



White Paper

Introduction

Today, people are becoming accustomed to accessing their e-mail-messages, their date- and adressbook or bank accounts from anywhere anytime. More and more people are sending billions of SMS messages all over the world. By the end of the year Multimedia Messaging (MMS) is supposed to become the next killer application.

A wide variety of different mobile devices are populating offices, buses, subway trains and airports. We are starting to cut off our fixed lines at home and browse the Internet with notebooks and web pads. Organizers and mobile phones are converging, and many things that we were doing using the Internet during the past years are suddenly appearing on little colourful displays of smart phones. Watching colourful photos and streaming video on a mobile phone, is everyday becoming more normal. So what has „The Internet“ become?

If kids one day start to watch a movie on their Sony Ericsson smart phone, will they consider the movie coming from the Internet? If sales managers remotely ask for prices and prepare quotations with their smart PDAs, printing out their invoices at a public Internet booth, need they claim to spend their work day on the Net?

Amid these changes in the perception and conception of the Internet, weblicon offers an answer to these trends in the market. Weblicon fuels the paradigm-shift from today's desktop applications to centrally hosted web services being accessed by various clients. Weblicon applications are designed for all kinds of devices be it a high-end PC or a WebPDA.

As pioneered by i-appli in Japan, J2ME-based ultra-thin web clients represent the next generation of mobile Internet applications. In Europe, WAP and SMS services have become a commodity and many online-banking services already take advantage of JAVA applets. As NTT DoCoMo pushes forward conquering a potential of more than 150 million European mobile subscribers, a European i-mode service is emerging. These changes in technology may have a deep impact on the way we communicate and therefore on our everyday life.

Imagine this scenario:

Paul and Francesca are both professionals, Francesca as an editor for a pan-European architecture and art journal, Paul as a company lawyer for a European car manufacturer. They have both studied abroad and thus have gained many friends and contacts in foreign countries. More than once a year, Paul visits friends while travelling for his company. In these cases, he often sends SMS messages from his mobile phone to let his digital agent search for the cheapest flight available and respond via e-mail or SMS. From time to time, he might contact friends near Paris, proposing a meeting through a common online calendar. His friends, Stephane and Maurice, access this same online address book and calendar allowing them to share this information while travelling.

Francesca often meets with artists and journalists, coordinating PR for her journal. Once a month she sends all members of the Eastern-European-Arts-Forum an invitation to the latest exhibition held in one of her selected galleries. Most often she informs all members of the Forum at once with a single group MMS sent from her smart phone. Concerning social life, her friends can always access her current address in a shared online organizer.

When Francesca enters new appointments in her smart phone, they are automatically applied in her online organizer by synchronizing the changes over the air, using the mobile network.

When Paul finds a comfortable Internet terminal he often takes time to read his e-mail. Some of his clients send fax documents or voice-messages that are automatically forwarded to his e-mail account. Paul and his colleagues share a common organizer as well and Paul can acknowledge proposed meetings or mark his vacation schedule in advance. Paul's calendar is multi-layered, allowing him to manage both private and business events within the same organizer.

When Francesca is abroad visiting a congress, she finds the time to take a photo from the beautiful sea coast outside with the digital camera that is integrated in her mobile phone. She includes the photo together with a spoken greeting in a multimedia message and sends it as a digital post card to Paul.

With recent developments in Internet standards, this scenario will probably turn into reality far sooner than expected. Standards are constantly improving and moving towards true interoperability. To view and manipulate appointments in another person's online calendar presupposes a vast deal of underlying interoperability. Address and contact information as standardized in vCard (RFC 2425-26), remote schedule manipulation and exchange as outlined in iCalendar (RFC 2445-47) and the SyncML synchronization standard cast away the road blocks and lead to seamless application sharing.

