Opportunities for Cloud based Software as a Service (SaaS) Warehouse Management System An Indian Industry Insight

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Abstract:

Warehousing is becoming a more critical activity in the supply chain to gain competitive advantage on customer service, lead time and cost. In today's market place, warehouse management system (WMS) plays a vital role, to achieve high performance and efficiency in serving the customer. Various functionalities of WMS are discussed in detail to provide insight on the value addition; it brings to supply chain performance. In spite of its importance, the reach of Indian industries for this technology is less owing to the high acquisition costs and other considerations. To explore further on this, we have researched on low cost alternatives like cloud and software-as-a-service (SaaS) and their advantages. One more issue faced by many organizations is whether to opt for a standard or a tailor-made WMS implementation. The paper analyses the advantages of cloud based WMS and current trends. It also gives a discussion point on the micro-study conducted to understand the level of

acceptance in the Industry. On the other hand standard WMS results in making compromises between the way a warehouse wants to work and the way the system allows the warehouse to work. The paper also explores on the complexities involved in the implementation by giving an insight on factors to be considered in choosing a WMS.

Keywords: Cloud, SaaS, Standard WMS, Tailor-made WMS, WMS modules

Introduction:

Over the last few decades, we have seen a paradigm shift in the operations of warehousing in terms of improving the overall supply chain efficiency as well as the business performance. Nevertheless, it is still in a transition phase and needs further technological upgradation. The two most important technologies that revolutionized the sector are: Extensive use of appropriate Warehouse Management Systems (WMS) and automated Material Handling Equipment (MHEs) greatly improved the efficiency of warehouses in terms of order processing time, cost reduction, stock visibility and material flow control. A Warehouse management information system (WMS) provides the information necessary to efficiently manage the flow of products within a warehouse from the time of receipt to the time of shipping. (Faber et al, 2002). The WMS industry is undergoing a complete revolution with the help of using the new technique called "Cloud computing", with WMS providers offering cloud-based deployments. In cloud-based deployments, WMS service provider host the software application and hardware infrastructure for the customer. This allows a user to access the particular resource/application over the internet without actually installing the required hardware and application on-premise. Owing to the high cost of On-premise Information Technology IT systems, companies are in the process of transition towards cloud based models such as Software as a Service (SaaS), which paints the advantage of cost reduction and less IT talent resources needed from the customer side. Going by the trend in the growth of Indian warehousing industry, cloud based SaaS model for WMS has great potential for growth in the Indian market, as it would improve overall supply chain efficiency enabling an organization to compete globally.

This paper provides an insight on the usage of cloud computing in warehouse management and its benefits, comparison between standard WMS and tailor-made WMS, challenges faced by the Indian companies in logistics and warehousing operations and future opportunities in WMS. The paper also reviews and discusses the importance of WMS, advantages of cloud computing and differences between cloud systems with On-premise deployments. Further it details the observations from an exploratory study conducted to research on the acceptance of technology in the

Warehousing industry in India along with the current technology available in the Industry.

Literature Review:

Research on Indian warehousing industry is still at a nascent stage. This paper reviews and consolidates available research on the proposed area and undertakes some preliminary work on) to build on the literature on WMS and integrates it with cloud computing. It also gives an insight into the recent advancements in the Warehousing industry in India and the consequent potential of using cloud computing in WMS implementation.

Warehouse Management System (WMS) is an important facet of supply chain management which has been gaining prominence and steadily growing across the manufacturing and services industry, to streamline the storage and handling of materials in the warehouse. It incorporates feedback to improve workflow by continuously simplifying and optimizing operations, especially with warehouse personnel and equipment. WMS business processes are highly integrated between the physical handling and movement of products and the interactions with the software. WMS processes are tightly linked to the employee and the physical movement of products.

There are many WMS providers available in the market, selling standard as well as tailor-made WMS customized to the company's needs. The leading players in the WMS market are Manhattan Associates, RedPrairie Technologies, SAP, Accellos, High Jump software and Epicor etc. Also on the IT infrastructure front, the enterprise has a choice to choose between On-Premise versus Cloud based SaaS technology. In the recent years many players have entered into the market with the enhanced product service such as the large data handling.

