Cloud Computing White Paper

Tony Kenyon, CTO
OchreSoft Technologies Limited

About OchreSoft Technologies

OchreSoft Technologies Limited was established in 2003, having been part of a two year research program inside a leading law firm (BPE Solicitors). Our strategy was to deliver an innovative workflow framework, building upon the expertise already gained, and optimising its use for wide area services such as the World Wide Web. We now offer several industry-leading workflow applications to over 150 online customers, delivered using our flagship product, Intelliworks^{TM}.

About VirtualFirm

The VirtualFirm is our web portal; it enables work providers and clients to benefit from up to the minute status information and reports. The portal currently tracks thousands of new instructions per month. It also gives work referrers and clients the ability to send interactive messages and new work instructions through the World Wide Web.

About Intelliworks^{TM}

Intelliworks^{TM} is an innovative suite of workflow and content management tools. Using the latest .NET technology we have designed a groundbreaking platform that uniquely delivers a range of expert workflows over XML web services, using distributed processing. Our simple pay-as-you go deployment model, and our automatic self-updating platform, means that the time to adopt leading workflow software has never been better.

About Workflows

Our workflows are fully functional applications which embody knowledge and expertise, as well as all associated content (letters, forms etc). These applications are encoded in a special XML-based business-process language (XBPL), and then encrypted and delivered via the Internet. Workflows comprise one or more *processes*, each comprising one of more *tasks*, where a task can be anything from a phone call through to filling out a complex form.

About This Document

This document is OchreSoft's position paper on Cloud Computing. Here we define what cloud computing and SaaS are, what these terms mean in relation to our service offerings, the general state of the market, and our view based on experience within the legal sector of both cloud and non-cloud offerings.

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OchreSoft Technologies Limited

Unit 11

Lancaster Place

South Marston Business Park

Swindon

SN3 4UQ

Tel: 01793 836730

Fax: 01793 836747

Email: enquiries@ochresoft.com

Web: www.ochresoft.com

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Introduction

A recent survey in 2011 carried out by PEER 1 Network Enterprises found that of the 88% of key decision-makers that do not use cloud computing, 39% said it was because they *did not know enough about it*. This paper helps define, in layman's terms, what cloud computing is, and how OchreSoft addresses user needs in both cloud and non-cloud terms.

Our History with Cloud Solutions

OchreSoft pioneered the use of scaleable public and private SaaS solutions for the legal market in the UK. Most of our competitors started from a background of traditional PC or client-server application – we designed SaaS features in from the outset. We were the first to introduce a truly cost-effective, scaleable, secure delivery framework for distributed workflow back in 2004, based on the latest standards and technology. This service has now been running and continuously improved and optimised over the last eight years.

Today OchreSoft offers two service options for Intelliworks[TM]: *Intelliworks Managed Cloud*, and *Intelliworks Private Cloud*. Both of these solutions are based on the Software as a Service (Saas) model, where you pay only for what you use on a demand basis. Whilst these two services are broadly identical, the main difference lies in where data is held and who manages it. In this document we focus on understanding what managed cloud solutions are, and the various pros and cons. If you would like further information please go to our website (www.ochresoft.com) or contact us at enquiries@ochresoft.com.

Scope

This document is OchreSoft's position paper on Cloud Computing. Here we define what cloud computing and SaaS are, what these terms mean in relation to our service offerings, the general state of the market, and our view based on experience within the legal sector of both cloud and non-cloud offerings.

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Keywords

Cloud Computing, Utility Computing, SaaS, Internet Datacenters, Distributed System Economics, Private Cloud, Public Cloud.

Cloud Computing Defined

As with many emerging web technologies there has been a barrage of branding, re-branding, jargon and hype over recent years, encompassing a range of old and new technologies, services and standards. *Cloud computing* is still somewhat poorly understood, and although definitions vary there is now a broad consensus around what the term means. In the context of cloud computing we often hear terminology such as: *Application Service Provision* (ASP)[1], *Software as a Service* (SaaS), *Managed Hosting*, *Webservices*, *Virtualisation*, *Co-Location*, *Platform as a Service* (PaaS) and *Infrastructure as a Service* (Iaas). In this section we will attempt to make the definition clear, and position these various solutions appropriately.

1. This term is now defunct and superseded by 'SaaS' but may appear in older literature.

What is Cloud Computing?

Over the last thirty years there has been a massive shift in the distribution of computing power from centralised mainframes to the desktop. We are now witnessing the early stage transition from desktop PCs to handheld mobile computing, as well as emerging hybrid models for computing (peer-to-peer, grid, virtualisation, and cloud for example). Since technologies are changing rapidly, with significant adnaces in storage, memory and computing power, vendors are constantly finding new ways to brand, aggregate and differentiate these services under new banners, often mixing old and new, presenting it as an entirely new concept.

Some of the ambiguity with cloud computing lies in the fact that many of the key components for cloud platforms have existed for years: for example if you have used Hotmail, Yahoo, Amazon, Gmail, MySpace, Facebook, or Photobucket (the list goes on) then you have been (perhaps unwittingly) using cloud computing – back then it was just called 'the web'[1]. What we are seeing today is effectively a *re-branding* and *formalisation* of these services together with related technologies, all under a new provisioning model.

Veterans in the industry also remain somewhat bemused about exactly what cloud computing is. For example, Oracle's CEO Larry Ellison was quoted in the Wall Street Journal, September 26, 2008:

"The interesting thing about Cloud Computing is that we've redefined Cloud Computing to include everything that we already do. . . . I don't understand what we would do differently in the light of Cloud Computing other than change the wording of some of our ads."

These remarks are echoed by Hewlett-Packard's Vice President of European Software Sales Andy Isherwood, quoted in ZDnet News, December 11, 2008:

"A lot of people are jumping on the [cloud] bandwagon, but I have not heard two people say the same thing about it. There are multiple definitions out there of "the cloud."

Regardless of the debate, which will no doubt go on for some time, cloud computing is here to stay[1], and the key differentiator is based on the promise of a general-purpose **utility model** for IT that goes back many decades [PK66].