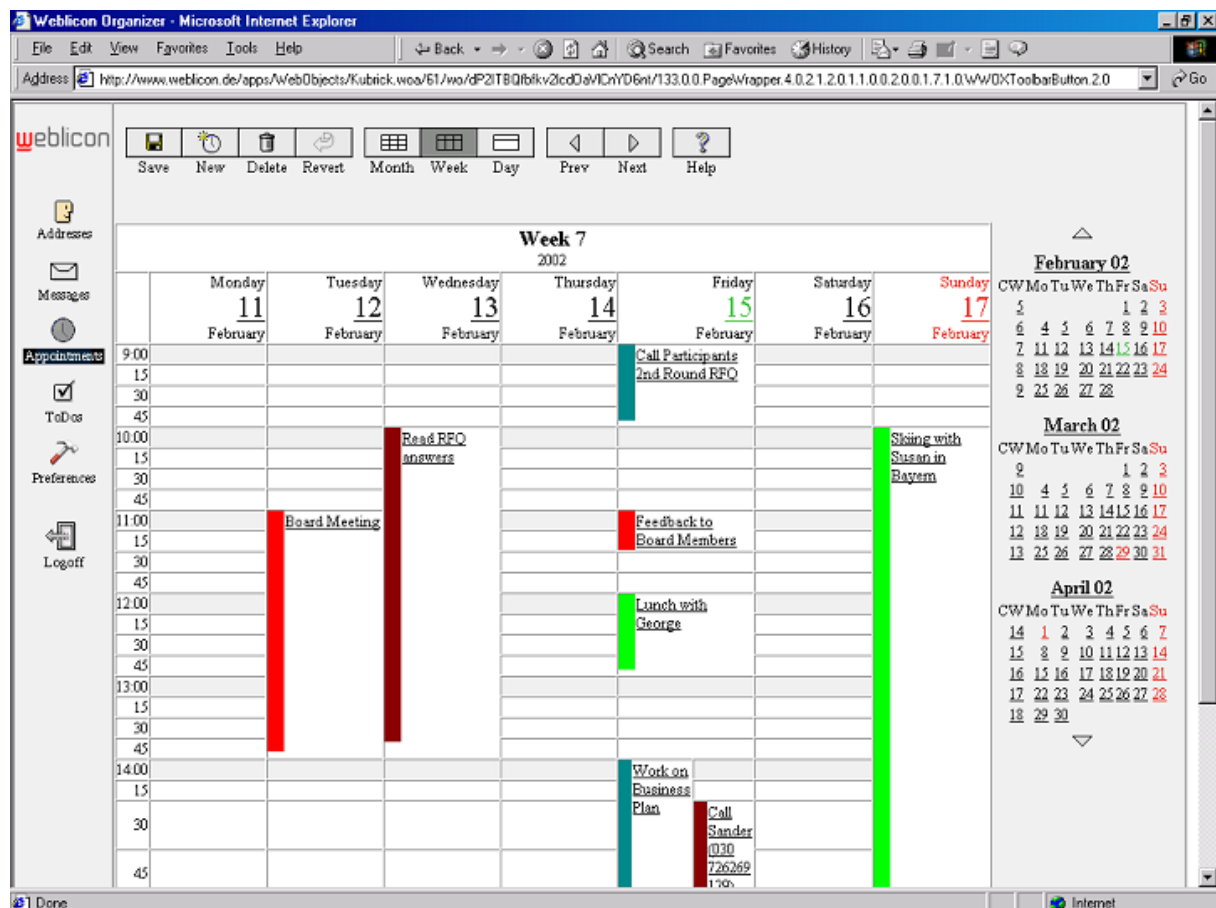
Weblicon Personal Information Manager

The Weblicon Personal Information Manager (PIM) is a highly scalable, platform-independent and customizable online application suite. Thus, Weblicon acts as a „white label“ which is not visible to the end user.

Weblicon provides a one-stop-solution for messaging & PIM services: One-stop since it includes a big variety of online services like calendaring, contact management, address book, to-do management, reminders, birthdays, messaging services for sending and receiving of e-mail, SMS and MMS messages.

Weblicon follows a multi-access-client strategy that makes the applications available on a HTML-client providing common web access compliant with all browsers compatible to the HTML 3.2 standard, a WAP-client offering mobile access through any WML 1.1 capable cellular phone, a highly interactive Java client with features like drag&drop commonly known only to desktop PCs, a J2ME midlet on smart phones like the Motorola Accompli and and intelligent voice access through a VoiceXML interface.

Weblicon includes its own SyncML compliant synchronisation technology, that lets new customers easily synchronize their online Personal Information Manager with Microsoft Outlook, Microsoft Outlook Express, Palm PDAs, Pocket PCs and SyncML-compliant phones like the Nokia Communicator 9210 and the Ericsson T68.



