

Enterprise Systems and Architecture

CA2

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Subject Matter

“A large percentage of organisations utilise some form of cloud computing model. In terms of Enterprise Systems such as ERP’s, SCM’s and CRM’s and the functionality they provide, what can an organisation expect to have available to them through these models, how does it provide advantages over ‘in-house’ implementations and what are the particular issues and risks involved in moving to cloud delivered business systems.”

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# Introduction

Over the past few years cloud computing and its availability have been on the rise. Enterprises may seek to utilise this more widely available technology over in house alternatives in order to help keep costs down, profits high and efficiency at an optimum level.

# Cloud Computing

According to (Amazon Web Services, Inc, 2018) “Cloud computing is the on-demand delivery of compute power, database storage, applications, and other IT resources through a cloud services platform via the internet with pay-as-you-go pricing”.

There are three main types of cloud computing that are available to a user. These are:

* Infrastructure as a Service (IaaS)
* Platform as a Service (PaaS)
* Software as a Service (SaaS)

Although IaaS and PaaS are widely used, especially in the context of an enterprise environment, I will be mainly focusing on SaaS throughout the course of this essay and its applications. SaaS offers users easy access to a piece or pieces of software over a network which can be quite appealing to a number of different types of users.

## Primary Users

Although they may not be aware of it, most people who avail of any online service may be directly or indirectly a user of cloud-based technology. User types can range from a single person to a multi-national corporation. The types of SaaS they utilise can also vary greatly. A non-commercial user may avail solely of Google Apps for example. On the other hand, anyone within an enterprise setting may have a wider range of options available to them. These may include examples such as Salesforce, Workday etc. Within the context of this report, I will be focusing more on the enterprise side of things as opposed to non-commercial users.

## Advantages and Disadvantages

No matter what type of user you are, cloud computing will still have both its advantages and disadvantages. As stated by (LevelCloud, 2018), some of the advantages and disadvantages that relate to cloud computing are as follows:

### Cost Savings

One of the biggest advantages of using cloud-based technology is that of cost saving. Not having to have on site facilities to host, run and maintain things like servers can reduce an enterprises costs significantly.

### Reliability

Most cloud vendors now boast 99.99% uptime which in itself is quite an impressive feat. Significantly low levels of down time coupled with access to a pool of resources can be used as one of the major advantages when choosing cloud.

### Manageability

Nowadays users are able to scale and manage most cloud services as needs be. They may also be able to have control over things like operating systems and versioning which are crucial in the day to day operations of many enterprises.

### Downtime

On the other side of things, downtime can be disputed as one of the biggest disadvantages of cloud technologies. It may be the case that a vendor is forced to enforce downtime for a number of different reasons. This can affect negatively on users of the service in question.

### Security

Although most providers have sophisticated security systems in place, it does not mean that they are 100% protected against security threats. Choosing to place your data in the hands of a third-party vendor can be a difficult choice for most businesses for this very reason.

### Vendor Lock In

The big problem with choosing a certain technology is that once it is implemented, you are stuck with them (to an extent). If you continue to avail of a vendor’s service for a few years and build up mass amounts of data, the cost of migrating to a new system could be costly. Users are also stuck with whatever services the vendor chooses to provide.

# Existing Enterprise SaaS Solutions

There are many existing SaaS solutions that allow an enterprise to implement competitive business strategies. These business strategies can assist an enterprise in saving on cost, staff and can allow its resources to be allocated more efficiently.

## Existing Business Strategies

Three key strategies that are utilised by many enterprises around the world are as follows:

### Enterprise Resource Planning (ERP)

ERP’s allow for seamless communication between various processes within an enterprise. These may include areas such as sales, human resources, accounting, etc and at the centre of it all lies a shared database that they can all use to connect to one and other. (NetSuite.com, 2018).

Although in theory an ERP can seem like a good idea, it does have its limitations. First and foremost, they isn’t a one size fits all option when it comes to ERP’s. Much like a person, every enterprise is different and has their own set of needs and requirements. This can be a problem when it comes to choosing a vendor vs implementing customised versions of the vendors software to suit your needs. On top of this, there may be issues if a company is a multi-national for example. Trying to integrate different departments that may exist across different countries can be a challenge in itself.