1. Google for example is investing huge funds in cloud computing.

The Utility Model

Cloud computing provides a *utility* view of IT, commoditising the traditional mainframe model, incorporating the agility of client-server, whilst challenging the conventional economics of IT. With Cloud Computing there is a major emphasis on delivering *highly flexible, highly efficient, cost-effective computing resource* to users, typically in a highly transparent way. The primary characteristics of cloud computing are defined by:

- ❑ Where *data* is stored and managed

- ❑ How *applications* and hardware resources are provisioned and maintained

- ❑ How is the *service* paid for and maintained

In simple terms cloud computing has a 'front end' and 'back end'. The front end is typically a *browser*, a *web service client*, *mobile device*, or possibly a *terminal service client*. This is the *access point* to the cloud for the user. The back-end is where servers and storage resources are held – effectively this is 'the cloud'.
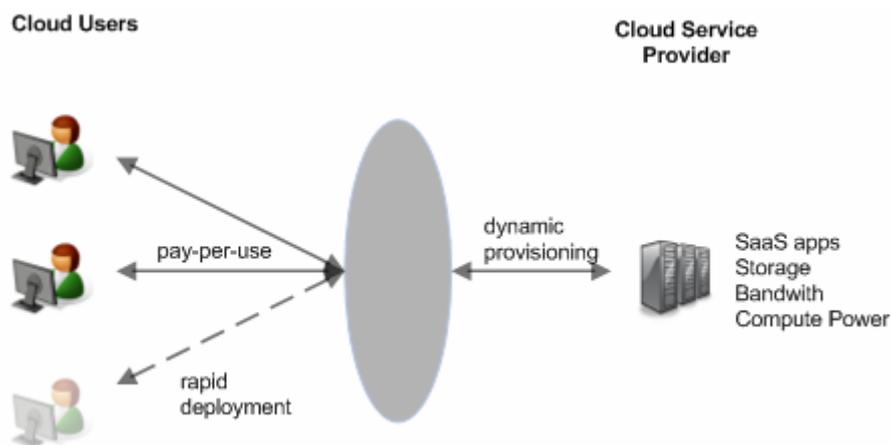
Unlike traditional computing models, with cloud computing data is held and managed *centrally* by a *service provider*, with applications provided over the web, paid for on a *rental* or *demand* basis. This is completely different from the traditional IT spend where hardware and software are normally purchased outright. The basic idea is that a competent third party manages and maintains some (or perhaps all) of your IT infrastructure: you pay only for what you use.

This can be considered as analogous to rental a vehicle. You don't own the vehicle, you pay for fuel and insurance to run it, but the rental firm is responsible for maintaining the vehicle and ensuring that it runs correctly and is safe. You don't have the headache or costs associated with fixing problems, replacing parts, complying with transport regulations etc.

Cloud computing removes much of the need for users to plan ahead for provisioning. Typically the service is set-up to deliver what the organisation needs at enrolment, with the capability to add more services dynamically as needs expand. When you need more resources these can be deployed painlessly and rapidly in a highly cost-effective manner. There are typically no up front costs, you pay for what you use on a *demand* basis – your IT spend becomes highly optimised.

1. Note that most of these general cloud services are 'free' to use. However Cloud Computing introduces a more structured financial model for accessing computing power and resources with the concepts of *rental* and *pay-per-use*.

Differences from Traditional Computing Models

Cloud computing offers end users access to a broad range computing resources without the need for them to understand, protect or maintain these systems. Typically these services can be enabled and deployed much faster than conventional IT, enabling business to implement scaleable and tailored services to best address their needs - in a highly *agile* manner.

Table 1 illustrates how cloud computing broadly compares with traditional computing models.

	Deployment	Benefits	Econmics
Mainframe	Thin clients accessing centralised computation & storage.	Typically optimised for efficiency because of high costs	Typically high up front costs (hardware & software), high maintenance costs
Client-Server	PCs and servers for distributed compute, storage etc.	Generally optimised for agility because of low cost	Moderate up front hardware costs with perpetual license for OS & applications
Cloud	Large managed data centres, built in security and scalability, commodity hardware	Efficiency and agility typically an order of magnitude greater	Typically low or no up front costs with the ability to pay as you go, pay only for what you use

Table 1: Comparison of traditional computing models with cloud computing [based partly on Microsoft sources]

Cloud computing enables much of the core technology to be centralised and managed on your behalf within remote **data centres**, where there are significant economies in scale[1] together with a concentration of expertise. These benefits are made available to users through highly flexible configuration and pricing models, significantly reducing risks, and minimal or no up-front commitment.

1. In quantifying the benefits of scale [BL09] states that cloud data centres can achieve factors of 5 to 7 reductions in the cost of electricity, bandwidth, operations, software and hardware.

Market Inertia

Although the arguments in favour of cloud computing are compelling, as with all new solution there can be significant inertia to overcome in the early stages – especially where people have invested significant time and energy into existing models. As we discuss later, despite all the obvious benefits there are several obstacles to overcome – and these need to be understood and if possible mitigated ahead of migration to assure success.

As we saw when virtualisation was first brought to market (promising savings of 20-30% [GT09]), decision makers will ultimately overcome initial concerns - the arguments for adoption are in many ways overwhelming – especially for small to medium enterprises. As more competitors enter this space the inevitable commoditisation and breadth of new services will only strengthen the argument, and as we have already seen, many of these tools are already familiar - the market does not need to be re-educated - fundamentally the debate comes down to *economics*, *flexibility* and *risk management*.

Differences from Traditional Hosting

Hosting services have been available for many years. Traditionally we think of this as renting server and storage resource in a remote data centre, normally managed by the client. The hosting provider often just provides a controlled environment and power. Whilst the concept of hosting is well established, and forms part of foundations for cloud computing, there are several key differences:

❑ Cloud Computing is sold *on demand*, typically as a *pay-per-use* or leased service. Users are able to control and budget costs much more efficiently.

