DATA SOUP: THE CLIENT IS THE SERVER
By Kevin Werbach

When it comes to personal (or personally selected) information, the Net has begun to shift beyond the client-server paradigm toward a user-centric model. We call this approach “data soup” (with a nod to the Apple Newton, which used the same term for its file-storage architecture). Data soup means that from the end-user's perspective the data are simply “there,” whatever that means in a physical sense.

Behind the scenes, data soup is actually a collection of different architectures: in some cases direct peer-to-peer connections between machines, in others information on servers synchronized with client-based repositories. What's important is the new emphasis on getting the data to where it's needed in the most efficient manner, without users having to differentiate local from remote content or know how it happens. This seemingly minor change has many consequences, some obvious and some not, because so much current thinking is built around other models.

In cyberspace, everyone is connected to everyone else, and just about anyone capable of receiving information has the ability to send it. Yet at the same time, each user has unique needs, interests and technical capabilities, and everyone engages in a range of activities with varying requirements. It may make sense to handle my address book differently from my music collection, even though both can be managed online.

The Net overcomes this tension between universality and heterogeneity, because it is built around open standards that are both open and standardized. New applications, content forms, even entire networks can be deployed over the Net without disturbing its foundations, so long as they are consistent with certain architectural principles.

Above the infrastructure layer, what shapes the appearance of the Net is what people want. The Net gives users more choices than they could possibly cope with if they had to sort through them all. So increasingly, these choices are tailored, filtered, selected...personalized to match user interests. =====>

FAREWELL HELEN!
Personalization technologies give everyone a unique experience even at the same site (see Release 1.0, 9-98). But personalization isn't enough.

The data soup idea goes beyond personalization, because the network itself becomes personal. The division between remote data repositories and local storage on client machines disappears, as users themselves shape the virtual topology of the network around their interests and circles of relationships. Many legal structures and business arrangements aren't ready for this new environment, so there will be tensions and confusion as the details are worked out. This is most evident today in the conflict over sharing of digital music files in MP3 format (see page 8).

Machines vs. people

The Net, like any computer system, comprises three elements: people, machines and information. The machines' job is to get the right information to the right people, and to process it as those people desire. But how best to do so? It quickly gets complicated. At the infrastructure level, the Net is defined by the principles of open, end-to-end architecture (see Release 1.0, 5-99), though new developments such as closed broadband networks and distributed content-delivery platforms (see Release 1.0, 2-99, 12-99) are putting pressure on established assumptions. In this issue, we focus on a different layer of information: the content users see and think of implicitly as "theirs."

One inescapable dynamic of the computer industry is that the number of machines is growing faster than the number of people. The mainframe days in which many people shared one computer gave way to the PC era of computers for each individual, which is now giving way to the pervasive computing era in which each person interacts with several computing devices. And thanks to the Net, every user can now manipulate and make use of information stored on thousands of servers around the world.

Each of these computing paradigms brings with it different relationships between individuals and "their" data. In the old dumb-terminal days, information resided only in one place -- the mainframe. With client-server the balance shifted, allowing some processing and functionality to be distributed among local and remote machines. The Web, by reducing client software to a universal browser, seems to herald a return to some dumb-terminal concepts, but the reality is different.

The Net is not one-to-many or many-to-one; it's many-to-many. Desktop PCs have enough horsepower to be their own servers for low-volume information transfers, as long as the Internet connection is fast enough. And every Internet-connected device is potentially able to communicate with every other, not just with a single host. That changes everything. To understand how, and why this matters, it's useful to start with the concept of personalization.

As we've noted before (see Release 1.0, 9-98), the distributed environment of the Net means that the only fixed point in the virtual solar sys-

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1 We discussed a related development, Internet-centric "post-groupware" applications, last year (see Release 1.0, 6-99). While those services represented a shift in the nature of applications, the data-soup notion concentrates more on the changing treatment of information.
tem is the user. The difficulty is that each user is his or her own center, so it's inefficient to build specialized maps of the space around each one, and there are many cases where it's valuable to combine users and aggregate their information for particular purposes. Moreover, because the Net is a distributed environment, encompassing a multitude of sites, networks and distribution platforms, users must be able to take their identities with them as they move around.

IN SEARCH OF THE DAILY ME: PERSONALIZATION GETS PERSONAL

The archetype of personalized content is what Nicholas Negroponte and others have called the Daily Me, a newspaper assembled on the fly to match a given user's interests. I read the New York Times every day, but I get the same front page as everyone else, even though, say, I'm particularly interested in e-commerce, professional basketball, the weather in New York City and Israeli politics, and not at all interested in some other topics that frequently make the front page. The editors at the Times decide what they think is important every day when putting together the paper, but because a Web page is infinitely flexible, I can now get just the stories I'm likely to want online.

