



Study on cloud based Supply
Chain Management and its
Effectiveness in global logistics companies

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Subject: Willingness for guiding dissertation of Mr. Ezzedine R. Bourghol, ID: 500064645

Dear Sir,

Ezzedine R. Bourghol is registered for Master of Supply chain Management, with the University of Petroleum & Energy Studies, Dehradun in October Batch

I hereby give my acceptance to guide the above student through the dissertation work " Study on Cloud-Based Supply Chain Management and its effectiveness in global logistics companies", which is mandatory requirement for the award of EMBA degree.

Thanking you,

Sincerely,

ABSTRACT

In the cutting edge world, organizations are researching best in class practices to advance both the cost and operational productivity of their supply chain. Cloud figuring develops as an important innovation that could add to this advancement by giving framework, stage, and programming answers for the entire supply chain network by means of Internet.

This research proposes an applied system model for coordination of cloud figuring with the supply chain network. This coordination can possibly enable firms to use the advantages natural in a cloud registering condition and accordingly, empower associations to enhance their cost and operational effectiveness of management of their electronic supply chain. A cloud based condition can incredibly upgrade SCM accomplishment by making data deceivability along the whole supply chain; improving pace, cost, quality, customer administration, and amalgamation of all SCM exercises into a bound together, open and virtualized stage. The e-SCM exercises can be designed according to the cyclic view so as to improve the conceptualization of combination of SCM with cloud figuring.

The usage of cloud-based administrations in supply chain management prompts money related and operational advantages, while simultaneously potential dangers and limitations ought to be considered by all supply chain partners. In this research, a review of cloud-based supply chain management is tended to. From the outset, a short prologue to cloud innovation is given. At that point, the use of cloud registering on supply chain exercises is exhibited, while positive and negative parts of adjusting this innovation in present day supply chains are talked about. The case for Third-Party Logistics (3PL) specialist organizations is uniquely ended to. At long last, conclusions, limitations and suggestions of future research steps are examined.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Cloud computing is a quickly advancing technology that an ever increasing number of companies are embracing so as to improve their proficiency. As indicated by an on-going research, a top worldwide Information Technology counseling company, and the utilization of cloud computing will be more than twofold uses. Through the research, they found that the members had just guided, received or generously executed cloud advancements and the respondents expected to have done as such in three years. All the more explicitly, the quantity of logistics companies have significantly executed cloud is required to develop from almost past years.

Utilizing cloud-based technology in supply chains can produce various points of interest, for example, capital venture reserve funds, rearrangements, adaptability just as constant deceivability. Be that as it may, dangers, for example, information security and absence of customization and accordingly absence of upper hand ought to be thought about. All things considered, the research explicitly exhibits how realized Logistics companies use cloud computing right off the bat in private and afterward in open level so as to acquire the entire advantages of cloud organizing. Advantages that cloud computing bring to the table in supply chain management yet in addition the potential difficulties that an organization should go up against when utilizing cloud-based frameworks. In the research exhibits the impact of cloud-based supply chain in logistics companies.

1.2 PROBLEM STATEMENT

The most serious risk companies need to experience is data security and protection. Cloud computing frameworks as programming items can't generally guarantee secrecy and therefore run expanding risk of being invaded by hacking frameworks. Moreover, potential data procurement by contending companies would represent an up and coming risk to the entire supply chain and accordingly companies ought to think about which data ought to be sent to the cloud. Obviously, data in the cloud should consistently be gotten too just by approved individuals, to be specific reliable supply chain's accomplices. Regardless, this sharing of

data and information in open infers an extreme change on the conventional method for working and figuring which can be a critical social business issue.

In addition, concerns exist about what will occur if the supplier can't convey the organization's administrations because of a framework crash down. Supply chain tasks are essential for one organization's money related welfare and therefore any deferrals because of cloud framework's glitch can be demonstrated deadly. Simultaneously, the issue of accessibility is additionally urgent. Clients stress that they might not have consistently access to the cloud, for instance because of poor web association in various geographic areas.

1.3 NEED OF THE RESEARCH

Cloud computing is a technology that is deprived for more investigations as it is still generally new. Extra research into this framework can just add to its development and improvement, consequently empowering supply chains to profit by the learning and comprehension picked up. Besides, numerous associations are still in uncertainty in regards to the additions and risks related with receiving cloud computing, are as yet sitting tight for the science and the training to demonstrate its utilization and dependability. Henceforth, the researcher trusts this can land at a persuading answer for business associations everywhere. The researcher's advantage lies in investigating identified with the supply chain improvement and streamlining, especially right now when rivalry is based on cost, speed, adaptability, and conveyance, and not simply final products in worldwide logistics companies.

In the present complex, profoundly coordinated and globalized world, as companies are grasping e-supply chain management so as to improve their expenses and operational productivity while attempting to keep up upper hand, cloud computing offers a practical arrangement by offering stage, administration and programming administrations for organizations that are reasonable, adaptable, financially knowledge and client centered. A cloud-based supply chain management framework can possibly make this deceivability and openness of information continuously on a whenever anyplace.

1.4 OBJECTIVES OF THE STUDY

- To find out the cloud based supply chain management and its activities in logistics companies
- To realize the impacts of cloud-based computing in supply chain management and its effectiveness
- To discuss the cloud-based supply chain in global logistics companies
- To find out the new advanced cloud-based models for supply chain management logistics of majority companies

1.5 CLOUD SUPPLY CHAIN SOFTWARE IN SCM OPERATIONS

Cloud-based supply chain software and applications are upsetting supply chain management today, scaling operations from small businesses to complex enterprises. Cloud supply chain software solutions are showing significant increases in usage.

The focus on accomplishing higher supplier quality, forecasting exactness and stock streamlining while at the same time driving down manufacturing process durations are priorities today as a gathering, the senior management teams driving supply chains perceive the desperation of arriving at these goals as fast as possible. Because of the snappy idea of sending and arrangement of cloud supply chain software, additionally manufacturing teams see the cloud as a fast way to accomplishing goals.

Key features

- Gartner expects that by 2020, more than 90 percent of spending on supply chain execution systems will be for cloud supply chain solutions.
- By 2025, ability shortages in the supply chain for 75 percent of the best 500 manufacturers worldwide will mostly have been moderated by the use of supply chain advanced assistants.
- Sixty-five percent of surveyed supply chain professionals accept that supply chain management (SCM) technology including cloud registering is a source of upper hand, as indicated by an ongoing Gartner study.
- Cloud-based supply chain management software solutions are set to surpass \$15B by 2025.

Succeeding with the Cloud's Speed and Scale

For all manufacturers, late years show massive upticks in development. Many were anticipating normal or slow request, just to be surprised by the quick increase in orders and purchasing movement by existing and new customers. The challenge is dealing with their supply chains to keep up. Ask a supply chain executive about cloud processing, and they possibly need to know whether it can convey more speed, scale and precision. None of them care about the technology; all they need are results. Cloud applications and platforms are the development catalysts that will continue improving supply chain execution while catalyzing and powering worldwide manufacturing development.

1.6 CLOUD SUPPLY CHAIN SOFTWARE MANAGEMENT REVOLUTION

1. Supplier quality management features are conveying constant updates on the latest inbound shipment inspection and quality levels, ensuring the bill of materials (BOM) just defines the highest quality components and crude materials.

Getting a 360-degree perspective on each quality measurement from start to finish reduces costs and increases customer satisfaction. Cloud-based SCM applications can track and report quality levels by creation focus, item and customer level. Another advantage of having a cloud-based SCM system is the capacity to screen and follow any assembly, part or subassembly all through the supply chain continuously. With cloud-based SCM apps and platforms, quality becomes an increasingly pervasive piece of the system of record in any business.

2. Applying cloud-based business analytics and manufacturing knowledge allows manufacturing cycle's times to improve.

"Manufacturing process duration" has to do with the time elapsed between a request's beginning until an item is made and stored in stock? Making improvements to this significant manufacturing metric requires consistent and clear information.

Cloud-based solutions enable fast assembling and access to information from different points across the globe. Without the cloud, sizeable global warehousing operations are stuck working as per time zones and topographical locations. With cloud registering, any individual from any section of the supply chain can access and trade information with different users. Correspondence is a principal bit of the supply chain, and cloud-registering takes this to the

following level. Improving process durations starts with knowing why and where delays occur in the manufacturing process. With the ongoing applications of the cloud, you can stay at your most aggressive. As an item finishes its cycle, the data about its production can loan important insight into any possible improvements. Indeed, even now, there are software solutions accessible that give continuous updates on how a specific item performs and in the long run impacts monetary results.

3. Using the general hardware effectiveness (OEE) metric is giving users the learning of which machines and tools are in the best wellbeing and in the event that they fit the present generation run.

Manual estimation of a machine's exhibition and wellbeing are time depleting practices of the past. With cloud-computation of OEE, decisions that influence item production can be made rapidly from anyplace. OEE is an important measure of a generation machine or instrument's wellbeing. It can also be used to measure a product offering, creation group or a whole generation focus' presentation. An OEE metric track all that you would need to decide a machine's wellbeing, execution and when support is required. This measurement, as clarified by IQMS, is determined using a recipe that measures accessibility, execution and quality. Cloud SCM allows for the easy assembling and analysis of OEE information. Without any borders between the various networks included, thanks to the cloud, this information can be sent and got from operations across the globe.

4. Scalable cloud-based applications are mechanizing consistence and detailing so that significant time isn't lost by physically getting ready industry and government filings.

Consistence with the numerous rules and regulations of various government or industry institutions affects quite a bit of a supply chain. These reports require cautious contribution of information and can drastically decrease the profitability of employees tasked with their creation and conveyance. For medicinal gadget manufacturers, cloud-based consistence applications evacuate the weight of spending their significant associates' time listing records and announcing them. The U.S. Nourishment and Drug Administration (FDA) require that each maker keep up gadget history records to the clump, parcel and unit level. A cloud-based application equipped for creating government gadget history records (DHR) is a significant efficient and upper hand. Restorative gadget manufacturers also need to stay in consistence with Current Good Manufacturing Practice (CGMP), CFR and FDA requirements, as well as ISO 13485 and 9001 standards.

Cloud-based figuring, while supportive for all parts of the supply chain, is valuable to specialty providers. Every industry has its own set of regulations set up to ensure safe creation and transport of goods. Without fast access to parts of the supply chain, companies with ties to various specialty industries would see a slowdown because of time wasted documenting these types of reports.

5. Accomplishing continuous track and detectability execution is ending up progressively reachable with cloud-based applications that scale across supplier networks.

The more generation locations a maker has, the more basic supply chain visibility is to keeping up quality levels and picking up information used for item following. Cloud-based track and discernibility features save numerous manufacturers from the variable expenses of an item review by getting item quality problems early.

As your enterprise thrives, the requirement for quick scalability increases depending on in-house software can prompt wasted resources when new solutions should be coordinated. On the off chance that your stock is developing, you have to address the scaling difficulty as fast as possible. Removing time from creation or any piece of the supply chain, for new software combination and preparing can be a channel on significant resources. Without the requirement for new software, stock errors expedited by a transition vanish. Everything being used before the need to scale up will still be set up. In the event that your supply chain was working before you started to take on stock, scale up and proceed onward!

6. Coordinating with diverse applications, databases and systems using APIs (application programming interfaces) is scaling manufacturing strategies faster than at any other time.

APIs are a factor that is driving the expansion of cloud apps and platforms across manufacturers' numerous generation and plant locations. Serving as the paste between systems, APIs make ongoing mix links between systems that empower progressively productive information sharing, joint effort and transaction exactness. Reconciliation costs kept on plunging as APIs turned out to be progressively pervasive and more extensive in scope. This ease of reconciliation frees up vast amounts of time that can be spent in a progressively significant manner. As cloud-based solutions keep on developing sought after, you can hope to see much increasingly game-changing additions incorporated into their software suites. With adaptable APIs set up, cloud processing can unite a wide range of applications without excessive time spent incorporating new software into your supply chain.

7. Cloud-based warehouse management systems (WMS) are empowering higher supply chain execution by upgrading request management and creation planning across all warehouse locations.

Realizing stock levels all through supply chains makes stock planning and management progressively effective for every creation focus. Cloud-based WMS and ERP (enterprise resource planning) systems produce informational collections after some time that shows patterns, making it possible to foresee shifts sought after. In addition to the fact that meeting demands keep your stock moving, yet it also fosters fantastic customer relations. With fast request calculations and easy to access information, request problems should never separate you and a customer. These insights permit improved forecasting precision, which thus makes streamlining manufacturing schedules all the easier. Also, with cloud-based WMS, ERP and analytics systems designed to enhance stock, request management and satisfaction, manufacturers can hope to see benefit and income development gains.

8. Lessening request process durations and revise via robotizing valuing, citing and customer approvals with a single coordinated system is ending up increasingly normal.

Item quality problems regularly start when a wrong or deficient request gets made. Errors in evaluating, citing, item design or conveyance instructions all present errors, slow down orders and drive down item quality. Robotizing estimating, citing and customer endorsement workflows with a cloud-based application help decrease request process durations and improve quality. Request exactness goes up alongside customer satisfaction, while delays in paying invoices drop, which reduces days sales outstanding (DSO).

9. Incorporating item advancement, building, supply chain management and creation planning on the same stage is increasing new item presentation success.

Instead of rushing new products into an underlying manufacturing run, manufacturers who exceed expectations at item quality are happy to sacrifice a couple of weeks to get the item right. Readiness reviews and the highest need problems or bugs discover a resolution, and the schedule gets shifted to support higher caliber. Cloud-based applications are incorporating item improvement, building, supply chain management and creation planning teams on a worldwide scale to arrive at higher item quality levels.

10. Companies can measure flawless request execution with ERP software.

As a maker, in the event that you can convey products on schedule, to the opportune spot, with the correct documentation on the first attempt then you can assume your ideal request execution statistics are progressing nicely. The challenge to keep up this statistic grows as multifaceted nature in orders and design rises. Taking advantage of cloud-based analysis from ERP software can give significant data on holding your ideal request execution in complex situations.

1.7 CLOUD-BASED BENEFITS OF SUPPLY CHAIN MANAGEMENT

The Cloud design and the interconnected world it currently creates far surpasses the primordial Internet and Web 2.0. This development is influencing the everyday lives of consumers similarly to other specialized breakthroughs such as the printing press, engines and personal processing. It is in the usage of forefront innovative advancements that the challenge becomes obvious when what seems engaging becomes a stretch and strain while consolidating new technology to current processes. In the territory of supply chain management, in any case, errors can be lethal to a business' main concern. Potential integrators rapidly understand that even the startup steps are sensitive and dread of the obscure can enormously discourage selection of another technology to receive its rewards. Fortunately, with a Cloud-based supply chain management systems integrator, it is simpler to do than it appears.

