the last week.*
> *... also another problem is that we have too many holidays in India and in addition to that workers are asking for more holidays to spend time with their families (Manufacturer 3)"*

The result obtained in this study indicates that the lack of responsiveness in Indian industry in not strongly related to the insufficient level of IT capability in the organisations. In fact there is substantial effort put into enhancing the communications and data sharing with western companies to facilitate the product development, reduce miscommunications and ultimately increase the visibility in the supply chain. The main bottlenecks in achieving faster delivery times are mainly out of firms' operational impact and depend on the business environment inside India. However the government support varies across India and problems such as electricity shortage is widely noted in the state of Tamil Nadu. In accordance with these results we establish the following propositions in the context of supply chain management, which should be analysed in further studies:

P1: Changing production cost differentials between India and UK is not the main reason behind the British manufacturers' re-shoring strategies.

P2: Lack of production responsiveness in India is the main reason behind re-shoring strategies in the UK.

India is still considered to be a low cost country and continues to be targeted by western multinational companies. Despite the dramatic increase in labour and transportation costs in Asian countries (RSA and Lloyds Banking Group 2013), India still offers price competitive advantages in comparison with other low cost locations (Make in India 2015). However lack of supplier responsiveness is challenging Western OEMs who need to meet ever increasing customer requirements. Today customers demanding for higher levels of product customizations have put the manufacturing industries under substantial cost pressures due to having to deal with shorter product lifecycles. Consequently unresponsive supply chains lead to lower customer satisfactions (Yang *et al*. 2005). By re-shoring parts of the operations required for producing products with shorter lifecycles and uncertain demand, the innovation and product changes will be much easier managed by shorter supply chains. This also supports the work done by Moradlou and Backhouse (2014) on implementation of postponement strategies in the context of re-shoring. Since postponement can potentially delay the activities in the supply chain and differentiation of end product until the real information about the customer demand are available (Yang and Burns 2003). Hence by moving the decoupling point (where the forecast driven production gives way to demand driven production) downstream in the supply chain, the delivery time needs to be shorter which in turn requires a more responsive supply chain (Van Hoek *et al*. 1999; Yang *et al*. 2004). Such strategy also allows to "right-shore" or "Intelli-source" the operations by

combining the local knowledge and global network (Fine 2013; Tate 2014). In other words both offshoring and re-shoring strategies can be adopted while having in mind that "the lowest price can mean highest risk and highest risk can mean high total costs" (Fine 2013; Bals *et al* 2015).

Moradlou and Backhouse (2016) suggest that the re-shoring manufacturing activities to western countries can be seen as an opportunity to further employ postponement strategy in the supply chain. Hence re-shoring can provide a platform to keep the products in generic state and delay the product differentiation by taking advantage of local suppliers in the UK. The businesses affected by slow supply chain can then improve their responsiveness by postponing their manufacturing activities that serve the domestic market. Despite of having a well-established literature available on the concept of postponement, the applications of this strategy are still at an infancy stage (Yang and Burns 2003; Van Hoek 2001).

Conclusion

Due to the urgent requirement to meet the customer specifications and survive in a dynamic business environment companies are revisiting their manufacturing location decisions. This has resulted in a gradual re-shoring of manufacturing back to the UK. However the motivations behind such strategies appear to be inconsistent in the available literature. Two objectives were outlined in this paper. Firstly it provides a clear viewpoint of the issues related to supply chain management that leads to re-shoring and secondly investigate the reasons from Indian perspectives. Results indicate that responsiveness plays a vital role in re-shoring decisions in the UK. This has ultimately led to number of industries re-shoring their production back to the UK. In addition, this study highlights four main elements which are currently slowing down the supply from India. These factors are logistics and transportation, electricity shortage, excessive paper work and working attitude.