❑ Most if not all of the service is managed by the service provider – freeing up organisations to focus on core business activity

- [ ] Users determine how much of the service they wish to use – typically at enrolment time or by changing configuration options dynamically through a web based admin interface.

- [ ] Users can typically access the service from any location – in many cases the solution may be accessible from multiple sites, or indeed globally..

In a world where technology is changing rapidly, there are enormous pressures on IT departments to maintain secure up-to-date platforms and cope with change control - in many cases they are losing the battle. There are significant benefits in choosing a cloud based solution for your business, leading to both direct and indirect cost savings. We explore these benefits later in this document

Deployment

In technology terms cloud computing typically involves the deployment of one or more server machines, accessible via a digital network (typically over the Internet via a broadband ISP connection). Resources are accessible as if they were a local machine (albeit with some additional latency – which may not be apparent). The *cloud* itself represents the virtualisation of computing resources (networks, servers, storage and application services) where users pay for access *on-demand*. These *virtualised* resources can be provided with minimal management overhead and typically made available very rapidly. For example you might wish to increase your storage space in 'chunks' of 100GB, which might be as simple as ticking a button on the screen and waiting a few minutes.

Examples

Increasingly we are seeing cloud based solutions introduced for almost every information based activity you might imagine, from hosting your image files through to a fully virtualised PC, enabling you to travel internationally without the need for a laptop. In tandem with this has been the emergence of mobile technologies such as smart phones and tablet computers (e.g. iPhone, iPad, Android and Windows 8 mobile devices): these are powerful mobile computing devices equipped with rich browser interfaces, applications and backed up by many cloud services. Examples of cloud computing applications include[1]:

- [ ] File storage, synchronisation and back-up.

- [ ] Customer Relationship Management (CRM)

- [ ] Distributed workflow

- [ ] Project management

- [ ] Web mail, messaging and blogging services - such as Gmail, Hotmail, MySpace, Facebook, Skype, Twitter, and Tumblr.

- [ ] Web content sharing services - such as YouTube, Vimeo, SoundCloud, and DropBox.

1. This list is far from exhaustive and likely to expand into many niche and new areas.

Private Clouds

It's now even possible for businesses to have their own *private cloud*[1], incorporating specific services and only accessible to a closed user group. For example a group of related or co-operating organisations might share a private cloud for secure document sharing for the purpose of mergers and acquisitions. This could be set-up dynamically (for the purpose of a specific project) or statically (where the relationships are long term). This is something which hitherto would have been impractical if not impossible to achieve with this degree of agility.

1. OchreSoft in fact offers a *private cloud* solution which we discuss later.

Keeping things Running

Because of the dependency on the Internet, organisations using cloud computing for any business- or mission-critical applications should consider providing *dual broadband access* via different service providers (where those ISPs should ideally be using different back-end trunks). We discuss this further in the section on '*barriers'*.

Cloud Computing Service Types

Cloud Computing is essentially all about *service*. It brings together a range of technology solutions that can deliver scaleable, tailored, virtualised IT resources over the Internet. There are three main types of cloud computing of note:

- ❑ Software as a Service (Saas)[1]

- ❑ Platform as a Service (PaaS)

- ❑ Infrastructure as a Service (IaaS)

These terms essentially determine what components of the cloud are '*rentable'*. With SaaS you would typically lease remote storage and applications, providing access to the Internet via your own ISP. With PaaS you would typically be leasing hardware at a data centre. Finally IaaS typically means leasing the network infrastructure required to get to the data centre.

In practice a number of these service types may be engaged at different levels as part of a solution: for example a SaaS solution provider might lease hardware and server-side infrastructure from a third party managed service provider in order to fulfil their service, whilst their clients lease the SaaS services and provide their own Internet access.

1. The term 'SaaS' was previously referred to as Application Service Provider (ASP) by the market (although definitions vary slightly), however the term ASP is no longer used in this context.

How Does Intelliworks[TM] Fit In?

Intelliworks[TM] provides mature **SaaS cloud** solutions for firms, enabling access to a range of workflow, CRM, CMS, analytic and third party services - all on a pay-per-use basis. This platform is professionally managed and protected 24x7x365 in a remote state-of-the-art data centre.

Whilst our primary service offering is a *public* cloud based we also recognise that *one size does not fit all*: we therefore provide an alternate **private cloud** SaaS solution[1], where the server and storage elements are typically held on the customer premises, or at a third party service provider accessible only by the firm and its various offices and affiliates.

1. It is important to understand that the term 'SaaS' does not mandate a *public* cloud. SaaS is essentially the leasing model - with Intelliworks[TM] you can run identical services as a private cloud solution on your own hardware at your premises.

Cloud Computing Market

Market Development

Cloud computing clearly has a high profile in the media, and the market for cloud computing is significant, and growing, although there is some debate about the various statistics:

- ❑ IDC estimated the market for public cloud products and services was $16B in 2010, and predicts it to grow to $56B by 2014.

- ❑ Gartner estimates the cloud market to be worth as much as $150B by 2013

- ❑ AMI research's estimate that SMB cloud spending alone will reach $100B by 2014.

- ❑ Merrill Lynch estimated the market at $160B by 2011.

Regardless of whose numbers (or definitions) you believe, it is clear that the market for cloud solutions is large, and growing much faster than many other areas in IT. Over the last two decades we have seen a major decline in mainframe use, and we are now seeing a gradual decline in conventional PC use in favour of more mobile 'light touch' hybrid form of computing.

This is a highly dynamic emerging field, and we are now seeing a flood of new entrants to this market, ranging from specialist application service providers, commodity storage and data sharing services, general-purpose web application providers (This is a highly dynamic market, and we are now seeing new entrants to this market, ranging from specialist application service providers (e.g. OchreSoft Intelliworks[TM] and Salesforce®), storage and information services, through to fully virtualised general-purpose computing platforms (such as Amazon's EC2, Google's AppEngine, and Microsoft Azure).