Confined Supply Chain Management vs. cloud-based

Of the two solutions, the benefits of Cloud-based supply chain management surpass confined methods of manual stock analysis matched with neighborhood. Several remarkable ways selecting the Cloud benefits companies are included savings, safety by means of redundancy, scalability and efficiency. Past those significant improvements, the Cloud solution integrates undeniably more smoothly than limited software inside current systems.

Cost Effectiveness

Business is still capably sensitive to the laws of supply and request even as transactions move on the web. Truth is told the increasing challenge of the online markets offered by Cloud-based supply chain management technology currently adds a more prominent scope of features and valuing benefits for service users.

Companies are empowered to cut costs with growing capabilities and a consistently broadening customer base through the sheer scale of the Cloud. Keeping up full-scale information storage arrange management software and incorporating it with neighborhood systems, including utilizing system administrators eat up a heavy segment of your business' financial limit from the combined expenses of hours, wages and hardware. The Cloud solution disperses the expenses across all users whether small or huge corporations or sole proprietorships and expands the market capabilities to everybody regardless of size.

Integration Capable Design

From the center, the software and stage services on the Cloud-based supply chain management integration solution are designed to work in a simple and expeditious way with the IT solutions businesses as of now use. A service that requires an excess of setup or significant modifications to different factors of a business make secondary costs that drive away customers, so the hand of the market has driven the service providers to ensure that their systems are completely capable of integration with either negligible exertion or included support.

Redundancy

How can one surmount the risks of personal time and coincidental information loss in the switch to the Cloud? Those risks turned reality lead to expensive and possibly catastrophic interruptions. At the point when actualized accurately, a Cloud-based supply chain management solution has more redundancy, not less. Actually, confined solutions are more risky than the established failsafe methods of the Cloud solution.

Isolated restricted system solutions are more powerless than Cloud systems in case of a blackout. In any event, when one server zone experiences a breakdown briefly, the Cloud moves the information and software around various system servers to keep up fast processing speeds and continuous services. Regardless of your area, The Cloud simply works in a hurry and you are not attached to your office, house or neighborhood web hotspot. Suddenly, the glitches and outages that would shut down your organization for quite a long time while specialized support quickly attempted to restore services are a relic of days gone by.

Efficiency

By utilizing the power of information analysis and computerized management, the Cloud keenly shapes the systems of the resupply process. "Automation" can prompt dread of fourfold sized orders mysteriously showing up because of a glitch in the code, however the cloud-based supply chain management system performs step-by-step, productive analysis based on the contribution of business and programming experts. Be that as it may, the Cloud does not manage how the association operates. No, it equips managers with the fast and easy information access to settle on the shrewdest choices based on sound information detailing frees of financing or time constraints.

Scalability

With a conventional supply chain, modifications in your demands cascade into a large number of considerations. While downsizing can be easy to embrace, including supplies for another business area can unleash ruin on the typical supply methods. With the more established supply model, chasing for the stock you have to deal with various locations can immediately turn into a nightmarish, headache initiating process.

The Cloud, similar to its figurative name, is an amorphous assortment of system connections and information. For the cloud-based supply chain management system, scaling your supply upwards is as easy as composing a couple of new lines of data like the address of the new area and contributing extra information. On the off chance that the management is performed nearby, the task of deciding the new supply needs and obtaining sources becomes progressively intensive.

The Future of Business

While organizations have had the savvy to deal with their own supply chains for quite a long time, with the advancement of the Cloud, owners presently have faster and increasingly effective information access to their supply chains. All sizes and all ages of businesses can profit quickly by updating from a restricted supply chain management service model to the Cloud. Presently free of dull, personality desensitizing tasks, owners and workers are at long last ready to truly focus on increasing organization profits and appreciate genuine feelings of serenity about the activity of their supply chains.

CHAPTER 2

CONCEPTUAL STUDY

2.1 SUPPLY CHAIN SOFTWARE SUPPLIERS

Regardless of whether they're getting shipment alerts, overseeing warehousing stock, doing request forecasting, or using analytics to use sound judgment, you can wager the warehouse and logistics personnel dealing with these tasks are using software to take care of business.

Be it a transportation management system (TMS) for associating with carriers, a warehouse management system (WMS) for orchestrating stock inside the four walls, or a more extensive enterprise resource planning (ERP) solution that incorporates numerous functions, the technology that drives the supply chain is getting stronger, better and faster consistently.

As supply chain becomes a greater need for companies everything being equal, the requirement for software that supports and streamlines this significant business segment has also developed. With e-tailers like Amazon pushing the envelope on same-and following day shipping, web based business sales skyrocketing consumers spent \$504.6 billion online last year, a number that is relied upon to hit \$735 billion by 2023 and numerous companies still using old or manual-based systems to oversee warehousing, satisfaction and distribution, the supply chain management (SCM) sector continues to climb steadily consistently.

Comprised of supply chain planning (SCP) and supply chain execution (SCE) software, SCM is still driven by the world's largest software developers, albeit a couple of smaller, scrappier players are starting to wear down those bigger players' piece of the pie. As per a yearly report from Gartner on the overall income of the supply chain software advertise, in 2017 and 2018, the best four suppliers kept up their positions and request, with SAP, Oracle, JDA and Infor asserting those spots on Gartner's list.

Descartes Systems Group climbed an indent to fifth, with Coupa on its heels in sixth (up from seventh last year). This year's fastest-climber was Jaggaer, which enters the Top 20 graph at No. 7, trailed by Manhattan Associates (which dropped three spots from 2017), WiseTech Global (up one score), and Epicor, which descended by two places more than 2017.

In pursuit of growth

Research for SCM software, says Jaggaer's jumping can be followed to the spend management solution supplier's 2017 acquisition of BravoSolution, a producer of worldwide strategic acquirement platforms and No. 18 on last year's list. The joined organization currently has 1,850 customers associated with a system of 4 million suppliers in 70 countries, as per Jaggaer.

As indicated by the Top 20, the SCM growth leaders are E2open (with 54% growth from 2017 to 2018), WiseTech Global (53%), IFS (42%), Coupa (41%) and Apttus (40%). Adjusting the growth leaders list were Tradeshift (28%), GEP (27%), Sovos (26%), Ivalua (25%) and Jaggaer (24%).

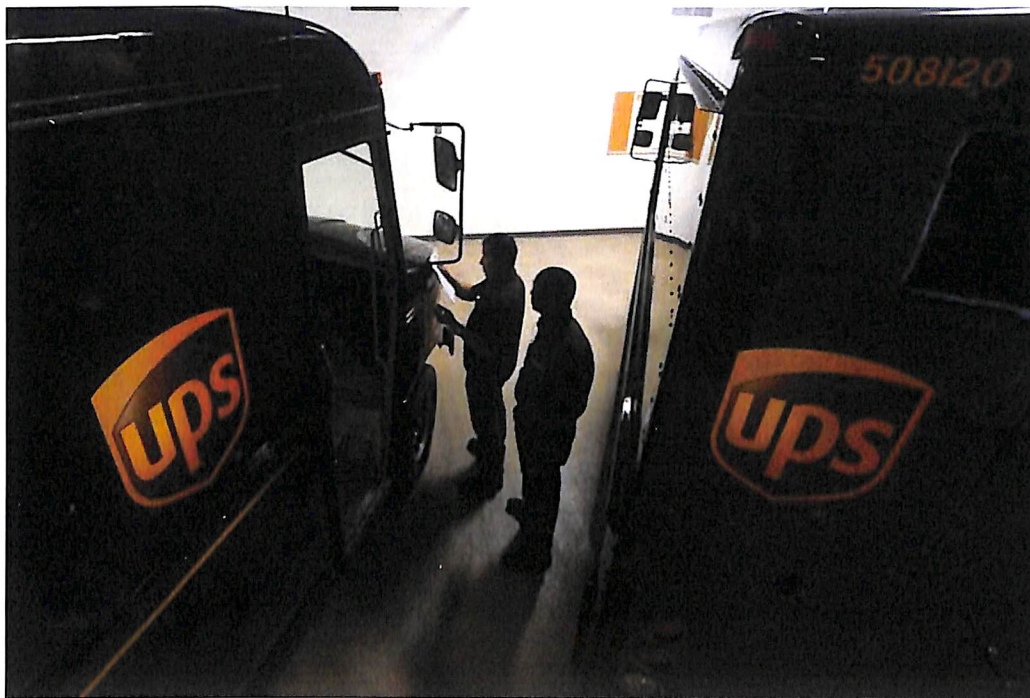
When Jaggaer purchased Bravo Solution it developed in terms of income and got into the best 10 SCM positioning. Outside of that, there weren't any genuine significant shifts somewhere in the range of 2017 and 2018. Watching out for Coupa, a business spend management (BSM) supplier that is on its very own spending spree, having just procured agreement lifecycle management supplier Exari In May. Coupa continues to become faster than most different vendors in the main 10 at the present time and likely has the highest growth pace of the gathering.

Top 20 supply chain management software suppliers

No.	Supplier	2017 Revenue	2018 Revenue
1	SAP	3385.8	3884.7
2	Oracle	1641.8	1672.4
3	JDA Software	730	782
4	Infor Global Solution	231	320
5	Descartes System Group	217	244
6	Coupa	166	255
7	Jaggaer	183	251
8	Manhattan Associates	225	217
9	WiseTech Global	140	213
10	Epicor	158	177
11	E2open	110	170
12	Basware	139	143
13	BluJay	114	131

14	GEP	96	124
15	IBM	118	124
16	Kinaxis	112	121
17	IFS	67	98
18	Highjump	82	85
19	Logility	69	75
20	TMC	67	76

2.2 WORLDS LARGEST LOGISTICS BRANDS USING CLOUD SOFTWARE



1. UPS

United Parcel Service is an American global bundle conveyance organization and a supplier of supply chain management solutions. Services also incorporate a payload aircraft, a cargo based trucking activity and retail-based pressing and shipping Centre's. UPS employs roughly 444,000 staff with around 240,000 drivers with universal bundle operations conveying to in excess of 220 countries. Its CEO is David P. Abney and the brand estimation of the organization is \$22bn.

2. FedEx

FedEx Corporation is a US global dispatch conveyance services organization with its headquarters in Memphis, Tennessee. FedEx offers a total suite of online services for shipment readiness, bundle following, shipment rates and tools for global shippers and small businesses. The name FedEx is really a shortened form of the name of the organization's unique air division, Federal Express. Brand esteem, as per Brand Finance, is \$18.1bn. The CEO is Frederick W. Smith.

3. Japan Railways Group

The Japan Railways Group is all the more usually known as the JR Group and consists of seven revenue driven companies that took over most of the assets and operations of the administration possessed Japanese National Railways in 1987. The JR Group has an all out course length of around 12,500 miles, of which about half is zapped. Current brand worth is believed to be \$11.1bn.

4. DHL

DHL is one of the most unmistakable logistics brands across the globe, specializing in universal shipping, messenger services, street and rail transportation, air and sea cargo, worldwide package and express mail services and agreement logistics. Established in the US in 1969, the organization had gone worldwide by the late 70s and its present worth is believed to be in the district of \$10.7bn.

5. Union Pacific

Union Pacific is a cargo pulling railroad that operates 8,500 locomotives consisting of 43 distinct models, working more than 32,100 course miles. Its system is the second biggest in the US. The organization started in 1862 when it was known as the Union Pacific Rail Road and its present CEO is Lance M. Fritz. The brand estimation of the organization is believed to be \$7.8bn.

6. McLane Company

The McLane Company is of the largest supply chain service leaders giving staple and foodservice supply chain solutions for comfort stores, medicate stores and more in the US. It has one of the largest private fleets in America and delivers around 50,000 products to

110,000 locations and employs around 20,000 employees. The President and CEO of McLane since 1995 is W. Grady Rosier and its image worth is right now \$4.8bn.

7. Poste Italiane

Poste Italiane is an Italian postal service supplier. Outside of its standard postal services it also offers various incorporated products such as postal savings, correspondence, logistics and monetary services all through Italy. In 2011, the business obtained UniCredit MedioCredito Centrale for €136mn (\$166mn) and in 2016 the Italian government endorsed the sale of stakes of up to 40% in the company. It's CEO and MD is Matteo Del Fante and its image worth stands at \$4.8bn.

8. CN

With a brand estimation of \$4.4bn, CN is a Canadian-based transportation company that offers incorporated services covering rail, multi-purpose, trucking, cargo sending, warehousing and distribution. CN has roughly 24,000 railroaders and transports more than \$250bn worth of goods yearly for a variety of business sectors, going from resource products to fabricated products to consumer goods, across a rail system of around 20,000 course miles spanning Canada and mid-America.

9. Deutsche Post

Deutsche Post is a piece of the Deutsche Post DHL Group and is Europe's driving postal service supplier. Deutsche Post delivers mail and parcels in Germany and across the world and provides discourse promoting and press distribution services as well as corporate communications solutions. Deutsche Post DHL Group employs around 510,000 employees in more than 220 countries and territories around the world. The brand esteem, as indicated by Brand Finance, is \$4.2bn.

10. CSX

CSX is a main supplier of rail-based cargo transportation based out of Jacksonville, Florida. As a railroad, the company operates around 21,000 course miles of track. The company was framed in 1981 by consolidating the railroads of the previous Chessie System, Seaboard Coast Line Industries then the Seaboard System Railroad in 1986. The brand is presently esteemed at \$4bn.

2.3 SOFTWARE REVENUE FOR SCE, SCP AND PROCUREMENT

In terms of absolute software revenue for SCE, SCP and procurement, SAP ranks at the highest priority on the list with \$3.79 billion in revenue up from \$3.28 billion out of 2017. Separating that number further, the software producer sold \$661 million in SCE, \$1.6 billion in SCP, and \$1.52 billion in procurement software.

Prophet's SCM revenues rose from \$1.65 billion of every 2017 to \$1.72 billion of every 2018, with all out SCE software revenue of \$521 million, SCP at \$598 million, and procurement at \$676 million. Following up is JDA, which saw its yearly all out SCM software revenues rise from \$720 million to \$781 million. Infor sold \$318 million in SCM software, with Descartes, Coupa, Jaggaer, Manhattan Associates, and WiseTech Global all falling into the \$212 million to \$240 million yearly revenue run.