While this paper has contributions to the body of knowledge, it also has some limitations in its research methodology and data collection. The findings in this paper are limited to the companies that were interviewed in the UK and India and the reduced sample size restrains the level of generalizability of the findings. This study can firstly benefit from further in-depth investigation and identification of other factors behind re-shoring. In addition to this further validation is required using quantitative approach and larger sample sizes to include a wider range of industrial sectors. It should be noted that responsiveness was found to be the main reason for re-shoring to UK only in the context of Indian industries. This can be further supported by studying other low cost countries such as China.

References

Arlbjørn, J.S. and Lüthje, T., (2012). Global operations and their interaction with supply chain performance. *Industrial Management and Data Systems*, Vol. 112, pp.1044–1064.

ATKearney, (2014). A Wealth of Choices : From Anywhere on Earth to No Location at All. *Global Service Location Index*.

Backhouse, C.J. and Burns, N.D., (1999). Agile value chains for manufacturing – implications for performance measures. *International Journal of Agile Management Systems*, Vol.1 No. 2, pp.76–82.

Bailey, D. and De Propris, L., (2014). Manufacturing reshoring and its limits: the UK automotive case. *Cambridge Journal of Regions, Economy and Society*, pp.1–17.

Bals, L., Jensen, P., Moeller-Larsen, M. and Pedersen, T., (2013). Exploring Layers of Complexity in Offshoring Research and Practice. *The Offshoring Challenge*, Springer-verlag London. pp.1–18.

Bals, L., Daum, A. and Tate, W., (2015). From Offshoring to Rightshoring: Focus on the Backshoring Phenomenon, *AIB Insights*, Vol. 15 No. 4, pp. 3-8.

Benito, G.R.G. and Welch, L.S., (1997). De-internationalization. *Management International Review*, Vol. 37, pp.7–25.

Boddewyn, J.J., (1979). Foreign Divestment: Magnitude and Factors. *Journal of International Business Studies*, Vol. 10, No. 1, pp.21–27.

Business Birmingham, (2013). Jobs boost expected as British manufacturers source more UK components - Latest News - Media hub - Business Birmingham. Available at: http://businessbirmingham.com/media-hub/latest-news/jobs-boost-expected-as-british-manufacturers-source-more-uk-components/ [Accessed April 21, 2015].

Casson, M., (2013). Economic analysis of international supply chains: An internalization perspective. *Journal of Supply Chain Management*, Vol. 49 No 2, pp.8–13.

Choy, K.L., Fan, K.K.H. and Lo, V., (2003). Development of an intelligent customer-supplier relationship management system: the application of case-based reasoning. *Industrial Management and Data Systems*, Vol. 103 No. 4, pp.263–274.

Davis, J., Edgar, T., Porter, J., Bernaden, J. and Sarli, M., (2012). Smart manufacturing, manufacturing intelligence and demand-dynamic performance. *Computers and Chemical Engineering*, Vol. 47, pp.145–156.

Duclos, L.K., Vokurka, R.J. and Lummus, R.R., (2003). A conceptual model of supply chain flexibility. *Industrial Management and Data Systems*, Vol 103 No. 6, pp.446–456.

EEF, (2014). Backing Britain. *EEF Report*.

Ellram, L.M., Tate, W.L. and Petersen, K.J., (2013). Offshoring and reshoring: An update on the manufacturing location decision. *Journal of Supply Chain Management*, Vol. 49 No. 2, pp.14–22.

Fawcett, S.E., Osterhaus, P., Magnan, G., Brau, J. C. and McCarter, M., (2007). Information sharing and supply chain performance: the role of connectivity and willingness. *Supply Chain Management: An International Journal*, Vol. 12 No. 5, pp.358–368.

Fine, C. (2013). Intelli-sourcing to replace offshoring as supply chain transparency increases. *Journal of Supply Chain Management*. Vol. 49, pp.6–7

Foerstl, K., Kirchoff, J.F., and Bals, L. (2016): Reshoring and Insourcing: Drivers and Future Research Directions, *International Journal of Physical Distribution and Logistics Management,* Vol. 46, No. 5. Forthcoming.

