

sage



Sage CRM



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Introduction

Investing in a Customer Relationship Management (CRM) application is no different than any other business management software investment—whether you are looking for an enterprise-level software application or a department-level solution, you expect a quick and measurable return on your investment. Before investing in a CRM application, consider several aspects of the application including its features, support for existing and emerging technologies, initial cost, ease of use, integration with other applications, and more. One of the most important aspects of a business management application, including a CRM application, is its underlying architecture. A well-designed architecture will accommodate future growth and adapt to business changes without affecting the performance of the application or requiring an exhaustive re-implementation. An application’s customizability, adaptability, portability, scalability, and extensibility are all functions of its architecture.

In an internet architecture, the corporate data, the operations performed on that data, and the user interfaces are built in clearly defined layers that communicate using internet standards¹. Internet architecture is characterized by central-server installation, thin client deployment, centralized administration, portable application, and optimized performance on WANs. The internet architecture of SageCRM offers superior performance across all user deployment scenarios including disconnected access (laptop), internet access (wired and mobile), dial-up access, and in-office access.

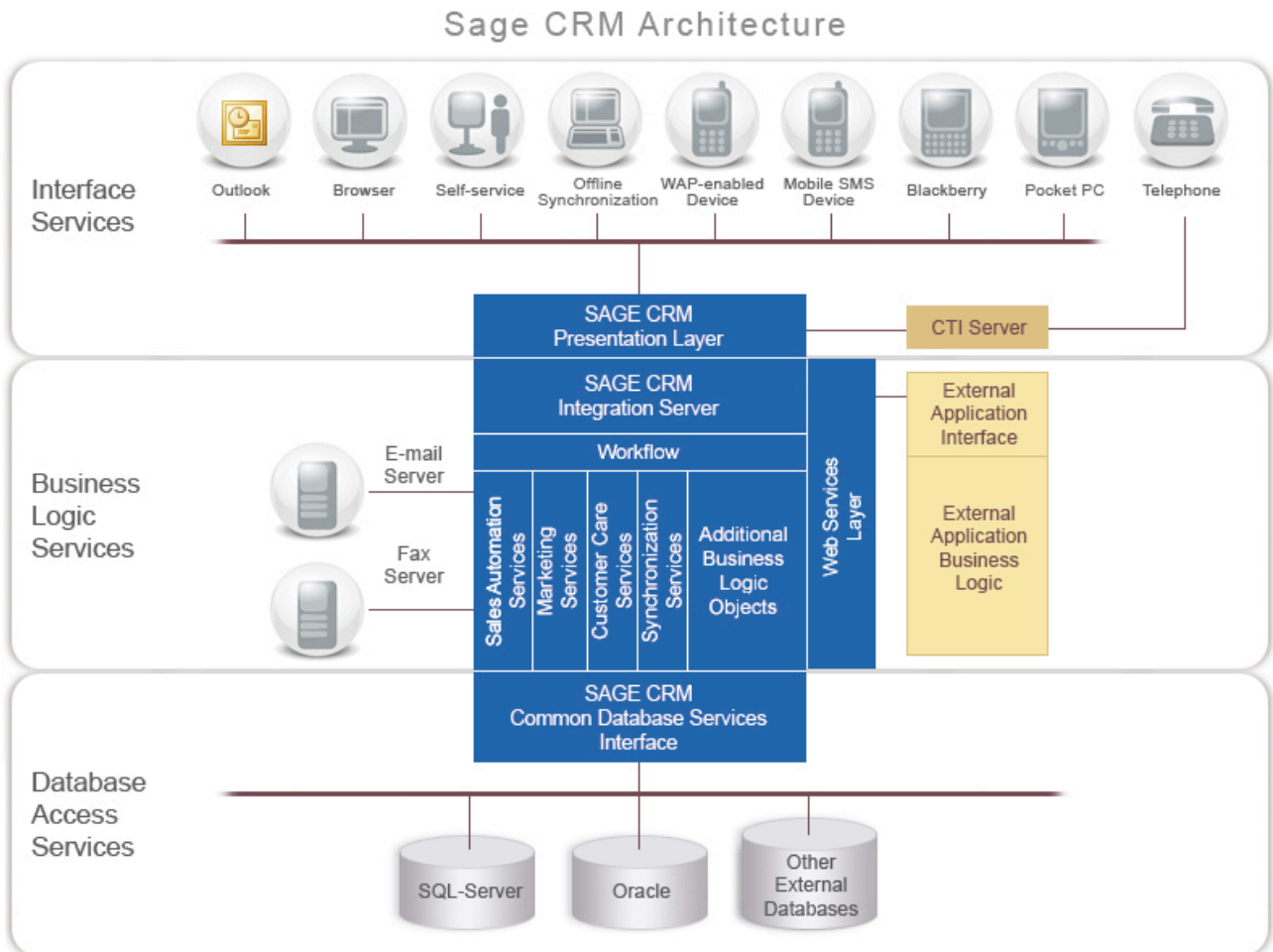
This document describes the underlying architecture of SageCRM and explains how the application of its internet architecture can become a competitive advantage for your firm.

