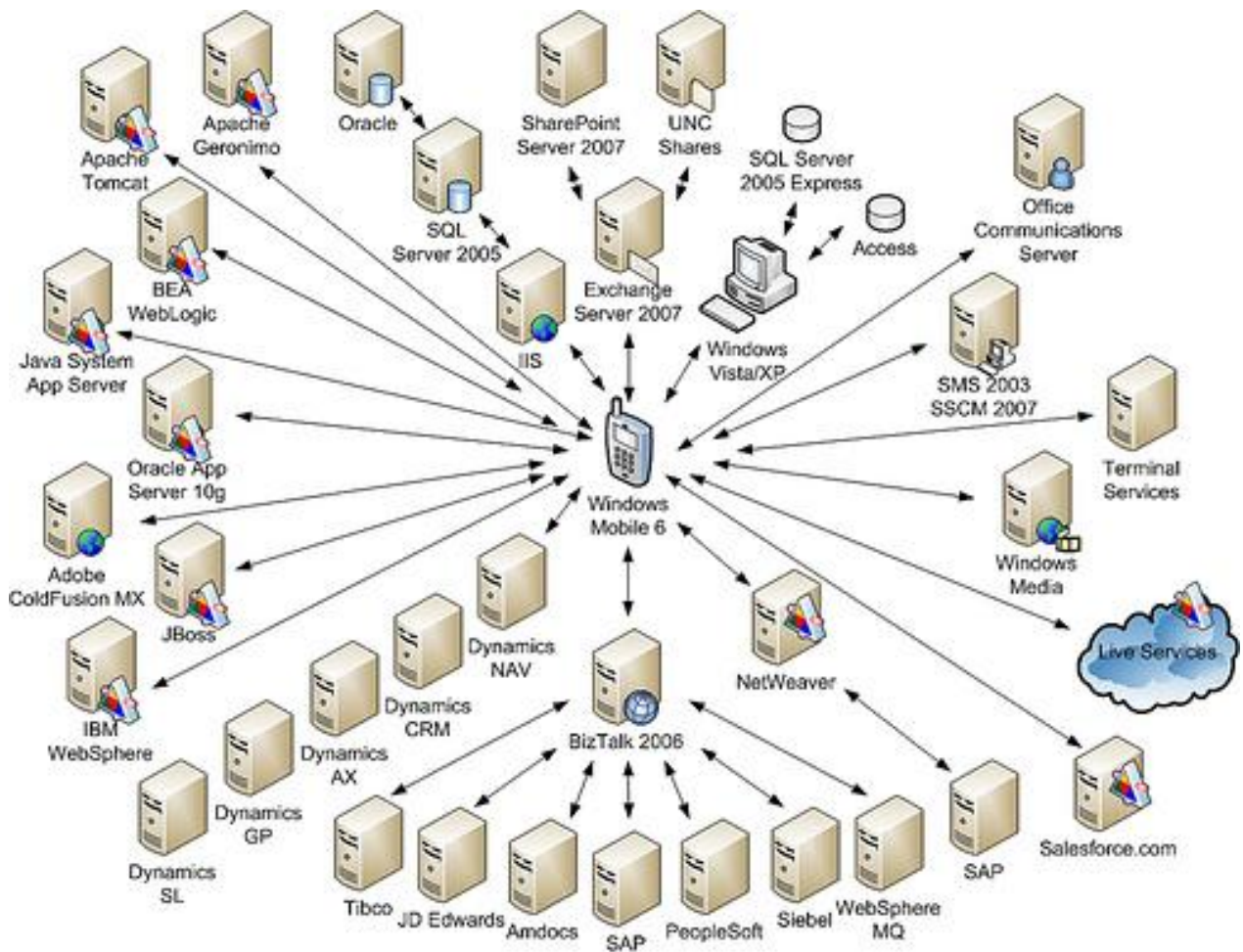




Using Internet Mobile Technologies for Health, Safety And Environmental Compliance Obligations

A White Paper prepared by Mobile Software Systems Ltd

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Introduction

We refer to Internet Mobile Technologies in our title, and so what are they and what exactly is it that makes them relevant in Health and Safety or Environmental compliance?

To begin with let us explain the technologies that we are embracing.

Firstly, we use a client-facing web site with a database structure behind it to store the programs and data needed to operate our back office system, from which we produce your reports. The information is accessible over the Internet (or an Intranet) just like any other web site, and the information is fully secure. Being Internet based, the system can be accessed from anywhere in the world.

Secondly, we use a mobile computer (PDA – Personal Digital Assistant) to capture information locally, effectively replacing the clipboard. Additional benefits of using the PDA are that communication is simple (most PDA's are also phones). Email can be delivered using 'push' technology direct from your corporate Email server to your PDA, meaning you are more mobile in your ability to work. Data transfer using broadband mobile connections is also possible, at speeds equivalent to normal household broadband connections, meaning you can have full use of Internet, office and Email facilities whilst out and about. Using this technology, you are freed from the normal constraints of working from a fixed location, as you can have full access to your normal daily systems.