Fratocchi, L., Barbieri, P., Mauro, C., Nassimbeni, G. and Vignoli, M., (2013). Manufacturing Back-reshoring - An Exploratory Approach for Hypotheses Development. *RSA AiIG 2013*, pp.1–35.

Fratocchi, L., Di Mauro, C., Barbieri, P., Nassimbeni, G. and Zanoni, A., (2014). When manufacturing moves back: Concepts and questions. *Journal of Purchasing and Supply Management*, Vol. 20, pp.54–59.

Gaimon, C., Ozkan, G.F. and Napoleon, K., (2011). Dynamic Resource Capabilities: Managing Workforce Knowledge with a Technology Upgrade. *Organization Science*, Vol. 22 No. 6, pp.1560–1578.

Golicic, S.L. and Davis, D.F., (2012). Implementing mixed methods research in supply chain management. *International Journal of Physical Distribution and Logistics Management*, Vol. 42 No. 8, pp.726–741.

Gov.Uk, (2014). New Government Support to Encourage Manufacturing Production back to the UK - News articles - GOV.UK. *January, 27th*. Available at: https://www.gov.uk/government/world-location-news/new-government-support-to-encourage-manufacturing-production-back-to-the-uk.

Gray, J. V., Skowronski, K. and Rungtusanatham, M.J., (2013). The reshoring phenomenon : what supply chain academics ought to know and should do. *Journal of Supply Chain Management*, Vol. 49 No. 2, pp.27–33.

Groom, B. and Parker, G., (2014). David Cameron tries to push reshoring with new advisory service. *Financial Times*. Available at: http://www.ft.com/cms/s/0/909e46fa-8453-11e3-9710-00144feab7de.html#axzz3Y7kgOshT [Accessed April 23, 2015].

Harrington, L.H., (2011). Is U.S Manufacturing Coming Back? *Inbound Logistics*, Vol. 31 No. 8, pp.38–46.

Herath, T. and Kishore, R., (2009). Offshore Outsourcing: Risks, Challenges, and Potential Solutions. *Information Systems Management*, Vol. 26 No. 4, pp.312–326.

Holweg, M., (2005). The three dimensions of responsiveness. *International Journal of Operations and Production Management*, Vol. 25 No. 7, pp.603–622.

Hopp, W.J. and Oyen, M.P., (2004). Agile workforce evaluation: a framework for cross-training and coordination. *IIE Transactions*, Vol. 36 No. 10, pp.919–940.

Kinkel, S., (2012). Trends in production relocation and backshoring activities: Changing patterns in the course of the global economic crisis. *International Journal of Operations and Production Management*, Vol. 32 No. 6, pp.696–720.

Kinkel, S. and Maloca, S., (2009). Drivers and antecedents of manufacturing offshoring and backshoring-A German perspective. *Journal of Purchasing and Supply Management*, Vol. 15 No. 3, pp.154–165.

Koh, S.C.L., Demirbag, M., Bayraktar, E., Tatoglu, E. and Zaim, S., (2007). The impact of supply chain management practices on performance of SMEs. *Industrial Management and Data Systems*, Vol. 107 No. 1, pp.103–124.

Koste, L.L., Malhotra, M.K. and Sharma, S., (2004). Measuring dimensions of manufacturing flexibility. *Journal of Operations Management*, Vol. 22 No. 2, pp.171–196.

Kumar, V., Fantazy, K., Kumar, U. and Boyle, T., (2006). Implementation and management framework for supply chain flexibility. *Journal of Enterprise Information Management*, Vol. 19 No. 3, pp.303–319.

Lambert, D.M. and Cooper, M.C., (2000). Issues in Supply Chain Management. *Industrial Marketing Management*, Vol. 29 No. 1, pp.65–83.

Lewin, A.Y. and Peeters, C., (2006). Offshoring Work: Business Hype or the Onset of Fundamental Transformation? *Long Range Planning*, Vol. 39 No. 3, pp.221–239.

