Measuring Return on the Investment in Cloud System Implementation for Supply Chain Management

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Abstract
Advances in computing technologies have presented the management of supply chain firms with opportunities to enhance the competitive advantages of their organisations. Some of those opportunities arise from the deployment of modern systems that encompass the three most important components in supply chains management; namely enterprise resource planning, customer relationship management and e-Commerce. The current technology available in cloud systems appears to satisfy the needs of supply chain firms for managing resource planning, customer relationship and e-commerce simultaneously. The main purpose of the paper is to alert supply chain firms to the risks that they could face if their cloud system implementation is not carefully managed or if not appropriately selected and supported. The proposed investment strategies could assist supply chain firms in ensuring that their cloud system activities are positioned to assist and sustain their competitive advantages.

Keyword
Cloud System Implementation, Supply Chain Management, Leadership, Investment Strategy, Return on Investment

1. Introduction
Everyone is talking about the ‘Cloud’ and every company is supposed to have a strategy for migrating their old-fashioned data centres and IT departments to it. It is seen as the future in technology, helping to cut overheads and effectively making of computing a utility in much the same way that we view the electricity supply. In the words of John Naughton, ‘The network is now the computer’ (Naughton, 2012: p.175), and the promise of the Internet acting as a grid connecting companies and users together is due to become a reality. The Internet is beginning to drive radical change in supply chains (Salcedo & Grackin, 2000). A feeling is present that if you do not get aboard quickly, then you will be left behind by the competition. The danger in this atmosphere is that strategic mistakes will be made and companies could suffer some financially detrimental consequences to their business. The purpose of this paper is specifically aimed at companies operating in the supply chain and so will examine some of the features of supply chain management and provide for investment strategies for companies when looking at the implementation of cloud systems. More importantly, how can the return on this investment be measured?

However, there is little known about the best implementation practices and most importantly the applicability of suitable business models that favour certain deployment over another in different applications and settings. Given that these cloud systems are very costly to implement and maintain, it would be almost imperative that firms find and search for new suitable business models and implementation practices that ensure cost effectiveness of their investment.

The significance of supply chain concept in the new economy is best demonstrated by the growing sentiment that many firms are not competing against each other alone, but instead their supply chains are in effect competing against their competitors’ supply chains. Accordingly, one of the most critical...
questions to be asked is: whether the selected cloud system meets the strategic objectives of the supply chain firm? Furthermore, whether the implementation of the cloud system in the supply chain firm is successful? To answer these questions, it would be necessary to identify the characteristics of the cloud system and match them with the required or desired features in the supply chain firm. In other words, a method of assessment and evaluation of cloud systems’ deployment would be necessary. Failing to do so could expose supply chains to unnecessary risks that should have been addressed at early stages of the implementation processes.

2. Cloud Systems for Supply Chain Management

It was back in the 1980s when ‘Just in Time’ and ‘Total Quality Management’ were being widely adopted by industry as techniques for improving efficiency that companies also began to recognise the benefits managing the supply chain more effectively. In the 1990s, Business Process Re-engineering again focused attention on all aspects of the business including the relationship with suppliers and customers. As efficiencies in production had reached saturation, increasingly, companies were looking to improving the performance of their respective supply chains to gain a competitive advantage. Enterprise Resources Planning and Customer Relationship Management have emerged in the present period to focus attention on all aspects of the business. According to Joel Wisner, ‘As companies began implementing supply chain management initiatives, they began to understand the necessity of integrating all key business processes among the supply chain participants, enabling the supply chain to act and react as one entity’ (Wisner, 2011: p.13).

Supply chain management is a complex process as it involves not just your own company but also suppliers and customers. In our consumer-driven society, companies can only survive if they get products to market at the time and price that customers are happy with. They need to be agile and ready to adapt to change. As Kim Bowen puts it, ‘Competitive priorities for the efficient supply chains are low cost, consistent quality and on-time delivery’ (Bowen, 2005: p.315). They have to be aware of the physical configuration of the company in providing this. Are production and distribution in the right place? How well are they in controlling their inventory? If they hold too much stock, there are potential cost implications for the company. If they hold too little, then they could potentially face shortages and not be able to supply the market. They need to be aware of logistics in ensuring that they have the best transportation options for the business. They need a procurement process that gives them competitive pricing. All these things require constant review and assessment in order to stay ahead of the competition. Above all it requires co-ordination between the company and its partners in the supply chain, and that means effective communication and the sharing of appropriate information.