In total, SCM software providers sold \$4.38 billion in SCE (up from \$3.98 billion out of 2017), \$4.95 billion in SCP (versus \$4.45 billion), and \$4.80 billion in procurement (up from \$4.13 billion) software in 2018.

2.4 USING CLOUD TO DELIVER VALUE

Push to receive Cloud-based SCM solutions continues to drive growth in the SCM sector; Cloud local vendors are commanding the market. Essentially all of top growth leaders are Cloud-local vendors, there is no surprise that Cloud continues to command that Cloud alone doesn't ensure a merchant's growth and it's about these vendors are using the Cloud to convey worth, and how they're approaching doing that.

He points to E2open and WiseTech Global as the two high-fliers in the Cloud-based SCM classification for 2018 a pattern that will probably proceed with this year. The repeating theme across the two, he says, is the capacity to seamlessly extend the set of features they offer customers. Having a single, bound together understanding through which vendors convey various features that customers can easily include onto their existing systems, for instance, is charming to companies working in the fast-moving distribution condition.

At the point when companies can easily add on without experiencing an entire usage organization integration process, and all while using the same set of features they're as of now using, it's a truly convincing contention, taking note of that this methodology is not constrained to Cloud-local vendors. For instance, IFS is a genuine case of an on-premise

software supplier that is added Cloud to its conveyance options, yet that is still to a great extent focused on its conventional conveyance technique.

"All of IFS' center customer segments are customary building, aeronautics and manufacturing industries that are intensely invested in on-premise solutions. And keeping in mind that IFS' growth has generally focused on creating focused on solutions for its center industry segments, the company is presently adopting a multi-pronged strategy to its business: convey better an incentive to on-premise customers while also adding Cloud options to its lineup. "The Cloud isn't a significant growth factor for IFS however it does enable the company to make it easy for customers to use more features with negligible extra exertion.

2.5 INVESTING IN THE FUTURE

Seeing this year's Top 20 numbers, the general SCM market developed by about 12.5% somewhere in the range of 2017 and 2018 of the three segments that SCM covers, obtainment saw an uptick of 16.3%, trailed by SCP at 10.9% and SCE at 10.1%. Acquisition pulled the growth rate up generally speaking. Probably some of that uptick can be followed to the progressing push for digitizing the acquisition process, and the way that buyers have since quite a while ago depended on manual processes to run their departments.

Not a ton of obtainment processes were digitized in the first place, such a significant number of acquisition departments started off with fresh start points out. As a result, they didn't have the challenge of supplanting inheritance solutions. a lot of manual processes need to digitize them, so be the best solution.

Acquirement software is also getting a boost from the expansion of direct spend management to its menu of options. Generally devoted to overseeing circuitous spend, these programs have widened out to where they currently help companies orchestrate progressively strategic sourcing activities.

In the event that circuitous sourcing prompted the present market size which by chance, exceeded SCE in 2018 and will become faster than SCP in the following couple of years at that point we're going to see considerably more growth ahead as more companies use software for direct sourcing.

A potential ahead for SCM developers, and SCE specifically SCE is in a truly interesting spot at the present time. Obviously, there are still a great deal of SCE inheritance applications being used, with companies proceeding to use on-premise software that has been set up for 25 or 30 years.

That landscape is starting to shift as companies invest in more robotics, computerization and IoT-empowered hardware, all of which requires the support of progressively present day, state-of-the-craftsmanship software systems than those made during the 1980s and 1990s. IoT becomes progressively pervasive, and with the increasing use of robots. A higher emphasis put on great decision making in a sector where the focus has been more on cost decrease, and less on investing in growing new systems for the future.

2.6 DIGITAL SUPPLY CHAIN NETWORKS COME OF AGE

Most supply chain strategies begin from prior times when the business condition was progressively stable. With unsurprising business cycles, equipped management teams could explore the challenges and still focus their supply chain strategies on cost decrease. They did as such to a limited extent by establishing minimal effort manufacturing in locations a long way from center markets, legitimizing the supplier base, diminishing inventories by incorporating partners into "ecosystem", and applying lean principles to their processes.

Presently, as each business becomes a digital business, digitization has the possibility to transform the supply chain by making services progressively important, accessible and moderate. For digital technologies to make new supply chain opportunities, another perspective is required. Organizations should reconsider the supply chain as a digital supply arrange that unites physical flows of products and services, yet in addition ability, data and account. In an abstract sense, individuals and data as well as materials, products and supplies must travel together across the all-inclusive enterprise.

As a key empowering influence in this new digital world, cloud figuring can have a transformational sway on the business and the supply chain working model by empowering data and analytics, portability and social media functions. Cloud registering helps organizations to acknowledge significant benefits from key commercial center trends that are reclassifying customary supply chain networks:

Unpredictability is the new ordinary: Although unstable conditions are recognizable territory to supply chain professionals, few supply chains can suit the relentless speed and abundancy

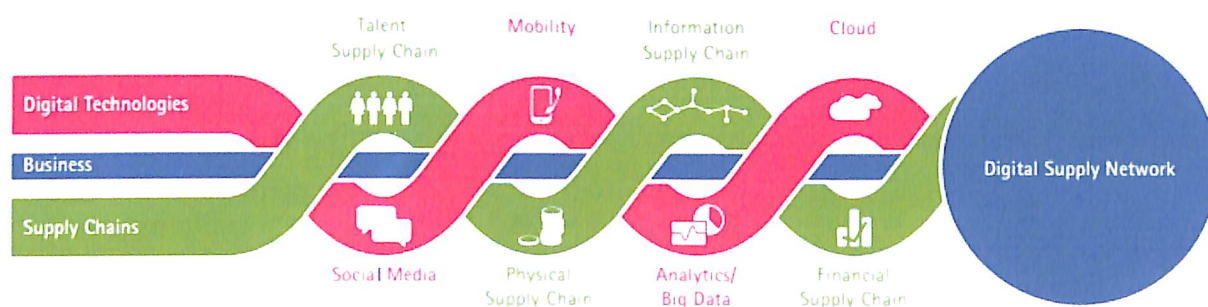
of instability today. Cloud figuring facilitates improved responsiveness to supply chain disruptions.

Data volumes are surging: Because most data technologies have been received in piecemeal fashion, enterprise data is vastly underutilized. To open the estimation of outside and interior data, companies must start to regard it as a supply chain, empowering data to course through the whole association and out to its ecosystem of partners. By utilizing this data, cloud solutions encourage the significant insights that make digital supply networks clever.

Digital technologies are industrial evaluation: The progression of goods would now be able to be made do with digital tools that influence high volumes of data from different sources, interface resources (machines and humans) continuously, and grasp social media to work together past association boundaries. By moving to the cloud, organizations can work with increased adaptability and mass-customize their products and services.

End-to-end visibility has shown up: New technologies and service providers make it possible for companies to transform their supply chains into start to finish business working strategies. The associated cloud enables the continuous coordinated effort that makes this possible.

Figure 2.6.1: Convergence of supply chains



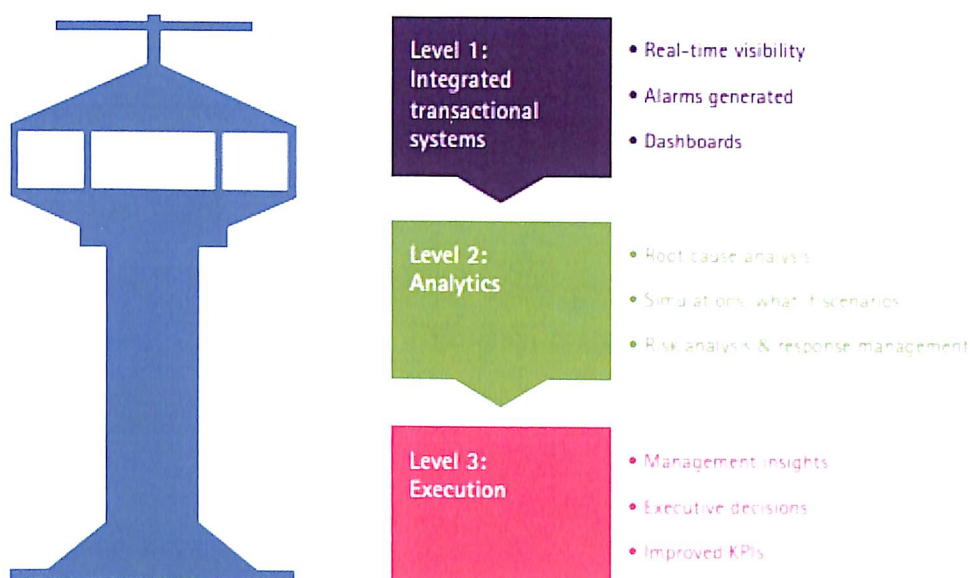
2.7 CLOUD COMPUTING DISCUSSIONS SUPPLY CHAINS BETTER

Supply chains face a typical challenge. Point by point learning of operations is held locally making silos hierarchical, practical and social and these undermine compelling cooperation between various elements of the supply chain, increasing the probability of problems developing at a late stage, and constraining options for response. By empowering an 'organize' see, digitization can help companies catch colossal savings and upper hands by

fostering arranged processes; improving the total enterprise instead of individual functions; and driving new ways of reasoning and working by upgrading visibility, coordinated effort and advancement.

As supply chain managers target significantly more noteworthy efficiencies, one all-encompassing cloud based strategy can be used to upgrade cost improvements and execution: establishing a "control tower" to arrange and orchestrate the elements that make up the supply chain. Control tower systems interface exchanging partners and service providers to make an energetic, "always on" electronic network. The data system spans the globe and must be capable of coordinating with the restrictive systems of hundreds of partners. This is a not insignificant list of "conversations" which must all be tapped, translated and understood which the reason the cloud is so essential is.

Figure 2.7.1: Understanding the benefits a control tower brings to the supply chain



2.8 UNDERSTANDING CLOUD COMPUTING FOR SUPPLY CHAINS

Digital supply networks, empowered by the cloud, have four distinct advantages which, together, drive remarkable visibility, insights and adaptability while working quickly and at scale. These advantages are summarized beneath.

Associated

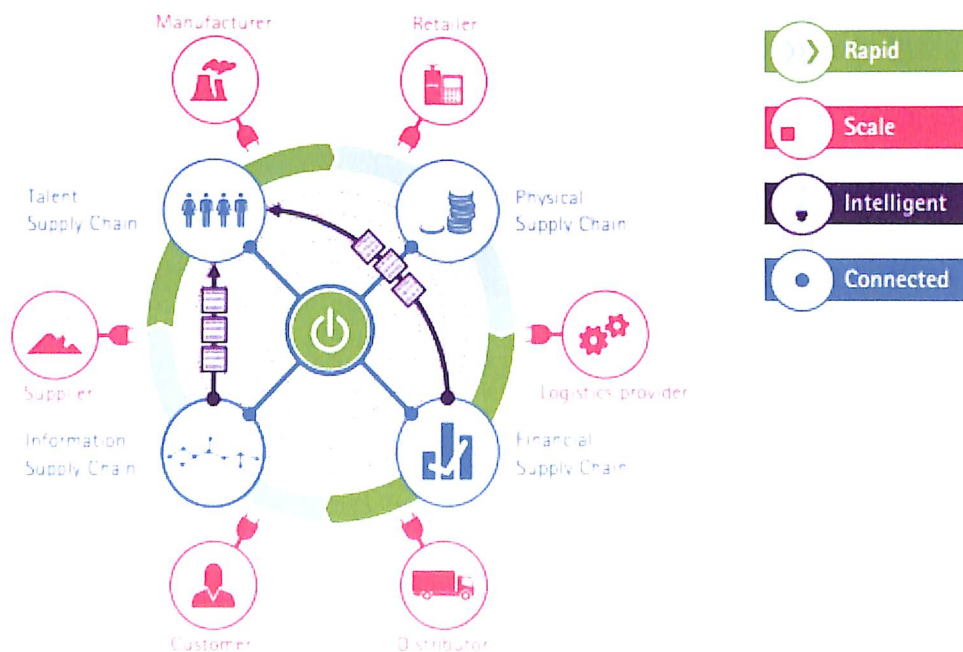
Availability provides remarkable visibility and the continuous capacity to touch/impact, resulting in a savvy supply system and developed working models. Utilizing this favorable position, companies can easily associate with their suppliers, vendors and customers.

Network also provides infrastructure advantages such as unique provisioning, multi-occupancy, improved server use, and datacenter efficiency. Past studies have shown cloud solutions can lessen vitality use and carbon emissions by in excess of 30 percent when contrasted with their corresponding applications installed on-premise.

The associated supply chain preferred position means:

- Real-time visibility: supply chains become progressively powerful, secure and intuitive
- Seamless coordinated effort: supply chain capabilities are orchestrated past physical boundaries
- Highly advanced working models: item/service conveyance is exponentially improved to satisfy customers' developing needs.

Figure 2.8.1: Four distinct advantages of digital supply networks



Intelligent

When the supply system is associated, it leverages analytics, psychological hardware and smart apps to give the correct data to decision-production, at the perfect time. These "intelligent" technologies imply that supply chain managers can settle on proactive decisions "in a hurry", while empowering set-up of standard based decisions for basic tasks. Prescient analytics can spot potential risks and give elective options to decisions on proactive actions and harm constraint. One case of cloud registering empowered knowledge is Taleris (a joint endeavor between GE Aviation and Accenture). Taleris uses prescient analytics technology to break down data from the various sensors installed on numerous flying machine parts, components and systems and make prescient recommendations on air ship support and operations.

The intelligent supply chain preferred position means:

- Actionable insights: creative data analysis supports propelled decision-production
- Automated execution: seamless human machine collaboration increases operational efficiency
- Enhanced, quickened development: digital inspires and supports imaginative advances in design, personnel, operations and customer relationships.

Scalable

Presently associated and intelligent, the supply system is ready to scale—as well as "connecting" various partners and suppliers as required, companies can scale down their operations to target specialty markets/segments/customers, as well as target more up to date markets. Because cloud based registering supply chain solutions work on an adaptable, usage-based model, system, storage, and limit can be immediately changed to assess the instability of customer demands and economic situations.

The scalable supply chain bit of leeway means:

- Maximum efficiency: integration of individuals, process and technology
- Organizational adaptability: digital fitting and play enablers give normal "design and re-arrange" capabilities
- Personalized experiences: channel-driven supply networks help foster individualized products and services.