Personalized news and information sites such as MyYahoo! go some of the way toward that vision by allowing users to choose headlines from checkbox categories. Sites that offer personalized content generally find that users who personalize view more pages, stay around longer and engage in more transactions than users who do not. On the other hand, several ambitious efforts to deliver personalized content as a standalone service, including PointCast and Newspage, had a difficult time gaining sufficient support, especially when users had to pay for the service.

Web aggregators

Portals became popular because they assembled content and services, making it easy for users to find things without having to jump from site to site. But portals have their limits, and they have business incentives to provide the resources that are most lucrative for the portal, which aren't necessarily what users want. In this sense, portals are like desktop software suites such as Microsoft Office. Many users preferred other presentation applications to Microsoft's PowerPoint, but with PowerPoint bundled at no additional charge with Word and Excel, why pay for something else? Application suites are particularly powerful if the applications are designed to work together and share information.

Similarly, you may not be thrilled with Yahoo!'s photo sharing or invitation service, but if you're there already for the Web-based e-mail and the personalized stock tracking, why schlep someplace else? After all, you've already gone to the trouble of setting up an account and uploading your contact information to a Yahoo! address book. Consequently, just as Microsoft Office steamrolled most other desktop productivity applications, portals have either overwhelmed or acquired standalone services in areas such as Web-based calendaring. The companies that have remained independent are generally focused on providing functionality to other sites, rather than competing with portals as destinations themselves.
This integration of functionality in one place is valuable for users. However, no portal is perfect. There will always be some information I find valuable that my chosen portal won't have available, simply because the range of user interests is so vast and idiosyncratic. And in many cases the content is on another site that doesn’t have a deal with the portal I'm using.

One way to give users exactly what they want in one place is to build content and applications with open interfaces so they can be syndicated and recombined however users desire (see Release 1.0, 7/8-99). This is the best solution from a user standpoint, because it offers the greatest flexibility, but it will require many companies to rethink their technology and business models. Things seem to be moving in this direction, though, with many startups building their content and services to be syndicated from the outset.

Several startups have identified an opportunity in aggregating data from many places onto a single page or Website, and have built their own technologies to pull in and reassemble content. We wrote about VerticalOne last year in connection with application syndication (see Release 1.0, 7/8-99), and covered Onepage last month (see Release 1.0, 3-00. Disclosure: Kevin Werbach is an investor in Onepage.)

Right now the Web aggregation space looks extremely crowded, but it's bound to settle down, shrink and clarify over the next year as the players refine and differentiate their business models...and as some merge or disappear. VerticalOne, the first out of the gate, has already been purchased by online banking technology provider S1, and Yodlee, which launched with great fanfare last year, has shifted from a consumer-destination strategy to focusing almost entirely on plugging into partner offerings such as vertical portals and wireless services.

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The market seems to be dividing between those companies concentrating on personal account information -- credit-card balances, stocks, airline frequent-flyer miles and so forth -- and those aggregating and transforming public content and applications. VerticalOne and Yodlee generally fall in the former category, as does EZLogin; the latter includes Octopus, Onepage, CallTheShots and soon-to-launch Kurion. Related services, such as Katiesoft and Quickbrowse, download and display multiple Web pages in the same browser window, but because they operate at the level of a page, they are less useful than the finer-grained aggregators.

**AudioBasket: personalized audio news**

Web-based personal news pages allow users to pick the topics they want to read about, but what about those people who get their news through the radio, or would prefer to hear information rather than see it on a screen? With the growing popularity of streaming audio on PCs, and devices such as portable MP3 players and standalone Internet radios, there are many outlets for audio news that is personalized and aggregated in the same manner as personal portal pages.

AudioBasket, a San Francisco-based startup, will launch a service this month that does just that. The company has raised $4 million, led by Rock Creek Partners. Co-founder and CEO Kim Fisher got her MBA from the Haas School at UC Berkeley then spent three years in Lithuania starting in 1994. She founded one of the first Internet startups there, a Web development company eventually acquired by Motorola.

AudioBasket will offer its service as a plug-in to portals and vertical content or commerce sites. Users will be able to select categories of content, specific content providers, or even specific content to add to their baskets, and then the service will stream down a personalized audio newscast. “We like to say we let people pull information,” in comparison to the push architecture of other personalized news and information services, says Fisher. AudioBasket is able to personalize at a fine level because it gets text transcripts of its content in addition to the audio files, which it indexes and tags to specific segments of the audio.