Some of these functions come within the direct control of the company, and some require cooperation with other suppliers. As Kim Bowen (2005: p.13) explains, ‘Thus a firm should be able to manage two different types of supply chain at the same time, one for intra-firm functions and the other for inter-firm functions’. As well as this two-sided nature of the process, a company could also be operating with multiple supply chains, making for an interesting and potentially complex matrix of relationships. When all these work well, the customers get what they want when they want it, and the company and its suppliers have confidence in the forecasting models that are being deployed. Confidence is the key, and this can help with the relationship building that is required in creating a successful company. When things go wrong, they can have catastrophic effects on a company and its suppliers. Cost over-runs, customers unable to get goods on time, and a breakdown in communication between departments and suppliers all suggest a company heading into trouble. When examining any possible transition to the cloud, the first pre-requisites are leadership and communication.

3. Good Leadership

Many IT projects have ended in disaster precisely because of poor leadership. This has often involved the abdication of responsibility from the top when complex projects are initiated. For example, it is
always tempting for a top manager to be persuaded by a salesman of the benefits of a particular system and then leave it to the IT department to implement without taking enough interest in the practicalities. There are many companies out there looking to tempt executives and IT managers with promises of increased profits and easy to attain reductions in costs. To quote one example, ‘So, say goodbye to costly equipment, maintenance and proprietary programming languages. And get acquainted with instant data flow across your entire value network. Connect to your entire value network in the cloud and see how easy it is to lower your costs and increase your profits’ (One Network Enterprises, 2012).

The first thing a good leader will need to do when faced with all these options is to clarify the goals of the business and to see how any changes could potentially improve performance. Given that any moves to the Cloud will impact upon existing structures within the company and relations with others in the chain, then an audit of the existing structures should be carried out. This could be an opportunity to improve the existing supply chain by eliminating duplication and unnecessary overheads. A business case needs to be developed in order to sell any proposed changes to colleagues, and the company will need to know if all their present information is up-to-date and accurate before migration to the Cloud. Comparative studies could be carried out to gauge how the company compares with others. Basically, the preparation needed is extensive and that involves persuading others in the chain of the need to move together on the transition. The business case needs to focus on how value can be increased by the changes proposed and in how the transition is to be managed. Given that some people’s jobs may be at stake, leadership is essential in order to maintain confidence in the journey. As Ravi Kalakota (1999: p.4) poses it, ‘Does top management understand what it takes to build inter-enterprise, technology supported processes, such as supply chain management, that form the backbone of e-business?’

Current economic circumstances drive the demand for a more effective model of delivering applications and computing services. Today’s cost- and resources-constrained business world requires executives and IT managers to constantly find new ways to innovate, and the potential that cloud services offer continues to be attractive. A recent study from the research firm IDC predicts that of the projected $27 billion in net new IT revenue in 2013, 27% will come from IT cloud services. The supply chain industry is prime for the cloud because of the sheer number of partners and suppliers that must collaborate to make products.

Businesses need to communicate and share data with their entire trade network. To do this, you need solutions that go beyond the four walls of your business, allow you to track and trace products, shipments, and orders, and make it easy to share massive amounts of information across an entire global trade network. You need the cloud!

4. Measuring the Return on Investment
There are many different ways to measure the return on investment in the supply chain implementation. This could be a subjective one of measuring customer satisfaction with the changes made. This will need to be carefully monitored so as to ensure that the investment made is achieving added value for the business. The implementation process is going to have to be carefully assessed. The company has to make a judgment about the investment made in legacy systems if these are to be subsumed under the new cloud-based applications.

