competitive research examples

A Fluidtime research document

Joanna Barth

Interaction Design Institute Ivrea

December, 2002

This research document intends to highlight examples of leading real-time information solutions. It has been prepared to augment initial research done in the earlier phases of the Fluidtime project. Partial contributions have been made from “Transportation Live: Detailed Research Findings,” May 2001 by Joanna Barth, Institute of Design, Illinois Institute of Technology, Chicago.

“Waiting is frustrating, demoralizing, agonizing, aggravating, annoying, time consuming and incredibly expensive.”

- FedEx advertisement

New working and living habits such as telecommuting demonstrate an increasing trend towards flexible time-management. However, few tools or services exist to support this new way of life. Currently, individuals don’t have access to time-sensitive information about services or appointments. Instead, they are left wondering if their doctor is on time, when their bus will arrive, or when their package is being delivered. The unpredictable nature of events requires a more flexible system of time.

Fluidtime is a new type of time-specific service.
By connecting people to critical time-based information, fluidtime supports flexible time planning according to personal needs.

The following is a survey of working services, applications, and devices that deliver time information about public services and private appointments.

air travel

Airline delays and cancellations cost [business travelers and their] companies 6 billion dollars per year.

— *The Economist*

TravelAngel (Siemens, Germany)
Using TravelAngel, business travelers will be able to view, create and modify their travel arrangements while on-the-go. Currently being tested with Siemens employees, the application will provide travellers with mobile access to services including updated flight schedule access, flight booking/re-booking, real-time weather information and hotel booking. Updated flight information includes boarding times, gate number and flight delay notification. The application processes trip-related information from various sources and provides only personalized, situation-specific information to the traveler at the various stages of his journey.

In order to provide this service, the application integrates direct access to major Global Distribution Systems with interfaces to other content providers. Information is provided via WAP-enabled phones and SMS. Using location-sensitive technologies, the system is able to provide information as it is needed as well as respond to travellers' specific queries.

The TravelAngel platform intends to generate revenue through airtime of mobile phone usage as well as collecting revenue from it's service partners. By collecting the personal data and travel patterns of users, TravelAngel will be able to supply it's content providers with valuable marketing data they can use to target their services.

TravelAngel
www.siemens-mobile.de

M-TRAVEL.COM
"Siemens Launches TravelAngel Mobile Application"
January 29, 2002

FlyteComm (US, San Jose)

Over one third of corporate travel expenses are due to costs other than actual ticket expenses, including re-booking and other logistics caused by changes in travel arrangements. FlyteComm provides a set of integrated intelligent flight information systems to reduce cost and hassle for both the corporate travel and aviation industries. FlyteComm's products include a desktop flight arrival notification system (FANS), a web-based flight monitor which includes live-flight mapping (WebTrax), an XML-based flight data feed (FlyteSource), as well as a full trip manager application (TIM).

Trip Information Manager

FlyteComm's Trip Information Manager (TIM) provides real-time information and decision-making support to traveler's and their families. TIM actively monitors the traveler's itinerary while also monitoring pertinent travel information including flight delays and cancellations, gate and booking information, and weather conditions. Trip monitoring uses FlyteComm's flight prediction systems. The system can give real-time arrival estimates that are 97% accurate within 3 minutes. TIM is directly connected to airlines' ticketing information system and is able to provide up-to-date information on departure and arrival times, gates and baggage claim. In addition to providing individual traveler's with up-to-date information, TIM is a groupware travel management tool, allowing corporations to check on the status of their traveling employees and allowing families to get up-to-date information on the expected arrival of their family members in transit.

FlyteSource

FlyteSource aggregates historical information with connected updates to provide a real-time data feed of air travel information. The system receives information from multiple sources including the Federal Aviation Administration, individual airlines, and weather tracking. The datafeed is delivered in XML, allowing developers to use build custom wireless applications to leverage the valuable real-time data.

FlyteComm provides a range of real-time travel applications that support multiple devices (PC, mobile phone and PDA). The company's system model and it's connection with content providers set a high standard for the Fluidtime service. FlyteComm should also be studied for it's multiple interfaces which range from strict time information for mobile devices to a real-time graphical mapping application for Web access.

FLYTECOMM

www.flytecomm.com

BUSINESS WIRE
"FlyteComm Unveils Flight Info for the Microsoft .NET Compact Framework"
September 17, 2002

EasyUpdate (United Airlines, USA)

Using United Airlines “EasyUpdate” service, travelers can receive time-sensitive information such as departure and arrival times, flight delays, gate changes, cancellations and rebooking information. Information is available in the form of notification messages which alert passengers of changes in their flight plans. Travelers can receive notifications via multilple different channels including phone, mobile phone, pager, wireless PDA, fax or email. Members can tailor their travel information to their particular preferences by selecting when to receive notifications and in what format (voice or text alert). Travelers may also request to have messages sent to family members or business associates in order to keep them informed of any changes to their travel itinerary.

