SAP IVR/WWW Demonstration System.

SAP employees now have access to a demonstration system where they can see and demonstrate the power of integrating telephony and World Wide Web(WWW) access to SAP's R/3 systems. This paper includes details on how to access these demos and the philosophy behind them.

by Robert Wenig
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We are making available a new demonstration system to highlight the open, flexible architecture of the SAP R/3 system. This system will show integrated WWW(World Wide Web) and IVR(Interactive Voice Response) applications working directly off of the SAP system. These programs utilize SAP's newest certified interface, the Intelligent Terminal.

Why the need for a new Interface?

SAP was facing several business hurdles regarding the presentation-level software. There was no provision for user interfaces other than standard desktop GUIs. SAP was losing business to competitors such as Peoplesoft who could provide interactive voice response (IVR) telephone interfaces for their offerings. Similarly, opportunities were being lost for providing other new interfaces such as multimedia kiosks and World Wide Web pages.

More fundamentally, the user interface for many applications was developed for trained specialists. Many reengineering projects restructure work to emphasize both less specialized tasks and greater self-service from customers and vendors. R/3's interfaces could be redesigned to better support non-specialist users, both for desktop and alternative interface technologies.

R/3 already provides several application programming interfaces (APIs) to support application extensibility. For example, a remote function call interface provides similar capabilities to many remote procedure call systems, and is accessible on PCs via OLE Automation. However, the existing interfaces have three principal barriers:

1. The business rules in the application software are only fully accessible via direct interaction with the SAPGUI, not through the existing programming interfaces.
2. Thus, programmers usually need to learn ABAP/4 as well, requiring long learning times to become familiar with the R/3 system and development environment.
3. The application must explicitly add support for the API in the case of ALE, RFC.

The Intelligent Terminal

We have developed a new integration technology for the R/3 system by programming directly to the SAPGUI through an intelligent terminal interface. The current SAPGUI communicates with the application server through a terminal-like protocol, evolved from the mainframe heritage of the predecessor R/2 product. On Windows systems, the SAPGUI interface currently consists of two executable files. We have converted one of those executables into a 32-bit dynamic link library (DLL) with three entry points. We then developed a C-language API on top of this DLL. The API is similar to other screen-scraping programs that take the contents of the screen and make them accessible through standard data structures and function calls. We further expose this API to application developers and systems integrators through a variety of interfaces including OLE Automation and TCP/IP sockets with an intelligent, interpretive language.

By programming the SAPGUI directly, we circumvent both the learning curve and business rule problems. To build a new interface to an existing application, one just needs to learn how the application is performed with the existing interface. Instead of learning an entirely new programming environment, one only learns how to use a new API within the existing programming environment. The SAP-specific knowledge required for developing a new interface can thus primarily reside with the users of the system, rather than with the programmers of the new interface. Intelligent terminal programs work primarily with transaction codes, function keys, and the labels of the controls that appear on the screen. In 3.0C and beyond, the application server to terminal server protocol has been enhanced to include 'Database Field Names' in the protocol. This enables a developer to build applications which are not affected by language translations.

Current Usage

Partner companies have developed several new application interfaces with the intelligent terminal. These interfaces were developed in a few days. Prior attempts with existing interfaces to R/3 had failed after several months of work. SAP demonstrated kiosk and telephone interfaces for self-service human resources transactions such as address changes at the 1995 Sapphire user conference. A pro active interface for service monitoring is part of Andersen's DAVINCI demonstration. The software monitors the plant management system and can call or fax the responsible party when it sees that equipment is failing too frequently. A kiosk application for self-service entry, update, and review of personnel qualifications is currently under development.

Within SAP, we have demonstrated telephone and Web interfaces for monitoring the status of problem reports that one has entered into a vendors problem-tracking system. We have implemented a Visual Basic program that can save any R/3 screen as a Visual Basic form, providing a starting point for GUI redesign. The OLE Automation server enables access to R/3 from many Windows applications. As an example, we can now save and replay R/3 interactions to and from an Excel spreadsheet.

What can I see today?

As of February 8, 1996 we are making available IVR and WWW access to the SAP P30 system in the SD areas. We will be looking into augmenting this functionality with some HR applications and we will look

into other technologies such as electronic forms.

How to Access?

In order to access the IVR(telephony) demonstration all you need is a telephone. That's the beauty of IVR integration – selected data from the SAP system can be made available for inquiry or update to any user equipped with a touch-tone telephone.

In short:

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Dial 1(415) 286-6957
Enter "1234" as the user and "1234" as the password.
Select Option "1" and use salesorder number "123"
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You may elect to receive other reports via fax.

To access the Internet demonstrations will require a few more steps. You need:

- An Internet Browser. Netscape Navigator(standard issue at SAP) is recommended.
- Access to the SAP network. Our demonstration system is inside of the SAP firewall(s). If you can read your email from MLP, then chances are that you have network connectivity.