Do users want to pick specific stories and topics, or are they content choosing a trusted information provider to package news for them? Both, says Fisher: “The way our initial beta testers are using the service is a combination of knowing exactly what they want on a certain topic, and ‘I like getting news from the BBC and I want to know what’s going on in the world’.” In other words, the typical user selects a set of specific topics and then a “catchall” general news provider.

The fact that the information is delivered in audio format changes the nature of the user experience. “The big plus for audio is that you can listen to it while you are doing other things,” Fisher notes. “You can listen to it while on a run or at the gym...or even at the desktop while checking e-mail.” Statistics back this up. According to Arbitron, consumers 25-54 listen to an average of more than six hours per week of news and talk radio, and the average American listens to radio for more than three hours every weekday.

AudioBasket will offer a content downloading option for MP3 devices so that users can take advantage of the service in a car or while otherwise
away from their PCs, and the company also plans to stream personalized content to mobile phones. Because it’s just audio, the wireless service doesn't require any special data service on the phone.

For content, AudioBasket has partnered with ABC News, Bloomberg, the BBC, the Wall Street Journal, Newsweek, the Associated Press and the Financial Times, among others. Fisher says the structure of the deals depend on the partner -- in some cases AudioBasket gets the content for free, since it expands the content provider's reach, and in other cases it pays licensing fees and/or provides the content provider with anonymous data from its subscribers about what content users select. AudioBasket generates revenue by embedding audio commercials throughout the news stream.

### iKimbo: personal communities

Though communities have flourished on the Net (see Release 1.0, 6-93, 7/8-93), it can still be difficult for groups of users sharing common interests to organize, communicate and share information. One reason is that virtual communities exist wherever their users are, so requiring everyone to come to a central Website adds an unnecessary layer of complexity.

iKimbo, a startup based in Reston that has raised $2.25 million from Draper Atlantic and PTEKVentures, hopes to overcome this problem with a novel distributed service set to launch in the next few months. iKimbo's client application is only 99 kilobytes in size, making it easily distributable through e-mail. When the client is launched it downloads community-specific elements and additional components automatically. The platform will support features such as chat, instant messages, e-mail lists, calendars, photo galleries and targeted e-commerce. Ceo Jamey Harvey thinks iKimbo could be one of the most viral Internet services ever, because every user has an incentive to distribute it within and between communities.

### PERSONAL MUSIC: THE DIKE ABOUT TO BURST?

Entertainment is inherently personal, in that people select content and categories of content that appeal to them. Then again, all existing entertainment media is based on the idea of packaging. The content provider organizes information into bundles that the audience can choose among, but the audience's freedom to choose at fine granularity is limited (see Release 1.0, 11-99).

On the radio, for example, you can choose which station to listen to, and by flipping between stations you can select among several concurrent songs. But you can't pick an arbitrary list of songs as a station’s playlist. You can create your own mix tapes from your CD or tape collection, but that takes time, requires you to buy the full albums, and is limited by the capacity of tapes or whatever medium you’re using.

The advent of digital music in MP3 format has terrified the established media world, because it threatens an end to that filtered, packaged media model. The industry understands that its current economics aren’t sus-
tainable in a world where users can select songs individually, especially if users can get those songs for free without copy protection.

But MP3 has so far been more sound and fury than truly transformative force. This is because, though MP3 makes it possible for users to create their own personal media, it doesn’t necessarily make it easy to do so. Even without MP3, anyone can now purchase a CD burner for a few hundred dollars and make illegal copies of his or her friends’ music. Similarly, most consumer software isn’t copy-protected these days, which means anyone can make an illegal copy. Most people don’t, for various reasons.

Some are afraid of being caught and punished (especially in a corporate environment). Some believe using products they haven't paid for is wrong. Some feel making illegal copies is unfair to the artists and developers who created the content. Others have no such moral qualms, but find the effort involved in locating and copying the applications or the products too great. For others, the presence of documentation and technical support make the legal approach more appealing.

Because of these factors, the music and software industries have historically achieved an equilibrium in which legal sales thrive despite the absence of strong copy protection.

Napster: throwing gasoline on the fire

Napster may shift this balance. It's not the first application that makes it possible to share music; it's the first application that makes it truly easy to do so. Napster executives won't divulge registered user numbers, but they believe Napster is the fastest-growing Internet service ever, with a user base expanding at five to 25 percent per day since Napster's release last August. On a typical day 200,000 people download the client from the Napster Website, and over 400,000 connect to the service simultaneously (a level it took ICQ over 14 months to reach). This from a company that has so far spent nothing on product marketing.