The service is accessible on the UAL website and is provided free to Mileage Plus members. United Airlines describes the system as a “communication enhancement” to support their customers. Robert Robless, United’s CTO of Loyalty Service describes the service as a part of the travel experience: “We don’t consider travel as only being your airline trip. What we view is that your trip is a journey that begins from the moment you step outside the door of your home— getting to the airport, getting on the plane, staying the night wherever you are, being able to move around...Providing information that’s as accurate and timely as we can while customers are traveling is one of our biggest missions.”

EasyUpdate
www.ual.com/easyupdate

M-TRAVEL.COM
“United Airlines Launches Wireless EasyUpdate”
March 20, 2002

INFOWORLD MAGAZINE
“Uniting the Friendly Skies”
April 26, 2002

Eland Technologies (Dublin)

Eland Technologies develops and supplies airlines and alliances with software applications to support their travel services. Eland's customers include most major airlines, online booking agencies, and travel agencies. Airline customers include United Airlines (see EasyUpdate), Virgin Atlantic, Air New Zealand, Mexicana Airlines and the Star Alliance which includes Lufthansa, All NIppon, United Airlines, British Midland and Air Canada. Eland also supplies travel applications to travel websites such as Hotwire and to Sabre, the leading provider of Global Distribution Systems for the travel industry.

FlightMinder

The company's FlightMinder application provides airline customers with the ability to supply their customers with real-time alerts and notifications on flight delays, cancellation and gate changes. Notifications can be received via PC, phone, mobile phone, pager or wireless PDA. Eland uses VoiceXML to allow users to access information via voice as well as text entry. The application enables airlines to reduce their costly reliance on call-centers to handle personal communications with customers. The service enhances customer loyalty by providing travelers with constant, direct access to up-to-date flight information using the device that is most convenient for them.

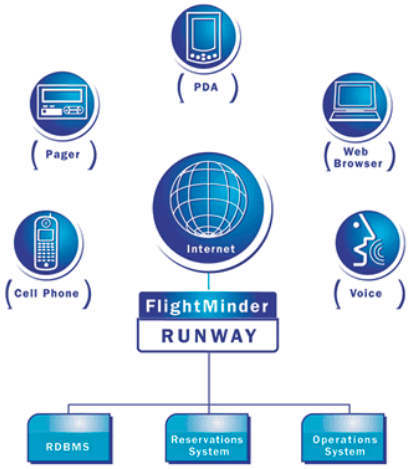
FlightMinder is branded by individual airlines (see EasyUpdate) and accessible from the airline's website. Customers enter their flight information and notification preferences, frequent travelers need only register once. Flight minder's message system allows airline customer service to manually intervene for extreme situations and to provide custom messaging if necessary.

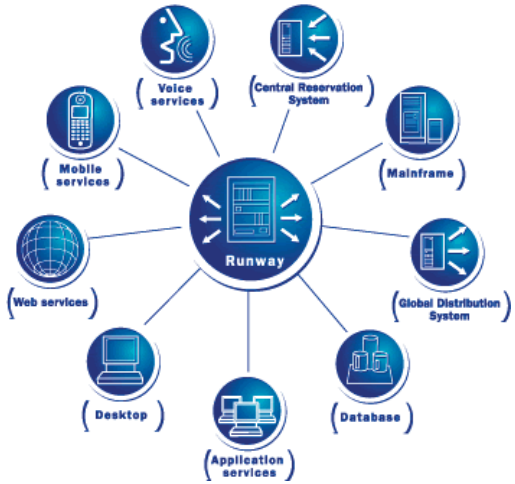
Runway

Runway is a messaging middleware platorm that facilitates the integration of different distributed travel applications and reservation systems. Runway is the only platform that supports all the major travel application protocols, allowing integration of back-end reservation systems, distribution systems, mainframe applications, databases, Web servers, application servers, wireless servers, desktop and other front-end applications.

Eland

http://www.elandtech.com/





ground transportation: private

LUXOR CAB (US, San Francisco)

Customer's who have requested a Luxor cab receive a computerized phone call, updating them as to the cab's expected arrival time. By giving people notification of the actual status of their cab's arrival, Luxor has managed to attract a following. The information calms the emotions of stressed travelers, who are often left in the cold waiting and wondering when their cab will arrive. "[Luxor's] computerized system calls me back to tell me when the taxi is a minute or two away, allowing me to calmly gather my stuff and present myself on my doorstep, ready for pick-up. The new system is clearly an improvement, and one that will no doubt soothe the jangled nerves of many a prospective fare."

Luxor uses a GPS-powered dispatch system in order to improve response times and forecast arrival times. When a client phones Luxor, they are requested for their phone number. The phone number and corresponding address are entered into the company's database. The dispatcher activates the GPS system, locating the GPS-equipped cabs that are in the vicinity of the call. The cab with the closest coordinates is offered the fare. The individual cab then uses an automatic call-out feature that directs the system to call the customer's phone to announce when the cab is nearby.

In addition to improving the experience for riders, Luxor's system is also helpful for cab drivers. Hal Mellegard, General Manager of a major US cab company explains the benefits of GPS to drivers: "We expect that GPS will make drivers' lives easier. They won't have to do anything to get a call but be there breathing."