Rapid

Expanding upon the first three advantages, companies would now be able to work their supply chain networks at speed successfully executing in the midst of perpetual instability. Faster planning and execution capabilities (supported by cutting edge analytics and in-memory processing) result in decreased time to showcase, while improved adaptability and responsiveness to economic situations comes from better access to resources or potentially brisk shifting of resources inside the company, as well as across the extended enterprise. For enterprises using private cloud figuring solutions, software-characterized organizing (SDN) enables incorporated bursting to open cloud registering infrastructure when business demands on processing limit overpower interior capabilities.

The rapid supply chain favorable position means:

- Enhanced responsiveness: using better data and sophisticated analytics to translate and respond speedily to disruptions, including request and supply signals
- Proactive anticipation: decision support, driven by prescient analytics, helps to affirm unwavering quality and rapid versatility
- Last mile postponement: swift repurposing of authoritative assets at short notice helps to ensure that supplies always satisfy evolving needs.

2.9 UNDERSTANDING THE ORGANIZATIONAL IMPACT

As we have seen, cloud figuring has the possibility to make extraordinary value for supply chain organizations in each industry. At the same time, be that as it may, it is imperative to perceive how the radial power of cloud processing pushes more noteworthy IT power out to the whole business. As needs be, increasingly more non-IT groups inside an association are presently engaged with IT purchasing decisions. As indicated by a 2012 Everest Group study, 64 percent of stakeholders associated with cloud-solution purchases were from outside the IT work.

So what's expected to all the more successfully deal with this new and progressively complex IT reality? The very term IT "administration" might be obsolete. Note that in an automobile motor, a "representative" is something that exists to confine the power and speed of the machine. It's about control. What's truly required today is an approach to increase speed, not throttle it, to oversee IT toward more prominent efficiency in its new job as a service delivery work. Also, that requires a set of capabilities focused on areas that are by and large not part of conventional IT administration:

Value

A value-creation work which in some cases is a genuine responsibility, much the same as a program management office works working together with the business to assess and acknowledge value from an IT activity, drive advancement and give an upgraded degree of insight for stakeholders.

Architecture

To oversee complex solution designs that may incorporate combinations of private cloud, oversight cloud, virtual private cloud and open cloud, business architecture ability is required one that pools resources and provides information across key business functions and delivery needs.

Delivery

The service delivery condition today is profoundly perplexing to some degree because the design condition is progressively mind boggling a cross breed of heritage and cloud registering technologies. In response to that multifaceted nature, there is a developing requirement for management skills outside the customary sweet spot of IT managers. These skills should span service integration, an educated purchasing capacity, contract assistance and monitoring, and vendor improvement.

2.10 CLOUD COMPUTING IN SUPPLY CHAIN MANAGEMENT AND FUTURE

Cloud computing-based item lifecycle management (PLM)

Cloud-based computing applications are required to transform the PLM showcase in the medium-term, with these solutions being used to empower field power item support, as well as facilitating Marketing in collecting/analyzing customer data.

In-memory databases

New cutting edge applications and ongoing data platforms are coming to advertise, with the first flood of cloud computing based applications for SCM effectively accessible. Processing that used to take hours would now be able to be executed in seconds with in-memory database technology.

Analytics

Basic supply chain analytics will increasingly decay into strategic departmental analytics, while a progressively strategic usage of supply chain execution management (SCPM) will, additional time; supplant this with a robust perspective on supply chain management.

CHAPTER 3

LITERATURE REVIEW

3.1 SCM IN IT

According to the best known IT (Information Technology) consulting corporations, cloud computing emerges as a quickly evolving technology that an ever increasing number of companies are happy to embrace in request to improve their efficiency. All the more specifically, as stated by IDC (International Data Corporation), investments on new technologies such as cloud computing are increasing at a pace of around 18% every year, while it is estimated to reach at any rate 80% of IT expenditure until 2020 (Gens, 2011). Similarly, according to an ongoing study of IBM Corporation, the use of cloud computing is required to dramatically increase until 2014 (Berman et al., 2012). The survey uncovered that 72% of the participating companies had just steered, received or substantially executed cloud technologies, while 90% of the respondents expected to pursue the same bearing in three years' time. In the meantime, albeit numerical estimations about the use of cloud computing in supply chain management have not been performed at this point, the consulting company

Accenture points out that cloud technology can induce a huge scale transformation in customary supply chains driving companies that use cloud computing to innovative, progressively unique supply chains (Schramm et al., 2010). Persuaded by the referenced trends, the point of this research is to give an outline of implementing cloud computing in supply chain management, with a special focus looking into it of 3PL (Third-Party Logistics) providers. Activities like planning and forecasting, sourcing and acquisition, logistics, and service and spare parts management are considered to be the first to move to the cloud (Schramm et al., 2011). Employing cloud-based technology in supply chains could create numerous advantages such as capital investment savings, simplified operations, scalability, constant visibility, as well as sustainability.

In any case, risks and limitations such as security of private information, as well as absence of companies' awareness on state-of-the-workmanship information sharing technologies, should be mulled over before applying cloud computing in present day supply chain networks. All things considered, understood 3PL companies nowadays use cloud computing firstly in private and after that in open level, in request to profit by the upper hands of adopting cloud networking.

3.2 CLOUD COMPUTING

Preceding introducing the idea of cloud computing in supply chain management, a general description of cloud computing technology is given following, including the definition of cloud computing and its classification in writing, as well as the presentation of three basic cloud service models. When referring to cloud computing, significance must be given to both the applications gave as online services as well as to the equipment and software that cloud providers offer to their customers (Armbrust, 2010). Cloud computing is an IT service model where computing services (both equipment and software) are conveyed on-request to customers over a self-service fashion, independent of gadget and area (Marston et al., 2011, p. 177).

Customers access cloud-based applications through an internet browser while the software and data are stored either on in-house servers or on servers at a remote area. Cloud computing can be classified as a rule into four types: open, private, cross breed and network cloud. Open cloud infrastructure is designed for open use by overall population. It might be overseen and worked by a company and its different partners and it exists remotely on the premises of the cloud supplier (Mell and Grance, 2011). The similar favorable position of open cloud against in-house systems is that companies don't need to worry about the systems' construction or maintenance (Pires and Carmago, 2010). Using open cloud, the end-user can accomplish an inexpensive set-up, as the application costs are secured by the thirdparty supplier. Also, the cost of using such a service is being kept at the lowest as the users pay for what they use (Zhou et al., 2012).

In contrast, private cloud is an on-premises cloud infrastructure accessed by users of various business units within a company (Pires and Camargo, 2010). Since the main inspiration for employing cloud services is independence from having to work internal computing resources, the term of private cloud is a paradoxical expression (Kim et al., 2009). Be that as it may, the requirement for lower risk and high security levels makes private cloud an intriguing idea As the decision among private and open cloud depicts a tradeoff among security and adaptability respectively (Schramm et al., 2010).

Another kind of cloud computing is the half and half cloud, which is a combination of private and open cloud. In this sort, "at least two distinct cloud infrastructures, while remaining exceptional entities, are bound together by standardized or exclusive technology that enables data and application conveyability" (Mell and Grance, 2011, p.3). In a cross breed cloud, a

company can maintain its private cloud and after that scale out to an open when nearby limit is exhausted (Sujay, 2011). As it were, when in-house systems are not ready to support outstanding task at hand peaks, the outside system becomes accessible for the users (Pires and Camargo, 2010). Half breed clouds balance the benefits and risks among private and open clouds, as well as the operating cost of the in-house infrastructure and the usage-based cost of the cloud supplier services.

Finally, people group cloud is the fourth sort of cloud computing. Network cloud is designed for organizations that share normal concerns, such as regulatory consistence or security requirements. This kind of cloud can be overseen by at least one parties of the network, an outsider or by a combination of them (Mell and Grance, 2011). In addition, it tends to be hosted internally or remotely.

3.3 SERVICE MODELS

Cloud computing consists of three diverse service models to be specific Infrastructure-as-a-Service, Platform-as-a-Service and Software-as-a-Service, every last one of them serving various requirements of cloud users.

Infrastructure-as-a-Service (IaaS): IaaS model is a stage through which businesses can profit gear in the type of equipment, servers, storage space and others, at pay-per-use service. In this service model, cloud providers offer from physical or virtual machines to crude storage, firewalls, load balancers and networks (Mell and Grance, 2011). All the more specifically, the user buys these resources as a completely outsourced service instead of buying servers, software and system gear (Conway, 2011). An exceptional case of IaaS is Amazon Cloud Services, an electronic stage that offers online services by means of its website page, amazon.com. Two prevalent services are Amazon EC2 and Amazon S3, every one of them covering specific areas of interest.

Stage as-a-Service (PaaS): PaaS model offers a more elevated level of abstraction contrasted and IaaS model that focuses on providing crude access on virtual or physical infrastructure (Garg and Buyya, 2012). In PaaS, cloud providers host a computing domain normally including operating system, data base and programming language execution condition, where users create and send applications (Sujay, 2011). Users can lease virtualized servers for running existing applications or developing new ones without the cost and unpredictability of buying and managing the related equipment and software (Conway, 2011). In some cases, the

underlying process and storage resources scale automatically to get application request so that cloud user does not need to assign resources physically. Some examples of PaaS are Google Apps and Windows Azure. Windows Azure is a service given by Microsoft, where someone can fabricate, convey and deal with every one of the applications across a system of data centers based on a Microsoft domain.

Software-as-a-Service (SaaS): SaaS model is a software delivery model providing on-request access to applications (Garg and Buyya, 2012). All the more specifically, cloud providers install and work application software in the cloud and users access the software various customer devices through either a thin customer interface, such as an internet browser or a program interface. The cloud users don't deal with the cloud infrastructure and stage on which the application is running however have power over the sent applications and possibly arrangement settings for the application hosting condition (Mell and Grance, 2011). This can be an appealing and minimal effort solution to get demanding software capabilities without the need of applying and maintaining conventional software and equipment (McPherson, 2010). A case of SaaS is Salesforce CRM, which is also separated into several categories. Those are Sales Cloud, Service Cloud, Data Cloud, Collaboration Cloud and Custom Cloud.

As a quickly evolving technology, cloud computing is constantly providing new, progressively specialized services, which are mainly subservices of the three existing ones as described previously. All the more specifically, some of them are Storage as a Service (STaaS), Security as a Service (SECaaS), Data as a Service (DaaS) and Desktop as a Service (DaaS).

The various pathways through which computing resources can be accessed from an assortment of customers (using various devices and from places) using one of the three distinctive service models of cloud architecture are illustrated (Marston et al., 2011).

3.4 CLOUD-BASED SUPPLY CHAIN MANAGEMENT

The utilization of cloud computing idea with regards to supply chain management is an innovative practice that generates another field of study. A cloud supply chain is at least two parties linked by the provision of cloud services, related information and funds (Lindner et al., 2010, p. 3).

Be that as it may, before shifting from a customary supply chain to a cloud supply chain, companies should first distinguish the specialized requirements for migrating supply chain activities to the cloud. This transformation process can be executed by using the cloud lifecycle, which is an improvement lifecycle with numerous steps that allows the process of transformation to be assessed and improved repetitively (Lindner, 2011). In any case, before that, companies should gauge every one of the factors to assess the execution of cloud technology in their supply chain. Questions about the changes, the benefits as well as the challenges that supply chain stakeholders need to confront when using cloud computing should be answered a long time before taking the basic decision of moving to the cloud (Schramm et al., 2010).

3.5 CLOUD COMPUTING IN SUPPLY CHAIN ACTIVITIES

All the more specifically, forecasting and planning, sourcing and acquisition, logistics, as well as service and spare parts management show up as the most well-known activities in which cloud computing can be adequately actualized.

Forecasting and Planning. Cloud-based platforms are designed to assist companies to improve their service levels by coordinating the supply chain system's partners (retailers, suppliers and distributors) that assume vital job popular forecasting. These platforms can assemble sales data through internet perform basic analytics and consequently execute progressively exact statistical interest forecasts for all the supply chain participants (Schramm et al., 2011). Such a process can prompt a significant decrease of the Bullwhip impact the information distortion among various stages of the supply chain, (Lee et al., 1997) allowing all stakeholders to know about the genuine interest unpredictability they need to adapt to. Cloud solutions for request and request planning combine EDI (Electronic Data Interchange) and forecast execution applications into a single multi-party stage. At the point when customers create request, distributors send the data to the open cloud, making at the same time the information accessible to the whole supply chain (Pires and Camargo, 2010).

Sourcing and Procurement: Sourcing incorporates acquisition, receipt and inspection of incoming materials with acquirement processes and selection of the suitable suppliers (Schrödl and Turowski, 2011). In this case, cloud-based platforms can work as a database, which contains various data about various suppliers, creating significant benefits for companies that transact with numerous suppliers. Consequently, companies can select their suppliers depending on their capacity to give the proper crude materials or semi-products

according to the end item's specifications and the satisfaction of time limits. Additionally, cloud-based tools empower companies and suppliers to create contracts, drastically developing agreement management (Schramm et al., 2011).

Logistics: Cloud computing is also useful for inventory, warehouse and transportation management, as it offers logistics tracking operations to numerous supply chain partners. Processes such as replenishment planning, request processing, armada management, transportation course planning as well as worldwide exchange consistence can move to the cloud (Schramm et al., 2011). All the more specifically, a sole integrated cloud stage provides the upside of streamlined transportation, as well as decreased close by and pipeline inventory that can prompt yearly cargo cost savings for companies. Especially in the logistics sector, cloud services have all the earmarks of being essential for 3PL companies' necessity for itinerary and warehousing management for a wide range of customers in a single system.

Service and Spare Parts Management: Cloud computing gives the chance to companies to integrate forward logistics with reverses logistics in the same closed-circle supply chain model (Guide et al., 2003). Indicatively, RFID (Radio-Frequency Identification) technology allows for tracking inventory's area and after that transmitting this information to a cloud application. As a result, inventory's course can be visible to all supply chain partners, from the maker to the customer and the other way around. At the same time, guarantee approval, returns processing, spare parts inventory and distribution or specialist dispatch are processes that can be hosted effectively in a single cloud based stage (Schramm et al., 2011).

3.6 POSITIVE IMPLICATIONS OF CLOUD-BASED SCM

Following, the main positive implications of cloud-based supply chain management, to be specific cost efficiency, simplification, flexibility, visibility, scalability and sustainability are discussed.