¹ SageCRM utilizes the following internet standards and technologies: TCP/IP, Hyper-text Transport Protocol (HTTP), ActiveX, JavaScript, Active Server Page (ASP), File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), eXtensible Markup Language (XML), Web Server, Web Browser, and Secure Sockets Layer (SSL).



SageCRM Internet Architecture

Most CRM applications—even applications with web interfaces—are built using a client/server architecture, with the administrative overhead and expense of support for both deployment paradigms. SageCRM, however, is powered by a pure internet architecture that leapfrogs the client/server technology prevalent today. As shown in Figure A below, the internet architecture of SageCRM includes three distinct layers that communicate amongst themselves using internet

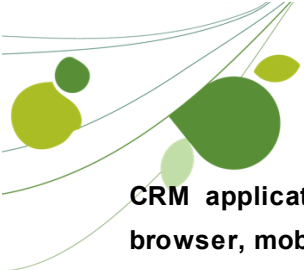


standards.

FIGURE A

Interface Services

Traditional methods of communication between vendor and customer such as phone, fax, and mail have been augmented by web, email, and mobile communications (xhtml-mp, mobile internet, etc.). In today's economy, internet access, both wired and mobile, is the fastest growing access method to business information. SageCRM's internet architecture provides universal access to



CRM applications for the mobile workforce by delivering the solution within a standard web browser, mobile html-enabled device, mobile SMS device, and Personal Digital Assistant (PDA).

The mobile and internet device layers (components of the SageCRM Presentation Layer) manage the connection between the SageCRM application and the Microsoft Internet Information Server (IIS). The Presentation Layer detects the device type being used (browser, PDA, mobile, etc.) and outputs the user interface in the format most appropriate for that device.

Business Logic Services

The internet architecture of SageCRM provides a framework that enables companies to integrate information from multiple applications into CRM solutions, making this consolidated information available through an intranet, the internet, and/or mobile internet platforms.

The Business Logic Services layer exposes business functions such as opportunity management, customer service, marketing automation, territory assignment, customer self-service, and workflow. These functions have several components that work together to coordinate the delivery of information and functionality to clients. These components check user security, maintain user persistence (remember what a user is doing), synchronize data with mobile users, return information from the database, generate web pages from data, perform transactions, process business rules and logic, and much more.

Exactly which functions are available to SageCRM users is managed by the server side SageCRM Dynamic Link Library (DLL). The DLL communicates with the web server using Internet Server Application Programming Interface (ISAPI) technologies.

From version 7.0 onwards, the server side also contains a Java server that hosts the Interactive Dashboard Web 2.0 feature and the CRM SData Provider.

Database Access Services

All database operations in SageCRM are performed through components of the Common Database Services Interface (CDSI) layer. To maintain data integrity, the CDSI layer validates data updates, such as sales leads being imported to CRM from an external application, before they are written to its database. This validation prevents any new data from corrupting the database or creating duplicate records on the server. The database server can be located on the same platform or on a separate network-connected server. SageCRM stores, retrieves, and collates data from these databases, and presents it in a uniform manner to the user.



BENEFITS OF SAGECRM INTERNET ARCHITECTURE

Single Server Installation and Centralized Management

SageCRM may reside on a central server(s) with full access to the CRM solution provided via an internet browser. This also allows administration of the CRM system to be more manageable and less expensive. Users of the application benefit, as they can access the centralized database anywhere, anytime.