Cloud computing and Software as a Service (SaaS)

Cloud computing is an emerging and rapidly developing technology which provides usage of computing resources both hardware and software that are delivered as a service over a network. Cloud computing has been recognized as the services with flexibility and Scalable tool (Lin et al, 2009). It is being identified as a potential area of research in supply chain technology and the firms also completely changed their approach towards this technology. If WMS is wireless capable, then it can further enhance inventory utilization, customer support and value addition. (Pokharel, 2005). Currently firms concentrate more on business issues rather than Information Technology (IT) related issues(Singh et al, 2013). In India, WMS vendors provide the

Warehousing management System (WMS) over cloud technology as software as a service (SaaS) model also, wherein the necessary infrastructure, operating environment (platform) and the WMS application is provided by the vendors. It can be accessed by the customers over internet. Singh et al (2013) augments that SaaS model is the boon for the Small and Medium Enterprises and newly incorporated organizations. In the current SaaS model, customers need not invest in any hardware or software applications specific to WMS. Industry analysts define SaaS as "hosted software based on a single set of common code and data definitions that are consumed in a one-to-many model by all contracted customers, at any time, on a pay-for-use basis, or as a subscription based on usage metrics." Here a single-instance of a common version of the software provided by the vendor is used by many users. In India, Red Prairie initiated providing SaaS based WMS after the acquisition of Smart Turn (a Web based Inventory and warehousing management solutions provider) who introduced the concept of SaaS based WMS globally.

Warehouse Management in India: Current Status

Indian warehousing industry is in the transition stage. With the demand from the downstream customers, Indian warehouses try to impart the agile systems to improve their efficiency. The warehouse performance has been ably supported and enhanced by the implementation of various IT/IT–Enabled services. The country has a total warehousing space of approximately 1800 million sq ft of which only 8 percent (140 million sq ft) is in the organized sector. The lack of quality in effectively handling the warehouse operations results in obsolescence and higher inventory carrying costs. The rapid growth in manufacturing and retail sector demands for a quality warehousing. On a futuristic view of the Indian business environment, with the implementation of GST (Goods and Service tax), the Government of India is planning to do away with the inter-state taxes. It would therefore be more advantageous for organizations to have a centralized warehouse rather than small warehouses at multiple regions, in individual states and also concentrated in the regions of lower taxes. With the onset of centralized warehouses, comes the big responsibility of maintaining product safety (avoiding pilferage), inventory management and efficiency. The direction towards achieving this goal is, by having an efficient Warehouse Management System (WMS) implemented. To unlock the working capital tied up in the warehousing and Inventory, the company's spending on IT Infrastructure becomes highly inevitable. Since the Indian warehousing industry is set to grow at a pace of 35 to 40 percent every year, the WMS implementation will become a major game changer among the players in the manufacturing and services sector. WMS also provides a wide range of advantages including increased inventory accuracy, improved order fulfillment speed, inventory turns and reduced order

picking time, reduced errors in loading/unloading of materials, Radio Frequency Identification(RFID)/Bar-code scanner based picking, voice picking etc, results in savings of direct operating costs. A study by NASSCOM and Deloitte estimates that Indian cloud computing market would reach USD 16 billion by 2020 (Deloitte report, 2012). The report says that 56 percent of supply chain software sold for the maintenance of Warehouses.

Industrial Benefits of WMS:

In India, Warehouse/ distribution center (DC) generally carries high level of inventory to minimize the likelihood of stock outs. If DC and Manufacturer's warehouse is integrated through WMS, benefits would accrue owing to supply chain visibility by integrating with their upstream and downstream partners by tracking SKUs, establishing labor standards in its operations, optimizing the distribution schedule, optimizing the storage and transportation planning etc. WMS helps the organization to stock optimal inventory levels throughout the year while balancing two conflicting interest of high inventory carrying cost and high customer service levels. This would not only help in providing consistent customer service but also increases inventory turnover ratio, through real-time integration of information which helps the decision makers to increase the efficiency and utilization of labor, inventory space which reduces the operating cost of warehouse.