What are the likely future charges for maintaining the present systems if it is decided that they are too critical to the business to be replaced? Are there companies that can incorporate legacy systems if needed on the cloud? Given the promise of the cloud, just how scalable are the systems? How will the company manage new Service Level Agreements with cloud suppliers in order to ensure that standards can be maintained and improved on an on-going basis?
It may well be that the company will see a reduction in the head count in the IT department as functions get transferred, but it may well be that new skills will be needed to monitor and manage the SLAs. Internally, the company may be able to assess how the implementation is going to impact on some of the company’s internal processes. For instance, problem management may be managed by the Cloud service provider rather than the internal department. This can be measured financially in terms of staff savings. Which types of models will suit the business objectives of the company? Would Software as a Service (SaaS) be the most appropriate to begin with given that this may preclude your partners, or should consideration be given to a wider Platform as a service (PaaS) to allow others to access the same data? Given that supply chain risk is primarily tasked with preventing disruptions to the customer, it may be necessary to consider some back-up procedures during any proposed implementation. This may initially incur some extra costs in allowing for extra stockholding and identifying some back-up suppliers in case of unpredicted problems. What safeguards will need to be put in place in order for company data to be protected? How will the process be measured and assessed? Some cost analysis is going to have to be done. This could involve some price comparison and will need to show some means of measuring outcomes. Comparisons of available solutions in the cloud will need to be made with the existing systems in order for functional matches to be made. All these questions will need to be answered before any changes to existing systems have taken place, and realistically, this process alone should take a company at least 6 months to complete if it is done properly. All this needs to be documented with the appropriate risk factors highlighted so that everyone is clear on the roadmap.

5. Investment Strategies
The first point to make is that companies occupy different positions in the supply chain and that some are going to be leaders and some followers in the process. As Wisner points out, ‘Firms with large system inventories, many suppliers, complex product assemblies, and highly valued customers with large purchasing budgets have the most to gain from the practice of supply chain management’ (Wisner, 2011: p.10). It could easily be envisaged that a powerful company decides to move on to the cloud because it has the resources to manage such a move with minimum disruption to their customers and suppliers. They also have the economic power themselves to be able to cajole their suppliers and sometimes even their customers into cooperating in their operational changes.

The supply chains of today are highly fragmented with silos of information that make it nearly impossible to share information with trading partners. Businesses need technology platforms that empower them to visualize a product in every stage of its lifecycle, in real time, from raw materials through delivery to end customer. Management must be able to make quick decisions to re-route shipments, locate containers, and collaborate with suppliers to meet customer demand.

For instance, a powerful pharmaceutical company like Pfizer was able to introduce the cloud into their supply chain precisely because they had the power to do so. Using an appropriate medical analogy, Ryan McBride writes that ‘Pfizer has treated the complications of its supply chain with doses of cloud computing, virtualization and other tools, enabling the drug giant to track shipments from a large network of internal and external sources with improved efficiency and accuracy’ (McBride, 2012). Although even with Pfizer, one of the benefits of the system they adopted is that the other suppliers could access the system regardless of their own IT systems, showing the need for cooperation with the existing suppliers in the chain.

In fact, the Pfizer example also points to another possible strategy for companies that are looking at moving supply chains into the cloud. Virtualisation provides the option to effectively create a ‘private cloud’ for internal use, perhaps as a complement to, or as a precursor to cloud implementation. In this way, critical company data can be protected and a way found in which a staged migration to the cloud over time can be achieved rather than any revolutionary change. It may be important that as with the Pfizer case, suppliers are able to access systems in the cloud as well as maintain their own legacy.
systems. Often it is within the legacy system built up over time by IT technicians close to the front line so to speak who provide the company with some unique selling points in the market place. They have created a bespoke system tailored to the unique needs of the company. Cloud systems which cannot offer this may have to be rejected. Areas that are not judged to be ‘core’ and that can be improved through cloud applications should be prioritised. This can include areas such as forecasting where the most widely shared access to information can improve performance. Logistics could also be improved where inventory management is kept properly aligned with forecasting. Procurement could be improved by allowing more open access to information so that any price changes are duly noted and savings passed on. Where collaboration can be improved is where the greatest effort should be targeted. But again, even with all these areas, some caution will need to be applied.