This single server installation makes SageCRM a highly cost-effective solution for companies with mobile employees and multiple offices worldwide, as well as for companies with large numbers of employees in a single building, where a typical client/server deployment can be difficult and expensive to maintain. Companies no longer need to waste time and money on multiple copies of the same software or installing upgrades on every PC across the organization. Moreover, this internet architecture eliminates the need for organizations to make investments in expensive and maintenance-intensive technologies to facilitate remote connectivity such as Citrix or Microsoft Terminal Server.

For connected mobile users, such as employees in remote offices that are accessing the application over the internet or travelling executives working from their hotel rooms, SageCRM's internet architecture allows secure access through an internet browser, PDA, or mobile phone device. To access SageCRM using a mobile device, a connection needs to be established through an internet connection managed by the mobile telephone company and the CRM server must have a static IP address accessible over the internet.

For disconnected mobile users, such as field salespersons and support personnel that are accessing the application without connecting to the internet, Sage CRM's internet architecture allows them to work from a personalized local copy of the central database. Users can synchronize over the LAN, or via the internet. SageCRM even synchronizes documents from the document library, a central repository of all documents that are exchanged and referenced in SageCRM.

Scalability

SageCRM is designed to accommodate change and grow with you. SageCRM is an open system that is built on industry standard technology. By virtue of the unique internet architecture of SageCRM, companies can manage exponential growth in their businesses and simultaneously maximize their returns from the application. Companies can choose to add the Computer Telephony Integration (CTI) module of SageCRM, providing telephone switch integration for inbound and outbound calls within the SageCRM interface.



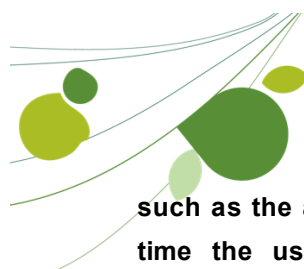
Many CRM systems marketed to small and medium-size companies economize by using a two-tier client/server architecture—over simplifying the system by eliminating the server tier and requiring each client to manage its own connection to a database. The lack of a true middle tier means that there is no central distribution of processing and that the database itself must directly support every client. Two-tier deployment models will not scale to a large number of users or to large data transfer requirements. Hence, these models are ill-suited architecture upon which to build robust, scalable, and adaptable solutions. To handle high transaction volume, SageCRM can allow for multiple application servers, running in parallel against the same database. Such multi-tier deployment can spread processing loads across multiple machines, thereby supporting the increased transactional throughput and only requiring the addition of inexpensive PC servers.

Typically, with an increase in the number of users, the performance of a client/server application can degrade. However, SageCRM's internet architecture relies on thin network implementation, with the average SageCRM web page being between 5k and 15k (no heavy, proprietary communication traffic between client and server, just HTML and XML). SageCRM pools all database connections used to handle incoming requests. Connection pooling enhances the performance of executing commands against a database. Before executing a command on other systems, a connection to that database needs to be established. After the command is executed, the connection is broken. Sometimes creating and terminating the connection is more costly in time than executing the command. For this reason, connection pools within SageCRM are created to keep connections alive. After a connection is created, it is placed in the connection pool. Connections are then used from the pool so that database resources are required to establish a new connection. Only if all connections in the pool are being used, new connections are created and made available through the pool. These connections are shared amongst all logged on users, eliminating the need to have one open database connection for each user, even when the user isn't currently using the system.

Adaptability

SageCRM provides easy to use customization tools, so companies can adapt the application to existing and future needs. SageCRM adapts to changing business process flows, and current and emerging technologies, thereby protecting your investment. SageCRM's open API, called the Integration Server, allows for ease of integration and customization. The Integration Server makes integration, modification, and customized implementations easy and cost-effective. Trained users can make frequent and significant functionality changes and additions as their business needs dictate, all without an expensive reimplementations. Customization is made through a web interface and stored in a centrally located metadata database². Any changes to the applications,

² Metadata is data about the database. It describes the structure and meaning of the database. Let us assume, "Leads" is one of the database tables in SageCRM and it is modified to include three additional fields. Metadata table will include descriptive and "properties" information about the "Leads" database table object, and characteristics of the three additional fields. Similarly, any changes to data entry screens, lists, drop-downs, field characteristics, etc. are all stored in metadata, within the SageCRM database.



such as the addition of fields or user interface enhancements, are delivered “on the fly” the next time the user connects to SageCRM, essentially eliminating roll-out time associated with providing additional features or enhancements. Further, the SageCRM development environment allows seamless re-use of business logic between connected and disconnected applications.

