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## High Technology Health Care Supply Chains: Issues in Collaboration

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### Abstract

Healthcare goods have witnessed an unprecedented growth in past few years, especially in developing countries. Being a prominent supply chain, it has drawn attention of the academia as well as the Industry. Cost cutting is one of the important issues in high technology healthcare goods such as heart stents, dental implants etc. Taking in view of the collaborating aspects in healthcare supply chain, we present the case of dental implants. From material procurement until the delivery end (patient) huge costs are involved which appear in different form from R & D to high technology manufacturing. Apart from the cost minimization, some sensitive areas seeking attention are core competency strength and degree of information transparency. In this paper; we present a few broad aspects of the entire supply chain for dental implants incorporating the prominent characteristics and issues. We also discuss how the collaboration and alliance formation helps in capturing value.

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### 1. Introduction

As companies operate globally; the supply chain network expands and so are the complexities encounter and require better enforcement of management tools.

Today, Healthcare industry is growing at a fast pace in India. Starting from the metropolitan cities to towns and then to rural areas, there is a huge demand of healthcare goods in this populous country. These goods and services have their different flows seeking the criticality of the situation. When dealing with the emergency situations it requires a

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fast response time from the entire supply chain e.g. in critical disease like cardiovascular diseases. The entire supply chain gives an untapped opportunity for the supply chain specialists and demands a lot of transformation in terms of developing tools, mechanisms so that the value can be delivered through the supply chain and correspondingly it should be beneficial for the healthcare organizations as well as patients at large. It is apparent that there is a huge unorganized sector involved in health care industry. Various big business houses outsource their part of business to different vendors. Hence, everyone wants to generate profit.

The high technology infers to the technology which is at the cutting edge and say most advanced technology. The industry which uses advanced methods and most modern equipment is called as “High technology industry” (<http://lexicon.ft.com/>) and these industries work in a cohesive manner with the supply networks in their specialities. With the high technology supply chains the issue always prevails is the growing pressure of the competitiveness and the up-keeping of the demand. Furthermore the speed to market of the high tech product is necessary.

Hence, the systems incorporated in high technology supply chains require a staged investment in the information systems at the point of sale so that the real time demand can be updated. This significantly reduces cost of logistics and efficient management of the inventory levels. Handling returns or service incurs huge costs and hence the same has to be efficiently handled. Further the high technology supply chains relate the issues relevant to a sub group like handling the logistics and inventory through the warehouse management; reverse logistics management involves the fully automated processes for the returns, sharing the data with the suppliers help in managing the inventory levels at the suppliers end and hence the production processes can be scheduled efficiently. Recently the high technology supply chains have suffered numerous service issues such as growing costs and inventories, lagging service levels, cost escalation or add ons later. Hence, in order to overcome such issues the companies incorporate changes in the production schedules which affects the entire supply chain network.

This paper aims to explore the issues and challenges in high technology healthcare supply chains. We come up with various issues pertinent in manufacturing, use of information technology and its impact. The remaining paper is as follows: section 2 sums up the previous research work in brief. Section 3 is about characterizing the high technology healthcare supply chains for dental implants. Section 4 deals shows collaboration as the important relationship to engage; section 5 talks about comprehensive framework for healthcare supply chains highlighting the need of high technology use. Section 6 is about some prominent issues in dental supply chains. Finally, section 7 presents concluding remarks.

## **2. Literature Review:**

The literature is examined keeping in view the high technology industry and the supply chains.

Apart from healthcare Industry; other high technology industries include space industry, arms industry, micro precision manufacturing of parts. Innovation and globalization have shaped these industries differently. This differentiation has been due to some of the happenings worldwide that made the industries incorporate changes. Cornell (2011) stated particularly about the high technology space industry in USA and happenings post-cold war: merging of the aerospace and defense (A&D) industry, acts related to arms regulation and control, collision of satellites and fresh space programs pushed the industry to go for such changes.

Wu, Yenyurt, Kim, & Cavusgil (2006) stated through a study that the investment in IT does not guarantee the better organizational performance. However, more investment in IT may be good for a particular Industry but this situation may not be scalable. From a resource based perspective he states about the supply chain capabilities as Information exchange, coordination, inter-firm activity integration and supply chain responsiveness. Lee, Palekar, & Qualls (2011) investigated about reducing the cost by implementing RFID in such a way that security and efficiency of the supply chain could be improved. Proper incentive mechanism are not available to deal with the challenge of incorporating the cost intensive technologies in a collaborative setup. Further, they observed that the tax benefits through some policy could motivate higher investment in technology. Felix & Valverde (2014) stated about the effect of using the RFID technology in the dental supply chain and compared the results with the existing dental supply chain taking a case of UK dental Industry. He stated that the RFID technology was helpful in eradicating

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