Luxor Cab's GPS system enables the company to provide enhanced service by matching the location of their cabs with the location of their customers. Luxor has ingeniously augmented this location-based sensitivity with the ability to also provide their customers with anticipated arrival times. Luxor's success shows that time information is critical to consumers, and is of special importance to travelers. The fact that Luxor also brings benefits to taxi drivers (service purveyors) shows that time and location information is useful from the service end to enable enhanced customer service.

LUXOR CAB
www.luxorcab.com

SAN FRANCISCO GATE
"Luxor's New Luxury How GPS Gets the Taxi to You Faster"
January 21, 2002

ground transportation: public

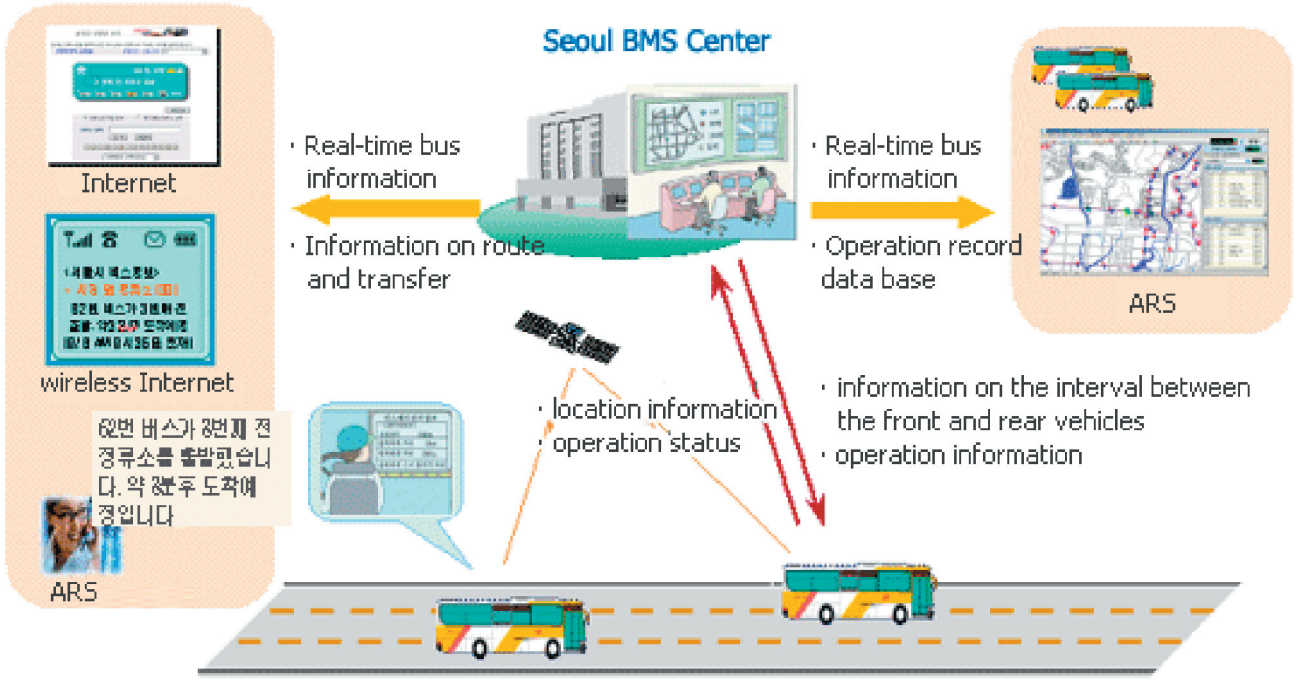
The network knows where we are. The network is there, all around us, a ghostly electromagnetic presence, pervasive and salient, a global infrastructure taking shape many times faster than the Interstate highway or the world's railroads.

— James Gleik, author

SEOUL BUS MANAGEMENT SYSTEM, (Seoul, Korea)

In February of 2000, the Seoul Ministry of Construction and Transportation initiated an 8 trillion dollar plan to invest in state-of-the-art intelligent transporation systems to be fully implemented by the year 2020. The integrated plan includes projects in five major categories: transportation information, public transportation, management of road/traffic facilities and traffic flow management.

One component of the plan is the Bus Management System, which provides travelers with real-time bus locations and estimated arrival times broadcast by the Seoul Traffic Broadcasting System (TBS). Location information is obtained by GPS and wireless radio transmitters installed on each bus. Bus timing data is collected by the Seoul Bus Management System Center and is then output to the TBS where users can access the real-time data via PC or web-enabled mobile devices. The bus timing service is currently running in the Seoul Metropolitan area and is expected to be available nationwide in the near future.



Seoul BMS
http://english.metro.seoul.kr/traffic/

KAO GPS RESEARCH GROUP
"The Development of Digital GPS Service Using FM DARC"
undated publication

MESSAGEWATCH (Seiko Communications, Japan)

MessageWatch, by Seiko Communications, is a combined product and service: users purchase a wristwatch and subscribe to a monthly service which them multiple types of real-time information including weather reports, stock market updates, skiing conditions and sports scores.

In 1999, the Washington State Department of Transportation used the MessageWatch to deliver personalised real-time traffic information to travelers. The program was conducted by SWIFT (Seattle Wide-area Information for Travelers) who ran a one-year study using the MessageWatch in 1996. The service allowed travelers to access traffic information and real-time bus times from mobile devices. The system operates using an FM-subcarrier-based paging and information system developed by Seiko.

