Chapter 84
Agile Supply Chain Management

Arnab Banerjee
Infosys Ltd., India

ABSTRACT

This chapter reviews some basic researches on agility and derives the various factors, aspects, dimensions, characteristics and distinguishing attributes that drive an agile supply chain. The chapter further explores characteristics for an overall agile supply chain and the finer detailed nuances of each echelons of an agile supply chain. This chapter discusses certain specifics to enable agility for retail businesses. Resilience is another aspect that is very important in today's retail supply chain and the characteristics of agility further helps achieve the same. Technology is an inseparable aspect of today's cutting edge supply chain and this chapter explores the various ways in which digitization enables an agile supply chain.

INTRODUCTION

Oxford's Dictionary defines Agile as "the ability to move quickly and easily". The term "agility" ideally refers to a "continual readiness to change, sometimes to change radically" (Goldman et al. 1995). Agility in the industrial engineering domain was first used for manufacturing. By the end of the Cold War, the United States were left with two parallel industrial infrastructures—one for defense, and the other for general commerce. Each sector relied on distinct technologies, production processes and business practices. This made defense systems unaffordable, that encumbered the US' industrial competitiveness. There was a need to unify the industrial base where defense and commercial products would share dual-use technology, and would be manufactured on rapid responses to meet customer demands. This study was tasked to the Iacocca Institute of Lehigh University in Pennsylvania, USA. The institute reported the study in a forum on their 21st Century Manufacturing Enterprise Strategy report and introduced the term 'Agile Manufacturing' therein.

The word then began catching the imagination of researchers across the globe and soon it was generalized to the "Agile Supply Chain" and extended to market behaviour. From the market's perspective, agility is defined as "using market knowledge and a virtual corporation to exploit profitable opportunities in a volatile market place" (Naylor et al., 1999). From a supply chain perspective, according to Christopher (2000) & Banerjee et al (2012), agility is "the capability to embrace organizational structures,

DOI: 10.4018/978-1-7998-0945-6.ch084

information systems, logistics processes and mindsets". As it could be seen from different definitions, it basically deals with the buoyancy between volatile markets and unpredictable demands. It is all about how to gain the buoyancy and apply it to the supply chain.

One of the key challenges today for any organization in any business space is the need to respond to unpredictable volatility in demand and variety. The consumer behavior is rapidly evolving in today's ever changing landscape with constant pressure to deliver as per the need. To meet this challenge the organization needs to be agile, such that, it can respond in shorter time-frames. In other words, it needs to be able to meet the market expectations both in terms of demand and cost.

CHARACTERISTICS OF AN AGILE SUPPLY CHAIN

An agile supply chain is expected to be both market-driven and market-sensitive. This simply means that it has to be capable of reading and responding to market demands. One of the major characteristics of an agile supply chain is that it focuses on "speed and flexibility" with little concern to the costs of attaining the agility. So for an agile supply chain, the service levels are the winning criteria, whereas quality, cost and lead times are the qualifiers. This is achieved through enhanced collaboration, as well as by changing the way supply chain traditionally operates. A focused agile supply chain develops nontraditional characteristics like 'core competencies', follows global outsourcing policies, and predominantly uses IT to develop enterprises. Gunasekaran et al (2008) rightly points out, that agile supply chains are characterized by "supply management, strategic alliances, virtual enterprises, global outsourcing, and IT". Thus the agile supply chains are focused on customer service with deep collaborative relationships with continual incremental changes towards a transformational agile strategy. Such supply chains focus on process integration and demand management. Sensitive to change in demand and customers' choice, such supply chains are flexible to bringing about a change in their design, production capability or, for that matter, their distribution ability. Information technology plays a major role in such supply chains, as it trains the employees towards knowledge-based learning, helps in virtual integration of departments and practices across the globe, enables vertical integration in supply chain, and enables supply chain visibility through enhanced information sharing. These characteristics were first highlighted by Harrison et al (1999) and later improvised upon by Christopher et al (2004) as shown in Figure 1. But this also eventually underwent multitudes of transformational changes over the next decade. The change has mostly been the incorporation of technology in everything possible. With this change, the new characteristics, as depicted in Figure 2, provide one more level demonstrating the use and impact of information technology and how it has evolved from the earlier proposed situation.

- **Market Sensitivity:** The agile supply chain needs to understand the market trend better and faster. This requires the ability to change and to adopt design. This also needs the ability to ramp up and ramp down production and distribution as per the real demand. Technology plays a major role in these characteristics. Digital media, like social networking, is widely used to obtain an insight into the customer's behavior and mindset.
- **Collaborative:** Collaboration among different departments of an organization, and among suppliers and customers, is the need of the hour. Collaborative planning, forecasting and replenishment (CPFR) are widely followed in an agile supply chain. Employees of respective organizations are increasingly being trained on their ability to respond quickly and effectively, based on their knowl-