Why Customers Want Cloud

The industry is very good at telling customers what they want, and often surveys require scrutinising to see *how* and *what* questions were asked, and as importantly what questions were *not* asked. Since OchreSoft have both public and private SaaS cloud solutions we can reasonably take a unbiased view of how this information should be interpreted, and what we think are the key drivers specific to the legal sector. We discuss here 1) what the market surveys appear to be saying, and 2) our experience in this sector.

TCO/ROI

Vendors of cloud solutions often focus heavily on TCO/ROI to sell the benefits of their solutions. As you might expect we have our own, equally persuasive, model for demonstrating TCO/ROI. Typically the costs savings include a range of direct and indirect cost savings and resource efficiency gains, such as:

- ❑ Minimal or no up front and maintenance costs

- ❑ Pay only for what you use[1]

- ❑ Improved productivity

- ❑ Lower training costs

- ❑ Time to market - opportunity costs

- ❑ Advanced CRM and analytics tools - for driving new business

Costs efficiencies with cloud computing are indeed compelling, and with a SaaS based legal workflow solution these are powerful incentives. However TCO/ROI is a very broad tool with which to quantify benefits. It is clear from both independent studies[2] and our own experience that there are other equally important drivers for moving to the cloud; these become much more apparent when considering specific sectors such the legal market, where in many cases these impact the bottom line.

1. The economic model for cloud computing is sometimes referred to a migrating CapEx (Capital Expenditure) to OpEx (Operating Expenditure), however we believe the terms 'pay-as-you-go', 'pay-per-use', and pay-on-demand' are more appropriate.

2. [BK09] provides analysis of various cost-benefit scenarios for cloud computing, including factors such as resource elasticity.

Business Agility

We know from independent surveys that many users choose cloud solutions for reasons of *business agility*. A survey of 500 IT decision-makers by SandHill found that approximately 50% of respondents cited business agility as a key reason for adopting cloud applications. Similarly, an InformationWeek survey found that over 65% of those polled cited *responding faster to the business* as an important driver for cloud computing. Whilst numbers vary the conclusion is clear: agility is often seen as the major befit when adopting cloud computing.

Paradoxically, in the SME legal sector we do not hear the term 'agility' coming up regularly with any significance - although the underlying need may perhaps be articulated in a more ad-hoc way (for example in dealing with mergers and acquisitions). What we do encounter regularly is the need to drive down costs, contain litigation risks, improve productivity, and reduce IT burden. For many smaller firms this may be their first real venture into any form of process automation beyond the spreadsheet, hence agility may be just one in a long list of benefits to be had.

Minimising IT Footprint

One of the prime drivers we see across all small to medium firms is the need to *insulate IT from core business functions*. Most small to medium law firms are simply not equipped to deal with the daily grind and technical challenges in maintaining a secure computing environment[1]. Even where a firm has local IT expertise, there is often a real desire to optimise IT spend within the firm, freeing up time and resources to focus on driving new business, in an increasingly competitive market.

Whilst a SaaS cloud solution can significantly help in simplifying IT, it remains important for firms who have local IT expertise that their staff are fully engaged in the process. It is likely for example that a firm may have a number of legacy applications running concurrently (for example digital dictation, VOIP, document management). In these cases it is critical to understand what is already going '*down the wire'* to ensure the best user experience beyond the deployment phase.

1. Note that we introduce the term 'secure' here, and this has several implications in the legal sector which will discuss shortly.

Driving Down Costs

We have already touched on TCO/ROI as a key driver for cloud computing, and there is no question that for SME law firms there are significant costs savings in adopting a SaaS cloud solution. Outside the top 100 legal practices we find that many law firms simply don't have the resource, skill, budget or energy to adequately maintain their IT infrastructure, irrespective of a full workflow automation suite. Furthermore, firms are not typically run like conventional businesses: in that there are often multiple partners involved in the decision making process; therefore IT budgeting and spend can be far from straightforward, and there may be a variety of equipment at different stages of the product lifecycle.

Forward-thinking firms may have already stepped on the technology ladder, and may have tried to adopt and customised a framework solution over several years. However, technology is clearly not a core business activity for a legal practice, and oftentimes these projects lose momentum, struggling to meet the original objectives with costs often spiralling out of control. When staff move on these systems may no longer be viable, and are simply left abandoned, resulting in a general reluctance to engage in new technology. Where these solutions have been successful, the only way forward might be to give these applications a '*cloud facelift*' by bolting on terminal services in front of legacy applications. Whilst terminal service can be a way forward this often leads to additional costs, maintenance, and performance bottlenecks unless deployed carefully.

For many small to medium law firms a cloud based SaaS solution is the only viable option where budgets are tight and the firm is typically risk averse. These firms need clear automation, with minimal up front costs, automatic updates, and embedded risk management - all professionally managed with minimal impact on their infrastructure. It is clear that this can no longer be achieved on an ad-hoc basis, the challenge is simply huge - which is why a specialised service provider is needed, offering the benefits of scale with centralised expertise, and leaving the firm to focus on core activities.

Maintaining Automated Up to Date Content

The legal industry has some particular nuances that drive the need for managed services. With constant changes in both legal content and financial data firms are simply struggling to stay current. This leaves them open to significant *risk*. If that weren't enough, the housing market is predicted to be flat for the next couple of years, with several new and very large entrants to the market, with a singular mission to handle volume legal case work at fee scales only achievable through large scale automation. When we consider that insurance claims are now rising to the point where premiums are becoming unaffordable for many small practices, margins are being squeezed from every angle.

In many cases firms have no alternative but to consider outsourcing and automating their legal processes. When one considers the complexity of workflow applications such as Probate and Residential Purchase, for many firms a SaaS based workflow solution is the only viable option if they wish to compete and stay in business. All of the benefits of the cloud come into play here.