The widely successful SWIFT study delivered information on traffic congestion and speeds, incidents, and actual bus arrival times to three devices: a car radio, IBM PDA and the Seiko MessageWatch. Although the watch is no longer offered by Seiko, the SWIFT study continues to be used as a model for providing real-time transporation information on mobile devices.

MESSAGEWATCH

www.govetech.net
www.wsdot.wa.gov

Annenberg School of Communication
Prof. William Dutton
“New Technologies: Emerging, Converging”
Spring, 1998

BUSVIEW + MYBUS (US, Washington University)

Bus View is a component of the Intelligent Transportation Systems initiative at the University of Washington. A pilot program sponsored by a grant from the U.S. Department of Transportation, the system uses radio transmitters and odometer reports coupled with signals from positioning beacons to make statistical predictions for bus arrival times.

Data collection capabilities includes 300 cameras mounted along highways and 3,000 sensors buried under roads—equipment necessary for gathering data about automobile traffic and transit schedules. The system is quite accurate: predictions made 20 minutes in advance should forecast the bus's arrival within two minutes' accuracy nine times out of 10.

In addition to bus timing information, the University ITS group also maintains SmarTrek, a traffic information website and cable TV channel, which provides congestion information to commuters. Travelers can access traffic information as well as news about construction work, road closures and skiing conditions from the web, mobile phone or dedicated cable TV stations.

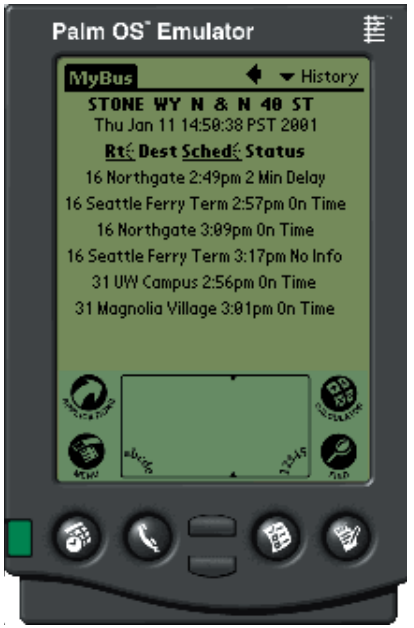
The Busview system allows users to watch buses en route in real-time. Commuters can filter the view according to their chosen busline. Using numerical abbreviations for each bus line, data from Busview is translated for output to mobile phones and PDAs (see right).

An extremely well-engineered system, Busview is the most advanced in terms of its use of statistical predictions for bus arrival times. The site and TV channel primarily suffer from poor information design, an area that Fluidtime might consider enhancing.

ITS, Washington University

www.mybus.org
www.its.washington.edu

INTELLIGENT
TRANSPORTATION SYSTEMS
"My Bus: Helping Bus Riders
Make Informed Decisions"
July 1, 2001

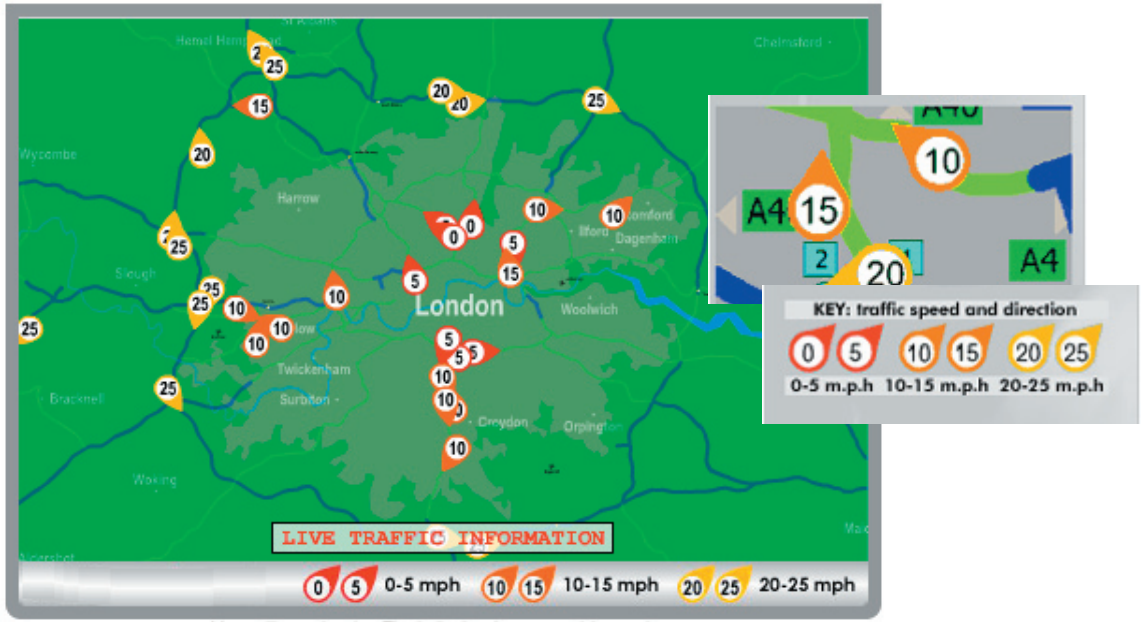


TRAFFICMASTER (Bedfordshire, UK)

Trafficmaster provides live digital traffic information for personal use and fleet management. The TrafficMaster corporation pioneered the collection and dissemination of digital real-time information in the UK and Continental Europe.