Figure B illustrates the typical customization environment.

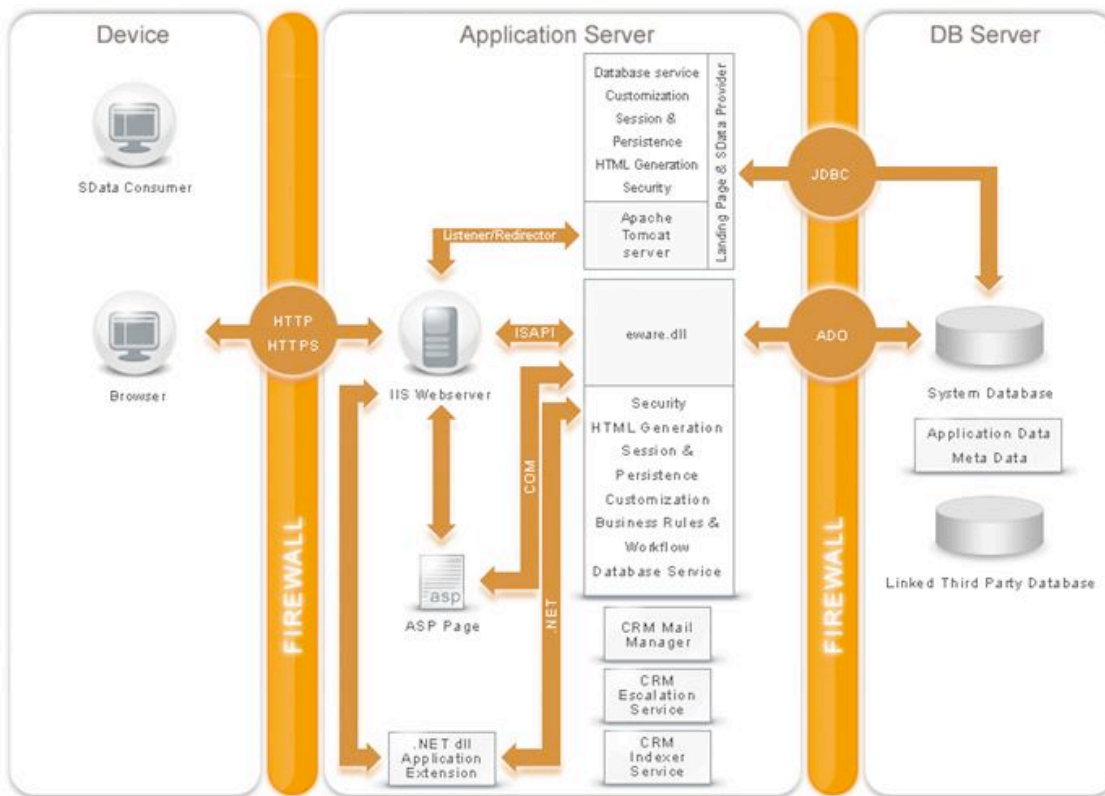


Figure B: Typical Customization Environment

With SageCRM, the following customization types can be developed:

Customization	Description
User Interface	All user interfaces that a user sees (menus, screens, entry boxes, grids, buttons, etc.) take their definition from properties and events stored in the metadata database and provide entry, display, validation, and database services for easy display and entry of information in a browser. User interface customizations support web and mobile users from a single application. SageCRM generates the appropriate client interface for each user.



Session Management	Store information about users and user sessions, tracking the action of users, and enabling user preferences and settings.
Database	Manage access to data, locking, caching and pooling of database connections.
Workflow	Monitor and execute workflows and escalations.
Graphics	Generate platform-independent graphics and charts.
Messaging	Integrate with standard messaging systems including email, SMS, and WAP-Push.
Business	Created to perform or access existing business functions/calculations using ASP/COM, .Net, DCOM, and XML interfaces.

SageCRM Web Self-Service

SageCRM also provides a Web Self-Service module that gives customer, user, and partner access to a subset of its data through a customizable self-service site. SageCRM Web Self-Service is a tool that helps integrate a company’s existing corporate website with the SageCRM application, allowing end-to-end continuity and closed loop marketing integration without the need for a separate system.