Lewin, A.Y. and Volberda, H.W., (2011). Co-evolution of global sourcing: The need to understand the underlying mechanisms of firm-decisions to offshore. *International Business Review*, Vol. 20 No. 3, pp.241–251.

Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S. and Subba Rao, S., (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, Vol. 34 No. 2, pp.107–124.

Make in India, (2015). New Initiatives _ Make In India. Available at: http://www.makeinindia.com/ [Accessed April 20, 2015].

Mehrabi, Ulsoy and Koren, (2000). Reconfigurable manufacturing systems : Key to future manufacturing. *Journal of intelligent Manufacturing*, Vol. 11, pp.403–419.

Moradlou, H. and Backhouse, C., (2014). Re-shoring UK Manufacturing Activities , Supply Chain Management and Postponement Issues. *18th Annual Cambridge International Manufacturing Symposium*, pp.344–354.

Moradlou, H. and Backhouse, C.J., (2016). A review of manufacturing re-shoring in the context of customer-focused postponement strategies. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, pp.1–11.

Plamer, J. and Griffith, D., (1998). An emerging model of Web site design for marketing. *Communications of the ACM*, Vol. 41 No. 3, pp 44-51

Prajogo, D. and Olhager, J., (2012). Supply chain integration and performance: The effects of long-term relationships, information technology and sharing, and logistics integration. *International Journal of Production Economics*, Vol. 135 No. 1, pp.514–522.

Quayle, M., (2002). E-commerce: the challenge for UK SMEs in the twenty-first century. *International Journal of Operations and Production Management*, Vol. 22 No. 10, pp.1148–1161.

RSA and Lloyds Banking Group, (2013). Making At Home , Owning Abroad. , (April).

Sachan, A. and Datta, S., (2005). Review of supply chain management and logistics research. *International Journal of Physical Distribution and Logistics Management*, Vol. 35 No. 9, pp.664–705.

Sawhney, R., (2013). Implementing labor flexibility: A missing link between acquired labor flexibility and plant performance. *Journal of Operations Management*, Vol 31, pp.98–108.

Soo, C., Deering, A., Midgley, D. and Deering, A., (2002). Knowledge Management: Philosophy, Processes and Pitfalls. *California Management Review*, Vol. 44 No. 4, pp.129–150.

Spens, K.M. and Kovács, G., (2006). A content analysis of research approaches in logistics research. *International Journal of Physical Distribution and Logistics Management*, 36 No. 5, pp.374–390.

Squire, B., Cousins, P. D., Lawson, B. and Brown, S., (2009). The effect of supplier manufacturing capabilities on buyer responsiveness The role of collaboration. *International Journal of Operations and Production Management*, Vol. 29 No. 8, pp.766–787.

Stevenson, M. and Spring, M., (2007). Flexibility from a supply chain perspective: definition and review. *International Journal of Operations and Production Management*, Vol. 27 No. 7, pp.685–713.

Tachizawa, E.M. and Thomsen, C.G., (2007). Drivers and sources of supply flexibility: an exploratory study. *International Journal of Operations and Production Management*, Vol. 27 No. 10, pp.1115–1136.

Tate, W.L., Ellram, L. M., Schoenherr, T. and Petersen, K.J., (2014). Global competitive conditions driving the manufacturing location decision. *Business Horizons*, pp.1–10.

Tate, W.L., (2014). Offshoring and reshoring: U.S. insights and research challenges. *Journal of Purchasing and Supply Management*, Vol. 20 No. 1, pp.66–68.

Taylor, A. and Taylor, M., (2009). Operations management research: contemporary themes, trends and potential future directions. *International Journal of Operations and Production Management*, Vol. 29 No. 12, pp.1316–1340.

Van Hoek, R., (2001). Rediscovery of postponement a literature review and directions for research. *Journal of Operations Management*, Vol. 19 No. 2, pp.161–184..