Cost Efficiency: Cloud computing systems can be used successfully in supply chain management as involved companies can exceptionally profit by the determined financial advantages. Cloud services don't require any investment for software or PC control ownership, not at all like regular in-house ERP (Enterprise Resource Planning) systems, as they are offered by outside providers (open clouds). Consequently, capital costs for supply chain management software can be changed over to operational costs, further enhancing one company's cash stream (Schramm, 2010). Indicatively, the main fees that companies need to

pay in request to obtain cloud based systems are first the actuation expense and after that the usage charge which varies according to the degree of cloud service use. Also, companies can save more cash by reducing maintenance costs and keeping overhaul costs to minimum (Zhou et al., 2012).

Simplification: Another main bit of leeway of cloud-based systems is the simplification they give. All aspects of the supply chain is accessible through the same stage, eliminating similarity problems as well as providing easy association and enabling supply chain information sharing among partners in a single supply chain system (Chen and Ma Yan, 2011). In this shared network, members can be included whenever and after that enter in the cloud just with a set of password and surname (Pires and Camargo, 2010). From that point forward, all users have the chance to work simple processes and applications in the same stage, reducing the response time of one accomplice to another's decisions. Essentially, cloud-based services offer information control through a single concentrated storage system, so that information stream is smooth among supply chain's partners.

Flexibility: From interest forecasting to warehouse or transportation management, there is an assortment of applications for the whole supply chain that can be hosted in one single cloud-based stage. Additionally, supply chain partners could approach such a stage from their very own condition or company regardless their area by using basic devices. At the end of the day, running the cloud applications is area independent (Zhou et al., 2012). This expansive system access offers greater readiness to the entire supply chain, which leads companies to enter rapidly in new markets with new products and services (Schramm et al., 2010).

Visibility: Visibility provides opportune network along various supply chain participants. In that manner, companies have the chance to observe supply chain events at the time they happen and as a result manage possible problems or deviations in plans (GT Nexus, 2009). Along these lines, visibility is a key issue for 3PL service providers as in addition to the fact that it helps such companies to coordinate their operations and oversee a wide range of customers yet additionally allows the customer system to have a transparent perspective on the whole system (Gillis, 2011). Cloud-based systems can give constant visibility of inventory and shipments and improve logistics tracking.

These systems, acting as a virtual warehouse for products in pipeline, offer companies the capacity to settle on strategic request satisfaction decisions and, if necessary, reroute

powerfully the inventory, based on the information about the genuine item area (GT Nexus, 2009).

Scalability: By employing cloud computing, supply chain stakeholders can control their system limit all the more precisely. In periods of popularity, companies need enough limit in request to have the option to satisfy their customers' orders. Consequently, using basic on-premises systems, they should possess the necessary database for the entire year in request to respond to the excessive interest just for a short timeframe. Be that as it may, with the approach of cloud technology, companies are allowed the chance to adjust their ability automatically according to their needs and scale their computing force depending on request fluctuations (Zhou et al., 2012). For using half breed cloud companies can deescalate their in-house limit up to the limits of the forecasted low request and utilize cloud-based limit with respect to sudden interest spikes (M&E Team, 2009).

Sustainability: Cloud computing can be considered as an emerging 'green' IT that can assist companies in improving their operations' efficiency, lessen their vitality costs, as well as their natural effect (Scott and Watson, 2012). In any case, numerous experts question if benefits of moving to the cloud do truly exist or on the off chance that it is tied in with outsourcing of natural effect to the service supplier (Abood et al., 2010). What could resolve such a controversy is the virtualization offered by cloud technology, which leads to a considerable improvement of vitality efficiency by leveraging the economies of scale associated with the huge number of organizations that share the same cloud infrastructure (Garg and Buyya, 2012). According to Abood et al. (2010), CO2 emissions per user are prominently decreased when using cloud platforms versus in-house systems, as by using cloud technology various companies can share the same infrastructure. Moreover, the utilization of cloud computing in supply chain management can add to the conversion of the customary supply chain to a 'greener' one in an indirect way. The previously mentioned favorable position of visibility can assist companies to diminish their carbon footprint. All the more specifically, through visibility, companies could upgrade their inventory routes based on constant events and thus diminish emissions that are hurtful for the earth.

3.7 CLOUD COMPUTING IN 3PL SERVICES A REAL-WORLD CASE

The cloud-based supply chain management, the effect of cloud computing usage by 3PL service providers emerges as an interesting issue. Continuous visibility of shipments and inventory, either within the company's borders or all through the entire supply chain organize,

is of utmost significance to each 3PL company. Cloud computing as private, public or hybrid cloud structure is ready to upgrade internal or outer visibility with consequent operational, as well as financial benefits. In the following subsections, cases of genuine successful 3PL providers are presented in request to demonstrate the impact of adapting cloud technology in their supply chain operations.

3.8 THE CASE OF PRIVATE CLOUD

The introduction of cloud computing as another technology couldn't have been so unexpected. Being used at first by companies internally, it upgraded their infrastructure and processes. Private clouds empowered sharing of computing resources among various business units, all fueled by one single infrastructure. The 3PL companies, FedEx is considered to be a pioneer in cloud computing. FedEx introduced this technology in 2011 at a private level in a joint effort with CloudX (Watkins, 2011). CloudX empowered the company to focus on its customer relationship management and obtain a single interface for a significant number of its sales processes. Prior to using private cloud, the company confronted several problems concerning enormous sets of data, which required a great deal of computing capacity to be examined.

Moreover, response time had been decayed because of enormous integrated group processes (Cearley and Phifer, 2009). Subsequent to turning to cloud computing, FedEx accomplished to decrease its response time by 60%, further allowing the parallel execution of bunch processes. The companies also figured out how to build up another diagnostic application for processing data, something that were not moderate using previous infrastructure models. Aside from the cooperation with CloudX, the company used other three cloud services, to be specific FedEx® CLI (Critical Inventory Logistics), ROADS (Route Planning and Optimization System) and Salesforce Automation (Dack, 2011).

FedEx empowered an intensive control of its activities all through the world by providing worldwide request to-delivery status and worldwide inventory visibility. The company manages FedEx® CLI for more than 60 provincial and multi-local customers in more than 200 request satisfaction locations around the globe. That indicates a normal of 160,000 orders for every month consisting of 200,000 packages which means 4,500,000 pieces. Besides, FedEx is ready to enhance messenger delivery routes and measure course efficiency through ROADS. This system runs in 500 locations and manages 20,000 day by day service plans. It also assists the company to reroute deliveries and better foresee delivery times.

FedEx has used its internal cloud structure at its best usage. In any case, it turned out to be certain that cloud computing needed to run public, in request for the company to exploit its full spectrum. Hence, FedEx went to the hybrid cloud (Salesforce.com), which utilizes features of both private and public cloud. This hybrid cloud system furnished company's sales teams with a full highlighted versatile solution increasing their effectiveness and improving service level for the customers.

3.9 THE CASE OF PUBLIC CLOUD

As a consequence, private cloud can't be sufficient for huge 3PL providers with numerous partners and customers. What should really lead these companies to public cloud is the absolute need of ongoing visibility of their shipments, did by information cooperation between all the supply chain partners. Regarding supply chain tracking, most of the conventional 3PL companies have been using emails or telephone calls in request to gather the necessary data. Be that as it may, these ways can't offer convenient shipment visibility nor do they offer system association between every one of the stakeholders. As a consequence, the inability of monitoring vast supply chain flows, which huge 3PL companies need to manage, is a significant bottleneck for their supply chain system's efficiency. In addition, regular ERP systems used for organizing gathered data or perhaps private cloud infrastructures, which both are sent within the company, can't suggest the dimension of network between the 3PL and its collaborators (Gillis, 2011).

Evidently, moving to the public cloud also implies essential financial benefits for 3PL providers. The immediate cost decrease is gotten from the absence of ownership cost of an EDI system, as well as of other consequent maintenance and overhaul costs. Nevertheless, the most significant benefit is gained from the opportune satisfaction of customer's orders and as a result the absence of cost of delays and unsatisfied interest.

An important case of a 3PL supplier that has as of late moved to public cloud is COSCO Logistics, the largest 3PL company of China and the world's second largest sea shipping company. In 2009, the company started to reestablish its supply chain management system upon a cloud computing architecture. Their objective was to give a SaaS service to their customers, subsidiaries and distributors, in request every one of them to use the same logistics management software (Harris and Alter, 2010). COSCO contracts contained secrecy

agreements so as to secure information that was shared among all supply chain partners. In spite of the fact that this cloud organize joint effort was still in preliminary stage, the company figured out how to offer ongoing visibility across shipments around the world.

3.10 CYCLE VIEW OF E-SCM

Cycle perspective on SCM proposes a series of cycles: customer, replenishment, manufacturing and acquisition cycles, wherein, activities are performed at the interface illustrate the stages in electronic supply chain management (e-SCM) as conceptualized in this research. Activities like community oriented item design and advancement (both inter and intra-firm), scheduling, service options and contacts could be put in a cloud based condition and oversee electronically. Moreover, all stages of the item improvement process can be shared over a secured cloud-based system including item specific information, marketing information, test results and customers input and so on. This allows for continuous online access to these data for all supply chain partners. We have thus extended the cycle perspective on SCM to the management of electronic supply chain management (e-SCM).

E-Customer Order Cycle

The customer request cycle sits at the interface between the customer and the retailer. This is the first stage in e SCM. The activities performed during this cycle may include customer appearance, inventory checking, request passage, satisfaction, and issuing receipt, electronically. Ubiquitous and whenever anyplace nature of cloud computing implies that customers can conceivably profit by online, ongoing access to item/service information using their computing and cell phones from anyplace. This is especially advantageous within a B2B domain.

E-Replenishment Cycle

Replenishment cycle occurs between the retailer and the distributor or the wholesaler and includes all processes for replenishing retail inventory including request passage, satisfaction and receipt. The second cycle in placing activities like interest forecasting, planning and inventory management within a cloud based condition that support complex databases containing information from different suppliers will permit supply chain partners constant access to all related information and in this way speed up their item comparison, selection, and decision-making process. Cloud-based tools can empower companies and customers to commonly create contracts and improve contract management as well.

E-Manufacturing Cycle

Manufacturing cycle is situated between the maker and the following downstream supply chain accomplice. Activities like synergistic item design and improvement (both inter and intra-firm), scheduling, service options and contacts could be set in a cloud based condition. All stages of the item improvement process can be shared over a secured cloud-based system including item specific information, marketing information, test results and customers input and so on. This allows for ongoing access to these data for all supply chain partners to profit.

E-Procurement Cycle

Acquirement cycle occurs between the maker and supplier. The activities involved during this cycle include: materials sourcing; warehousing and transportation; logistics and information management systems and so on. Application areas where cloud-based solutions can assist are e-obtainment, distribution, inventory, warehousing, and transportation. Vendors like IBM, JDA, and Ariba are among the early deployers of cloud technology. This moreover, a cloud-based logistics management system offers the additional benefits of on request and online self-service, multi-vendor resource pooling, elasticity and scalability of systems in request to stay away from the bullwhip impact within a customary supply chain.

3.11 CONCEPTUALIZING INTEGRATION OF CLOUD COMPUTING

Cloud computing's commitment to e-SCM includes providing firms with infrastructure, stage, and software solutions for its whole supply chain over the internet. Using a cloud-empowered, non-restrictive digital stage can possibly empower all players of e-supply chain management to impart and work cooperatively.

E-supply chain management execution can be upgraded by exploring reception of novel technologies like cloud computing. The main advantages of integration with cloud computing is the simplification of interfaces thus eliminating the similarity issue arising from using numerous platforms for various players within the esupply chai. By integrating their e-SMC with cloud computing, smaller firms can also profit by significant decrease in section cost and access to business analytics previously inaccessible to them because of cost constraints.

It is thus advisable to consider the integration of cloud computing within e-supply chain management. Cycle view is one method for outlining the processes performed within a company's supply chain. As within e-SCM, the four process cycles will comprise: ecustomer

request cycle, e-replenishment cycle, emanufacturing cycle and e-obtainment cycle. The cycles specify the roles and responsibilities of every individual from the supply chain and the desired result of every one of the processes and can be integrated into cloud computing to improve the benefits offered by e-supply chain management. Synthesized from various sources, the key characteristics of cloud computing are: ubiquitous, cost-successful, whenever anyplace, scalability, value and service-focus.

Ubiquitous: Cloud computing offers ubiquitous services wherein computing facilities are made accessible wirelessly through digital devices like smartphones, tablets, laptops and so forth from multi-cloud sources. Cloud computing, when integrated with e-SCM, will suit n-consumer devices in the front-end with different cloud services at the back-end. The proposed system promises high scalability and dexterity by accommodating an increasing number of supply-chain partners.

Cost successful: Provision of IT services on the cloud can demonstrate to be cost compelling for the service supplier and the customer. For the customer, there is no direct investment cost since cloud computing uses a compensation as-you go model; and for the supplier, services are kept running from their virtualized infrastructures which can suit different tenants.

Whenever, anyplace: The unpredictability resulting from the inter - connectedness of various players within an association's supply chain is somewhat because of their geological dispersion and mostly because of the sheer volume of information that needs to be overseen and followed up on continuously. Cloud computing delivers services such as software, stage and infrastructure through cutting edge data centers which are based on process and-storage virtualization technologies. This enables consumers to access data from a 'cloud' anyplace on the planet on request. All application data are stored in remotely found servers and data Center's from where data can be shared and accessed practically.

Value: Cloud computing is alluring to business owners because it eliminates the prerequisite to claim IT infrastructure and allows organizations to start from small and increase in scale just when the interest mandates both the service supplier and the service user gain from an efficient single application software that serves a different clients. Resources in a cloud domain can be immediately assigned and de-designated on request; the process tends to be cost-compelling for the service supplier and the user.

Service arranged: Cloud computing offers three significant types of services: infrastructure as a service (IAAS); stage as a service (PAAS); and software as a service (SAAS). Cloud computing makes resources like equipment, software and stage accessible as general utilities that can be leased and re-leased by numerous users simultaneously over the internet on an on-request basis, subsequently making computing resources exceptionally service situated. A combination of these services can possibly integrate shippers, service providers, distributors, logistics providers, customers; sellers and so on in a worldwide supply chain and thus make a supply chain network of stakeholders similar to a social system condition. Esupply chain management can be improved by integrating supply chain practices with effective information sharing. Within this condition, information on prices, inventory, schedules, request status, online installment system, shipping and delivery updates, service options, contacts, announcements and so forth could be put in the virtual cloud. This will result in opportune information updates from all stakeholders and result in companies becoming interest driven instead of receptive.