SageCRM Web Self-Service components enable users to view and input data into customized web pages, showing and updating information most relevant to the team success including communication, transactional, and contact history. Using self-service tools, a company can allow its customers to selectively interact with its client database, thereby freeing up some of its internal resources and allowing the customer to “help themselves.”

SageCRM Multicurrency and Multiple Language Support

SageCRM concurrently supports users in multiple languages, regions, time zones, and currencies, all from a single codebase. Even if your users are all in one country, your customers and partners may be more geographically diverse, requiring localized interaction with the centralized data. All captions, lookups, etc. are stored in reference tables and are used to dynamically build web pages and screens in the users’ chosen language. Moreover, SageCRM provides multilingual support from a single codebase and allows users to share a single language-independent database. Multicurrency support allows users to use the system with one or more currencies and run reports in any currency.



Automated Workflow

SageCRM includes built-in workflow functionality. The SageCRM workflow engine routes information such as sales opportunities, support cases, etc, using a comprehensive set of communication options, including escalations, alerts (using email, SMS, and pop-up message), and alarms. Workflow in SageCRM is designed specifically to control and direct a communication process. It revolves around the concept of interactions, notifications, reactions, and inter-departmental communications.

SageCRM utilizes workflow agents to extend the reach of enterprise applications—allowing employees, customers, and suppliers to access CRM applications whenever and wherever they need them. Using this model, for example, salespeople can be alerted to leads immediately allowing them to respond rapidly to customer inquiries. Business executives can receive alerts while they are on the road, allowing them to spot trends and pursue new opportunities as they emerge. Mobile technology brings users a fast, easy-to-use interface delivering the access that users need on the road.


SageCRM not only ensures rapid routing and dispatching of mobile service workflow agents, it also ensures that all members of an account team receive critical information about the customer—as it happens. Using workflow agents, SageCRM can increase the speed, accuracy, and scope of automated business processes. Additionally, workflow items can be routed and completed in less time. Manual processes that occur far away from desks and desktops can also be automated.

Rapid Deployment

SageCRM is easy to deploy, manage, and modify, thus reducing total cost of ownership and implementation. The application is designed with rapid deployment in mind, offering straightforward customization options and strong integration capabilities.

Many early CRM solutions come from an era of long implementations, where deployment timelines of over a year are common. Today businesses cannot endure such lengthy cycles because of the high expense associated with long implementations and the changing needs of business over a relatively short time. Moreover, over time a partially deployed CRM application might offer inconsistent and incomplete information to its users, defeating its very purpose of providing a 360-degree view of the company to its customers and a 360-degree view of customers to the company.

Secure Access



From day one, the architecture of SageCRM was designed for internet access and for running securely within a corporate IT security infrastructure. SageCRM is modelled on an n-tier³ architecture, and each tier includes a number of security mechanisms.

Application-level security in SageCRM is based on the supplied user and password. A user's password is encrypted both within the administrative functions in the system and in the back-end database for maximum security. The System Administrator can change, but not view, an existing user's password. Functions within the application are available based on user group, user profile, team, and territories, and both record-level and field-level security options are available. Additional security is applied to self-service users, such as customers, partners, etc.

Users can access the master system anywhere in the world using a web browser. If they have a laptop or mobile device and an internet connection, they can easily synchronize their data with the master system. Security within the SageCRM Integration Server ensures the integrity of user security, system security, data segmentation, and profiles.

Server-level security includes NT Challenge / Response, Secure Sockets Layer (SSL) Encryption and support for Firewalls. SSL encryption secures data sessions with client users. When an SSL session is started, the server sends its public key to the browser. The browser then uses the key to send a randomly generated secret key back to the server in order to have a secret key exchange for that session. When the web server uses SSL encryption, SageCRM Self-Service is aware of this. Firewall types supported by SageCRM include packet filter, proxy server, network address translation (NAT), and state inspection. SageCRM can operate behind a firewall to protect the server, and limit only certain types of interactions to take place.

The SageCRM web-based self-service option works with standard firewall encryption and authentication technology to provide secure internet access to customers, partners, and prospects. For additional security, the SageCRM self-service server can be physically separated from the CRM server, and a firewall can be set up to further protect the CRM server. Within a self-service ASP page, a screen can be designed as read-only or editable, restricting what different users can do on the page. User passwords can be allocated at the person or company level.