Both these modern technologies - which have only recently reached a stage of robustness to allow them to be used for mission critical processes - can be of immense value in the control of risks. This is where we begin...

With ever changing and more pressing needs within the health, safety and environmental arena, businesses are looking more and more towards technology to allow them to implement safe effective systems to protect their workforce as well as allowing them to manage their corporate obligations effectively.

Currently, businesses face many challenges in maintaining an appropriate level of resource expenditure against acceptable returns in terms of due-diligence systems and the protection they offer, and of

course find it ever more difficult as the business expands and legislation changes to maintain control over those systems. In stark terms, the failure of an order processing system may indeed result in the loss of thousands of pounds of revenue, but the failure to implement an appropriate level of control and safe working practice can cost life, and ultimately the loss of liberty for those culpable.

Many businesses, although diverse, still operate an implementation at a local level, with a business unit being responsible for the application and management of company guidelines for safety health and environment. This leads to the inevitable diversity of policy application, and the difficulty that centrally, the company has no clear picture on the state at any point of those implementations and controls.

Today's technology allows for obviation of this disparate situation with centralised management, greater ease of information access and deployment, less cost than current solutions and provision of consistency of policy through all facets of the business.

With ease of access to company-wide information on the state of the safety and health policy implemented at any or all localities, management can readily run off dynamic reports which tell them any current problems which exist on any locality in near real-time. No more paper chasing, lost information or difficulty of data access need exist. Inspectors can manage their entire workload on a simple PDA at the point of implementation, knowing at the touch of an icon any outstanding problems that require attention, and being able to perform full inspections, audits, surveys or hazard assessments electronically with no further work to be undertaken.

Information is now returned and available in hours rather than weeks. Multiple entry systems are obviated, as are the costs involved in multiple transcriptions of the same data. The reduction in support costs for current processes can in itself more than match the costs involved in implementation of such new technology systems.

The benefits are obvious. Electronic systems can be used to notify key individuals of problems as they arise.

Notifications in various guises are automatic:

- Automatically generated emails allow clients to see report data as defined by the company as soon as data is received by the central system, meaning no paper waste and instant access to electronically defined data in an acceptable way through modern reporting technologies.
- Auditors and inspectors responsible for actions (that are

automatically created by the system in response to a non-compliance being identified), are notified without further process. All person-specific data is presented via the PDA to allow individuals to manage their personal workload and easily take responsibility for follow-ups and close-outs of existing non-compliance information

- Managers can see instantly the status of non-compliances for the entire company, or a single locality/region/area of the company using nothing more than a web browser and a secured connection and scores can be easily compared, using simple traffic light systems and/or KPI's.
- Reports can be instantly accessed to allow full statistical and comparative views of the status of the company's compliance issues. Drill-downs can allow access to multiple levels of the original data directly from the reports if required, allowing ease of access to all information without the need for complicated and convoluted systems.

Historical data is accessed as readily as today's current data, in a formatted, instant report – from anywhere in the world.

Gone are the days where individuals can abscond from responsibility, and rightly so. But it is also understandably difficult keeping abreast of the situations which exist in the many extremes of operation within the company.

With the Mobile Safety Solutions Compliance Management Suite, you can at least ensure that one very important aspect of the company is being maintained and controlled in as diligent a manner as possible through the use of technology for business benefit, normalised implementation and control and ultimately, a safer working environment for those at risk.

Development Technology

To be a contender in today's technology arena requires companies to build systems that can integrate into existing systems without compromising the power and flexibility of the developed system.

To this end, the Mobile Safety Compliance Management Suite is programmed with the very latest in development tools and using the most up-to-date programming techniques.

.NET is used as our programming solution of choice. .NET is the

Microsoft Web services strategy to connect information, people, systems, and devices through software. Integrated across the Microsoft platform, .NET technology provides the ability to quickly build, deploy, manage, and use connected, security-enhanced solutions with Web services.

.NET-connected solutions enable businesses to integrate their systems more rapidly and in a more agile manner and help them realise the promise of information anytime, anywhere, on any device.

Coding for the .NET platform is done in the most up-to-date manner using C# which fits hand-in-glove with the .NET architecture. An evolution of C++ and including Java-like features, C# allows us to rapidly deploy solutions using the power of the Visual Studio environment, meaning powerful code delivered in a cost-effective manner.

C# simplifies programming through its use of Extensible Mark-up Language (XML) and Simple Object Access Protocol (SOAP) which allow access to a programming object or method without requiring the programmer to write additional code for each step. Because programmers can build on existing code, rather than repeatedly duplicating it, C# makes it faster and less expensive to get new products and services to market, much to the benefit of the customer. This is the benefit of object orientation in code.