WMS can reduce paper work associated with the warehouse operations, as receiving reports, allocation of goods in warehouse, move tickets, packing list can be maintained electronically and easily archived for further reference. Secondly, Warehouse space is very important in the Indian context, as land rates are very high and complexity in acquiring land for construction of new warehouse is enormous in India, so effective utilization of existing space in necessary.

WMS increases available warehouse space by more effectively locating items in relation to receiving, slotting, order picking, packing and dispatching to shipping points. There can be a significant improvement in staff productivity and reduction in number of employees required for warehouse operations. This is achieved by WMS system directing the user to take up the tasks from queue, based on picking routes and the type of material handling equipment preferred and used, known as "Task Interleaving", which greatly increases the labor productivity. Above mentioned advantages of WMS help in streamlining the order management process and companies can accurately determine product availability and realistic delivery dates. WMS identify and release back-ordered inventory and also reduce product returns as a result of increased shipment accuracy, thus improving the customer service level. It

also provides complete access to the warehouse data, and gives visibility on the warehouse operations such as the amount of inventory in the warehouse at any given time, orders currently being shipped, stages of processing of pending orders, staff productivity details, goods shipped by the warehouse over a period of time.

Implementation of WMS: Some Insights

Over the decade, evolution of WMS shows a positive trend in terms of system implementation and customized service. WMS service providers engaged in continued research to incorporate various tools for better efficiency and faced challenges in integrating the systems.

1. Based on the buyer's requirements, the WMS Software vendor can provide the system, either as a standard system, which incorporates the industry best practices or a tailor-made WMS, which meets the customer specific business needs. To design a tailor-made WMS, the vendor needs to add additional functionality (in terms of code changes) resulting in additional cost to the buyer. Thus the Total cost of Ownership (TCO) increases, when opting for a tailor-made WMS.
2. A standard WMS offers an advantage in respect of the scope to draw on best practices in industry. However, critical user specific needs are not likely to be incorporated by such a system, resulting in inefficient use of the technology provided.
3. Need for Customization: WMS customization starts with identification of gaps in the existing standard WMS in comparison with requirement of WMS users, It can range from simple placement of organization logo to development of complex new module.

   Most WMS systems incorporates features such as scanning of bar codes and these bar codes are interpreted as displayed on the label as item, location, pallet, quantity, serial number, etc. However in some cases a single bar code is formatted to present information in a compact form that must be parsed into multiple data fields as it is scanned. For example, a 16 character bar code might contain information about supplier, product, quantity etc. In some instances of WMS only the previously mentioned information are placed in A database, but with a minor customization to the scanning module, more information from bar codes like pallet, color, customer and many more information can be extracted and placed in the database.

   - Let's consider an organization that operates a warehouse with a standard WMS which supports few Automatic Identification and Data capture (AIDC) like bar codes, RFID. Now the company has decided to increase its automated systems to automated guided vehicle systems and automated storage and retrieval systems which are not currently supported by the WMS,

hence the customization of WMS to support the new level of automation should take place.

4. Software upgrades cannot be easily done in a tailor-made WMS, as the complexity of the system has already been increased with specific code changes. In such a scenario, the upgrade will result in vendor demanding higher costs, extending timeframes, resulting in system being inactive for a longer period of time. These constraints sometimes, de-motivate enterprises from opting for a tailor-made WMS, which will increase their capital expenditure affecting the Return on Investment (ROI) on the technology investment.

Table 1.1 Standards versus Tailor-made Warehouse Management System

Critical Factors	Standard WMS	Tailor-made WMS
Total Cost of Ownership(TCO)	Low	High
WMS Implementation Time frame	Less	Extending
WMS S/W Upgrades	Easier and less costly	Difficult and more costly
SKUs and Order-lines per day	Low	High
Suitability	For SMEs	For Large Enterprises
WMS Functionality	Industry Best Practices	Business process Specific

4. On-Premise WMS demands for the necessary hardware and IT infrastructure in-house to implement the WMS. So, the company needs an initial fixed investment to go ahead with the implementation. With global economy slowing down and companies adopting the cost cutting measures to protect their margins, it's a real challenge for them to invest in WMS.