In the same way that ERP applications have not been employed to automate 100% of enterprises' business processes, it is unlikely cloud computing will be adopted as a wholesale replacement for on-premise systems. Instead organisations are likely to use a more hybrid patchwork of on-premise, "public" cloud and "private" cloud services where appropriate.

The concept of "private" cloud computing involves companies deploying key enabling technologies such as virtualisation and multi-tenant applications to create their own "private cloud" datacentres. Individual business units (or partners) then pay the IT department for using industrialised or standardised services in line with agreed charge-back mechanisms. For many enterprises this approach is less threatening than a wholesale move to the public cloud, but should make it easier to hand individual services over to a third-party provider in future. But a particular area of the supply chain in which the public cloud is believed to have much potential, particularly in a globalised world, is that of boosting visibility in those processes where collaboration with and between third-parties such as suppliers and partners is key.

For example, in the case of inventory, it can be difficult for manufacturers to ascertain what is happening with various stock items at any given moment in order to take action should it become necessary. This is because partners across the supply chain often do not provide each other with timely enough information, and process steps tend not to be joined up as seamlessly as they might be.

Commercially available, SaaS applications such as drayage dispatch, transportation management, and equipment maintenance and repair exist on the market today. For example, automated dispatch management systems link ocean carriers and third party logistics providers (3PLs), providing critical pick-up and delivery information that reduces transportation spend by shifting business to the most efficient vendors, increases equipment utilization by combining moves, and automates time-consuming manual tasks. Costly billing errors are eliminated, processes are streamlined, and all parties involved have access to key information to make more informed decisions.

The availability of Cloud-based neutral processing platforms, that often underpin the SaaS software applications, boost the value of the Cloud to the supply chain. These platforms provide direct connectivity with networks of diverse trading partners, regardless of their systems capabilities, through any-to-any data exchange and online web portals. The resulting virtual communities enable shipment track and trace, streamline routine transactional workflow, and optimize the flow of equipment to maximize asset utilization. SaaS users readily connect with a network of equipment maintenance and repair providers on the web to manage container equipment and chassis repair estimates and service requests. Further, advancements in visibility technology allow companies to track equipment as it moves through the supply chain.

In today’s fast-paced, highly competitive global environment, companies need supply chains that are agile, savvy, and adaptive. Customers, suppliers, and trading partners are demanding; they want information immediately and require the right products arrive at the right location at the right time.
This can best be accomplished in the Cloud. In place of a manually-driven supply chain, use SaaS solutions to transform your supply chain into an automated, dynamic demand-supply network, offering visibility, control, and collaboration across all trading partners.

6. Conclusion

A transition to the cloud may be a question of when and not if for the supply chain, but careful planning and assessments will need to be made before embarking on the journey. Along the way, there are going to be casualties, those who do not react quickly enough and those who react too quickly without proper planning. The cloud offers opportunities to new entrants into the marketplace as they do not carry the costs of legacy systems and they may displace many existing companies.

Nevertheless, enough is now known about managing change for existing companies to make the incremental changes needed to adapt. Firstly, companies need to be well led so that everyone is aware of the strategic goals of the company. An audit of the existing structures will need to be conducted and a business case made for any proposed changes. Investment strategies will need to be devised that best meet the company’s strategic goals. Among these could be the use of virtualisation so that a ‘private cloud’ can be used in a transition to a more public cloud. Areas such as forecasting may be the most appropriate to begin with as they provide for an early ‘win-win’ situation supply chain. Measuring the return on the investment made in the cloud system implementation for the will involve an honest assessment of measuring the cost savings to be made in retiring old legacy systems and possibly redundant IT departments against the new costs to be paid out to cloud-based companies and new systems. As well as the financial measures, a company will also need to be able to measure the effectiveness of the changes for their customers so that the process is adding value in the marketplace. In the competitive world of today, that is the bottom line.

References

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