A solution to this problem however can come in the form of modularity. The idea being that an enterprise signs up to use a specific vendors software and then chooses the components that they need (e.g. sales component, human resources module, purchasing module, etc.). The enterprise can only use components that they need to use and can ultimately save on cost above other things. They may also develop custom solutions to add on to the vendors software (if it is viable) to further enhance the experience.

### Customer Relationship Management (CRM)

(Salesforce.com, 2018) states that “Customer Relationship Management (CRM) is a strategy for managing all your company's relationships and interactions with your customers and potential customers”. For large enterprises one of the most important, yet difficult tasks they can undertake is customer management / retention. Many enterprises may have a customer database that exceeds one million records. Managing this efficiently without the use of some kind of software would cause many issues which could be costly to an organisation and frustrating for its customers. In order to combat this issue, CRM is usually implemented to help track customer information across departments.

The idea behind CRM is very simple. Create a piece of software that can access a database and can easily display all information about a given customer. This can include information about past dealings with the customer, contacts names and numbers, supply channels or revenue generated from the customer. CRM also allows for greater customisation of customers. They can be divided into different categories, flagged if they are important or troublesome to the enterprise and can even have custom plans added to their records which can help to optimise revenue.

Having CRM in place means that an enterprise can have a single view of the customer which is accessible within a single application. They can also have better knowledge of their customers by tracking interactions and analysing the data. Customers’ needs may also be a lot easier to identify as a result of logging feedback relating to the likes of a sale or a check-up call etc. Things like customer satisfaction, reduced marketing costs and increased sales revenue may also be a direct result of having CRM in place.

On the flip side of things however, there are some drawbacks to CRM. To begin with and similarly to ERP’s, there is no one size fits all solution when it comes to CRM. Many enterprises may need to record specific information about their customers that might only be seen in a handful of cases. There can also be great difficulty when it comes to integration a CRM solution with existing ERP software. On top of this, there is the issue of big data and scalability of the application to handle the increase in data.

### Supply Chain Management (SCM)

According to (SME, S, 2018) “Supply chain management (SCM) is the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage”. If an enterprise wishes to provide more clarity to its customers, it must first be able to track and record information about their services / products. By utilising an SCM strategy, an enterprise is able to offer more clarity to its customers while at the same time guaranteeing that they are fully aware of material, information and financial flows.

A good SCM does not only mean that an enterprise can provide greater clarity to customers however. It also ensures that things like high inventory cost, poor customer service and a poor quality of products is avoided. SCM is usually divided into five main sections. These are:

* Plan
* Source
* Make
* Deliver
* Return

Breaking down the entire process into smaller, more manageable components allows for greater micro management of the enterprise. It means key business decisions can be taken around over and underspending and optimal use of time. Components of the supply chain that are underperforming can also be identified and changed if needs be. This can lead to optimized efficiency and cost saving within the enterprise.

There are some factors which can block SCM. One of the most prominent factors is that of trust. Many trading partners nowadays do not trust each other with sensitive information relating to the supply chain of a product. A fully functional SCM system would require quite a high level of transparency between participants of the supply chain. Traditional methods of exchanging information about the supply chain may be preferred in some circumstances as opposed to a system. Finally, and usually one of the more deciding factors is the cost of the implementation. Decide who has to pay the fee often leads to issues and arguments between participants of the supply chain.

## Main Providers

There are many different vendors which currently provide services to implement three of the key strategies. Some of the major competitors are:

### SAP

SAP are one of the biggest competitors within the ERP, CRM and SCM market. They provide SaaS solutions for each of the three strategies. They employ a modular approach to ERP so that customers can pick and choose what is needed. SAP provide solutions to enterprises ranging from small to large.

### Microsoft

Microsoft have their own range of SaaS solutions as part of their Dynamics range. The Microsoft ERP package is more so targeted at mid-size enterprises and also at smaller divisions of large organisations. Dynamics also comes with its own CRM module. Microsoft have not chosen to compete on the SCM front however.