Van Hoek, R., Pellen, E. and Commandeur, H.R., (1999). Achieving mass customization through postponement : A study of international channels. *Journal of Market-Focused Management*, Vol. 3 No. 3, pp.353–368.

Waller, M.A. and Fawcett, S.E., (2013). Big Data , Predictive Analytics , and Theory Development in the Era of a Maker Movement Supply. *Journal of Business Logistics*, Vol. 34 No. 4, pp.249–252.

Wilburn, K. and Wilburn, R., (2011). Abbreviated Scenario Thinking. *Business Horizons*, Vol. 54 No. 6, pp.541–550.

Yang, B. and Burns, N., (2003). Implications of postponement for the supply chain. *International Journal of Production Research*, Vol. 41 No. 9, pp.2075–2090.

Yang, B., Burns, N.D. and Backhouse, C.J., (2004). Management of uncertainty through postponement. *International Journal of Production Research*, Vol. 42 No. 6, pp.1049–1064.

Yang, B., Burns, N.D. and Backhouse, C.J., (2005). The application of postponement in industry. *IEEE Transactions on Engineering Management*, Vol. 52 No. 2, pp.238–248.

Zimmerman, A., (2013). Contending with Chinese counterfeits: Culture, growth, and management responses. *Business Horizons*. Vol. 56 No. 2, pp. 141-148

Table 1. Firms Profiles

Sector	Firm	Number of employees	Informant position
Automotive	Manufacturer 1	1500	Commercial Officer
	Manufacturer 2	6000	Supply Chain Manager
	Manufacturer 3	150	Managing Director
	Manufacturer 4	120	Managing Director
	Manufacturer 5	80	Managing Director
	Manufacturer 6	200 in one department	Senior Quality Officer
Marine and Industrial goods	Manufacturer 7	3000	Design Manager
	Manufacturer 8	1300	Supply Chain Manager
Electrical	Manufacturer 9	600	Supply Chain manager
Textile	Manufacturer 10	260	Managing Director
Industrial goods	Manufacturer 11	720	Sales and Marketing Manager

Table 1, Summary of the interviews in the UK

Organisation	Type	Date of Interview	Viewpoint about re-shoring
Interview 1	Governmental Organisation	02.04.2014	• *Create more jobs in the UK* • *Serve domestic market* • *Cut production costs and time* • *Use government incentives*
Interview 2	Governmental Organisation	02.04.2014	• *Improve quality of the output* • *Create more jobs in the UK* • *Reduce product delivery time* • *Minimise logistic costs*
Interview 3	Consultancy	29.07.2015	• *Reduce costs* • *Shorten lead-time* • *Improve quality*
Interview 4	Consultancy	02.06.2015	• *Be more responsive to the demand* • *More integrated supply chain* • *Lower transportation costs*
Interview 5	Original Equipment Manufacturer	26.11.2014	• *Lower production costs* • *Better communication* • *Shorten lead-time*
Interview 6	Educational Organisation	02.04.2015	• *Be more responsive to the demand in UK* • *Better supply service* • *Better customer satisfaction* • *Lower transportation costs*