For decades, software deployment was done on-premise of customers, where the necessary hardware and operating environment to implement a specific application is first deployed and then, WMS application is installed, such method poses lot of disadvantages, here cloud computing comes in handy which provides wide range of advantages which is discussed below.

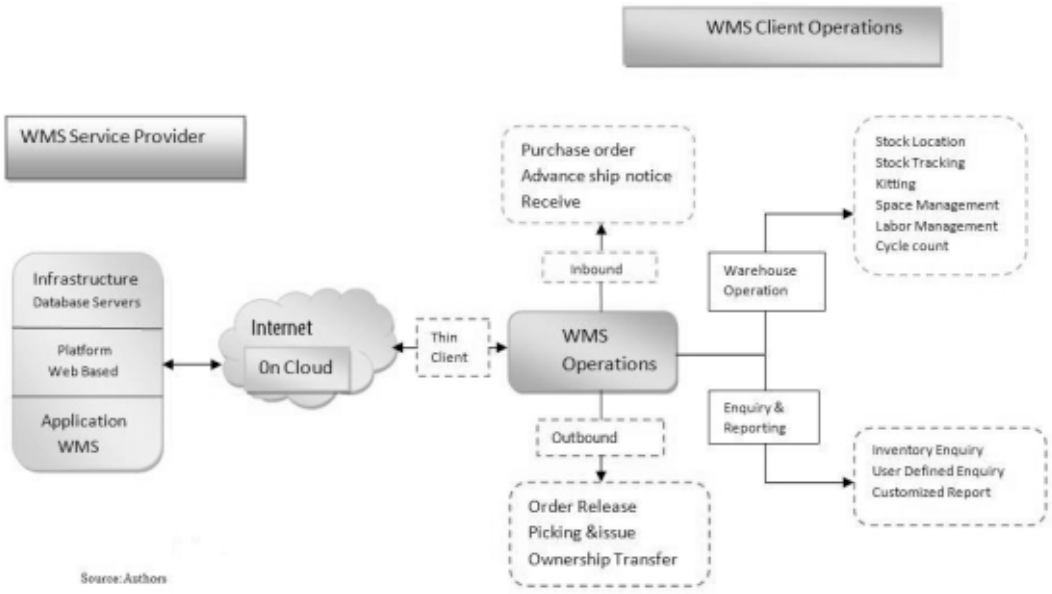

Fig 1: Schematic View of Cloud based SaaS WMS

WMS Functional Modules:

Inbound Operations:

- **Pre-Receiving** - It automates interaction with suppliers and trucking companies to accept and transfer information about the goods coming to the warehouse and to record delivery appointments primarily using Advanced Shipment Notice (ASN). This functionality replaces the manual paper records maintained by the warehouse.
- **Receiving** – This module helps to capture information about purchase order, quantity, serial number, etc from the truck arrived. Bar-code scanners are widely used during this step to identify the SKU and its quantity, system also determines the location for each SKU scanned.
- **Quality Control** – Series of quality checks are performed on the received merchandise. Generally, a random sample is taken from the received goods to perform quality checks on the SKU's. Any discrepancy in the quality check is immediately notified to the warehouse manager. Also, data on quality issues, places rejects on hold is tracked to ensure quality compliance.
- **Cross docking** - allows for opportunistic or planned truck-to-truck transfers, including timed merging of items for a customer's order.
- **Storage location management and optimization** - To allocate spaces for the newly received inventory by creating put-away algorithms and determines location by type, size, volatility, and velocity. In order to maintain the inventory accuracy it is a good practice to scan the product and the location.

Outbound operations:

Order Processing is the mainstay of every distribution center and warehouse, as it is a measure of the speed and flexibility in delivering the customer orders. WMS generates the shipping orders and is forwarded to the respective logistic service providers to ensure timely delivery of the order to customers.