We can combine the developed solutions with Web Services to deliver a truly dynamic solution focussed on business benefit whilst ensuring maximum functionality and flexibility in data access and system function.

In technical terms, Web Services are self-describing software modules, semantically encapsulating discrete functionality, wrapped in and accessible via standard Internet communication protocols like XML and SOAP.

More importantly, in business terms, Web Services are an approach that helps your business work more efficiently with and unlock information so it can flow to every employee who needs it. They reduce development time and expense for new projects, and allow dynamic retrieval of information that will help you identify and deal with non-compliances within your company in an effective manner that suit your needs rather than the needs of the developers.

Localised configuration files hold key information to allow our systems to tailor their output depending on the user, providing maximised productivity and allowing more focussed attention to detail from the

safety and health inspectors.

Security

As you would expect of a system like this, we use the latest in secure access technologies, with encrypted data transfer and password authentication. Code obfuscation protects the program assemblies, whilst SQL encrypts internal transactions. Coupled with industry standard SSL encryption available between the web browser and Back Office systems, you can be assured of reliable data protection

On top of this, the system allows users to be assigned permissions through roles, with each element of the system customisable in its level of access. So, regardless of your access policy, described below, you can only carry out the functions defined in your 'role' at your level of access.

With access policies, we implement policy access to the system, meaning that people at different levels in the companies hierarchy can be granted permissions to access the system at the appropriate level (so a site manager will only ever be able to view information about their particular site, and a regional director will see all sites in their region).

This allows you to set the right level of data access at the right level of corporate access, with the added benefit of user access control.

All these security measures add up to a system that is as secure as an NTFS protected server and then some more on top.

Due Diligence

Due diligence processes are undertaken based on the software implementation of ISO 27002 (17799) 2005. We constantly strive to work toward standards which are acceptable to the wider audience, and ISO 27002:2005 provides clear concise guidelines for the implementation of software solutions in terms of data security.

As mentioned earlier, our solutions can employ SSL encrypted communications so all information transmitted across the Internet is secure and protected from prying eyes. SSL is used by all major financial institutions and online transaction processing sites so you can be assured it is robust enough.

Hand Held Computers (PDA's)

Our PDA deployments are based on the latest Windows Mobile 6 technology, offering the power of SQL server technologies with enhanced user interaction and stability. WM6 is the latest in the line of Microsoft's mobile device operating systems, providing access to mobile Office applications as well as calendar and email management utilising direct-push technology. Now, you can enhance your work experience in the field by utilising the power of the PDA running WM6 and the Mobile Safety Compliance Management Suite to reliably and cost-effectively manage your compliance management needs, whilst at the same time providing standard business functions.

Our solution uses a pre-formatted response pool based on your particular needs.

We understand fully that nobody knows your business like you, and to this end, our deployments are normally started under trial to allow us to fully identify your exact needs and allow us to define a package of enhancements to our core solution that will tailor it to become your perfect compliance management solution.

In our mind, we have a fully functioning system that is 100% deployable, but for your particular needs, it may only be 85% acceptable. The 15% of modifications required are done by identifying your needs over the trial, thus you get a bespoke system at a greatly reduced cost.

Whether you use Yes/No/NA as a standard response, you use numerical data for responses, or you have multiple response types, our solution can match your needs. Inspectors/auditors and clients will see the data in the same manner as they are currently used to, with the system replicating your inspection/audit proforma to allow ease of transition into the digital arena. This is additional to the reports available.

With response pools, our solution can automatically include comments based on question scoring, meaning all inspections carried out can return a consistency of response based on company standards, eliminating spurious anomalies that occur in general response systems.

Our design of the PDA's has been to reduce the input requirement to a minimum by predefining the expected answers to any question, by using predictive text and handwriting recognition. The use of PDA's is therefore just as quick and easy as using a clipboard.

Risk Analysis can be performed, allowing assessors to identify current risks as exist at the point of assessment and then further identify the hazards that exist for the risks. Control measures are then automatically presented to the assessor and identified, resulting in a score based on the actual control measures in place for the hazards that actually exist for the risk category. Of course, weightings can be set up to allow more specific control measure assessment.

Web Site Deployment

A variety of factors are converging to create an information storage explosion. Enabled by new types of information, such as digitization of images and video, and sensor information from RFID tags and bar code scanning, the amount of digital information within an organization is mushrooming. Growing regulatory compliance and globalisation require that information be stored securely and be available at all times. At the same time, the cost of disk storage has dramatically decreased, enabling organizations to store more data per pound invested. Users must quickly sift through mountains of data to find relevant information. Furthermore, they want to use this information on any device and with the programs that they use every day. Managing this data explosion and the increase in user expectations creates numerous challenges for the enterprise and the developer.