Scaling: In a cloud computing condition, infrastructure providers can pool a lot of resources from data Centers and make them easily accessible to users. In the event that the service request increases the service supplier could extend the services to a bigger scale. A combination of these services can possibly integrate shippers, service providers, distributors, logistics providers, customers; sellers and so on in a worldwide supply chain and thus make a supply chain network of stakeholders similar to a social system condition. Esupply chain management can be improved by integrating supply chain practices with effective information sharing. Within this condition, information on prices, inventory, schedules, request status, online installment system, shipping and delivery updates, service options, contacts, announcements and so forth could be set in the virtual cloud.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 DIRECTIONS FOR FURTHER RESEARCH

In today's mind boggling, exceptionally integrated and globalized world, as companies are embracing SCM in request to improve their costs and operational efficiency while trying to maintain upper hand, cloud computing offers a feasible solution by offering stage, service and software services for businesses that are reasonable, scalable, cost-compelling and customer-focused. Success of cloud computing in SCM depends upon complete visibility of and access to information at each cycle of the e-supply chain, in request to encourage decision-making and move making. A cloud-based SCM system has the possibility to make this visibility and accessibility of information progressively on a whenever anyplace basis along these lines enabling firms to improve the speed, cost, quality and the degree of customer service at each cycle of its e-supply chain, consequently integrating all activities within the e-supply chain all the more firmly. For cloud computing provides a logistics infrastructure in the globe stage as a service for all partners of a cloud supply chain. The regular foundation of cloud computing also helps satisfy the need to coordinate various activities within internal units of the association as well as with outside supply chain partners. The capacity to scale up the down the SCM infrastructure helps relieve the bullwhip impact made by flighty interest fluctuations within various levels of conventional supply chain as well.

4.2 RESEARCH METHOD

The research method utilized for building up the web administration for the fruitful utilization of supply chain management essential through diaries that are in the regions of activities management, supply chain, tasks research and information frameworks. It was gone for basically helping researchers and professionals in executing a fruitful administration for accomplishing a powerful supply chain management.

For realities the cloud-based administration proposed needs to cover the enhancement of the procedure to guarantee a viable supply chain in the class of quantitative and qualitative research. Going for the quantitative research combination, staggering expense and low

effectiveness of conventional supply chain management, an advancement strategy for supply chain management based on cloud-based technology.

Also the qualitative research, by various hubs in the supply chain, this research of the supply chain and structures the management to meet the necessities of the supply chain and its logistics in worldwide companies to plan the management model and create the logistics. The techniques demonstrate that the cloud-based model is just cost based, which is lower than other conventional models. The outcomes demonstrate that the cloud-based model can viably decrease the expense of supply chain management, has a high level of union, and can diminish the work power of staff.

4.3 SOURCE OF THE STUDY

To start with, the logistics issue in regards to the individuals' work turns into a problem area. The customary research in such manner is identified with transient item, style item, and electronic item, which have short life cycle. These days, such subjects may incorporate city logistics, crisis logistics, and supply chain.

Logistics and supply chain management can be realized by the improvement of economy and technology. A common is the information technology which prompts the research on e-business and related appropriation channel decision. These days, the basic utilization of cloud strategy, and enormous data can be significant research headings for future research in gathering primary and secondary data. The primary data collects from the ecological related research. Numerous logistics companies' nations make another standpoint in modern and specialized challenge by expanding interest in the green logistics and supply chain field, detailing and actualizing different bills, plans, and systems, and reinforcing the execution of green monetary advancement technique. The secondary data collected from the remanufacturing, invert logistics, and shut circle supply chain and subtleties collected from the web, books and logistics related administrations.

4.4 SAMPLING

This development will keep taking the approach of communitarian robots individuals utilized in distribution center tasks will do their work with assistance from versatile robots that move about the floor freely; at any rate half of enormous worldwide companies will utilize man-made brainpower, progressed investigation, and the Internet of Things in supply chain exercises.

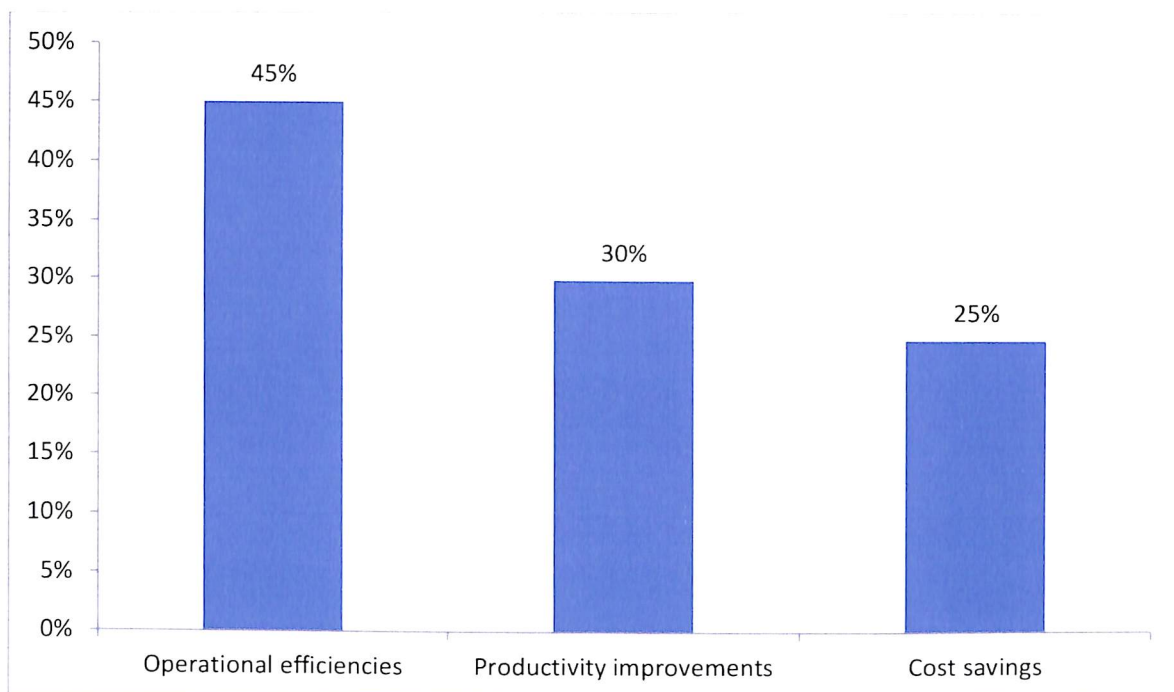
CHAPTER 5

DATA ANALYSIS

Table 5.1: Strategies of supply chain management

Options	Percentage
Operational efficiencies	45%
Productivity improvements	30%
Cost savings	25%
Total	100%

Chart 5.1: Strategies of supply chain management

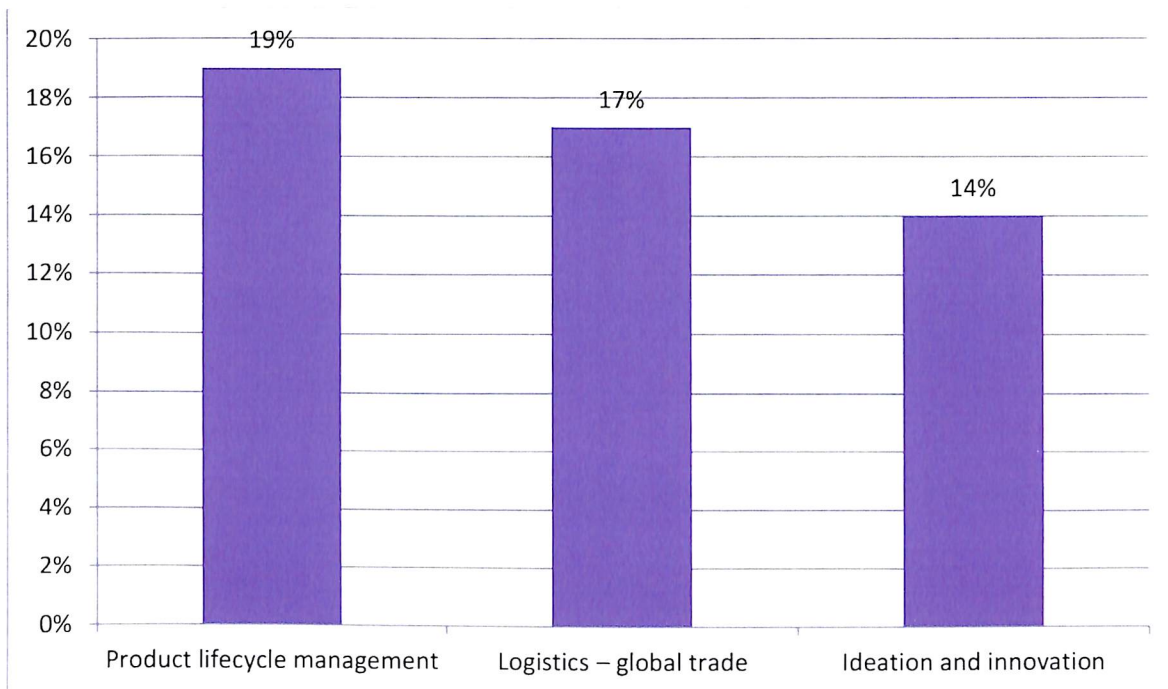


It is interpreted that 45% operational efficiencies, 30% productivity improvements and 25% cost savings are the three strategies applied in the supply chain management

Table 5.2: SCM to grow in next two years

Options	Percentage
Product lifecycle management	19%
Logistics – global trade	17%
Ideation and innovation	14%
Total	50%

Chart 5.2: SCM to grow in next two years

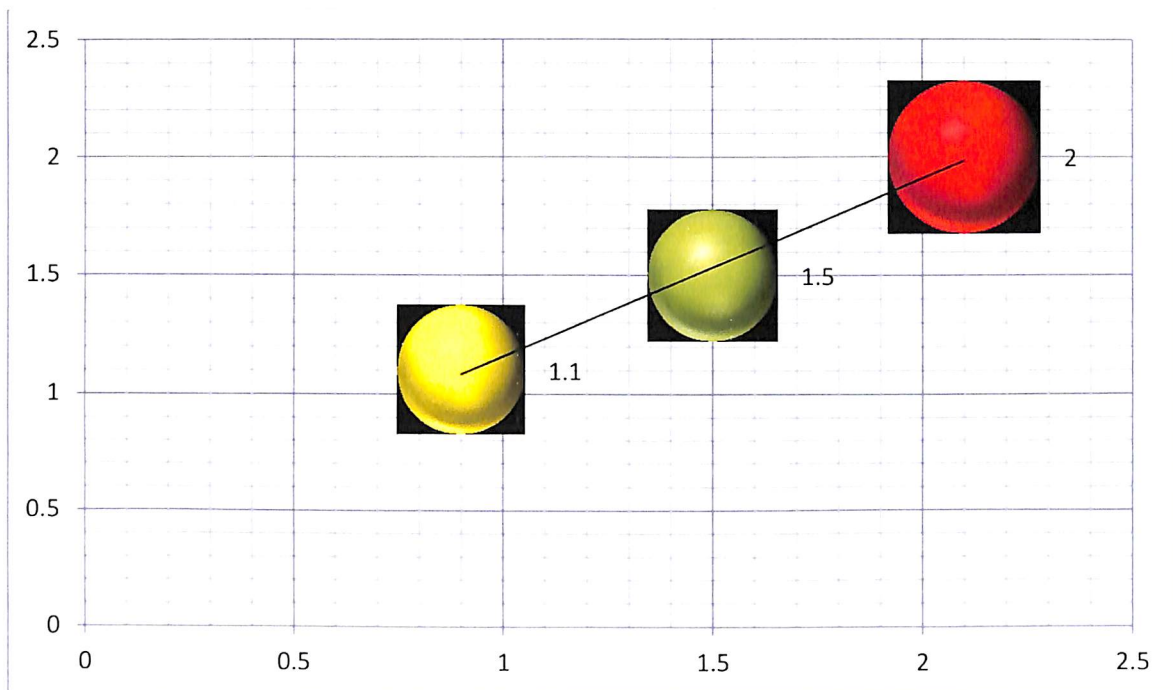


It is interpreted that 19% product lifecycle management is expected to grow in next two years in SCM and next is 17% logistics-global trade and 14% ideation and innovation

Table 5.3: Cloud-based SCM advantages

Options	Percentage
Faster implementations	41%
Cost savings	30%
Improved customer service	29%
Total	100%

Chart 5.3: Cloud-based SCM advantages

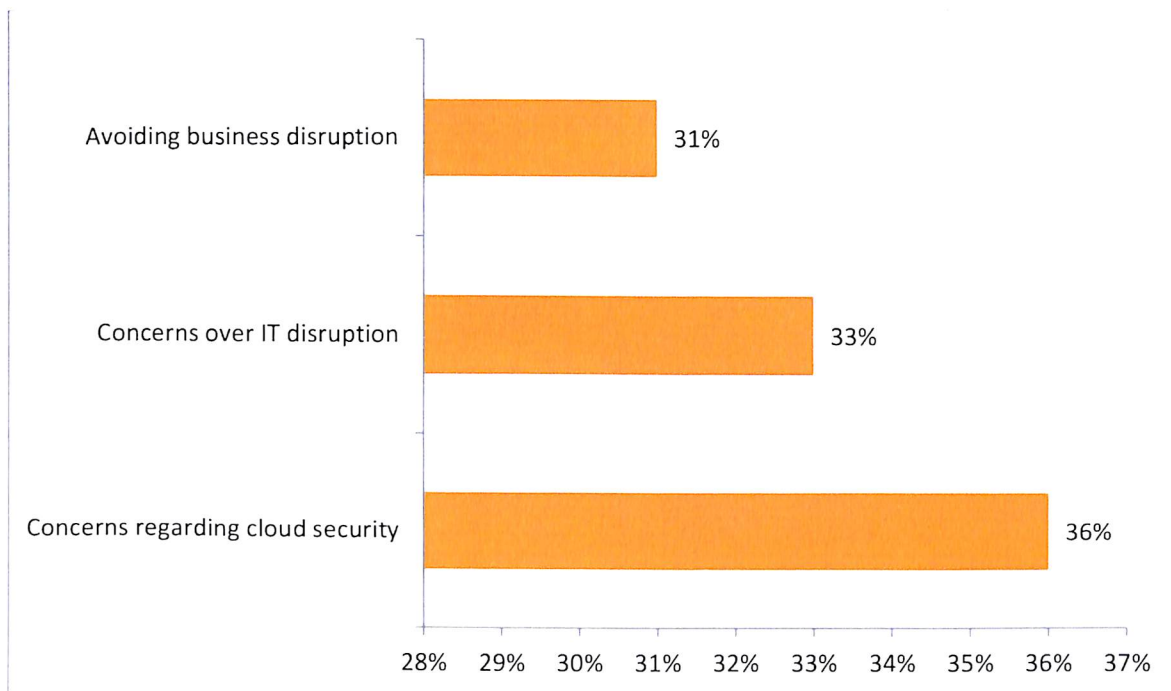


It is interpreted that we have been found that that faster implementations having with 41% and it has reached with 2.5% growth and 30% cost savings with 1.5% growth and 29% improved customer service having 1.1% growth having advantages with cloud-based SCM