- **Replenishment** – Replenishment functionality consists of the logic that decides when to bring up more of a given SKU to the forward pick area and the screens used by the associates to pick and deliver that merchandise to the forward pick area.
- **Picking** - With a WMS there are many different "pick mediums" other than paper such as labels, bar code scanners, and voice-based picking. Also new 'pick methods' can be invented, which greatly decreases the labor pick up time, e.g. multi-order picking or batch picking.
- **Outbound value added services** - After the picking process is over, the merchandise needs to be processed before it is shipped out, e.g. labeled/ kitted / shrink wrapped.
- **Packing / Checking** - Orders involving a few small pieces need to be placed into a box, checked, and then packed before shipment. Larger orders consisting of multiple cartons need to be 'checked' to make sure that they are complete. Both of these are accomplished via packing / checking screens in the WMS. These screens require the warehouse associate to scan all the items or carton bar codes tied to an order to confirm that all of an order is present before loading may commence.
- **Loading / Shipping** - Once the cartons are being loaded for shipping, the serial number on the pallets are scanned using bar code scanners and the shipped goods are made an entry into the WMS.

Other Warehouse operations:

WMS provides more features like kitting; wherein similar products are grouped together during put-away which helps in reducing lead-time once the order is placed by the customers. Once the quantity of the stocks in the warehouse is consumed beyond certain level (Reorder Point), WMS prepares purchase order for the replenishment of the goods.

- **Task Management** - This assists the warehouse supervisor to allocate tasks to the laborers at an individual level.
- **Cycle Counting** - It decides on the locations and SKU's to be counted in a given period

- **Productivity Reporting** – Gives detailed report on the productivity of the resources used in the warehouse, such as the labor, material handling equipments etc.
- **Returns** – Manages reverse logistics for repairs, returns, and recycling.

Integrating Warehouses through Cloud:

In a cloud based WMS deployment, multiple Warehouses/DCs at various tiers of the supply chain are connected over cloud and the Centralized server or server farm is maintained by the cloud service provider. This provides an opportunity to integrate the data of multiple warehouses/DCs and helps in sharing the information of inventory status in real time across all the warehouses/DCs. This provides warehouse managers, real time visibility on the number orders initiated and fulfilled across warehouses at any given time. This vital information equips the Warehouse manager to tackle the impending stock out scenarios at any point in the supply chain, by routing the orders to an alternate warehouse/DC to fulfill the order on time, thus maintaining the perfect order fulfillment rate. Traditionally, in On-premise WMS, warehouses can be consolidated using a secured web link such as Hyper Text Transfer Protocol Secure (https) or Asymmetric Digital Subscriber Lines (ADSL) over internet, which are generally cost prohibitive. So, cloud based SaaS can be considered as a low-cost alternative in bringing about the same functionality.