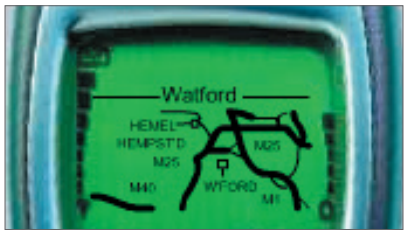
The system uses a combination of infa-red technology for speed sensing and license-plate number recognition for journey time calculation. Speed and delay times for traffic are delivered through voice or screen-based units. The Trafficmaster system supplements GPS based navigation by combining navigational information with traffic data. Drivers can access the TrafficMaster system via PC, mobile phone or in-car GPS navigation systems. Users can interact with a voice interface when using the onboard navigation system.

This system exhibits excellent information and visual design. This system is proof that even on small screens, map information can be made readable. TrafficMaster is accessible across multiple channels and can be personalized to check specified routes. The system does not include transit information.



TRAFFICMASTER

www.trafficmaster.net



above:
Real-time traffic information, including a map view is accessible for mobile users.

left:
An interactive map uses color to denote areas of congestion.

callout:
Dynamic markers specify traffic speed and direction.

SMARTRAVELER by SmartRoute Systems (Boston, USA)

SmartRoute Systems, Inc., collects, organizes and distributes a database of advanced traveler information through various electronic media and telecommunications. Route specific, real-time traffic information can be accessed by travelers by dialing a special number from their mobile phones. Travelers can access up-to-the-minute traffic information while they are on the road, allowing them to make crucial time-saving decisions. Construction and event information that might alter road conditions is also available.

SmartRoute Systems, which operates the SmarTraveler service, provides just-in-time travel information directly to consumers through various electronic media channels. SmarTraveler provides route specific, real-time traffic and transit information, weather, directions, flight arrival and departure times and rental car, dining and other tourist information. The system's traffic data gathering network includes over 225 mobile cellular probes, 100 radio probes, 49 cameras and 2 aircraft in the metropolitan Boston area. Since its beginnings in 1996, SmarTraveler has expanded to provide it's traffic coverage to 83 US cities.

Travel routes are given numerical codes, enabling users to access them quickly from a mobile phone. Travelers can also live video traffic data provided by webcams. In addition to the web and mobile phone, users can also access SmarTraveler on TV as well as through pager and email alerts.

SmarTraveler uses subscribers as one means of collecting traffic data. The Road Reporter program allows drivers to assist fellow SmarTraveler® commuters by reporting traffic conditions, travel times, and road accidents.

Interesting use of subscribers to augment information reporting capability. Site provides only limited transit information. Retrieval of travel information from mobile devices should require limited input—entering numerical codes rather than alpha information is preferable. While video data is rich and can be feasible to access online, a visual or audio summary of traffic or transit data would be required for access from mobile devices.

SMARTRAVELER

www.smartraveler.com

top:
Travel routes are given numerical codes according to their route number, enabling users to access them quickly by from a mobile phone.

bottom:
Live web-cams provide users with a video view of real-time road traffic.

delivery

FedEx long ago realized that information about a package is as important as the package itself.

— Mike Glen, VP Market Development, FedEx Corporation

FEDEX (Memphis, TN)

FedEx is an industry leader in incorporating wireless tracking for package delivery, having pioneered the use of wireless technology for shipping in the early 1980's. FedEx was the first shipping company to offer customers with package tracking online, and has been providing customers with real-time tracking since 1986. Customers can track their FedEx package on the company's website using a PC, mobile phone, PDA or RIM pager.

FedEx's wireless tracking capability benefits its customers by providing location information regarding packages. The $80 million data-collection system gives customers enhanced tracking and delivery information for FedEx Ground deliveries. The system includes on-van computers, hand-held scanners, and radio-frequency-enabled ring scanners worn by package handlers to scan packages at loading. FedEx couriers rely on the wireless system to improve efficiency and provide critical location and time information.

The latest innovation in FedEx's wireless tracking devices is the PowerPad, using Microsoft Pocket PC operating system. Developed jointly with Motorola, the product will enable couriers to provide enhanced package tracking for FedEx customers. The PowerPad uses GPRS and Bluetooth Technologies to enable couriers to wirelessly send and receive near real-time tracking information and updates from any location. Ken Pasley, head of wireless developement at FedEx expains the benefits: "We're moving the edge of our network from the delivery van to the customer's front door." The device uploads tracking data to the FedEx network as soon as it has been entered and allows couriers to input data in the field, even while they are away from their delivery vans. The devices connect to Bluetooth-enabled smart phones that link them to in-truck systems. From the trucks, data is relayed in near real-time using GPRS-based packet-data networks.

The PowerPad is expected to be widely available starting in 2003 allowing customers to receive frequent real-time updates of their package throughout the entire shipping process. The device will also give couriers information on shipping rates and weather advisories.