### Oracle

Oracle, much like SAP are heavy hitters in the area of ERP, CRM and SCM. They also have taken a modular approach in order to better satisfy the needs of their customers. Once again like SAP they also provide a version of CRM and also SCM to enterprises ranging from small to large.

# SaaS vs In House

One of the biggest debates when it comes to IT is whether to develop custom in house solutions or use a SaaS alternative. It can sometimes be what makes or breaks and enterprise. One wrong decision and the whole enterprise could go bust. It can often be the case where there is a requirement to use in house as opposed to SaaS and vice versa, but if a choice is available, it can sometimes be difficult. There are both many advantages and disadvantages to each.

## Advantages and Disadvantages

According to (Ideyatech, 2018), some of the main advantages and disadvantages of SaaS vs In House are as follows:

### IT Department Size and Skillset

Many large enterprises may already have quite a large IT team at their disposal. On top of this, those IT professionals employed by the enterprise may already possess the necessary skills needed to develop and maintain an in-house application. For some small to medium size enterprises however, this may not be the case and they may have no other choice except to opt for a SaaS alternative.

### Information Sharing

Sharing of information can be quite a touchy subject these days. Many of the larger enterprises would prefer not to share information with third party vendors and for this reason alone, will choose an in-house solution. On the other hand, if an enterprise has no problem sharing customer data with a third party, they may opt to choose a SaaS alternative.

### Government Regulations

Many larger enterprises must conform to standard government regulations when it comes to sharing customer data. Financial institutions have very strict regulations with regards to sharing data with third party sources. The regulations alone may force an enterprise down the route of in house as opposed to SaaS.

### Cost

The cost of maintaining in house software can be quite considerable. There are many things which have to be accounted for such as the cost of servers, specialised software to manage and develop as well as the cost of hiring staff to develop and maintain the software. For larger enterprises, the overall cost may be minimal in the grand scheme of things. For smaller enterprises however, the cost may be quite considerable, and they may have no other option than to resort to the SaaS alternative.

### Urgency

It may be the base that a solution to a problem is required very quickly. As a result of this, it may not be possible to develop an in house solution within the given time frame and an SaaS alternative will have to be used. The SaaS alternative may offer “out of the box” functionality straight away also, which in some cases is perfect.

# Issues and Risks Moving to the Cloud

As with anything in IT, there are issues and risks associated with migrating to the cloud. (Healy, R, 2018) has identified some of the main concerns. Here are some of the main ones:

### Security

Anything IT always has a security concern no matter how big or small the project is. It’s all well and good having everything in house with full access and control over how secure and well protected everything is, but what about when the responsibility is given to a third party? Some vendors may have more strict security regulations compared to others. However, the notion of security is no longer in your hands when control is given to a third party.

### Control

Some vendors may have procedures in place which allows a user to manage / control the infrastructure / data associated with a cloud solution. For the most part however, control is limited to the side of the vendor. This can be a concern for many enterprises.

### Downtime

As stated earlier in the essay, most vendors can now boast up to 99.99% uptime. Unfortunately nobody is completely immune to downtime at the end of the day. Downtimes at certain points in the day can be detrimental to certain enterprises and can end up costing them a lot of money.

### Migration

Sometimes migration from one system to another can go down without a hitch. Other times, not so much. If migration is involved, plans will have to be made well in advance in order to minimise disruption for customers. There is also the issue of migrations failing altogether and requiring several tries to successfully complete. Once again, if this is the case, it can end up costing an enterprise quite a considerable sum of money.

### Change

Change within an IT environment is something that can be feared by many and embraced by few. A brand new UI, a different way to access data, different tools. No matter what changes there is always going to be some consequences as a result of it. If the change is minimal, there may not be as big a consequence, but quite large changes often see problems introduced very quickly into the equation. Proper planning is required to ensure that everything goes smoothly and that “damage” is minimal.

# Conclusion

In conclusion, it is clear to see that there are a number of existing SaaS solutions that are available to enterprises to assist them in a number of ways. On top of this, there are also many advantages as to why an enterprise may choose to utilise an SaaS alternative as opposed to in house. Finally, there are also a number of risks which are associated with migrating from an existing in house solution to a SaaS alternative.

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