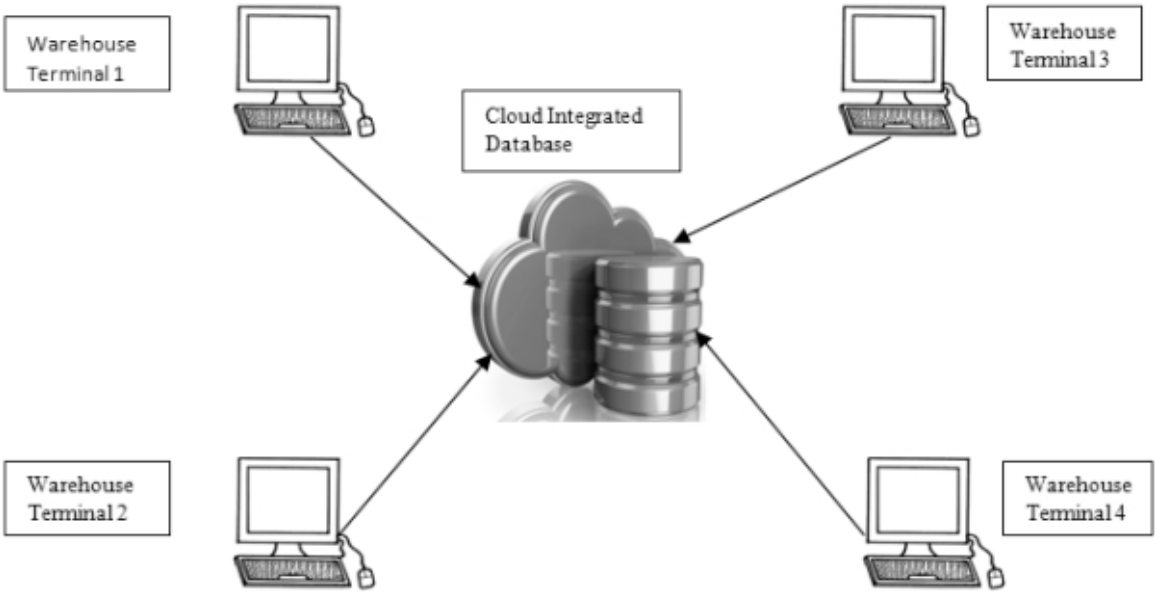

Fig 2: Virtually Integrated Warehouse using Cloud

Benefits of Cloud based SaaS WMS:

Reduced Upfront Capital Expenditure:

Cloud based WMS deployments are generally cost effective for the companies compared to On-premise installations, since it does not require the company to pay one-time installation charges for the software and cost of perpetual software licenses as annual maintenance costs. Also, the cost of necessary IT infrastructure at the premise can be avoided. Recent studies show that small and medium business(SMBs) are driving the sales of WMS to improve their efficiency and stay competitive in the market, for such companies cost of the application is very important as SMB cannot afford high initial cost of installment, for such companies SaaS is a very attractive option. (Singh et al, 2013)

No Software upgrade cost:

In case of On-premise deployments, organizations have to pay the WMS service providers for software upgrades as well as for the maintenance contracts. Also, dedicated IT personnel are needed to supervise the Upgradation process smoothly. But in the case of SaaS based WMS, software upgrades are done at the end of the service provider. So, organizations need not have to incur the software upgradation costs separately. Approximately one-fifth of the initial cost has to be spent for the upgrades. Given the tough economic scenario, Indian SMBs are mulling over several ways to cut down on the operational costs. So, Software upgradation costs would discourage them from taking decisions on technology investments.

Focus on Core Competence:

Since, WMS cloud service providers manage the software upgrades and maintenance of the system, Organizations can focus on their core competencies. In many cases, technology infrastructure can be managed more effectively by the engineers who created the technology rather than your own IT organization.

Quick deployment of WMS:

On-premise deployments generally take more time owing to the fact, that it needs the necessary IT infrastructure in place to deploy the WMS software. So, it takes a long lead time to the get the WMS up and running. But, SaaS based WMS takes very less time, as already the servers and systems are being kept in readily available condition by the SaaS service provider. So, the normal working of the warehouse will be interrupted largely.

Accessibility and scalability:

In a cloud-based scenario, WMS application can be accessed globally, by all the stakeholders of the Order management using a thin client. Once you see a significant improvement in warehouse operations same can be scaled up at low cost to the 3PL service providers, suppliers and customers warehouse to synchronize the operations to maintain minimum inventory and to achieve Just-In-time(JIT) this helps in improving the overall supply chain surplus. Above mentioned benefits helps in lowering overall cost of ownership, even in the long term eliminating upgrade cost, maintenance cost brings down the total cost of ownership. Nevertheless, cloud based system measures the performance of the warehouse through various KPIs as similar to the on-premises system.

Cloud based SaaS WMS: Challenges in Implementation:

SaaS based WMS has its own challenges in the implementation step. Wu et al (2011) discuss the challenges to SaaS model implementation. In an On-premise WMS implementation, warehouse managers and the internal IT personnel have complete control over the data stored in databases maintained internally. But in case of cloud based deployments, the data is stored in the service provider's database, hence Organizations have a general perception that data over cloud may not be safe and moving to cloud systems may jeopardize their business secrets. Organizations feel the insecurity, because of the possibility of data being accessed by the competitors. Hence Organizations should do the due diligence on selecting the service providers, by formulating the proper privacy, security and Internet usage policy.