Table 5.4: SCM challenges

Options	Percentage
Concerns regarding cloud security	36%
Concerns over IT disruption	33%
Avoiding business disruption	31%
Total	100%

Chart 5.4: SCM challenges

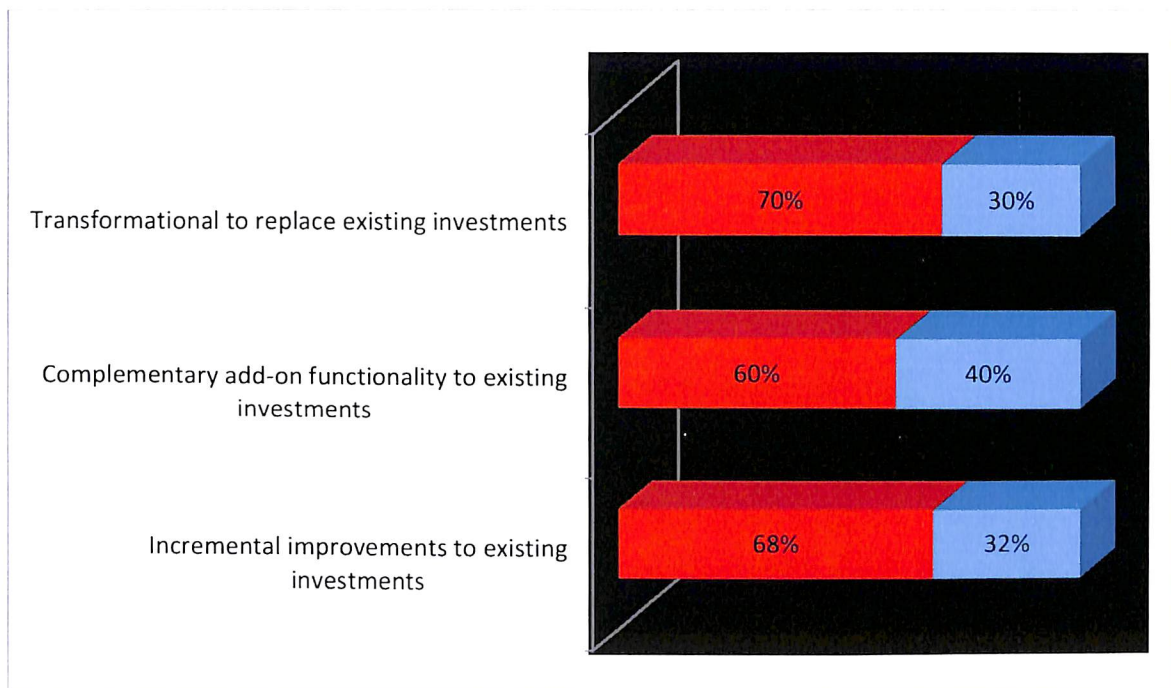


It is interpreted that 36% concerns regarding cloud security are the SCM challenges, 33% concerns over IT disruption and 31% avoiding business disruption are the challenges facing in SCM

Table 5.5: Current approach to supply chain management

Options	Current	Desired
Incremental improvements to existing investments	68%	32%
Complementary add-on functionality to existing investments	60%	40%
Transformational to replace existing investments	70%	30%

Chart 5.5: Current approach to supply chain management

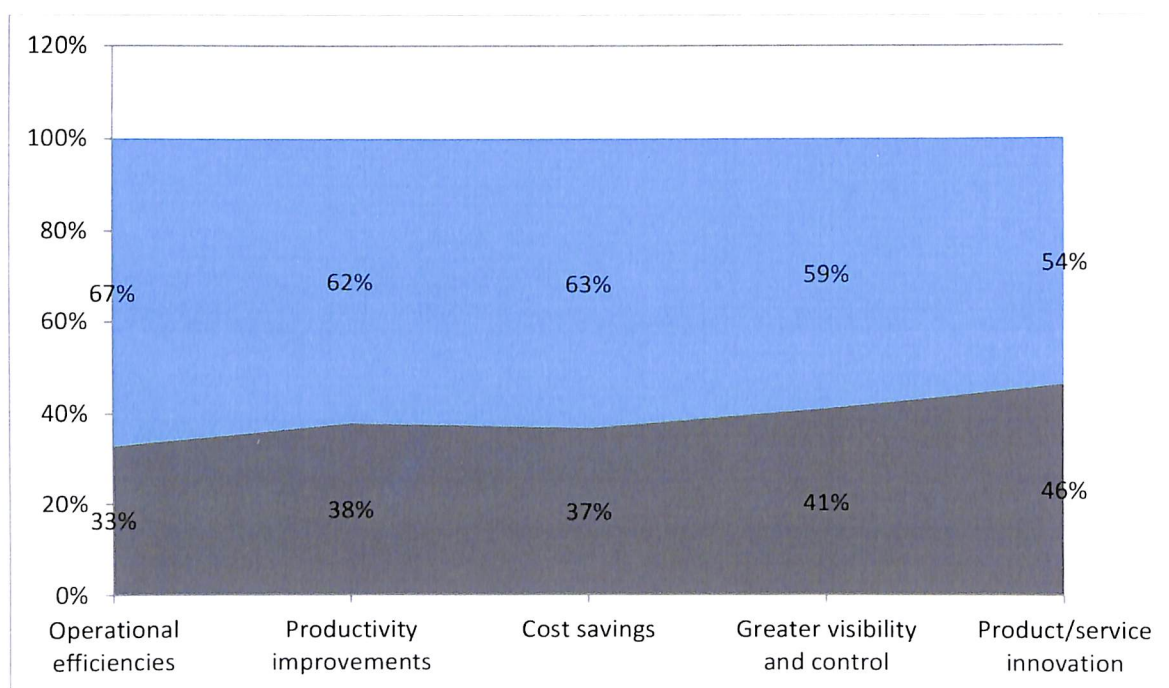


It is interpreted that we have currently approached to supply chain management with the two fields with the current and desired having (70%, 30%) in transformation to replace existing investments, (60%, 40%) in complementary add-on functionality to existing investments and (68%, 32%) are the incremental improvements to existing investments are the currently approached in the SCM

Table 5.6: Strategic advantages of Supply Chain Management

Options	Strategic advantage	Greatest strategic impact
Operational efficiencies	67%	33%
Productivity improvements	62%	38%
Cost savings	63%	37%
Greater visibility and control	59%	41%
Product/service innovation	54%	46%

Chart 5.6: Strategic advantages of Supply Chain Management

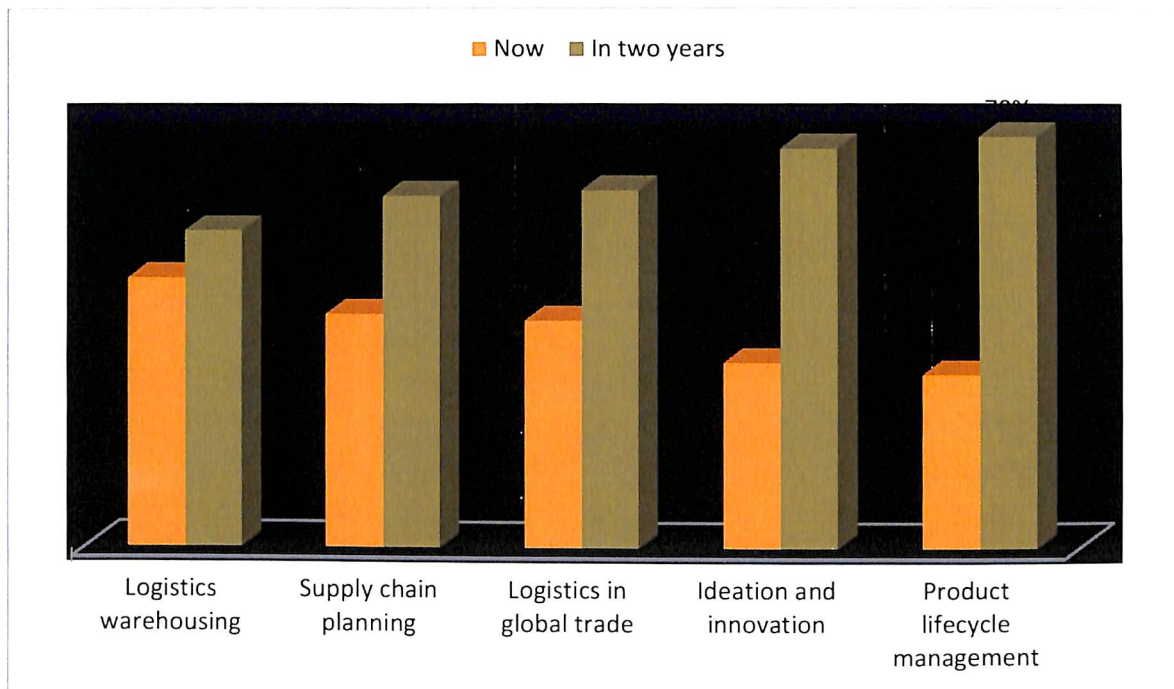


It is interpreted that greatest strategic impact and strategic advantage makes the advantages in the supply chain management with operational efficiencies with 57%, 55% productivity improvements, 54% cost savings, 56% greater visibility and control and 59% product/service innovation are the advantages in supply chain management

Table 5.7: Supply chain management processes residing in the cloud

Options	Now	In two years
Logistics warehousing	46%	54%
Supply chain planning	40%	60%
Logistics in global trade	39%	61%
Ideation and innovation	32%	68%
Product lifecycle management	30%	70%

Chart 5.7: Supply chain management processes residing in the cloud

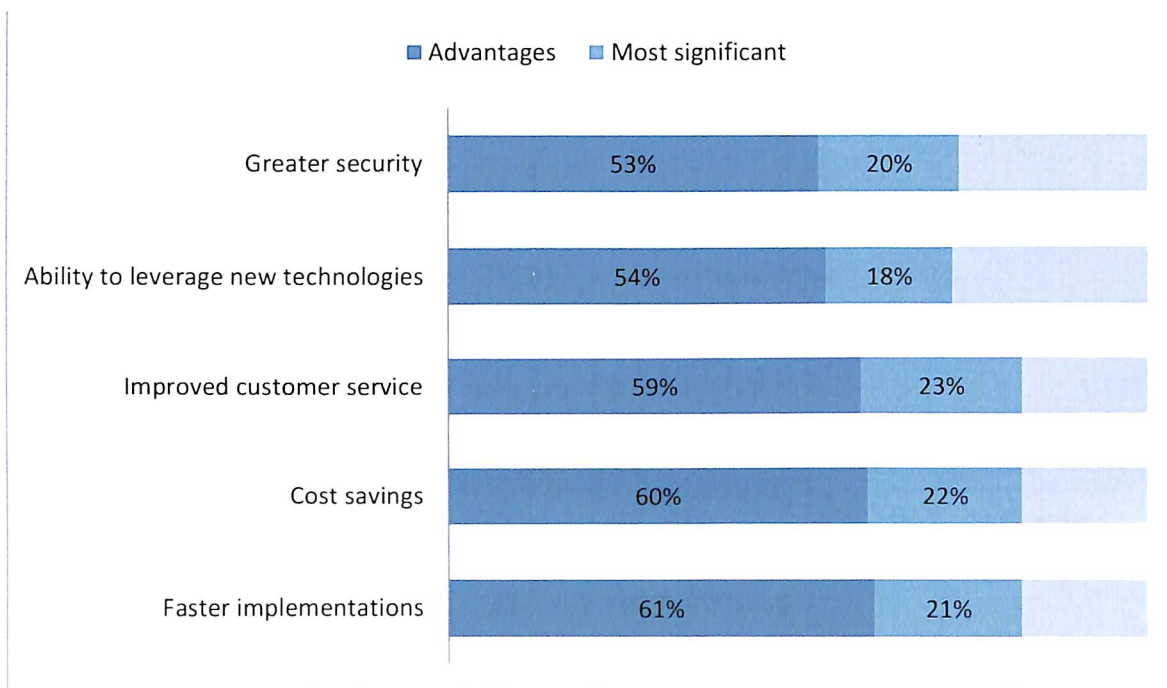


It is interpreted that for supply chain management processes residing in the cloud in now having in the logistics, planning, global trade, innovation and lifecycle management with the 40% and in next two years it will rise with 60% in the cloud based supply chain management

Table 5.8: Significant advantages of cloud-based supply chain management

Options	Advantages	Most significant
Faster implementations	71%	39%
Cost savings	75%	25%
Improved customer service	59%	41%
Ability to leverage new technologies	55%	45%
Greater security	56%	44%