Database-level security ensures that no user has direct access to the database. All database access is performed via the Sage CRM DLL. For additional security, this DLL can be configured to access the database using a login with limited access.

³ N-Tier means any number of tiers. The N-Tier model of computing provides the ability to distribute independent components or services over as many tiers as makes sense and then link them dynamically, in order to provide unlimited application flexibility. Programs partitioned into tiers allow each layer or component part to be developed, managed, deployed, and enhanced independently.



Integration with Business Applications

Sage CRM offers integration with legacy systems; back-office systems such as accounting, supply chain, other corporate databases; partner information systems such as knowledge base and web self-service; and public information systems such as corporate websites, credit rating websites, etc.

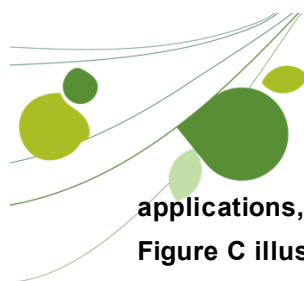
Integration with line-of-business applications dramatically increases productivity of users. To inquire on the transactions of a customer, a SageCRM user need not switch and log into a second application. Integrated information is available with a click of a button, anytime, anywhere. With real-time integration, users are able to view the latest information from either application. With this single point of entry, availability of integrated information, and ability to run business electronically, companies can lower their unit cost transactions and increase efficiency.

Once a connection is made to existing legacy systems or line-of-business applications, the user interface can be customized using the same web-based administration and customization tools used to customize standard CRM functionality.

SageCRM integrates with Microsoft applications for increased productivity and improved communications. Bi-directional integration with Microsoft Exchange benefits non-SageCRM users, who use Microsoft Outlook for scheduling and emailing, by providing access to view both SageCRM and Outlook calendaring, task, and interaction management functions. This integration allows non-SageCRM users and SageCRM users to interact, removing inter-departmental communication barriers. Users can set up appointments that include both SageCRM and non-SageCRM users, and these schedules are reflected on both systems—Microsoft Exchange and SageCRM. Mail-merged documents can be created using Microsoft Word, and such documents can be stored in SageCRM for future reference. The Document Library within SageCRM can be used as a central repository for all file types from quotes to contracts, schematics to maps. With a single click of a button, a SageCRM user has access to all documents relating to sales opportunities, support cases, companies, and contacts. The user need not search through physical filing cabinets to look for a document while the customer is on the phone. A simple process of dragging and dropping a document can initiate a workflow for document approval and archival purposes, for example. Company, contact, and lead data can be imported in Microsoft Excel format, and SageCRM reports can be exported in Excel format for further analysis. To integrate with business applications, SageCRM uses three types of interface; COM/ASP, Web Services, and .Net. Because the data flowing into SageCRM is validated by the Business Logic Services, data integrity is maintained. Mail-merged documents can be emailed, printed, or faxed from within the application.

Typical Configuration for SageCRM

SageCRM can be deployed in internet and/or intranet environments. A single SageCRM Application Server can serve both web-based and mobile clients within or outside the firewall. The entire functionality of SageCRM, along with the integrated functionality of external



applications, is available to remote users, self-servicing customers, partners, and prospects. Figure C illustrates a typical SageCRM configuration.