Table 1.2 On-premise versus cloud based SaaS Warehouse Management System

Critical Factors	On-premise WMS	SaaS based WMS
Initial Fixed Cost	High	Low
Installation Time	> 3 months	< 1 month
Maintenance(S/W Upgrade) Charges	High	Low
Scalability to 3PL, Suppliers, Customers	Difficult	Easy
Downtime Support handling	Internal IT staff	Better Support during Downtime
Data Storage	Servers on premise	On Vendor's cloud
Data Confidentiality/Security	High	Less
Total Cost of Ownership (TCO)	High	Low

The customer has to pay for the services (WMS) subscribed, thereby relieving themselves of any fixed investment for hardware infrastructure. Aligebra (2012) elucidates the role of cloud computing in increasing the business value of the enterprise. In the recent report to Confederation of Indian Industry, KPMG believes that cloud computing is a disruptive technology which will act as an accelerator for the economic growth of India as it connects people with data, information and computing resources anytime and anywhere (KPMG Report, 2012). In India, still large businesses are reluctant to embrace the cloud. They cite the reasons of data protection over the cloud. Small and Medium enterprises are showing more interest in shifting towards cloud as it gives them the chance to compete with big players at a lower cost over cloud. In addition, Cloud technology is suitable for the applications that have fewer interactions with back end systems and for a short term usage. (Condie, 2011).

Chauhan et al, (2012) try to articulate the various reasons for the cloud technology failures and the impact on the various industries. They discussed the fear situation among the practitioners in terms of the data handling in the cloud mechanisms. However they have not done the empirical research on proving the factors that lead to the failure of cloud model. Since both the standard and cloud-based deployments have its advantages and disadvantages, it is wise for the company to analyze the existing scenario, to identify the expectations from WMS implementation and to work on the specifics of the deal and calculate the TCO and ROI for both the cases to decide on the kind of WMS. Implementing a standard WMS remains largely a compromise between the way a warehouse wants to work and the way the system allows the warehouse to work. The wrong choice of WMS, either standard or tailor made may lead to competitive or cost disadvantage.

Micro-study:

A micro-study has been conducted through a focused group and interview method in an exploratory approach to gather feedback from various stakeholders in the warehousing industry on the adoption of the cloud technology in the warehousing industry. Interview method was selected as they have the distinct advantage that they can be targeted, focusing directly on the research questions and are often used in situations in which the intervention being evaluated has no clear, single set of outcomes, as per this research (Easter by-Smith et al., 1991). These interviews were conducted as a semi- structured nature and the questions were specific to seek further information on the selected areas. The advantage of the interview method is to have the flexibility for the interviewer and built the additional questions based on the questions answered to him. In order to understand the questions, a careful

attempt has been made by the authors to study the various practices in the Indian context and to be aware of the various trends in the Industry. The study included Warehouse administrators and supply chain executives (20 people) to get the feedback on the usage of the cloud technologies in the Indian distribution environment. The background of the executives are Warehousing executives (4), Supply chain planners, (6), Senior Professionals in Supply chain (4), IT coordinators (2), Decision Makers/CEOs/owners (4). The study was moderated by the experienced professional in the warehousing Industry. The following research questions have been framed in structuring the questions to the Industry professionals

R.Q1: What is the interest and awareness level amongst the Supply chain / warehousing professionals on the cloud based platform.
R.Q 2: What are the complexities in Cloud technology implementation at a primary level
R.Q 3: Changing Dynamics in terms of IT- infrastructure of Warehousing Industry in Indian context.

The questions related to the challenges of employing cloud platform in an open ended form. The questions were asked in the following directions:

- What is the current level of technology adoption in the Warehousing industry in India?
- What are the preferred technologies in the Warehousing Management?
- What are the current barriers to adoption other than capital Investments?
- Do they know about the feasibility of cloud technology applications in WMS?
- Have they got an idea about the cloud technology application features in WMS Operations?
- Do they have an idea about general application of WMS in other than Warehousing Industry?
- IT enabled service possibilities with WMS and how do they increase the efficiency of supply chains?