Chart 5.8: Significant advantages of cloud-based supply chain management

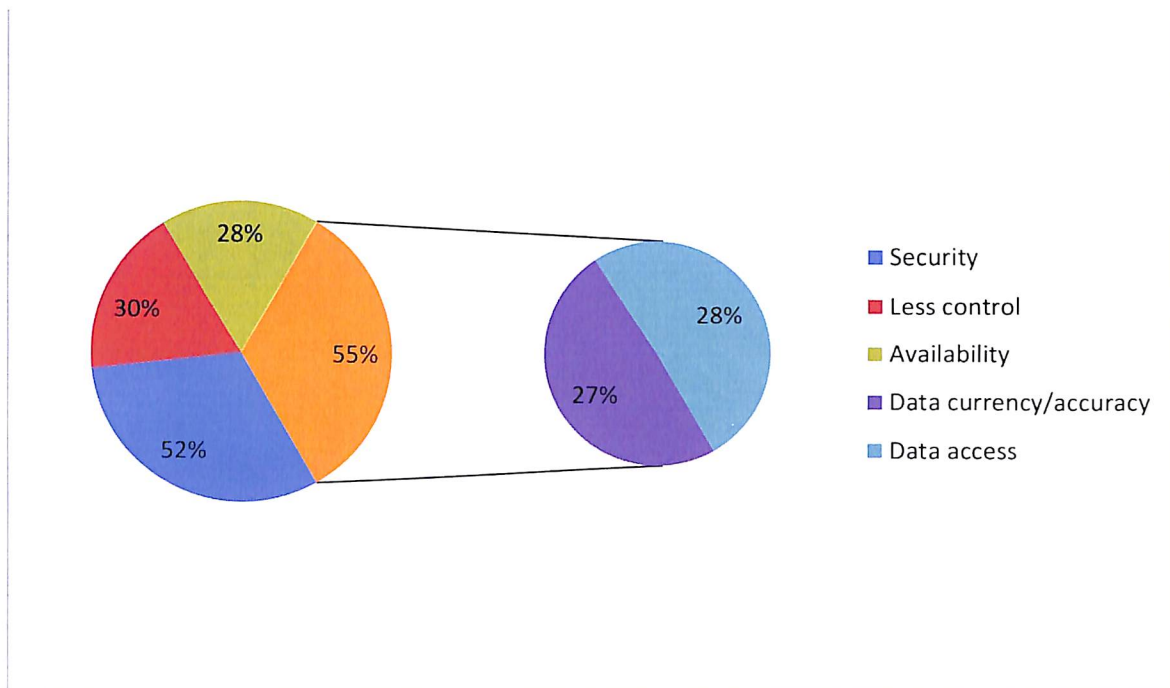


It is interpreted that most of the significant advantages based on the cloud-based supply chain management with greater security, ability to leverage new technologies, improved customer service having significant advantages and balance rising for the coming years

Table 5.9: Disadvantages of using technologies for supply chain applications

Options	Disadvantages (%)	More protected (%)
Security	52%	48%
Less control	30%	71%
Availability	28%	68%
Data currency/accuracy	27%	67%
Data access	28%	68%

Chart 5.9: Disadvantages of using technologies for supply chain applications

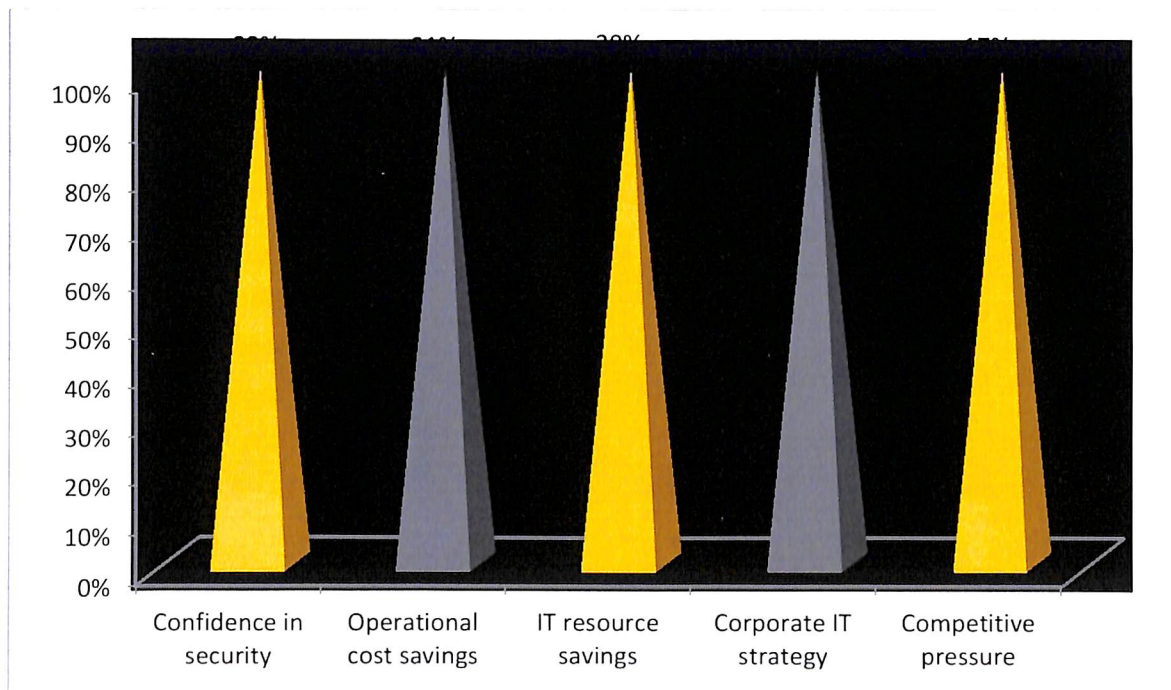


It is interpreted that the possible disadvantages of using technologies for supply chain applications were most of them pointed out 52% for security as much security is the main disadvantages, 30% less control over them, 28% availability of security, 55% is data currency/accuracy and data access are the disadvantages found in SCM applications

Table 5.10: Factors for adopting cloud-based supply chain applications

Options	Percentage
Confidence in security	23%
Operational cost savings	21%
IT resource savings	20%
Corporate IT strategy	19%
Competitive pressure	17%
Total	100%

Chart 5.10: Factors for adopting cloud-based supply chain applications

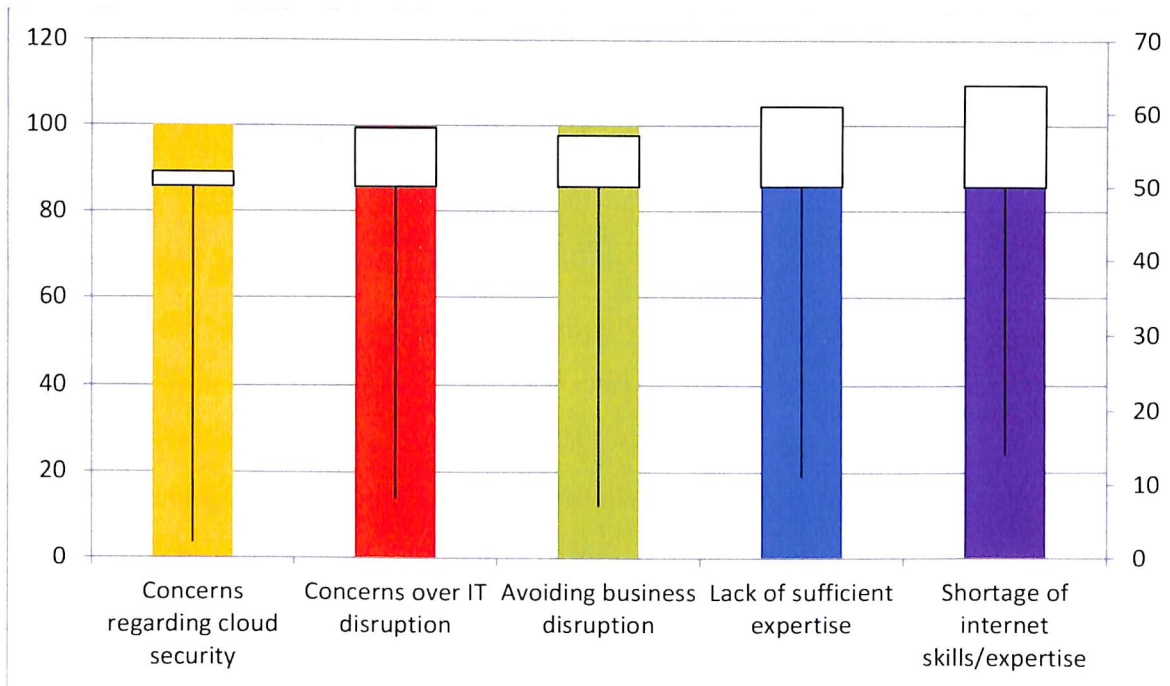


It is interpreted that motivating factors for adopting cloud-based supply chain applications with higher responses with 23% in confidence in security, 21% operational cost savings, 20% IT resource savings, 19% corporate IT strategy and 17% in competitive pressure received responses for motivating factors in these categories for cloud-based supply chain applications

Table 5.11: Challenges to adopting cloud-based supply chain applications

Options	Biggest challenge (%)	Most significant (%)
Concerns regarding cloud security	48%	2%
Concerns over IT disruption	42%	8%
Avoiding business disruption	43%	7%
Lack of sufficient expertise	39%	11%
Shortage of internet skills/expertise	36%	14%

Chart 5.11: Challenges to adopting cloud-based supply chain applications



It is interpreted that the most challenges for adopting cloud-based supply chain applications concerns regarding cloud security with 48% out of 100 responses then receives for IT disruption, avoiding business disruption, lack of sufficient expertise and shortage of internet skills and experience persons in cloud based systems

CHAPTER 6

CONCLUSION, LIMITATION AND SUGGESTIONS

6.1: Conclusion

As completely conversed in this research, the idea of cloud computing can be adequately used in the field of supply chain management facilitating mainly the joint effort among the supply chain stakeholders through the integration of supply chain activities. All the more specifically, forecasting on the cloud can lessen the distortion of interest when moving endlessly from the genuine customer's interest.

Moreover, cloud-based acquirement enables companies to oversee various suppliers in one integrated database. Last yet not least, cloud systems can give tracking in forward and reverse logistics in one closed-circle supply chain model. In this way, companies are eager to improve their supply chain activities are recommended to receive cloud technology with consequent positive aspects. Cost efficiency, simplicity, flexibility, system scalability as well as opportune visibility are the main benefits for businesses that choose to apply cloud computing on their operations.

At the same time, implementing cloud computing in supply chain management also implies some challenges. Uncertain data security, out of line data acquisition from competitors, system's crash down or poor internet association have all the earmarks of being the most widely recognized. Especially in center processes such as manufacturing, the absence of customization that characterizes cloud systems, which are designed to be used by several customers, could prompt loss of upper hand. Therefore, cloud providers should strive to alleviate cloud disadvantages either by strengthening the system's insurance or by offering customization options for their customers in request to persuade them to purchase and apply the cloud services. Nevertheless, one of the significant obstacles that companies need to beat when applying cloud technology is the transition from the conventional non-utilitarian working concepts and methods to new innovative present day practices.

Thus, companies that intend to apply cloud technology should fundamentally change this nearsighted mentality by adopting another one which entails ongoing sharing of information as well as joint effort with all the supply chain stakeholders. By and by, cloud-based models have just been executed by leading international 3PL companies with incredible success so

far, firstly at private and later on at public cloud structure. These genuine cases, as presented in this research, indicate that these companies have succeeded in adopting the new collective thinking in supply chain management and appreciate the benefits of cloud computing, especially constant visibility all through their customer organize.

The field of cloud computing appears to be vast yet moderately new. Thus, writing about cloud computing in supply chain management is very restricted yet quickly increasing after some time. As a consequence, numerous aspects of cloud execution in supply chain management have not been altogether studied and its true abilities have not been at this point sufficiently discovered. Quantitative models as well as cost analyses of companies, which have just actualized cloud technology, could archive all the more precisely the cost benefits of cloud in comparison with customary ERP systems or other on-premises infrastructure. Finally, subsequent scholarly research could possibly grow new progressed integrated cloud models for supply chain management, which will empower most of companies, including 3PLs, to innovate and drive forward their enterprises by moving to the cloud.

6.2: Limitations

The most widely recognized challenges and limitations that companies face when using cloud-based technologies are data security and privacy, the outdated business thinking, system availability, as well as absence of customization, as discussed are.

Data Security and Privacy: Data in the cloud should be accessed uniquely by approved members, to be specific trustworthy supply chain's partners. Notwithstanding, cloud computing systems as software products can't always ensure secrecy and as a result run increasing risk of being infiltrated by hacking systems. Also, possible data acquisition by competing companies would pose an imminent danger to the entire supply chain.

Outdated Mindset: The sharing of data and information with public implies an extreme change on the customary method for working and thinking, which can be a significant social business issue. As of recently, most of companies have been keeping secret snippet of information regarding generation processes or supply chain networks. Those companies are worried that wide sharing and disclosure of such data could prompt loss of their upper hand. Then, adopting cloud technology implies an extreme change in the business model of the entire supply chain arrange. As such, all the supply chain partners, who have been managing their operations till now with regular on-premises infrastructure, should figure out how to use

the new cloud systems viably. Such adaptations can't be finished in a short timeframe, since the transition to an increasingly open method for business strategy needs slow pace to do.

Availability: Users of cloud computing regularly have concerns on the consequences of a potential crash down caused by the supplier's system remaining task at hand and thus disruption of the conveyed services. Supply chain operations are critical for a company's financial welfare and as a result any delays because of the cloud system's glitch can be demonstrated deadly. At the same time, users stress over their access to the cloud, for instance because of poor internet association in various geographic regions.

Absence of Customization: Most of the times cloud computing systems offer standardized services that don't fit precisely to their specific supply chain operations. For instance, because of the way that manufacturing is a mind boggling center methodology that consists of individualized processes depending on each company's products, it requires a high level of customization that cloud-based services can't offer yet. All the more specifically, absence of customization would prompt slow market response or far more terrible loss of the company's upper hand.

6.3: Suggestions

- Respondents need to move towards cloud-based, end to-end SCM solutions, seeing a wide scope of strategic advantages
- New technology is a key motivator to receive a cloud based SCM solution, with incentives including visibility, metering and monitoring, and integration with cutting edge technologies
- Operational efficiency is a key favorable position of supply chain management solutions, alongside customer-centricity and innovation
- Numerous SCM processes previously keep running in the cloud, including item lifecycle management, worldwide exchange logistics, and ideation and innovation
- Challenges to the selection of cloud-based SCM remain, including security and operational disruption, despite the fact that these are not seen as insurmountable
- In terms of outcomes, companies need an end-to end, integrated SCM solution that offers a wide scope of functions
- Vendor support for cloud based SCM is essential, despite the fact that vendors need to accomplish more to justify its selection, especially with respect to security, confirmation and integration
- Despite the fact that companies are prepared to embrace cloud-based SCM solutions, they should be convinced, especially over business benefits and full vendor support

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