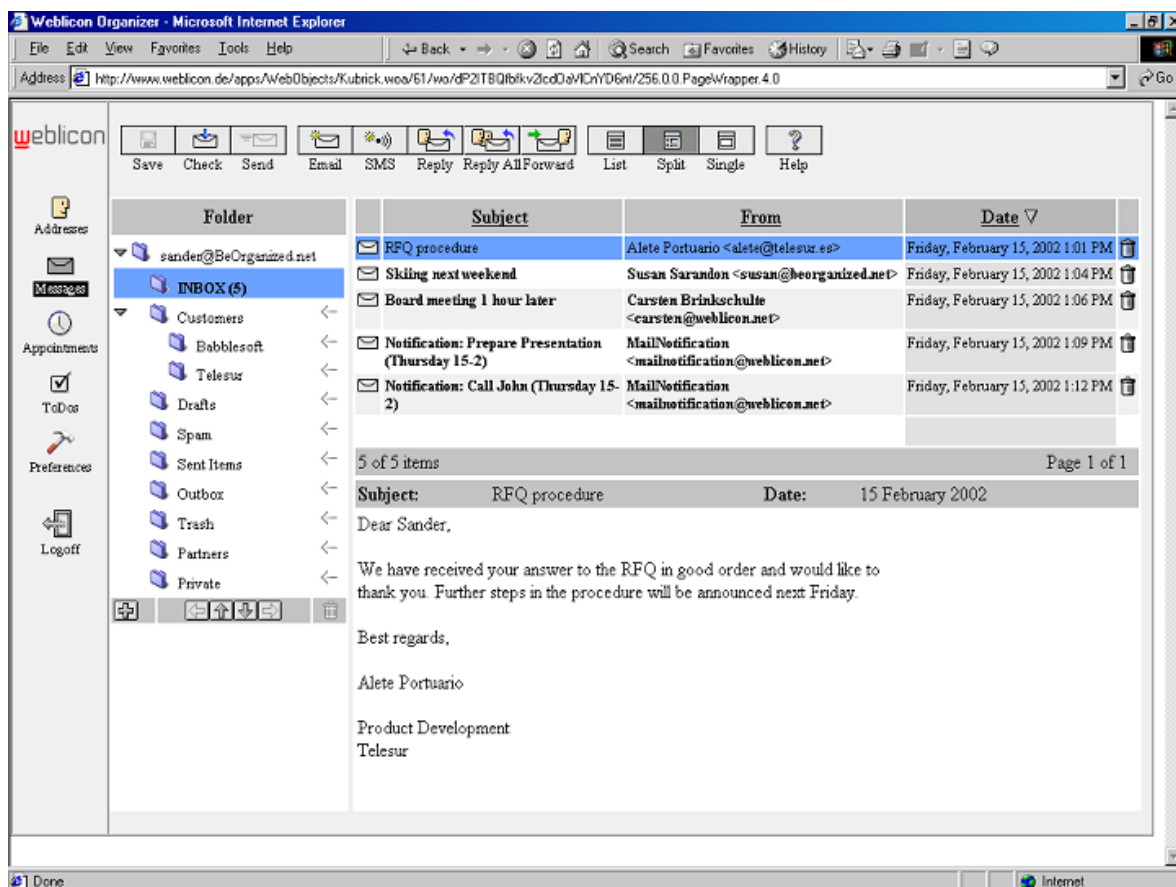
weblicon PIM: HTML Calendar

The weblicon messaging & PIM applications have been fully localized and translated for use in English, French, Italian, Dutch, Spanish and German and can be offered in any language.

Since weblicon focuses on user interaction design, the organizer offers perfect integration of applications with a single navigation bar resulting in high usability. Usability studies with a user-base of almost 30.000 „ClockWork“ desktop calendar users lead to the development of a smart graphical user interface (GUI), which has already been proven in Japan, USA and Europe. In 2001, the weblicon PIM was awarded the “Usability 2010” certificate for userfriendliness as the first German company ever.

Weblicon PIM provides a maximum of „stickiness“ to the hosting portal: users will frequently come back to the site to review and update their schedule, to-do list and contacts. In addition, users will be unlikely to defect once they have entered their personal contacts and schedule. The weblicon PIM transforms visitors of a portal site into users, and users into customers.

Concerning the look and feel, Weblicon software can be smoothly adapted to the corporate design of any hosting brand, using different „Skins“ to improve identification with the hosting site. Standards-driven interfaces help to integrate with legacy databases, application servers, SMS-gateways, location-based-services (LBS) and voice-portals, as well as to synchronize with PDAs and desktop PIM applications.



weblicon PIM: HTML Messaging

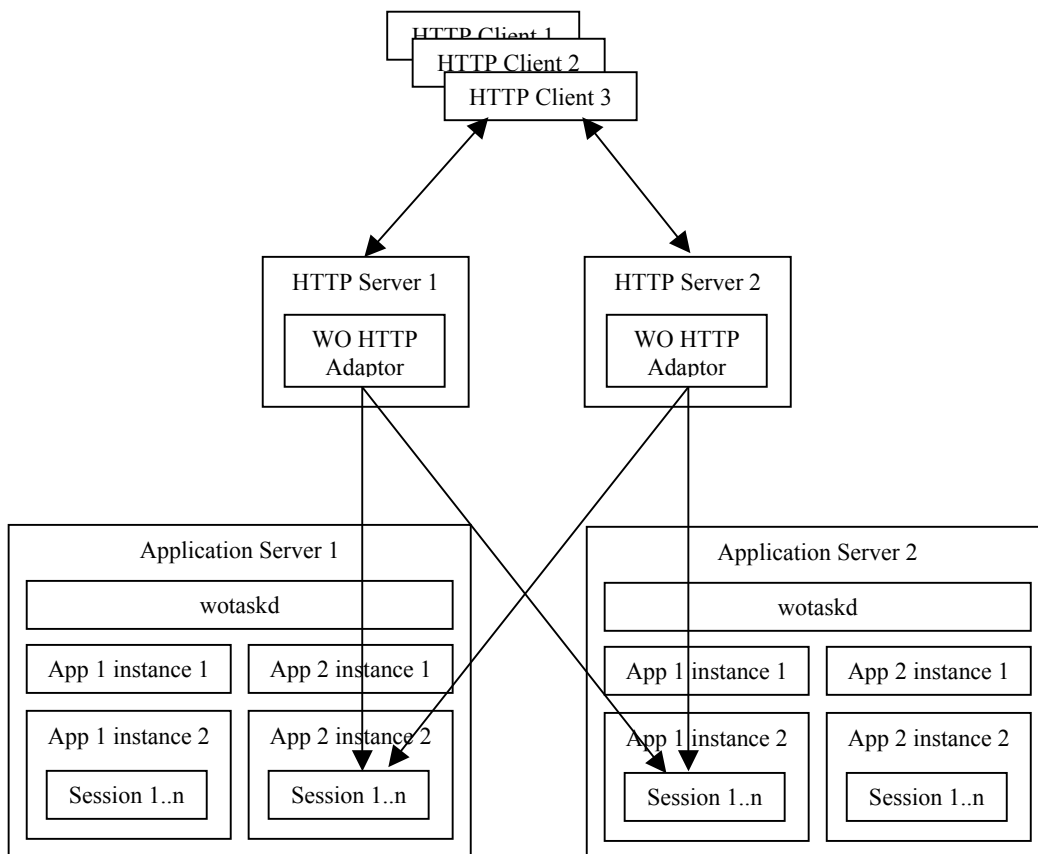
Weblicon Architecture

Weblicon architecture targets the following main requirements for mission-critical deployment scenarios, necessary for any portal site or telco installation:

1. High-Availability
2. Scalability
3. Platform-Independency
4. Multiple-Access-Clients
5. Usability
6. Integration
7. Customization
8. Standards Conformity

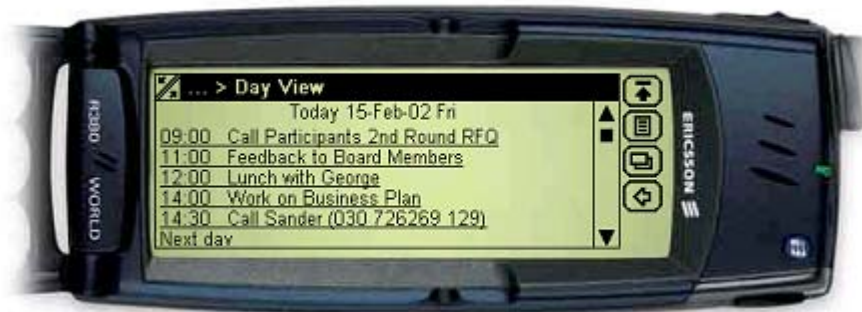
1. High-Availability

The routing of incoming requests to a cluster of servers offers redundancy thus gaining high-availability. Also gained through this parallelism is the possibility for real-time exchange or addition of hardware without disturbing the service.



2. Scalability

The use of an industry-proven multi-tier-architecture allows modern online applications to scale their database tier separately from the application server tier. With the use of WebObjects Application Server, weblicon products rely on a industry-proven application server solution with years of successful enterprise-scale deployments such as Deutsche Bank 24, TUI, Consors, OTTO, AppleStore and others. WebObjects Application Server supports multiple instances of applications running on distributed hardware, using any number of processors, each with multi-threaded sessions running simultaneously. Multiple WebObjects Application Servers are dispatched through HTTP-Server-Plug-In's using a round-robin or load-based mechanism. Therefore WebObjects deployments form a cluster of redundant applications with sophisticated load-balancing providing potentially unlimited scalability.