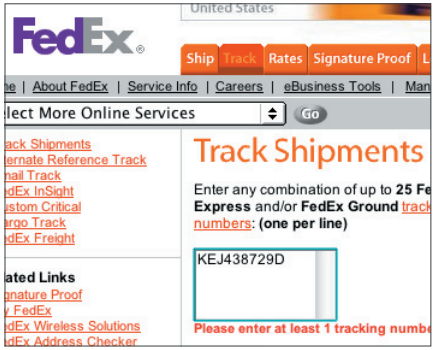
FEDEX

www.fedex.com

MPULSE (cooltown magazine)
"Special Delivery: FedEx, UPS put Future of Wireless in Driv ers' Hands"
December 5, 2002

BUSINESS WIRE
"Motorola, FedEx Develop Wireless Pocket PC for Couriers to Enhance Customer Service"
November, 27, 2002

BUSINESS 2.0
"Wireless at Work"
February 1, 2001



restaurant reservations

OPENTABLE (US, San Francisco)

Using OpenTable's online restaurant reservation service, customers are able to locate restaurants with availability and make reservations on demand in real-time. OpenTable is customized to a given restaurant, taking into consideration it's hours of operation, size, and capacity. Customers can search for restaurants by location, cuisine, hours, and average dinner cost. After selecting a restaurant, the customer can enter their desired reservation time. If this time is not available, OpenTable will show alternate times or other nearby restaurants. Because participating restaurants are directly linked to the system, the current table availability can be shown in real-time. As soon as a table opens up due to a diner leaving or a cancellation, the availability will show on the OpenTable website. This feature gives diners up-to-date information on dining availability.

OpenTable's provides it's service free to diners, charging restaurants about $300 a month for a computer terminal and about $1 per reservation. Restaurants are willing to pay for the service since it allows them to devote their staff's time to serving rather than taking reservations. In addition, the OpenTable system collects information about regular diners, enabling restaurants to provide personalized service and more increase the targeting of their direct-marketing campaigns. In addition, analysis of reservation and ordering histories allows restaurants to forecast trends and stay ahead of their competition.

"The system offers paybacks through the operations costs that are saved, by reducing the number of people needed to take reservations and seat people; but it also creates many ways for the restaurant to expand its marketing efforts and enhance revenue," explains Regan Daniels, director of communications for the San Francisco company. "So it both cuts costs and adds profits." Indeed, OpenTable has been successful. With 240,000 registered members, OpenTable was able to contribute an average of 270 diners to each subscribing restaurant in San Francisco last August. This translates to approximately $8,000 in monthly revenue for each participating restaurant.

OpenTable's success demonstrates a demand for up-to-date information about the availability of services, such as dining. OpenTable's subscription-based service which charges the service provider, rather than the end-user is a potential revenue model for the Fluidtime service. OpenTable also serves as an example of the marketing value of the demographic and personal information collected from users of a time service.

OPENTABLE

www.opentable.com

EXECUTIVE CIRCLE MAGAZINE
From Reservations to Tableside Ordering, Dining Goes High Tech"
5/1/2001

THE WALL STREET JOURNAL
"A Slump in Snooty Restaurants Makes It Easier to Pull Strings"
6/19/2002

USA Today
"OpenTable: the dot-com Survivor"
10/31/2000

ORLANDO SENTINEL
"Online Reservation Company Closes In On Millionth Diner"
10/7/02

medical appointments

Appointment cancellations and no-shows cost the National Health Service in the UK nearly £300 million each year.

— United Kingdom National Health Service Report, 2001

E-CEPTIONIST (Houston, TX)

E-Ceptionist is an online scheduling and booking service that allows doctors, administrators and patients to schedule health care appointments in real-time over the Internet. The service also allows administrators to create and manage electronic patient records. Patients can arrange appointments either online or through the E-Ceptionist call center. The service allows patients to set up their appointment preferences and then select a convenient appointment time. After entering their appointment request, the patient is given immediate feedback about appoinment availability. E-Ceptionist also allows doctors and medical staff to creat electronic patient records that can be stored in the system and attached to patients appointments to increase effeciency.

E-Ceptionist is sold as a turn-key service via the application service provider. Using this model, E-Ceptionist hosts the application on their server, customers access it via the Internet and can individually brand the application for their needs. The application may also be licensed for individual servers. E-Ceptionist's customers include WellPoint Health Networks (Blue Cross of California), the United States Military's TRICARE network, the High Plains Rural Health Network, Vitao Denmark A/S, tds (Dermatology) Limited in the United Kingdom and TelBios S.p.A. based in Milan, Italy.

E-CEPTIONIST
www.e-ceptionist.com

HEALTHCARE INFORMATICS
"9 Tech Trends 2002"
February 9, 2002

online scheduling

“Web-based scheduling exploits the ubiquitous, real-time nature of the Internet...in essence, we bring together buyers and sellers of time.”