Napster was originally developed by Shawn Fanning, a 19-year-old college student who wanted to simplify the process of sharing MP3 files. As Napster's popularity exploded, the company raised initial financing from Angel Investors and others, brought on Eileen Richardson from Atlas Venture as ceo, and set up shop in San Mateo, CA. (Disclosure: Esther Dyson is an investor in Angel Investors.)

“We are at the very beginning of a huge shift,” says Richardson. “The Internet is giving end-users more control in many ways. And they are loving it.” The genius of Napster is its distributed architecture: Unlike FTP sites or Web-accessible file repositories, Napster doesn't store any music inside the network. It builds a virtual directory that points to all the music currently available, but the files themselves are transferred peer-to-peer between users' own machines. A Napster user connects to the service, types in a search query, and sees a list of available tracks. Once a user receives a file, it is automatically viewable and downloadable by everyone else, along with other tracks in the user's shared local directory.

With a broadband connection and a multi-gigabit hard drive -- both now available at consumer price points -- a Napster user can assemble several
hours of music in one sitting. Launch an MP3 player such as Winamp or RealJukebox, select the “random” option, and voilà: your own private radio station, playing only music you like, without commercials, traveling with you wherever you take your laptop or MP3 device. This level of control, and the instant gratification of getting exactly the track you want, represents a fundamental change in the way people experience music.

While Napster has been using the peer-to-peer approach to ease the exchange of music, other companies have launched complementary services that also blur the line between local and remote content. MyPlay gives users personal Web-based “storage lockers” for their music, making it accessible from anywhere. MP3.com's new Beam-it service is similar, but with a twist. A user can place a CD in his or her CD-ROM drive to verify physical ownership, and Beam-it will make the contents instantly available online from a server-based repository. To save time, the music isn't actually transferred from the CD; the digital copies are virtually identical to the originals. In the data soup, after all, music is just a collection of bits; the physical location is of fading relevance.

Those pesky intellectual property issues

Now, of course, there is the minor point that downloading copyrighted music you haven’t purchased is illegal. Napster can transfer MP3 files that are freely available or already owned on CD by those downloading them, but of course most of the traffic is in illegal copies. The Recording Industry Association of America (RIAA) has sued Napster for contributory copyright infringement. (It has also sued MP3.com over Beam-it.) Napster’s response is that it is simply a directory, and that like an Internet service provider, it shouldn’t be held responsible for the illegal actions of some of its customers. The case is pending.

Whether the court finds the situation similar to the Diamond Rio MP3 player, which prevailed against the RIAA because it simply played digital music files, or similar to the ICraveTV service in Canada that was shut
down because a court concluded re-broadcasting television programming over
the Net was a copyright violation, a door has been opened. The millions
of Napster users won't simply go away. “We felt all along that all we
had to do was get to the place where people couldn’t ignore us, and they
would invite us to the table,” says Richardson.

In public, the record labels argue consistently that Napster encourages
theft and defrauds artists, but Richardson sees signs that they recognize
the more positive potential of the technology. “They understand that
Napster has built a brand that is cool and grassroots,” she notes.
“These guys understand that. They get consumer branding.” She likens
Napster to an alternative band that must deal with a label in order to
reach a mass audience, but is mindful about being perceived by its fans
as selling out.

Is the horse out of the barn?

Napster is one of those relatively incremental innovations that passes an
invisible threshold and spawns a revolution, like the PalmPilot, the
Apple Macintosh and the Mosaic Web browser. Whether Napster prevails
against the RIAA or is shut down matters a great deal to the people
involved in the company. But file-exchange services like Napster will
continue to grow in popularity regardless.

Independent developers have already released several Napster clones that
allow sharing not only of MP3 audio files, but of other forms of media
as well. Organizations such as the RIAA may slow use of these services,
especially by companies, just as the Software Publishing Association and
other groups have limited illegal software copying. In the real world,
though, piracy continues, because it's impossible to control every user
without imposing excessive burdens on legitimate customers.

Last month some employees of Nullsoft, which developed the Winamp MP3
player and was acquired by AOL last year, released a beta version of an
application called Gnutella. Gnutella is similar to Napster in function-
ality but almost impossible to regulate because it operates entirely in
peer-to-peer mode, without any central directory. Machines running
Gnutella, called servants (a hybrid of client and server), link together
in a chain. Connect to any other servant, and you see all the other
servants it links to, with full access to files on all of them.