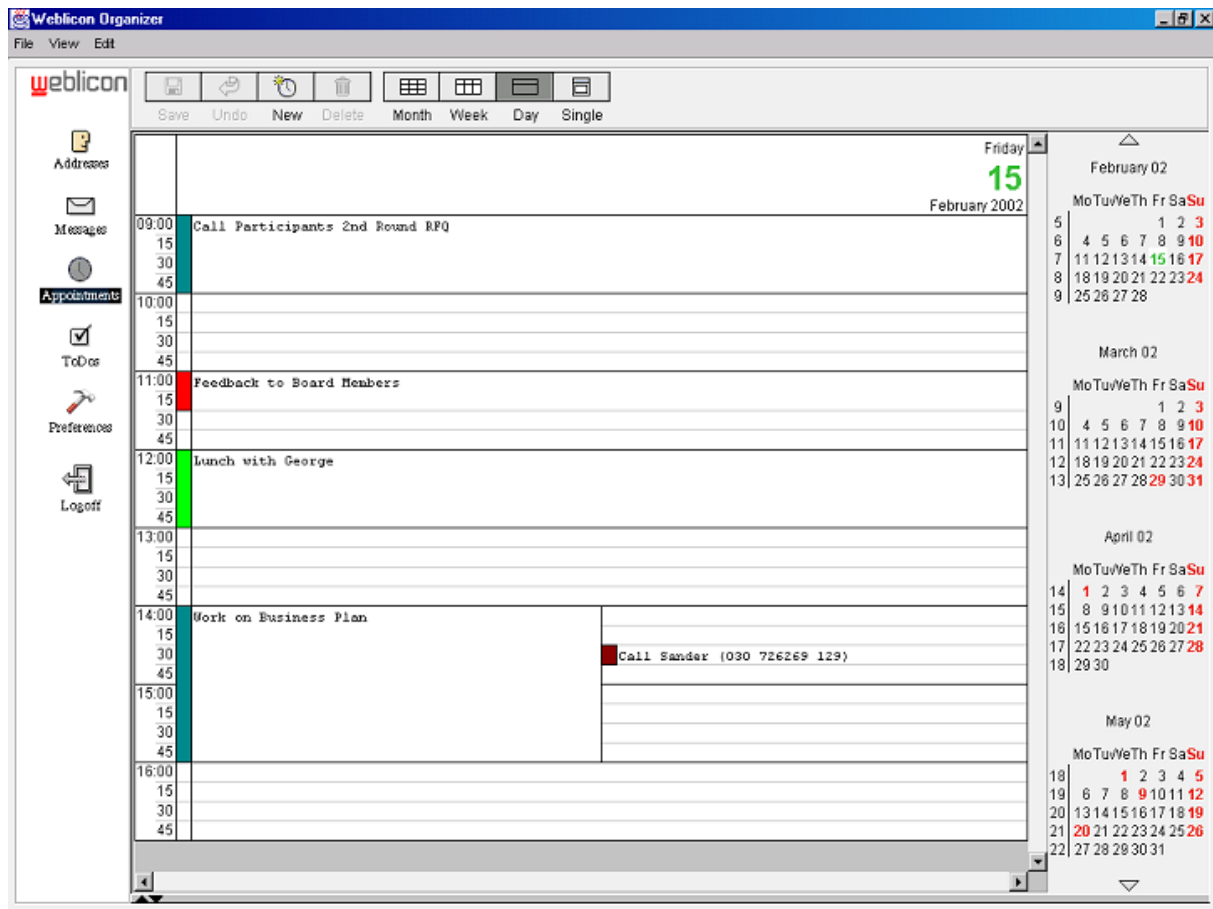


weblicon PIM: WAP-client

3. Platform-Independency

WebObjects currently supports deployment on WindowsNT/2000, Solaris, HP/UX and OS-X-Server. The Enterprise Objects Framework (EOF) abstracts from databases and transparently allows data exchange with any Oracle, Informix, Sybase or ODBC-capable database. Database specific SQL statements are encapsulated within WebObjects database adaptors. Weblicon also supports LDAP v3 directory server for sharing contact data and managing user authentication with a „single-sign-on“.

The recent availability of WebObjects 5.1 makes it possible to deploy the weblicon applications on virtually any J2EE compliant application server (e.g. IBM WebSphere or BEA WebLogic).



weblicon PIM: Java-client

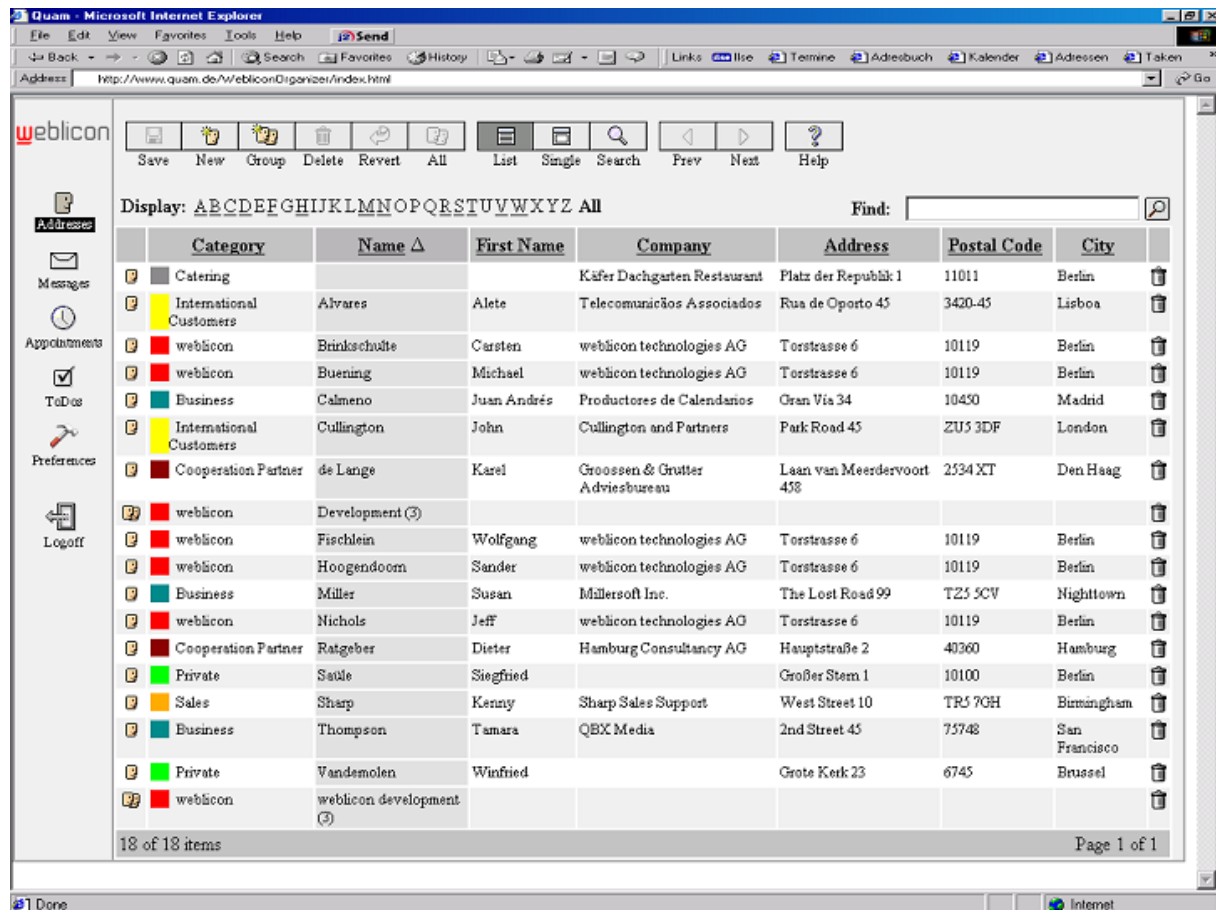
4. Multiple-Access-Clients

The Weblicon PIM is currently available with three different clients to access centrally stored contact and schedule data via standard HTML browsers, WAP-capable mobile phones and through a high-end JAVA-client.