—Marc Peterson, CEO, TimeTrade

TIMETRADE (Waltham, MA)

TimeTrade provides individual service businesses (health clubs, hair salons, auto services or doctors) with online appointment scheduling capability. Businesses pay a monthly subscription fee for a back-end database and front-end web application to interface with customers. TimeTrade provides call-center support and integration so clients can schedule appointments either online or by phone. The TimeTrade service is free to consumers.

The application supports many-to-one appointments such as courses or exercise classes as well as one-to-one service appointments such as haircuts or doctor exams. Schedules are constantly updated providing both service businesses and their clients with up-to-date information on appointment availability.

The service benefits consumers by allowing them to schedule appointments with greater flexibility. Consumers can view appointment availability and select, schedule and change their own appointments without dealing with a receptionist. Appointments can be scheduled via PC or WAP-enabled mobile device. The application also allows users to synchronize their TimeTrade online appointments with their own online calendar applications.

TimeTrade provides value to service customers by reducing administrative time spent scheduling appointments and by filling time slots that might otherwise remain unsold. By providing online scheduling, the application gives customers another channel to access services, reducing lost business. One TimeTrade customer explains, “Missing a phone call can cost an excursion operator a thousand dollars. TimeTrade pays for itself immediately.”

Because the TimeTrade accommodates phone scheduling through call-centers, customerd can access the service even without web access. Supporting more established as well as emerging communication channels will be critical for a successful time service.

TimeTrade allows users to receive real-time availability information about appointments, but does not go so far as to provide real-time status information of their appointments. The application does provide customers with email reminders as their appointment draws near, but it does not connect to the dynamic schedules of service providers in order to adjust the reminder or send notification of appointment delays. Fluidtime can provide new value by connecting users with dynamic time information about schedules and appointments.

TIMETRADE

www.timetrade.com

INFOWORLD
“Online Appointment Scheduling Services can Reduce Frustration and Increase Business”
November, 24, 2002

CONNECTIONS MAGAZINE
“Leading Providers Select TimeTrade Appointment Scheduling Services”
March, 2001

BUSINESS WIRE
“Timetrade Brings Rules-Based Scheduling to the Web”
October 1, 2001

resource management

New companies have innovated by organizing around real-time data and broad communications. They are communication centric rather than computation centric. This is a fundamental shift in application design.

—Steve Jurvetson, Draper fisher Jurvetson Venture Capital

TIMENGINE (XTIME San Mateo and MOBITE Copenhagen)

XTime's Time Inventory Management (TIMEngine) software allows service businesses to provide their customers with the ability to schedule appointments online. TIMEngine's clients include DaimlerChrysler, Fiat, Goodyear, Honeywell, Interwoven and Life Time Fitness who use a customized version of TIMEngine for automated service planning, selling and fulfillment.

Unlike most online scheduling applications, TIMEngine also provides real-time data to service businesses, allowing them to view and manage their resources and facilities. Xtime provides analysis tools to allow their clients to integrate appointment information with customer-related data in order to capture service performance metrics and improve customer relationships. By allowing service companies to plan their schedules in advance and analyse scheduling trends, TIMEngine helps these companies to staff adequately, minimizing lost revenue.

TIMEngine automates both front and back-office service operation by providing tools such as customer self-service scheduling and management tools for resource planning. On the service side, the software enables service providers to use dynamic pricing to fill service time slots that might otherwise go unsold. Customer profiles and preferences are captured in order to allow business to increase their level of personalisation and customer service.

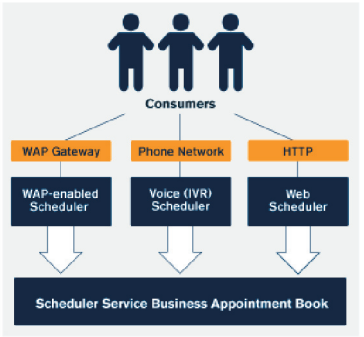
Customers can self-schedule their appointments with health care providers, fitness centers or other XTime clients via PC or an automated phone system powered by voice recognition software. Service business manage their time slots using XTime's online real-time scheduling application.

On the service side, XTime encourages companies to see time as product or inventory. The software enables service providers to use dynamic pricing to fill service time slots that might otherwise go unsold. Customer profiles and preferences are captured in order to allow business to increase their level of personalisation and customer service.

www.xtime.com
www.mobite.com

RED HERRING
"Real-World People Will Benefit from Real-time Enterprise"
September 15, 2001

FINANCIAL EXECUTIVES INTERNATIONAL
"Technology Tools"
March 1, 2002



entertainment

SCARABOO (Munich, Germany)
Scaraboo is a developer of mobile gambling software for the German market. The start-up company is part of a group of portfolio of mobile application developers currently being funded by Siemens Mobile Acceleration GmbH. Scaraboo's live betting application allows users to place real-time bets during sporting events. The application uses dynamic odds to constantly update users about the chances of their bet during a game or match. Users can place bets during a live event in a stadium or remotely from a different location. The better is guaranteed the odd value at the exact moment in time that he or she places a bet. Scaraboo's live-betting supports all standard transfer protocols such as WAP, SMS, i-mode, HTTP as well as with all transfer techniques like GSM, GPRS and UMTS.

TOTO
Toto is the first mobile horse-betting application, the company's initial live-betting offering. The application allows users to watch live horse races on mobile displays and to place real-time bets throughout the race. Toto uses videostreaming technology to bring users a live visual display of the event.