Mobility

Mobile and social computing are growing faster than anything before in the history of technology, and enterprise applications need to adapt. Morgan Stanley estimates that by 2015, the mobile web will be bigger than desktop internet – this represents a massive shift in behaviour. To support this there will be increasing pressure on IT to make enterprise applications available for mobile users. Cloud application providers already have a head-start here. In most cases retrofitting legacy applications will be a major challenge both for vendors and IT departments.

The legal sector has historically been conservative in technology adoption, and whilst there is not a significant drive for mobile computing right now, it will no doubt come. Our own experience shows that the market is changing quickly - the adoption of web and messaging systems are increasingly commonplace, and across all legal firms there is now an understanding that process automation is becoming a necessity, driving business efficiencies to cope with increasing pressures on margins, and to mitigate complex compliance issues in order to contain insurance premiums. As the market matures SaaS vendors will naturally introduce additional mobile computing service where required.

Information Security

This is perhaps the one area where the industry needs to take the lead in educating customers. Whether we like it or not security must be a key driver. Historically information security took a long time become fully appreciated in the mainstream market - even as late as the 1990s security was often relegated to the back office, seen as a specialist niche function. Today things couldn't be more different. Security is now so critical to many organisations that these businesses simply could not be function without it - it has become mandatory and mission-critical.

In the legal sector the profile of information security is particularly low - especially in the SME sector – and notably even with some service providers. This is somewhat surprising since the legal sector has a

particular need to handle data 'with care'. However this is partly related to the structure and spread of legal firms, and the overall technology conservatism that pervades the industry. Consider the following:

❑ More and more information is being digitised in the legal sector, in fact there is a growing desire to make as much information as possible 'paperless'.

❑ Firms often stumble into using technology without considering the implications of putting all this information online.

❑ Client and case records may often contain sensitive information which the firm is obliged to handle with care. This data is no longer held in a locked filing cabinet – so much more thought is now required concerning *which data* is *passed* and *stored* in *what format* and *where*.

❑ There are both regulatory and financial implication for mishandling sensitive data. In recent years several high-profile organisations have received stiff fines for such transgressions.

❑ The threat landscape for security is now almost unmanageable. It is probably only the low profile and dispersed nature of law firms that shields them from the worst effects. For some organisations fighting attacks and malware is a daily battle that ties up some of their brightest talent.

Anecdotally we know that SME law firms rarely have the skills or motivation to adequately resource and secure their IT infrastructure, and so one of the major potential benefits of going cloud (and certainly SaaS) is that security is often included 'for free' embedded within service. This is because cloud solution vendors simply have to take security seriously in order to protect their service and their brand. For legacy software providers the idea of 'bolting on' security may be both challenging and in some cases flawed. Security needs to be designed in from the ground up to be properly effective.

Benefits

Summary

There is now a general consensus that cloud computing delivers significant long term benefits for organisations and their users. In the context of EMEA, [CBR10] predicts that the "*widespread adoption of cloud computing has the potential to generate over €763 billion of cumulative economic benefits over the period 2010 to 2015*", with the UK being a major beneficiary. These benefits broadly include a combination of costs savings, plus the ability to generate new business. Unsurprisingly the benefits of are closely aligned with some of the key market drivers discussed earlier:

- ❑ **Low Start-up Costs:** service use is typically billed as a utility with minimal up-front costs

- ❑ **Pay only for what you use:** users avoid fixed IT spend on hardware and software, only paying for what they need, when they need it

- ❑ **Managed Storage:** public commercial cloud solutions typically include the secure storage of your data, and regular archiving of that data.

- ❑ **Lower IT Burden:** Access to a broad range of applications without having to download, install or update anything personally

- ❑ **Rapid Deployment:** new applications, storage resource and compute power can typically be rapidly (and even temporarily) deployed with minimal preparation and effort.

- ❑ **Agility and Mobility:** applications and data can typically be accessed from any computer, with the ability to dynamically collaborate between sites.

- ❑ **Centralised Resource:** organisations can share access to resources and information in one central location

- ❑ **Built-in Security:** information security features are typically designed in 'for free'

- ❑ **Automatic Updates:** applications and content are typically updated as part of the servcie

- ❑ **Scalability:** Scalability is built in by design, with one-demand resources

- ❑ **Low Carbon Footprint:** the efficiencies of scale and centralisation of compute power start to make a significant impact on carbon emissions

At the SME end of the legal sector our experience is that benefits are clearly focussed around low start-up costs, rapid deployment, minimal IT footprint, automated updates, centralised access and control, and built-in security.

We will explore some of these areas in more depth below.

A Review of the Benefits

Low Start-up Costs

With cloud computing, you subscribe to the software, rather than buying it outright. This means that you only need to pay for it when you need it, and it also offers flexibility, in that it can be quickly and easily scaled up and down according to demand. This can be particularly advantageous when there are temporary peaks in demand, such as at Christmas or in summer, for example.

Lower IT Burden

There is no need to take on specialist IT staff, and businesses don't have to worry about maintaining and upgrading software, or fixing bugs, since all maintenance is now done by the provider. This frees-up in-house IT teams to focus on technical issues specific to the business. Remote maintenance also means it's easy for businesses to always have the latest and most powerful version of any particular software. Automated updates mean that overall system availability is much higher.

Pay-Per-Use

Cloud computing is typically cheaper and less labour-intensive for organisations. There is no need to buy and install expensive hardware and software because it's pre-installed and updated automatically. Many cloud computing applications are offered free of charge. The need to pay for extensive disk space is also removed.

Agility & Mobility

One of the major advantages of cloud services is the flexibility that it can offer. Staff can access documents and case files over the Internet - even when they're working remotely - even outside business hours. Staff can work collaboratively, even when they are not located at the same site geographically. Infomation can be simultaneously be viewed and edited from multiple locations.

Rapid Deployment

Cloud computing can be very quick and easy to get up and running. Consider, for example, how quickly you can set up a Gmail or Hotmail account and start emailing - it takes minutes and all you need is a computer and the Internet. Installing hardware and software the traditional route typically takes much longer and *it is easy to make expensive mistakes in purchasing the wrong technologies*.