The official Gnutella site was taken down immediately after the beta
announcement under pressure from AOL, but copies of Gnutella are readily
available on several other sites, and other developers are working to
reverse-engineer it so they can build similar applications.

Toward a new equilibrium?

The fact that these services are difficult or impossible to stamp out
doesn't mean that the music industry as we know it is doomed. All elec-
tronic media can, in theory be copied, and any digital media can be
copied perfectly. Fights over piracy have erupted in connection with the
videotape, consumer software and the audio cassette tape, but the level
of piracy has been sufficiently limited that content creators and dis-
tributors haven't gone out of business.
Napster, Gnutella, et al. are much easier than other mechanisms for sharing pirated MP3s, but they still require some effort. Tracks may be damaged, mislabeled, or cut off in mid-download when the other party logs off, and downloading a single file isn't always a substitute for a complete album. And even though some laws, such as speed limits, are routinely violated, the fact that downloading copyrighted music is illegal (and may deprive artists of revenues for their work) makes many users think twice about doing so even when the risks of punishment are minimal.

The real question is whether the existing packagers and distributors of commercial music are adding value or are just extracting revenue from inefficiencies in the present market structure. The Net doesn't destroy all middlemen; only the ones that add nothing to the value chain. “For all of the argument about copyright, it's essentially a big stick you keep in the closet,” says Clay Shirky, professor of new media at Hunter College. He continues: “There are business models that treat piracy as an indication of untapped demand, rather than illegality.”

Launchcast: radio gets personal

Music is typical of most media. Consumers develop a taste for certain content, and that taste becomes more refined over time (though it may also shift and evolve). Most of the time, people want to hear things they are familiar with, but they also want to hear new things from time to time that expand and update their library. Thus, having your own music collection is no substitute for listening to the radio. Even if everyone used Napster to assemble a personal music collection, there would be room for third-party streaming music services on the Net.

Several companies, including Spinner.com (now part of AOL), WWW.com and NetRadio, offer genre-based Web radio services. Another group of services, including Nullsoft's Shoutcast and the open-source Icecast, turn users into DJs, allowing people to offer music streams for listening by others. But with thousands of channels, how to find one that matches your tastes?

Launch Media's Launchcast service, unveiled in February, combines open content aggregation with personalization techniques into a unique hybrid. Launch has been in existence since 1994, originally as a distributor of an entertainment-oriented magazine on CD-ROM. In recent years it has, unsurprisingly, shifted its focus to its Net-based music and entertainment portal at Launch.com.

Each Launchcast user creates a personal radio station, starting either with a random selection or by selecting songs, artists, genres, offline radio stations or other Launchcast stations. In other words, as with Napster, every content consumer is also a distributor. Users can rate everything they hear on a scale of one to 100, and the system uses those preferences to personalize the music it delivers. The more ratings the user provides, the more the station conforms to his or her tastes. Users can also fine-tune how often the system serves new music they may like versus songs they already know.
Record labels argue, with some justification, that they act as filters, searching out undiscovered talent, supporting promising artists, producing albums when only a small percentage become hits that recoup the investment, promoting stars and so forth. It's back to the old problem of too many choices. In a disintermediated music industry, where artists and consumers dealt with each other directly, how would people differentiate good content from bad and find music that matched their tastes?

Napster and its progeny will force the music industry to change or face economic consequences, just as Microsoft's free browser pulled the rug out from underneath Netscape. But change is not the same thing as extinction. And though Napster and MP3.com may value the buzz their renegade status brings them, they still have investors and balance sheets. If they want to reach their potential as businesses, they will eventually have to meet the record industry somewhere in the middle.

Most consumers will still pay for commercial music most of the time; even without the middlemen, there must still be some financial return for the artists. The division of the economic pie between consumers, artists and labels may shift, but the biggest difference will be the voice that consumers themselves have as packagers, aggregators and tastemakers alongside the professionals.

More than music

Sharing music is the first killer app for personal peer-to-peer information exchange, but it's not the only one. Napster itself is designed for MP3 files, but competitors such as Scour Exchange extend the model to pictures and video clips, and there's no reason why a similar approach can't be applied to all types of files that people wish to share.2

Isn't that what the Web itself was supposed to do? The Web does allow people to share files by posting them on Web pages, from which anyone can download them. But the person who wishes to make the information available has to establish a site with sufficient hosting space, create a Website, upload the content, keep it updated and make it searchable.