The HTML-client is based on standard HTML 3.2, resulting in high compatibility with browsers, screen-phones or any HTML-capable device. The WAP-client supports any WML 1.1 capable cellular phone and can be accessed on several different models of various vendors. Currently released, weblicon offers a highly interactive Java-client through a JAVA application, which is automatically installed on the user's desktop. The Java-client provides drag and drop, immediate response, highlighting and double-click functionality. It offers modern ease-of-use currently known only to desktop applications. Weblicon's intrinsic software design follows a highly generalized approach enabling additional front-ends to be added with relative ease.

5. Usability

The usage of Internet applications does not require any installation; therefore, potential visitors might be easily attracted to a particular service. Internet usage patterns indicate that online applications typically receive 1-2 minutes of trial period.



weblicon PIM: HTML Contacts

Only within this short period does the application have the opportunity to make a significant impression upon the visitor, thereby resulting in a bookmark. This demands that the application have a stable, consistent and intuitive user interface. Weblicon applications are built following strict user-interaction guidelines to achieve the goal of transforming visitors of a site into users, leading to the ultimate directive of transforming users into customers.

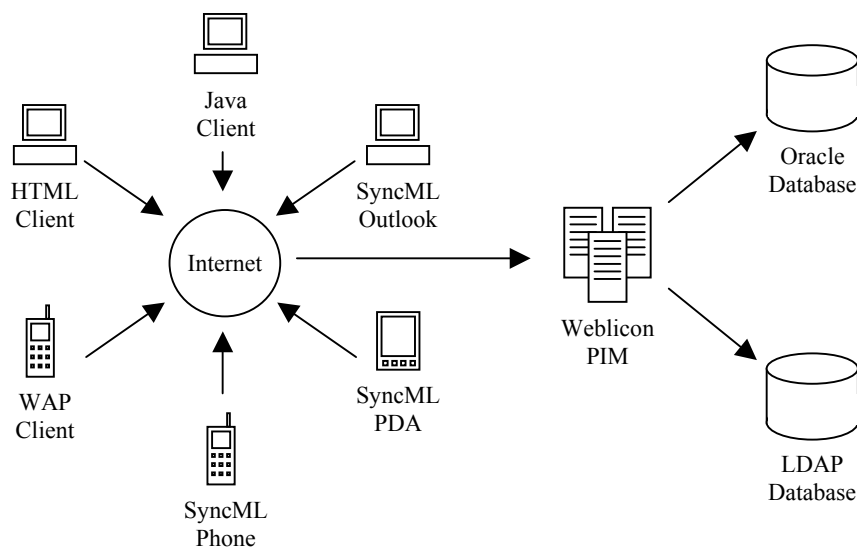
6. Integration

Integration into legacy services, databases and application server environments requires standard interfaces, protocols, APIs and open access to databases. Since the Weblicon PIM supports the most important industry standards (refer to section 8. Standards conformity), integration is made easy and flexible. For third-party access to schedule or contact management information, weblicon has already implemented a standard XML API server.

The XML API server is an infrastructure tool enabling integration of the weblicon PIM with 3rd party products such as voice portals or content management applications. The XML API server

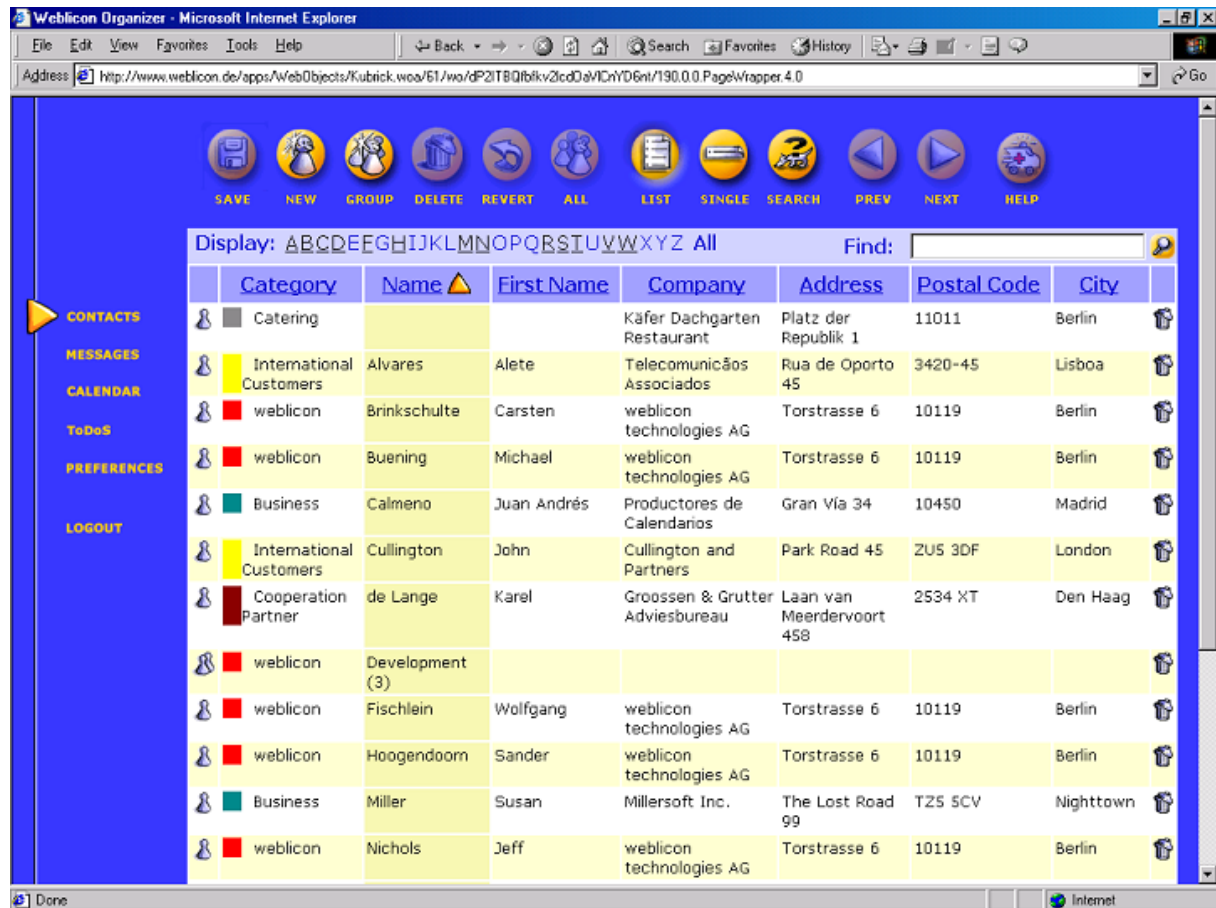
opens up the personal data maintained in the weblicon database to others by offering a generalized Application Programming Interface (API). The XML API server is based on state-of-the-art industry standards such as WSDL, SOAP and UDDI which eases integration with other 3rd party web services and applications supporting these standards.