LIVESCORE
Livescore allows users to receive up-to-date, continuous information and scores of live sporting events. The application uses Multimedia Messaging Service in order to add video streaming sequences to it's live sports updates.

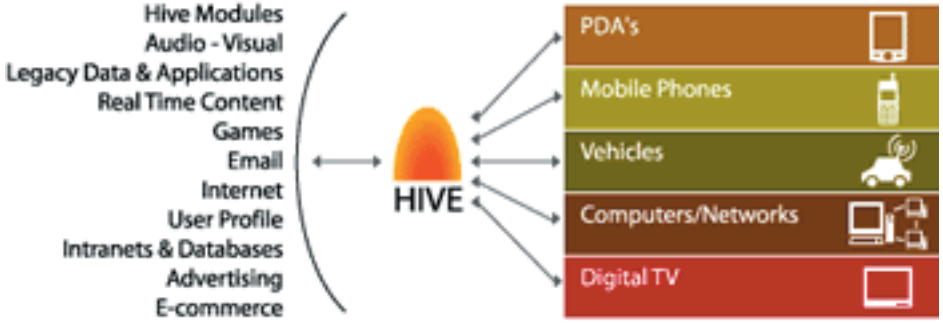
SCARABOO
www.scaraboo.de

ZDNet UK
"Siemens Bets on Mobile Gambling"
August 14, 2002

HIVESPORTS

The Australian Olympic Committee used a wireless platform called HiveSPORTS during the 2002 Winter Olympics to allow athletes to view streaming video, instant replays, progressive scores, and statistics of the Winter Games. The sports content is tailored to individual subscribers. The application is currently being developed by the mobile data specialist Icewrx with the intention of using it on 3G mobile networks.

The HiveSPORTS application demonstrates that people want and will pay for real-time information about entertainment events. Finding out scores and watching plays as they happen lets people feel like they are a part of the event, even when they are not at the same physical location.



HIVESPORTS

http://www.icewrx.com/

The Australian: “Mobile bandwidth to put sports fans into a spin” September 7, 2002.

household appliances

We want to offer consumers what they really want: more time, but also an improved quality of that time.

— Andrea Guerra, Managing Director, Merloni Elettrodomestici

Merloni WRAP, Ariston Digital, Merloni Elettrodomestici (Milan, Italy)
WRAP (Web Ready Appliances Protocol) is a digiital technology which allows household appliances such as washing machines refrigerators and ovens to communicate with each other through telecommunications networks. The technology was developed and launched in European markets in1999 by Ariston Digital, a brand of Merloni Elettrodomestici. The appliances are equipped with an advanced control system based on micro-controllers and innovative software whic uses fuzzy logic technology and sensors which provide precise diagnostics to allow each appliance to achieve mazimum performance.

Consumers can set and monitor their appliances remotely through the internet. Appliances communicate to a Digital Service Center through home telephone lines or GSM networks. Because the appliance is constantly connected, it can be constantly monitored and problems are diagnosed and fixed by the Service Center without the intervention of the appliance owner. In addition to providing quick and accurate diagnosis, the system allows each appliance to run at power levels that are just high enough for it's performance, saving energy for the consumer. Each appliance stores it's own data history including washing or cooking cycles, consumption and repairs, allowing the Service Center to compile trends in use and repair histories in order to improve the performance of new machines.

Ariston's Margherita2000 washing machine is equipped with a modem; the machine can be turned on via the internet or mobile phone and be monitored over the web. Each machine can be monitored and controlled by a dedicated web page or via a mobile phone. The machine can download wash-cycle programme upgrades and is in constant contact with the Digital Service Center for ordering new parts and upgrades.

Merloni WRAP
www.WRAPhome.com
http://www.merloni.com/digital/it/

ZDNET UK
"Net Savvy Washing Machine from Ariston"
December 6, 1999

APPLIANCE MAGAZINE
"Sensors and Biometrics: Leveraging Lifestyles Through Solutions"
January 14, 2002

e-SUDS, IBM (Armonk, USA)

IBM and USA Technologies have teamed up to web-enable washing machines for communal use, specifically in college dormitories. The smart machines uses m-commerce hardware and software developed by USA Technologies and are linked to intelligent back-end systems hosted by IBM.

The program called “e-suds” enables students to search for an available machine via the web or mobile phone, remotely dispense soap and fabric softener, and select a wash cycle. Rather than using coins, students pay for their laundry with smart cards which can be connected to an online account for billing. Alternatively, the machines can each be accessed by an individual 800 number. When the user “calls” the machine, their use is charged to their phone bill.

Students can monitor the progress of their laundry and even receive an email to their PC or pager when their load is wash is finished.

Machines can be serviced remotely as well: laudromat owners can go online to monitor performance and check filters, water temperature and usage patterns. This remote service attendance reduces the need for expensive on-site repairs.

IBM
www.ibm.com/press

CNET
“IBM LAUNCHES SMART-CHIP CONSULTANCY”
September 27, 2002

WIRELESS NEWSFACTOR
“IBM Sends Smart Laundry Machines to College”
September 4, 2002