In the peer-to-peer model, by contrast, any client machine connected to the Net is also a server, so making information available and accessible through a search engine is simply a matter of connecting and designating a shared directory. Already, genomics researchers wishing to share large data stores of human genome information are looking at peer-to-peer applications as a more efficient mechanism than the Web.

Napster's Richardson views the potential of peer-to-peer networking expansively: “The future is where you don’t actually need a Website or Web server, because people will be able to publish off their hard drives the pieces of information they want to share with the rest of the world.”

2 In addition to peer-to-peer file exchange applications, there are also Net-based distributed computing projects such as the SETI@Home effort to search radio astronomy data for signs of intelligent life. Here the goal of information sharing is to achieve a shared objective, rather than to move content around.

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THE NEW IDENTITY INFRASTRUCTURE

The data soup needs a way to make sense of whose data is whose, and to keep that data separate and secure according to user preferences at several levels of granularity.

Multi-lateral personalization requires new mechanisms for dealing with personal data. In a face-to-face relationship, or even in a bilateral transaction online, the two parties can exchange information and set the terms of the interaction. As they develop a relationship over time, they can dispense with some of the formalities and with information the other party won't be interested in. Set up your one-click ordering account and buy some merchandise from Amazon.com, and you'll get personalized recommendations and the ability to make additional purchases without re-entering your address and credit card number.

All well and good, but this approach doesn't scale when users start interacting with many sites and other users, some of them only occasionally. The inconvenience of filling out user information repeatedly and remembering multiple passwords is only the beginning of the problem. When your address or credit card changes, you have to do it all over again. And if, instead of just Websites, you need to exchange information with other people, you're still stuck in the stone age: retyping business cards or pasting information from e-mail messages.

The basic problem is that user information resides locally, in the physical world, even though interactions are taking place through the remote servers of the Internet. And when once the information has been sent somewhere or used remotely, it is no longer automatically updated.

The solution is to make it possible for users to put their contact information on a server, retaining a single username and password pointing to it. (Interestingly, this is in some sense the opposite of the Napster architecture, which keeps the content on local PCs with only the directory pointers stored on the server.) With such a system in place, people can exchange information with each other or with sites simply by means of their universal ID, and when that information changes it can automatically be updated everywhere.

These identity structures don't address the related problem of being sure that someone is who she says she is. A password offers some security, but beyond a certain point additional mechanisms are needed to verify the identity of the parties. That's where digital certificates come in (see Release 1.0, 2-98). Certificates still aren't widely used by individuals, though they are becoming more prominent in business-to-business transactions. Verisign's pending acquisition of Network Solutions, bringing together the company that manages the database of Internet generic top-level domain names with the leading digital certificate provider, might speed the adoption of certificates. Ease of use and integration with applications and Websites will have to improve, though, for consumer adoption to increase.

Firefly, with its Passport service, had a site-independent identity management offering almost three years ago (see Release 1.0, 2-98), but it never gained critical mass. Firefly was bought by Microsoft in 1998. Passport is now available as a single sign-on mechanism for services
under the MSN umbrella. Similarly, PlanetAll offers server-based address books as part of its community-oriented service, but like Firefly it was acquired by a company (Amazon.com) that has its own business objectives.

This being the Internet, a new crop of startups has arisen around similar ideas, though each has a slightly different spin. The difficulty for all these companies is distribution. A universal ID works best when it's, well, universal. Having three or four different IDs, even if each of them is good at many sites, is still much more confusing than having one. Plus the ID providers have to convince partner sites of the value added.

The most highly trafficked sites hold most of the cards, because any universal ID provider they select will be on the positive side of the increasing-returns network effect. The one saving grace for the startups is that, though the large sites may seek to acquire providers of this technology (much as Microsoft bought Firefly), none of them is large enough to create a standard all on its own. An ID service that is part of any one of the Net's superpowers will be viewed warily by the others, creating an opening for new players such as those below.

PlanetID

PlanetID, a 12-person startup based in Sunnyvale, CA, was founded in August and is currently in beta, with plans to launch its service in May. Its first-round financing was led by SunAmerica Ventures. Co-founder and interim ceo Joyce Thom was formerly responsible for managing the online transaction business at Intuit. She says the problem PlanetID is tackling starts with the fact that “every day people have to exchange information with other people and businesses, and businesses have to exchange the same information with each other over and over again.”

Users of the PlanetID service select their own unique PlanetID and then enter information, including contact data and other personal identifiers and preferences, into an encrypted password-protected space called the vault. They can set rules to allow pieces of information to be automatically given out on request, or only with their approval. When a request comes in (for example, from someone adding the user's PlanetID to his or her address book on a partner site, or from a company such as an airline looking for a frequent-flyer account), the user is notified and can decide whether or not to approve the disclosure.