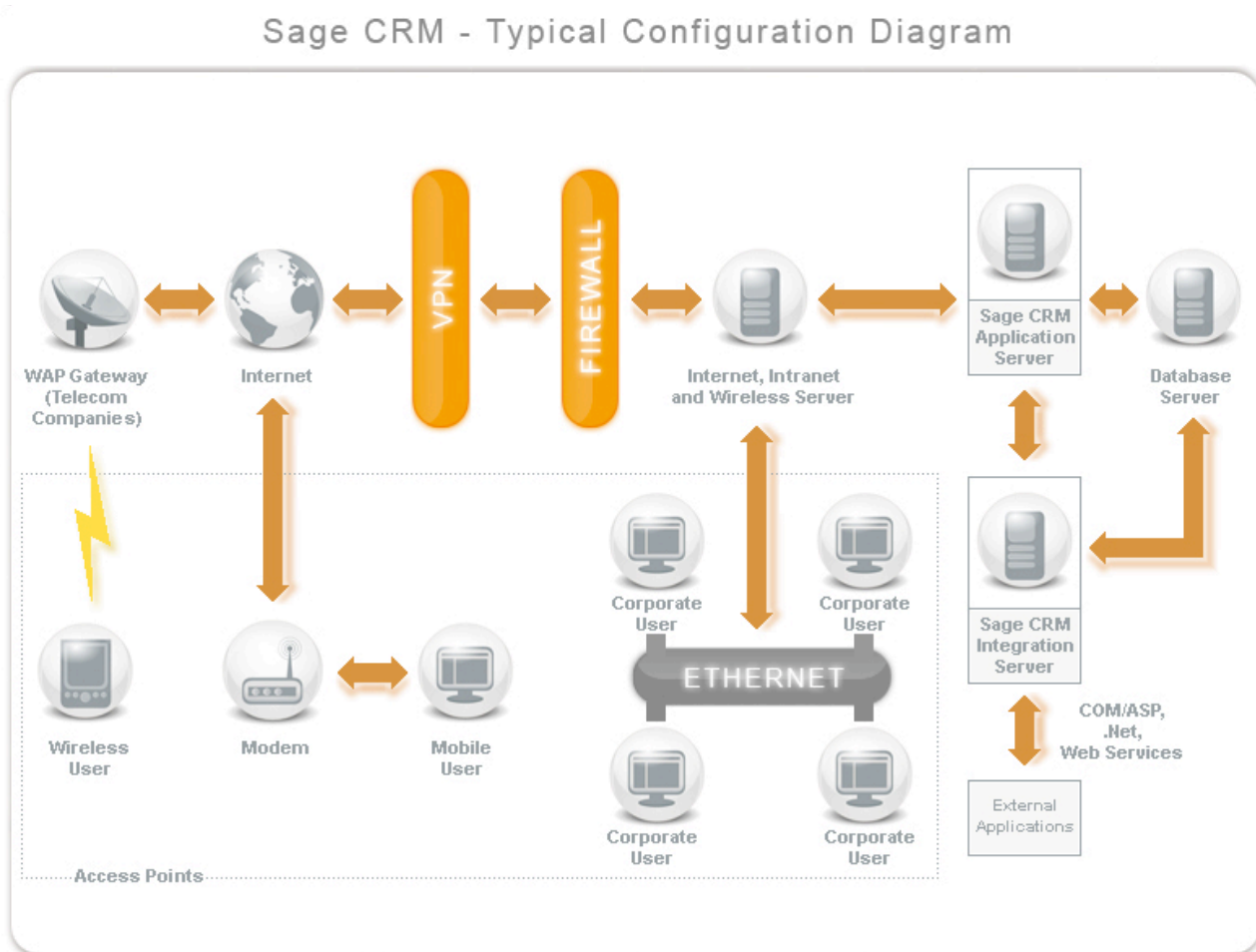
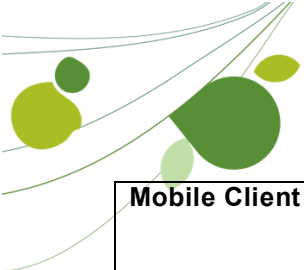


Figure C: Typical SageCRM Installation

Components of SageCRM Configuration

Web Client	Supports requests from industry-standard web browsers and automatically renders the correct markup language for the requesting browser.
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Mobile Client	Supports mobile devices. User Interface Services of Integration Server are used for implementing mobile enablement.
WAP Gateway	Receives requests through gateways operated by mobile network operators and also private corporate gateways from select suppliers.
Internet/Intranet Server	Supports Windows NT/Windows 2000/ 2003 server-based web servers running Internet Information Services (IIS).
SMS Gateway & Email Server	Supports workflows with alerts, reminders, notifications, and escalations. These can be transmitted to Web clients and/or as SMS messages through any SMTP-compliant SMS gateway or as emails through a standard SMTP/POP email server.
Database Server	Includes native driver support for Microsoft SQL Server, DB2, and Oracle.
Network	Supports TCP/IP network on a Local Area Network (LAN), Virtual Private Network (VPN), or internet.
Application Server	Coordinates with all other components of the application. Includes components from all three layers of the internet architecture.