The following are the main outcomes of that study posed as the challenges faced by the Indian warehouses to adopt the cloud based WMS systems. From the micro study, we could identify that:

- Industry is showing the awareness about the cloud platform applications in the day to day function.
- Since the cloud platform service providers are less, there is always a fear on the data manipulation as well as problem for retrieval.
- Costing for the service is also perceived to be very high than having them as their own capability.
- Services from cloud platform service providers are not fine tuned to the Indian operating conditions.

- The cloud services are not streamlined properly. This results in a non-standardized service.
- There is always a fear amongst the companies for the increase on the costing as well as data security.

Scope of research:

It is becoming very clear that the warehousing industry is undergoing a paradigm shift in adopting new technologies. Research reports on the acceptance of those new technologies are available. Still, there is a gap existing on the empirical research on the acceptance of the technology and their barriers using qualitative as well as quantitative tools. It is imperative to research in the lines of processing time, costs and techno-managerial aspects across various service providers.

The present study also needs to be validated by a structured empirical analysis from the multiple directions through a proper scale developed to measure the challenges faced by the warehouses in implementing the cloud services in the Indian context. Further work on the lines of acceptance of the technology, barriers for their implementation along with the qualitative and quantitative study parameters can be taken. The literature in this area is very minimal and any further work would add the ground knowledge to the Indian warehousing industry.

Managerial Implications and Future Insights:

Traditional WMS has been viewed as an IT tool for the storage and maintenance of inventory, order management system and dispatch of goods along with value added services like RF and barcode scanning. Now, the role of WMS has been expanded to integrate with the Vendor management and transportation management system to control the movement of goods across the entire supply chain. Going forward, WMS can be integrated with Merchandising systems, CRM systems, Vendor payments, material handling and requirements planning and finally with the organization's Enterprise Resource Planning (ERP) system as well. Thus, WMS in future will play a major role in Organization's Supply chain strategy (Kunders, 2010). Many of the WMS users predominantly use the basic modules of WMS, such as Receiving, Order Picking, Dispatch of goods, not giving much attention to other modules embedded in the WMS package, which has larger potential hidden in it, unutilized. WMS modules which are largely unused are, in the functionalities of task Interleaving, Slotting, Cartonization, Performance event management (Maida Napolitano, 2012) which actually maximizes the ROI on the WMS implementation.

WMS Consolidation:

Another significant change happening In the WMS arena is the usage of standardized and common WMS package across the multiple tiers of the entire supply chain. Any company has its inventory stocked in Regional Distribution Centers (RDCs), local warehouses, Stock houses etc. Each of them varies in the way, it functions, as it maintains different SKUs, uses different Material Handling Equipment (MHEs), volume handled, order picking techniques and item velocity. So, Companies wanting to implement WMS in their warehouses are forced to customize the software to accommodate to the individual needs. This adds to the cost of the investment in WMS implementation. So, WMS service providers try to standardize the package, to incorporate the industry best practices to create a single instance of WMS to be used across all distribution centers.

Conclusions:

As the government is mulling over the biggest tax reforms initiative of introducing the Goods and Services Tax (GST) in the coming Fiscal year, this will bring a sea change in the way, warehouses and DC's operate in India. Till now, to avoid central sales tax for inter-state transport, companies maintain smaller DCs within states, which results in huge maintenance costs. With the introduction of GST, companies will be mulling over on the strategy of opening Regional warehouses to take advantage of economies of scale, or outsourcing the entire warehousing operations to 3PLs.To take advantage of the situation. Individual players are constructing logistic parks across different geographical regions in India. On account of this, choosing the right Warehouse Management System (WMS), will help the companies in a great way to reduce operating cost, Order processing lead time, improvements in the overall supply chain efficiency and customer service level. This will change the perspective of viewing warehouse from being a cost center to a profit center. In developing country like India, manufacturing and distribution of products and services are highly fragmented between large businesses and SME's. But, these SMEs cannot afford to have on-premise WMS implementation owing to huge initial fixed cost and costly infrastructure requirements. Cloud based SaaS WMS will be the game changer for SME's to adapt to, for them to improve their competency in the market, as it has the dual advantage of less implementation costs and better connectivity. Thus, cloud based SaaS WMS is the right strategy for companies to adopt in the way forward.

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