Managed Storage

A major advantage of using cloud computing for many companies is that because it's online, it offers virtually unlimited storage compared to server and hard drive limits. Needing more storage space does not cause issues with server upgrades and equipment - usually all you need to do is increase your monthly fee slightly for more data storage.

Centralised Resource

Organisations can now share access to resources and information in one central location. In the past this information might be held in separate 'silos' spread throughout the organisation, often at different sites. Centralisation and 'normalisation' of this information can lead to substantial improvements in productivity and transparency (further assisting activities such as cross-departmental reporting, assisting business development etc), and avoiding expensive activities such as data migration.

Productivity

In general terms cloud computing is expected to increase staff productivity (because of factors such as data sharing and transparency). Whilst [CBR10] predicts a *baseline* productivity increase of 2.1% per staff member, we anticipate a much higher productivity increase when you consider the full benefits of specialised SaaS process automation tools on top of the cloud (such as delivered by Intelliworks[TM]).

Built in Security

Service providers have to consider security as part of their solutions to assure information integrity and protect both the users' data and their own brand. Legacy solutions may implement either no, or ad hoc security practices; service providers have to ensure a more *holistic* embedded security architecture is in place.

Automated Updates

Automatic software updates can be especially useful for legal or financial compliance reasons. For example, consider accounting and probate software - when tax rates change the system will be automatically and centrally updated. It is also imperative for compliance reasons to ensure that all legal content is current.

Low Carbon Footprint

The efficiencies of scale and centralisation of compute power start to may a significant impact on carbon emissions. Centralisation cuts down on transport costs, optimises processor and storage resources, and optimises power for computing and cooling. When you scale this over thousands of organisations and users one can easily see that there are significant energy savings to be had.

Many international organisations choose cloud computing because of its green credentials. Microsoft recently claimed that cloud computing may reduce a business's carbon emissions by as much as 30%, often these businesses don't need to power an entire server, they can switch to using only what they need, when they need it through the cloud.

Benefits of Intelliworks™ Cloud Solutions

In addition to the benefits we have already discussed, below are some specific advantages we Intelliworks™ Cloud solutions.

❑ **Professional Managed Data Centre**: With Intelliworks™ our data centre is managed and maintained 24x7x365 and is constantly being updated to deal with the latest security threats. You can access this resource at any time over the internet and be assured it is working and your data is protected. Note that this helps to satisfy the SRA business continuity requirements, and we have a contractual arrangement with the SRA which allows them to inspect records to assure compliance.

❑ **Value-Add 'free-to-use' Services:** Intelliworks™ includes a number of applications 'for free' built directly into the software. These include: a Customer Relationship Management (CRM) application, a Content Management System (CMS), Postcode lookup and Bank Check services, Reporting/Analytic Services, and Automated messaging services

❑ **Rapid Deployment:** For firms wishing to improve business efficiencies rapidly Intelliworks™ can be up and running in a matter of days, with years of expertise built-in by design so that the application works right 'out of the box'. There is no need for lengthy testing and customisation – we simply customise your letters to look the way you want, provide setup training and you are good to go.

❑ **Automated Updates:** Intelliworks™ is completely self updating – this is particularly important in the legal market. Updates include all software and content (legal forms, letters, database fields etc.) In a changing legal and financial market this is critical to staying in regulatory compliance and ensuring you are using the latest tax rates, legal content and process.

❑ **Flexible Deployment Models:** Intelliworks™ is not a one-size-fits-all solution. Whilst we can scale from a small office of a single partner and secretary right up to multi-partner multi-site solutions we also recognise that *public* cloud solutions are not necessarily for everyone. We therefore offer a **private cloud** solution with many scalability options, and the ability to switch between public and private with minimal fuss.

❑ **Data Protection & Privacy:** We implement a number of layered security measures in order to protect data both in transit and in storage. These include multi-level passwords, role-based access control, permissions, partitioned data, firewalls, VPNs and encryption.

Barriers

Summary

As we have seen, cloud computing has many benefits, however it would be unreasonable to assume that there are not downsides. In this section we will summarise these risks and obstacles, and how we can mitigate against them. We pay specific attention to the legal sector and consider the risks of *not* adopting cloud solutions. The following list is derived from a number of sources as well as our own experience in this field, and includes:

- **Lack of Ownership of Data:** Users do not physically possess storage of their own data, which leaves the responsibility and control of data storage with the provider

- **Over-Dependence:** Users could become dependent upon the cloud computing provider

- **Information Security:** What happens if your cloud provider is hacked?

- **Privacy**: how much data and what kind of companies are able to collect about them and their business?

- **Availability:** With data held externally, business continuity and disaster recovery are in the hands of the provider

- **Performance:** will the service perform as expected, and over time?

- **Data Migration:** Data migration issues when changing cloud provider

- **Stability of Provider:** What happens if your cloud provider goes out of business?

While many experts argue that cloud computing is inherently more secure than traditional server methods, however some organisations are rightly concerned that malicious users could bypass security systems and access confidential data. A recent survey from IDC found that *security* was the main concern that businesses have about cloud computing, followed by *availability* and *performance*. However, as we discuss below it is worth weighing up the risks and benefits, especially when one considers that that traditional servers can be hacked, passwords may be weak, hard drives can fail and computers are frequently lost or stolen.

A Review of the Risks

Lack of Information Ownership

With public cloud computing users do not physically possess storage of their own data, which leaves the responsibility and control of data storage with the provider.

On the face of it this might seem a bad thing. However the counter-arguments to this are:

- In many cases service providers are far more professionally equipped and resourced to **secure**, **manage** and **archive** this data

- Many organisations are running under the illusion that their disaster recovery (DR) processes will get them out any failure situation. In practice DR plans often fail and are unlikely to be even tested regularly.

Availability

With public cloud computing data is held externally, business continuity (BC) and disaster recovery (DR) are in the hands of the provider.

The counter argument to this is that in reality a service provider is often much better equipped and resource to handle DR processes professionally and efficiently – it is a routine part of their business. Furthermore, with the benefits of scale to be had in centralisation means that the provider may even be able to offer business continuity on top of legacy DR processes, significantly improving availability.