The Microsoft Data Platform vision meets these needs by providing a solution that organizations can use to store and manage many types of data, including XML, e-mail, time/calendar, file, document, geospatial, and so on, while providing a rich set of services to interact with the data: search, query, data analysis, reporting, data integration, and robust synchronization. Users can access information from creation to archiving on any device, from the desktop to a mobile device.

To this end, our system employs this robust enterprise-level technology to enable our solution to meet and in many cases exceed the design requirements of our clients.

SQL Server

All data in the system is stored in a SQL Server database, each one being unique to each client. We utilise SQL Server for our reporting features. This is deployed in a number of guises for different aspects of the system on the BackOffice, allowing all data transferred to be managed and accessed in a timely and simple manner using Structured Query Language (SQL) requests.

SQL Reporting Services expands the Microsoft business intelligence vision by making it easy to get the right information to the right people, in any business environment. Reporting Services is a complete, server-based platform for creating, managing, and delivering traditional and interactive reports. It includes everything you needed to create, distribute, and manage reports. At the same time, the modular design and the extensive application programming interfaces (APIs) of Reporting Services enable software developers, data providers, and enterprises to integrate reporting with legacy systems or third party applications.

SQL Server Mobile Edition

This allows the power of SQL Server to be utilised on mobile devices, allowing the creation and maintenance of localised SQL databases that are replicated automatically with the main server.

Transactional Processing and Merge Replication

These technologies allow us to minimise data transfer costs if the system utilises GPRS or 3G connection methods. All transfers from the mobile device to the BackOffice are fully transactional, meaning that the whole transfer must succeed for the transaction to be successful. This operates in the same way as a cash point – you must succeed in every stage of the cash withdrawal for the withdrawal to succeed and debit your account (right down to actually removing the cash from the ATM) – or the transaction (data transfer) will 'roll back' to the beginning and try again – this gives us completely reliable data transfer ensuring the integrity of your inspections are maintained. Adding merge replication allows us to truly minimise costs and file transfer size, by only transferring the data that has been changed instead of the whole database each transaction.

AJAX

Utilising the latest AJAX technology, the Back Office can deliver desktop power applications across the Internet, so there are no hosting or integration requirements into your current I.T. infrastructure. This streamlines the deployment of the solution and allows us to rapidly configure and deliver your line-of-business application. This also sports advantages in system maintenance, which is taken care of by Mobile Safety Solutions – the system has object level error handling built in so in the event anything should go awry, the system will email us and tell us the problem – we will fix it and due to the self-repairing features of the .NET deployment, you won't even see an interruption in service.

Of course, with such powerful technology employed, the system is

scalable from a single user to thousands of users, all with their own level of permissions and policy access controls. Whatever the size of your organisation, our Compliance Management System can meet its needs.

Automated Software Versioning

When a new version of a PDA program becomes available the system will check this with each PDA user and an automatic update can be initiated. The same process applies to new users so that time wasting application loading of the PDA is avoided.

Compliance Management

From the practitioner point of view we have developed software replacements for audits, inspections, surveys, variation orders, action planning and risk assessments. From the management point of view we have developed event scheduling, incident reporting, automated non-compliance management and full reporting capabilities. Furthermore, some of the functions of our system can be fully utilised from a PC without the need of a PDA (such as incident reporting and action planning). All of our modules dovetail into the Action Planning module, meaning that you can access non-compliance information from any source in a single location.

With our Action Planning module, we move the system into a different league, allowing the automated and manual creation of action plans that detail areas of non-compliance. Action plans are dynamic, allowing full document upload facilities to enhance data accessibility, picture capture from the PDA, reassignment, due-by dates and costs, as well as chronological notes and a full a change log.

Action plans can be manually created for capture of non-compliance information that exists outside the scope of an inspection or audit, or can exist because of a non-compliance being identified from within a modules questionnaire.

Action plans can be modified at any time after creation to allow the action plan to accurately represent the state of completion of the identified non-compliance. They can have single or multiple items associated with them, and show a percentage completion for a quick visual indication as to the current state of the plan.

As the system is fully automated in terms of email delivery of reports and suchlike, we can enhance the delivery of information to allow our system to place key events directly into your Outlook calendar so you

can see your tasks and events in a single convenient location.

Also, owing to globalisation, we have created a solution that can be deployed in multi-language format, with language detection being automatic when deployed. This works for both BackOffice and PDA systems, making the solution truly versatile in a global marketplace.

Integration with other systems

Of course, our system can use all the latest technologies to enable cross-platform communications and data transfer, so our system can easily integrate with existing technologies and expand to incorporate new ones as they emerge. Microsoft Dynamics, Oracle, S.A.P., can all utilise the data collected from our solution to allow true data integration.