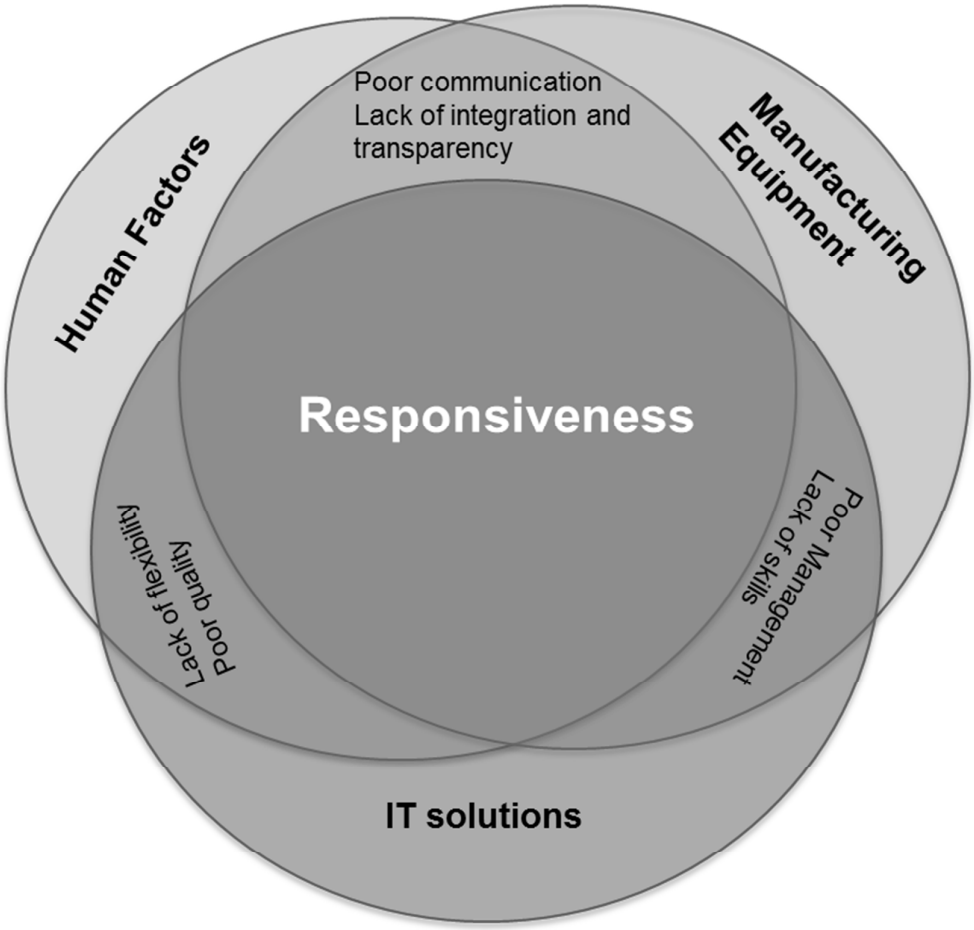

Figure 1. Responsiveness Framework

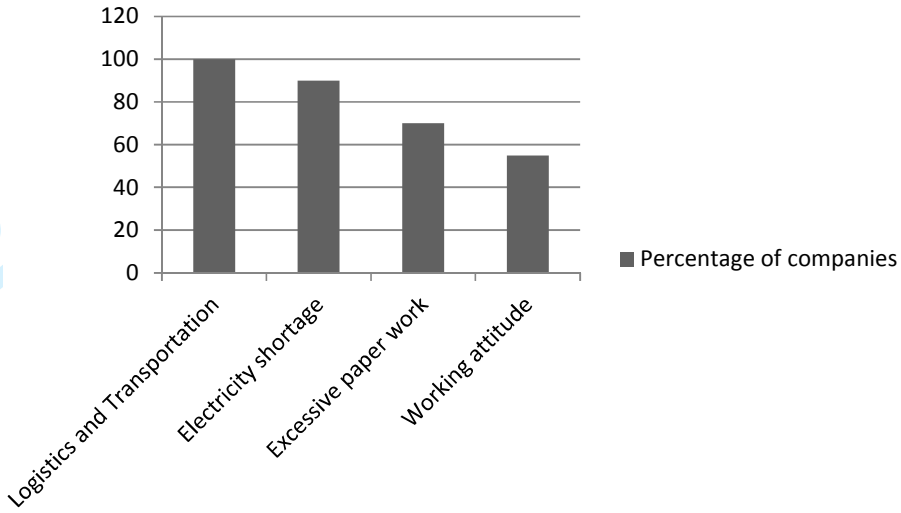

Figure 2. Factors affecting the responsiveness of Indian industries expressed as percentage of companies identifying the factors as their top 3 factors