Table 2 shows recorded outages for Amazon Simple Storage Service (S3), AppEngine and Gmail in 2008. Note that despite the negative publicity that ensued, few enterprise IT infrastructures in practice offer the same level of availability.

Service	Description	Downtime	Date
S3	Authentication service overload leading to unavailbility	2 hours	15/02/2008
S3	Single bit error leading to gossip protocol blowup	6 to 8 hours	20/07/2008
AppEngine	Partial outage due to programming error	5 hours	17/06/2008
Gmail	Site unavailable due to outage in contacts system	1.5 hours	11/08/2008

Table 2: Service outages reported from Amazon Simple Storage Service (S3), AppEngine and GMail in 2008 [BK09]

Data Migration

One argument often used against cloud computing is that there could be data migration issues when changing cloud provider.

This is really a non-argument. If you are switching between two systems, regardless of whether they are cloud or traditional applications, you are likely to encounter migration issues. Firstly, if one of your application providers will or cannot import your data it makes no difference whether the solution is cloud or otherwise. Secondly, if the two systems are markedly different in database design (irrespective of whether they are both SQL databases fro example) then migration may be a major challenge and prohibitively expense.

Information Security

As stated above, many experts argue that cloud computing is inherently more secure than traditional server methods. Users are right to question what will happen if their service is hacked (and there have been a number of high profile cases recently). However the situation is not clear cut. The rationale behind the belief that service providers are best equipped to handle security is as follows:

❑ Traditional onsite servers can be hacked, hard drives can fail and computers are frequently lost or stolen. Service providers are much better equipped to deal with failures. Providers also implement sophisticated prevention and monitoring systems to deal with potential mal-use.

❑ In the legal sector, high quality specialist IT resources, especially security expertise, are rare. It would be somewhat naive to believe that an organisation is completely secure. In fact information may have been stolen or misused without any trace unless specialist monitoring systems are installed.

❑ Provider-based solutions have to have security designed right into the architecture from the ground up. Legacy applications and services may have developed over several years, with security features added in an ad-hoc manner, if at all. Whilst seemingly providing security it is always far better and inherently more secure to embed security into the heart of the software design.

Privacy

One concern users often have relates to *privacy*, and specifically how much data and what kind of organisations are able to collect about them and their business. This is really a legitimate concern for many free-to-use social applications such as Facebook, MySpace Google, and Yahoo for example (and of course many more), where the provider has a vested interest in creating a commercial model based on your profile or interests (e.g. via targeted advertising)..

For specialist commercial cloud service providers (such as in SaaS workflow) there is often little value in personal information, users are to a large extent treated anonymously (that is, only their *role* is important). In terms of data protection in a more general sense it is important that appropriate measure are taken to protect databases and information in transit.

Provider Stability

Finally, with public cloud computing you need to consider what happens if your cloud provider goes out of business. There are two major impacts to consider in this event: access to the applications may stop, your data will be held remotely.

To mitigate you should choose a provider who has a mature presence in the market. The provider should also take precautions to escrow their code and offer some additional help in recovering your data in this event. In practice this is not dissimilar from any application vendor getting into difficulty, just because you have your data to hand does not mean you can easily access and recover it without specialist help.

The Risk of Not Adopting Cloud Solutions

For law firms there is a more subtle risk in not adopting process automation through the cloud, the risk that they will become increasingly non-competitive.

- ❑ Legal case work is becoming increasing commoditised

- ❑ There are new large entrants to the market where the benefits of scale will drive down fees even further, and saturate the media with advertising for new business

- ❑ Risk management is becoming more challenging to deal with manually. The two pronged attack of compliance and increasing insurance premiums mean you need to consider automating some or all of your processes.

- ❑ Without automated updates you run the continual risk of human error and non-compliance when legal and financial data change.

- ❑ Clients now expect a certain level of automation, such as web based case tracking and SMS messaging. These mechanisms make the firm look professional and reduce expensive call-backs.

- ❑ Productivity without best-practice automated workflow is almost certainly reduced and invisible to the business.

- ❑ For future business development and growth you need good analytics across the full database of existing cases and external data feeds. This simply cannot happen whilst your files are held in a filing cabinet.

How Does OchreSoft Mitigate these Risks?

OchreSoft mitigates a number of these risks through its use of risk managed best-practice software and (as importantly) the associated processes.

- **Data Ownership:** on the whole most law firms have difficulty with storing, securing, and managing large volumes of data. We are experts in workflow, data management and security. Adopting Intelliworks^{TM} frees up practitioners to focus on case handling and new business generation. Furthermore we provide state-of-the-art data centre protection for data protection, and embed security into our messaging protocols for data in transit.

- **Availability:** disaster recovery is not a job for law firms where there may be no permanent IT resource. Furthermore, if DR processes are not exercised regularly they typically fail. This risk is mitigated by choosing a mature established provider, ensuring that your service provider adopts an SLA with a clear definition of the uptime available targets and procedures, and focussing more on *continuity* instead of DR. In practice providers implement sophisticated managed data centres with far more skills resources (and more rigorous processes) than any law firm could ever reasonably hope to emulate. We also recommended a dual broadband connection as a general rule for firms wishing to adopt public cloud solutions.

- **Over-Dependency:** We believe the dependency risk is a overstated. Cloud providers are in many ways offering very similar and competing services so the barrier to switching providers essentially comes down to the inertia you may have in switching applications. You might be just as dependant on a legacy software solution that could impede your decision to move to the cloud. Our software is also not dependent on any specific hardware, we can migrate to and from private cloud scenarios, and over different backend service infrastructures without any change to the products.

- **Data Migration:** Data migration is again a factor regardless of whether the application is cloud or otherwise. We have processes in place to either partition off a firms data or provide a 'frozen' onsite version of Intelliworks^{TM} should the situation arise where a client wishes to move providers.