Life events such as a marriage or changing jobs can trigger automatic notifications to a user's contacts, ensuring that information is current, and also helping friends, families and business colleagues stay in touch. Thom says initial users see the ability to stay up-to-date with friends as the biggest benefit of having a PlanetID, and adds that this is what makes the service likely to be so viral.

Thom says PlanetID hopes to distinguish itself from competitors by offering support for all sorts of information, not just contacts, while remaining focused on the universal ID functionality. She sees other services, such as online address books and calendars, as already well handled by existing providers.

In addition, says Thom, PlanetID positions itself as partner-friendly, because it doesn’t intend to compete against potential distributors of
its service: “Our approach is to create an infrastructure to enhance other applications rather than to create applications ourselves. Our goal is to enhance address books, form-fillers and wallets by offering the most comprehensive, up-to-date information available and to keep it up to date automatically.”

PlanetID plans to generate revenue by sharing advertising and commerce revenues with its partner sites, and through premium services such as customer record management. Thom says the company will also offer targeted services to boost user adoption, such as a service for people who move that automatically notifies credit cards, magazines and financial services companies of a new address.

Contact Networks

Contact Networks was founded in August 1998 by Arnon Dinur and Eyal Hertzog, two Israelis living in Silicon Valley. (Hertzog worked at quality of service software vendor CLASS Data Systems, which was acquired by Cisco and profiled in Release 1.0, 6-98.) Recognizing the need for more seasoned management, they recruited Andy Halliday, former vp and gm of Excite@Home's e-commerce group, as ceo. Contact Networks has received $13 million from Accel Partners, Polaris Ventures and Sum International, and its service is now available in public beta form.

The company is initially taking a downloadable software approach, delivering its service through a personal information manager (PIM) that synchronizes with other PIMs such as Act! and Microsoft Outlook. The Contact Networks software automatically updates contact information from its Web-based records, ensuring that information is up to date.

“No one had really delivered an Internet-enabled address-book client application,” says Halliday. He was initially reluctant to leave Excite@Home, noting that he took the call from the headhunter only because he used the name of Halliday's personal trainer as a reference. But Halliday was eventually persuaded to join Contact Networks, and he brought along Excite@Home vp of engineering Adam Hertz to head up product development. Dinur and Hertzog started by building an Internet-enabled contact-management client, to which Contact Networks has now added the server-side components. “What we're really architecting here is a network service that allows people to be connected to others, and to stay connected,” explains Halliday.

Contact information such as e-mail addresses and phone numbers are the basic identifiers around which Contact Networks' service revolves, but Halliday sees the potential as much greater: “We aspire to be a gateway for communications and transactions, because we’re the nexus for exchange of personal information.”

Contact Networks is in the process of adding other features such as integrated communications and messaging, plus a new user interface to its client, with a release targeted for June. It is also developing wireless interfaces, which Halliday sees as a large opportunity. “We become the community model for wireless, because we have in our architecture a permissions model, which allows you to define various levels of intimacy,” says Halliday. Users can select what information to give out, and how to establish communications with particular users or groups of users.
service will also offer wallet functionality so that wireless users need not enter personal information and credit-card numbers for every transaction (a service for which Contact Networks plans to charge a small per-transaction fee).

Contact Networks is unique among its competitors in offering a downloadable Windows desktop client, though the company will soon release a completely Web-based version. Halliday agrees browser-based access is important, but sees hidden benefits in having a client as part of the service. Contact Networks' client automatically synchronizes data with other personal information managers (PIMs) such as Microsoft Outlook, rather than trying to displace these existing applications. Halliday points out that any company that wants to sync with users' local contact databases, even for a Web-based service, must use some client-side synchronization software.

Halliday argues that whereas music files are best played locally from a hard drive, thus making Napster's peer-to-peer model effective, contact-based services can more easily be scaled through replicated databases that provide connections to up-to-date information both locally and through network-based access mechanisms. When two Contact Networks users link to the same contact, the database automatically collapses the two records into one, with multiple pointers. Thus, even though the total number of user relationships in the system grows exponentially, the number of records stored in Contact Networks' databases expands more slowly.

Zkey

Zkey offers an interesting combination of a Web-based personal identification and contact management service with additional applications such as calendaring and file storage. The company, which is based in Los Angeles and currently has about 60 employees, was founded in September 1998. The company has raised $19 million led by Zone Ventures (the Los Angeles affiliate of Draper Fisher Jurvetson), Bear Ventures, Ridgely Capital, France Telecom and Oracle.