The XML API server plays an indispensable role in integrating the weblicon PIM with existing 3rd party web services. Weblicon controls all technology in-house and can seamlessly integrate its PIM into any existing environment of Internet portals or telcos by offering modular customization and tailored solutions. With its XML API server, weblicon is open for third-party access on schedule and contact data through a smart and open interface.



7. Customization

Granularity in software development design allows easier customization, provides exchangeable „Skins“ and offers easy-to-use adoption to any required look and feel. Granular application design additionally increases re-usability of components and services to deploy and integrate highly-tailored customer-specific solutions in time.



Family skin: example of weblicon skin architecture

8. Standards Conformity

The Weblicon PIM was built on standards like XML for integration of any data source and data exchange.

Weblicon supports the open LDAP standard to store contact and authentication information in common directories, most often important for a seamless single-sign-on. Weblicon publishes its ER-model to customers for integration. With the support of SyncML, all Weblicon applications offer a standard interface for data synchronization with PDAs, desktop PIMs and other address books. Weblicon's SyncML server supports synchronisation of the centrally hosted PIM with Palm PDAs, Pocket PC PDAs, Microsoft Outlook and Microsoft Outlook Express. The SyncML server is compatible with every application or device that supports SyncML, for instance the Nokia 9210 or the Ericsson T68.

In addition, weblicon supports vCard (RFC 2425-26) and vCalendar (RFC 2445-47) and is constantly evaluating new drafts for standards in order to assure future compatibility.

Weblicon takes standards conformity serious. Therefore is a supporting member of the SyncML initiative, member of the Wireless Village Initiative (spearheaded by Ericsson, Nokia and Motorola), an official Microsoft MSDN licensee, PalmOS-developer, ORACLE Partner, Apple Select Member and is with its Java-client 100%-pure Java compliant. The weblicon PIM has passed the Ericsson GATE test for GPRS compliancy and is certified to run in GPRS networks around the world.

Besides, the flexible Weblicon architecture makes the integration of an intelligent voice control through a VoiceXML interface possible. It takes just one call to the Weblicon Organizer Office and the PIM turns into a speaking assistant, reading out and processing messages and dates. The caller accesses the PIM trough a voice gateway. It integrates voice recogniton, text synthesis and CTI technology, thus connecting the telephone network with the Internet.



weblicon SyncML synchronisation: PocketPC

9. Administration utility

For portal site administrators every-day-control of deployed online applications is a must. A portal site administrator wants to know the total number of users logged in or registered at any time. He periodically needs statistics for usage and coverage of the different services among clients. For scalability and availability purposes, he might closely watch capacity utilization. When deploying new machines or exchanging any hardware component he wants to remotely control start and shut-down of application instances. For maintenance of network or database components he needs centrally bundled control over the entire application cluster.

With WebObjects Monitor all of the mentioned requirements are fulfilled. Additionally, the Monitor application offers a variety of statistics and analysis on performance, stability and capacity utilization. Weblicon offers another application called „Weblicon Administration Toolkit“ which provides more application-related information like userbase and number of concurrent users per module. It provides basis information like average online time per application or average usage per user per month. With the help of the administration toolkit, the portal site administrator may e.g. delete outdated user records.