Closing Comments

Many CRM solutions are available that provide a unified way to organize, analyze, and understand customer data for sales, marketing, and customer support personnel. SageCRM is at the forefront of technological innovations in the CRM marketplace through its unique internet architecture, providing uncompromised performance and unparalleled ease of installation, customization and versatility. SageCRM provides the low cost and ease of installation of turnkey software, with the customization capabilities of a bespoke solution, allowing companies to implement it quickly and economically, without sacrificing degree of fit or adaptability. It is affordable, not only in terms of the initial purchase price, but also in overall cost of ownership to implement, maintain, update, and expand.

SageCRM offers outstanding end-to-end CRM functionality—from lead generation to sales to support—while providing an architectural foundation unique in the industry that adds value both at installation time and for the lifetime of the business. Investing in SageCRM is a smart business



decision which guarantees quick returns and future protection. SageCRM is a vital component of any end-to-end e-business strategy.

About SageCRM

SageCRM is an easy-to-use and fast-to-deploy feature-rich Customer Relationship Management (CRM) solution with out-of-the-box but configurable business process automation. Access methods include both hosted and deployed models through a web browser.

**Sage ASIA (Regional Office)**

210 Middle Road
IOI Plaza #06-04
Singapore 188994
+65 6336 6118
www.sageasiapc.com

Sage Australia & New Zealand & Pacific Islands

Level 6, 67 Albert Avenue, Chatswood
2067
Australia
+61 2 9921 6500 (Australia)
www.sagebusiness.com.au
www.sagebusiness.co.nz

Sage Austria

Business Software GmbH
Primoschgasse 3, A-9020 Klagenfurt
+43 (0) 463 3843-0
www.sage.at

Sage Belgium/Luxembourg

Sage Bob Software
Excelsiorlaan 3
1930 Zaventem, Belgium
+32 070 22 21 20
www.sage.be

Sage China

Suite 2605 Liu Lin Tower
No. 1 Huaihai Zhong Rd
Shanghai 200021
+86 21 6385 0097
www.sagechina.cn

Sage France

10 rue fructidor
75834 Paris, Cedex 17
France
+33 (0)825 825 603
www.sagecrm.fr

Sage Germany

Sage Software GmbH & Co. KG
Emil-von-Behring Str. 8-14
60439 Frankfurt am Main
Germany
+49 (0)69 500076300
www.sage.de

Sage India

100, Okhla Industrial Estate Phase-III
1st Floor
New Delhi-110020
+91 11 40712488
www.sagesoftware.co.in

Sage Ireland

3096 Lake Park Drive
Citywest Business Park
Dublin 24
Ireland
+353 1800 255300
www.sage.ie

Sage Middle East

Office No. 211, Building 12
P O Box 500198
Dubai Internet City, Dubai
UNITED ARAB EMIRATES
+971 (4) 3900180
www.me.sage.com

Sage North America

56 Technology Drive, Irvine
California 92618-2301
+1 866 996 7243
www.sagenorthamerica.com

Sage Poland

Sage Symfonia ul Berna 89
01-233 Warsaw, Poland
+48 (0) 22 455 56 00
www.symfonia.pl

Sage Portugal

Edifício Olympus II
Av.D.Afonso Henriques, 1462-2
4450-013 Matosinhos
+351 22 120 24 00
www.sage.pt

Sage South Africa

Softline
Softline Technology Park
102 Western Services Road
Gallo Manor Ext 6, 2191
South Africa
+27 11 304 1000
www.softline.co.za

Sage Spain

SP Grupo Sage S.A
Calle Labastida, 10-12
28034 Madrid
España
+34 91 837 35 05
www.sagecrm.es

Sage Switzerland

Sage Schweiz AG
Oberneuhofstrasse 3
CH 6340 Baar
Switzerland
+41 41 769 68 68
www.sageschweiz.ch

Sage UK

North Park
Newcastle Upon Tyne
NE13 9AA
+44 (0)800 44 77 77
www.sage.co.uk

About Sage CRM Solutions

Sage CRM Solutions is a portfolio of market-leading applications consisting of ACT! by Sage, SageCRM, and Sage SalesLogix. Over 68,000 organizations and 3.1 million users worldwide rely on Sage CRM Solutions to develop profitable, long-term business relationships.

Insert BP contact details where appropriate

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