- **Escrow:** OchreSoft places its development code in escrow as a matter of corporate responsibility.

- **Try-Before-You-Buy:** OchreSoft can mitigate the risk a law firm may perceived in purchasing software that may not be fit for purpose. With Intelliworks^{TM} we can enable a new workflow within minutes and trial this software before you commit and spend.

For those firms who still want more control over their solution we also offer a **private cloud** solution, as described below.

Choosing Public or Private Cloud Solutions

Fortunately with OchreSoft you can choose between either or **public** or **private** cloud solution. We recognise that not all law firms are the same, and for some firms this process may need to be more *evolution* than *revolution*. With our private cloud SaaS solution it's possible to get many of the benefits of cloud computing, whilst retaining more control. You might choose a private cloud solution where:

- the data must be held at the firm's site

- the firm wishes to own and maintain the server hardware,

- future business growth (hence provisioning) is well defined.

- You have high case volumes and you wish to retain complete infrastructure control (and hence all business continuity/disaster recover processes)

It is advisable to consider our public cloud solution where:

- future growth and usage patterns are uncertain

- there is little or not specialist IT resource onsite

❑ the firm has an ad-hoc approach to IT spend and there is no consistent IT budget

❑ you have no desire or resource to implement continuity or disaster recovery processes

In practice we find that larger firms tend to consider private cloud if their overall IT process is reasonably mature and they have good historical data with which to plan future growth and IT spend.

Conclusions

For SME organisations particularly the benefits of SaaS based public cloud workflow solutions are simply overwhelming. In an increasingly competitive and challenging market, law firms need to focus on *core business activities*, which clearly do not include IT. IT should be an *enabler* for firms to run operations smoothly and in order to help optimise and generate more business. The potential benefits to law firms are:

- ❑ Low cost of ownership, with minimal up front costs

- ❑ Pay only for what you use

- ❑ Flexible, agile, on-demand computing and storage with rapid setup

- ❑ Managed automated updates

- ❑ Minimal IT impact, controlled IT budget and long term spend

- ❑ Staff are freed up to focus on core revenue generating activities and new business

For larger law forms there remain compelling reasons to look at SaaS based workflow solutions, whether that be *public* or *private* cloud based. The key point is that the SaaS model delivers best-practice professionally managed legal workflow services, on a pay-per-user demand basis. It can be weaved into the existing IT infrastructure with minimal disruption, and be up and running in a matter of days.

Going forward the true scope of the long term economic and business benefits of cloud computing for both law firms and the wider market are still not fully realised. There is so much momentum behind cloud services that this is going to revolutionise every personal and business activity one might imagine, presenting new ways of doing things that were previously impossible, or unaffordable.

Why OchreSoft?

OchreSoft is not a new entrant to this market; we already have nearly a decade of expertise in designing and optimising the best SaaS platforms for the legal market. Not only that, we have invested significant development effort working directly with leading legal practitioners, encoding best-practice expertise in software, enabling you to access *complete* workflow automation suits, delivered over a mature SaaS framework.

Summary Benefits of Using Intelliworks™

In addition to the major benefits of cloud computing listed above, our solutions are specifically geared towards making the legal process fully risk managed, and always up-to-date. The level of automation we have encoded into our workflows assures that you will realise significant *productivity* and *quality* gains almost immediately, and our applications work right out-of-the-box.

- ❑ Ultra low IT burden

- ❑ Rapid setup and deployment

- ❑ Built in risk management and reduced error rates

- ❑ Automated legal content updates

- ❑ Significant productivity gains

- ❑ Reduced training overheads

- ❑ Opportunities to charge for value-add services to your clients

- ❑ Reduced double-keying

- ❑ Reduced call-backs

- ❑ Potential lower insurance premiums

- ❑ Increased 'visibility' of overall business performance

- ❑ Ability to 'try-before-you-buy' new workflows and features as and when required.

Over the lifetime of the solution we are comfortable that you will see a very real Return on Investment (ROI). If you would like a illustration of how our ROI model works for your business our sales force would be very happy to demonstrate.

Flexible Public and Private Cloud Solutions

For much of this document we have focussed on public cloud computing, meaning cloud access over the Internet to a multi-tenant database server. For firms who are still debating whether to 'go cloud' we also offer a functionally identical private cloud service. This means the same software and content on a server installed either at your premises (or a hosting centre of your choice) accessed either over the Internet or through private channels. All usage remains on a pay-per-use basis, you pay only for what you need. The user experience is essentially identical, and all software and content updates are still managed by OchreSoft automatically. The only differences are:

- ❑ the data is held at the firm's site

- ❑ the firm takes care of the server hardware,

- ❑ the firm handles backups and storage.

Glossary

ASP – Application Service Provider – a term essentially superseded by SaaS.

Business Continuity – The set of technologies and processes required to optimise the continuous operation of computing systems and resources.

Data Centre – A professionally managed 24x7x365 hosting location, typically with high-bandwidth network access, resilient power, controlled cooling and sophisticated monitoring and backup systems in place.

Disaster Recovery – The set of technologies and processes required to recovery operations after systems or resource failure.

Hosting – The provision of server resources (or space for a client's servers) on a rental basis.

IaaS – Infrastructure as a Service

Latency – the performance delays introduced by message turnaround

MSP – Managed Service Provider, a provider of general computing services.

MSSP - Managed Security Service Provider, a provider of specialist security computing services

PaaS – Platform as a Service

Private Cloud – SaaS Cloud solution run on the clients hardware, still with a pay-per-use model and automated updates..

Public Cloud – SaaS Cloud solution where the service is run and maintained in an Internet Data Centre, with only client software for user access. Adopts pay-per-use model with automated updates...

SaaS – Software as a Service, the provisioning of software on a pay-per-use (rental) basis.

Virtualisation – the abstract representation of hardware, software and infrastructure in pure software. For example the use of VMware to emulate a complete operating system, file system, and network connectivity.

VPN – Virtual Private Network. Typically a secure message channel established through an encrypted stream (e.g. between two sites over the Internet).