The screenshot shows the 'Monitor for WebObjects 4.5' application interface. The main content area displays a table for the application 'Kubrick'. The table has columns for Host, Port, Status, Schedule, Auto Recover, Refuse New Sessions, Transactions, Active Sessions, Average Transaction, Average Idle Period, Deaths, Exceptions, WOSTatus, and Configure. Two instances are listed, both with a status of 'OFF' and 'WOSTatus' of 'WOSTatus'. A 'Totals' row shows 0 transactions and 0 active sessions. Below the table, there is a small table for 'Transaction Rate' with 'Per Second' and 'Per Minute' values of 0.00. A link for 'Exception and Death History' is visible at the bottom.

Host	Port	Status	Schedule	Auto Recover	Refuse New Sessions	Statistics					WOSTatus	Configure	
						Transactions	Active Sessions	Average Transaction	Average Idle Period	Deaths			Exceptions
1	hardy.weblicon.de:2000	OFF	OFF	ON	OFF	-	-	-	-	0	0	WOSTatus	Config Delete
2	hardy.weblicon.de:2000	OFF	OFF	ON	OFF	-	-	-	-	0	0	WOSTatus	Config Delete
Totals						0	0	0.000	0.000				

	Per Second	Per Minute
Transaction Rate	0.00	0.0

[Exception and Death History](#)

Development of the Product

Weblicon will extend the functionality of the existing PIM to bolster the product line and add outstanding functionality. The product development strategy is focused on improving our product by adding functionality, which promotes the business of our customers: telcos, Internet portals and ISPs.

1. Messaging

The messaging application will be extended with instant messaging and presence services (IMPS). Instant messaging (IM) services will be developed between IM clients and via SMS. Examples of presence applications weblicon will develop are integration with location information, client device availability and user status. These new features will be integrated with the current messaging, calendaring and address book applications and made available on all access clients, making the IMPS services real mobile services as well.

As member of the Wireless Village Initiative (spearheaded by Nokia, Ericsson and Motorola), Weblicon guards its known standards conformity and interoperability in developing the new IMPS applications.

2. Groupware

The Weblicon PIM will be extended by providing groupware functionality for sharing schedules and contacts as well as to-do lists. Many end-users spend their day in work-groups and therefore have the need to share appointments, to-do lists and contacts with colleagues. Shared group events and task lists will be accessible to all users of the group automatically updating for all group members. Users of a workgroup will be able to look at each others schedule in order to find free time for a meeting or to coordinate holiday and projects schedules. Introducing groupware will help weblicon's customers in targeting the business market.

3. File Storage

While introducing the Weblicon PIM to the business market, file storage will be developed. Especially business users need to exchange datas and documents anytime and anywhere. No matter what happens to the file on the local hard drive, Weblicon software helps manage and use files safe and sound. The file storage will support the SSL protocol to insure the files security. Utilizing the industry-standard WebDAV protocol, the Weblicon File Storage will support smooth integration into the user's desktop where the remote volume will appear like a normal hard disk.

4. Bookmarks & Notes

Weblicon will complete the PIM functionality by adding bookmarks and notes modules. The Bookmarks Module will allow the user to maintain WEB and WAP bookmarks independently from the location or device used. The Notes Module will maintain unordered and un-timed bits of information and can be used like a physical notepad.

5. Content Syndication

Content syndication will allow Weblicon's customers to integrate the Weblicon PIM with content management and e-commerce systems. Users will be able to indicate their area of interest (such as sports, music, cinema, etc) and the Weblicon PIM will display matching content next to the user's schedule.

Examples for content syndication include TV movies schedule, music events or IPO dates. With a single click, users can add an event to their schedules and will be reminded for the event with an SMS or Email message. Combining content syndication with e-commerce, a ticketing service could contribute tickets for a rock concert with links leading directly to transactions. The Weblicon content syndication will add a revenue stream for Weblicon's customers in their cooperation with content providers.

6. J2ME Client

Weblicon is currently developing a new client for Java-enabled mobile phones offering a superior user experience. The first weblicon application on J2ME is available as a prototype and can e.g. be shown on the Motorola Accompli. The weblicon J2ME client provides a Palm-like user experience to mobile phones including drag-and-drop and a graphical display for appointments, contacts and to-do items. It can be downloaded as a midlet "over-the-air" to the user's mobile phone and will access the centrally hosted database via the network. The J2ME client helps telco companies in driving the air-time and differentiating their product portfolio from their competitors.

7. Transition to WebObjects 5 and J2EE

The company is about to complete the transition to the WebObjects application server version 5.1 in order to become compatible with the J2EE industry standard. The application server industry is moving towards the J2EE standard, which promises compatibility between competing application server architectures. By supporting J2EE, the Weblicon PIM can be deployed on virtually any J2EE application server such as BEA WebLogic or IBM WebSphere in addition to the currently used Apple WebObjects application server.

8. PIA Functionality

Weblicon will extend the basic Personal Information Manager (PIM) to a Personal Information Assistant (PIA). The PIA will actively assist the user offering information and services relevant to the user's schedule and address information. The weblicon PIM will be integrated with 3rd party web services such as location based services, mapping, route planning and e-commerce sites such as a flower service. For example, the PIA will be able to locate the user utilizing Location Based Services (LBS) and create a map including a route from the current location to the destination just in time for a meeting. The PIA will become more attractive to end-users and weblicon's customers can integrate the basic PIM with other services forming a compelling solution.

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