President and coo Jay Udani, who co-founded the company with ceo Nick Desai, believes virtually all personal data -- contacts, demographic information, schedules, files, and so forth -- is best managed through an Internet-based service. “All of these things need to be stored in one central place,” he says. “So if you as the user need to change something, you go to one place and change it, and anybody who has access to that data will automatically have the most updated information.”

Each user selects a free alphanumeric Zkey for a unique identifier. As with Contact Networks and PlanetID, users sync their personal data to a Web-based repository and can control which information is disclosed to third parties. “We simplify information exchange, very much like the credit card did for cash,” Udani says. He emphasizes the flexibility of Zkey’s data architecture, which stores all information fields in XML (see Release 1.0, 5-98). In addition to standard contact information, if I want to include, say, my favorite pizza toppings, I can do so even if no one else in the system has the same field. The Zkey Website includes integrated e-mail, address books, calendar and scheduling applications and conferencing, all of which leverage the underlying universal ID.
Zkey's use of XML, and of Java for the server applications, makes it easy for the company to support other platforms beyond the PC. The single identifier system is particularly valuable for wireless devices, whose small screens and limited keypads make it difficult to type in full addresses or credit card numbers. Zkey already supports the Wireless Access Protocol (WAP) (see Release 1.0, 4-99), and it will integrate directly with handheld devices running KVM, the Java virtual machine for embedded and handheld devices. The company recently signed a deal with Casio to load Zkey on all Casio Cassiopeia Windows CE-based PDAs out of the box.

Udani acknowledges that universal ID systems are most effective when they have large numbers of users, but he thinks Zkey offers enough functionality for early adopters to make use of it. Beyond the inherently viral nature of the universal ID, Zkey is depending on its breadth of distribution partnerships to achieve critical mass. Its existing partners, in addition to Casio, include Corel, Hollywood Stock Exchange and Virgin, with other deals in process. Udani says Zkey currently has distribution deals putting its service in front of 2.5 million users, and expects deals reaching five to ten million by the end of the year.

Zkey plans to make money by using the information it has to deliver targeted e-commerce. "We can deliver you concierge level recommendations that turn commerce into a yes or no question," promises Udani. For example, if I want to schedule a trip, I can use the Zkey calendar to find the most advantageous flight, and automatically have my preferences about seats, meals, frequent-flyer accounts and more linked to the reservation.
SCALING FROM THE BOTTOM UP

Data-soup architectures represent an exciting experiment in self-organizing complexity. These are bottom-up phenomena, gaining strength and scale from the independent decisions of many distributed users rather than any central authority. Because users of most of these new services are also producers and distributors, feedback loops are everywhere. The sense that your information is wherever you need it is an emergent phenomenon; the basic mechanisms by which data are stored and transferred around the Net haven't changed.

As Novell's Eric Schmidt pointed out last month (see Release 1.0, 3-00), the number of relationships in a network grows much faster than the number of users. The value of personal information such as your contacts or the music you'd like to share with your friends grows along this exponential curve. As content is shared from individual to individual, it spirals out among networks of friends, friends-of-friends and so forth.

Where exactly this will lead is anyone's guess. Shirky of Hunter college argues that "content that's created at the edges is going to stay at the edges wherever the user base is small and well-known," but acknowledges that small user bases can overlap in a "cascade of hierarchies" that touches virtually everyone. Remember, we're all divided by only six degrees of separation.

New structures and behavior patterns are bound to emerge. In entertainment, for example, some hits will emerge bottom-up as the virtual distance between users shrinks. If you want to evaluate a person, a company or a review, maybe you'll check how close the source is to you and to others you trust in the virtual relationship space.

All this will develop over time. And the growth of the data soup will parallel, rather than replace, the continued development of more familiar client-server structures on the Net. All that's clear is that users will have a new set of choices. The rest is up to them.

COMING SOON

• The Net in the educational process.
• Voice portals.
• Invasion of the weblogs.
• And much more... (If you know of any good examples of the categories listed above, please let us know.)
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June 28-30 eMediatainment World - Los Angeles, CA. Contact Catherine Taylor, (800) 535-1812; strategicailles@hotmail.com; www.emediatainmentworld.com.

* Events Esther plans to attend.  # Events Kevin plans to attend.

Lack of a symbol is no indication of lack of merit. The full, current calendar is available on our Website, www.edventure.com. Please contact Joanna Douglas (joanna@edventure.com) to let us know about other events we should include.
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