

## Chapter 22

# Impact of Cloud Computing on Green Supply Chain Management

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### ABSTRACT

*Almost every market in the world aims to go globally as wide as possible. It is important to understand the need for information and internet merged together in order to achieve such goal. Cloud systems are the new way of delivering and managing information to different parts in the world in a secure manner. However, not many organizations have moved to cloud. The rely of green supply chain management systems on cloud is not as popular as expected and not increasing fast enough. There is a trust issue raised against cloud and the adoption to it. Cloud can bring different benefits to green supply chain management systems such as the low cost of running, speed of dealing with information, and information availability which can have significant impact on energy savings. Organization contribution in the process of moving to cloud is important to attach any knowledge database to take competitive advantage.*

### INTRODUCTION

Information technology has been changing the way business works interlay through over the past few decades. More information to analyze and more to process. One of those areas is cloud computing. Cloud computing is a new technology that can be defined as a group of distributed computers powers that works together to process different sources of data and deliver solutions through common pool online. Different companies built huge data centers and offered public cloud services to end-users such as Google and Dropbox. Also, companies use such powerful data centers to introduce different solutions to business. Companies can use such cloud computing services to increase the efficiency and speed of works all over the process. The impact of cloud computing thoroughly reformed how industries operate specifically in Green supply chain. Cloud computing introduced some tasks for companies like data storing and accessing of online software with real-time data updating. To go through these developments,

DOI: 10.4018/978-1-5225-9570-0.ch022

we did summary surveys that evaluate some research papers that study the impact in the green supply chain in those major aspects: Architecture, Optimization and Information Sharing.

## **BACKGROUND**

### **Architecture for Green Supply Chain Network Simulation**

This part introduces a cloud computing architecture solution (CCAFSCNS) to shorten the time significantly when the simulation is applied to test the performance of a green supply chain. Since the main reasons for companies with large-scale multi-echelon green supply chains and complicated behaviors of different participants is predicted green supply chain performance, track the system performance, achieve what-if analysis and compare alternative system configurations, simulation techniques can take a long time. And companies needed to find a rapid simulator to do so. To test (CCAFSCNS), the res-assumed four characteristics described in Rossetti and Chen (2008). After that, a details establishment was introduced for the system architecture which includes the following layers: data layer, data tools layer, cloud computing system layer, web application layer, simulation layer, and prototype layer. To compare the time spent on simulate on the local computer and the time spent on the cloud computing solution, the solution may be classified into four components: (A) startup time of VMs, (B) scheduling time, (C) execution time and (D) file transfer time. Then, the paper compared between Traditional Solution and Cloud Computing Solution. To conclude, from Comparison, the cloud computing architecture solution can significantly shorten the simulation time.

### **Adoption of Cloud Computing in Manufacturing**

The research provided by the author is an effort to fill the knowledge gap of implementation of the Cloud Computing Technology (C.C.T) in the manufacturing technology and improve its green supply chain performance. The manufacturing industry is chosen because the business in this industry is becoming increasingly IT-resilient, globalized, distributed and agile demanding (Ali & Imran,2013).

### **Theoretical Framework**

The maximum capacity of cloud computing? According to a recent Merrill Lynch study, cloud computing is expected to be “\$ 160 billion in commercial and productive applications, and \$ 95 billion in management opportunities, \$ 65 billion in online advertising.” (Lindner et al., 2011)

There are three types of cloud deployment models proposed by the author:

- **Public cloud:** The Internet is featured by the presence of an external service provider and is particularly a cost-effective way to implement IT solutions for small and medium-sized enterprises.
- **Private cloud:** Public cloud computing provides many benefits to the environment, but organizations manage FV it. Private clouds provide better control over the cloud infrastructure and are often suitable for larger objects.

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