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  Just to be sure, try "ping 147.204.176.34"
  If you can't ping this address, then you can't do this demonstration.
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- Assuming that you were successful at the above ping, then there is one last configuration step. You will need to set the option 'NO PROXY FOR' address '147.204.176.34'. In Netscape Navigator 2.0 this option appears under "Options/Network Preferences."
- Now, you are ready to give the Internet(intranet) a try.

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  The URL is http://147.204.176.34
  Click on  "COMMERCE"
  Log in using "1234" as the ID and Password.
  (Advanced users may wish to experiment with CALLBACK
  by entering their full ten digit phone number)

  Navigate away.
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Caveats?

This interface is live. We are using the P30 system in Germany as the backend SAP system. P30 is a development system which is not tuned for production usage. If P30 goes down(or the network to Germany, etc) then the demonstrations will not work.

You can test for P30 being alive by pinging '155.56.81.2' or you can attempt to logon to 'HS1012.wdf.sap-ag.de' with a system number of 20.

You may wish to follow the transactions in P30 to show the live linkage of the IVR or WWW access. We cannot generate P30 logins for you.

We have intentionally placed timeouts in the various transactions. For example, we will automatically disconnect your WEB browser after three minutes of inactivity. If this happens to you, you must restart by logging back in.

We are in the process of getting more inbound phone lines hooked up.

We know that these interfaces represent a critical need for our customers. These demonstrations showcase the power of the Intelligent Terminal and the open architecture of SAP. These applications are not 'smoke and mirrors demoware' but rather the template or foundation for solving real world problems.

As a development group, our ability to support individual demonstrations is limited. We've tried to bullet proof the systems administration so that we can gracefully recover from common points of failure(i.e. loss of network, power cycle, etc).

In the near future, these demonstrations will become a base-line part of our IDES systems where they will be professionally maintained and administered.

SAP'S Role?

In general, we view the Intelligent Terminal as key enabling technology – in the same genre as RFC and ALE . We have starting working with our existing partners to promote the use of this technology to solve business needs.

In the telephony area, SAP realizes that a successful telephony implementation requires SAP knowledge along with specialized telephony expertise. Work has begun with telephony providers such as Edify to facilitate this knowledge transfer. In addition, we are working with the consulting companies to bring them up to speed.

In the near future, SAP will also host its first developer's conference where the SAP architecture and all of our interfaces will be explored in detail.

SAP will not be OEM'ing telephony software and supporting the software/hardware combo as this is outside our realm of expertise. It is very important for customers to understand that SAP R/3 is telephony aware and enabled, however the delivery of such a solution will come through systems integrators who use our certified API's such as the Intelligent Terminal.

SAP will be unveiling a complete Internet strategy in the months to come. As discussed in greater detail below, the complexity of creating Internet interfaces pales in relation to the adoption of more complex and dynamic business practices.

The power of the Intelligent Terminal comes from the fact that application developers can reuse complete SAP transactions(no changes are made at all to the app server) while presenting radically different front ends(IVR, WWW) to the end user. Typically these transactions could be geared towards self-service which

involves no end user training.

The reason that we have invested so much time in working with one telephony/WWW vendor such as Edify is that they have the only 'middleware' which allows for multiple front ends to SAP. We created a single back end interface to R/3 using the Intelligent Terminal and the Edify software was used to create the phone and web front ends.

What does SAP get out of extending R/3?

By making R/3 transactions available to phone and WWW users we get more users! Logically, we can treat each phone line or Web Agent as a named user. By enabling our customers to exploit the infrastructure of a worldwide digital network(Phone or Internet), we encourage greater use of the SAP system to manage all phases of commerce.

How does SAP license Alternate Users?

The rate of change in technology continues to increase at warp speed. Our policy of 'named users' may not make sense when you want to enable a 40,000 employee organization to have self-service access only to their HR data.

Pricing is a complex art best solved by consultation with your regional VP.

More info about the Intelligent Terminal

When/where is the interface available?

The Intelligent Terminal is a free interface which is shipped with R/3 3.0C and higher. The interface works on all R/3 systems (i.e. 2.2 and up). Functionality may differ according to R/3 release since items such as database field names only occur in 3.0C and up.

If you need the interface sooner, please contact me for private arrangements.

Who supports this interface?

The interface will be supported out of the development organization in Foster City.

Why Edify?

We selected Edify because of their unique product which enables telephony and WWW access through a common back end. To date, they are the only providers of such technology.

Is Edify a certified partner?

The systems integrator of Edify technology will be using a certified interface to create these applications. The integrator may be a consulting partner(i.e. Andersen), Edify or an Edify VAR or the customer.

How do I get more info about Edify?

Visit their web page at www.edify.com or call John Kurst at (408) 982-2000.

What about other telephony providers?

To date we have shared our interface with TALX and CCS. We believe that our interface is well suited for any IVR package – however we have only the resources to work directly with a small number of companies. We have documented the API extensively – however our API still requires the integrator to have SAP specific knowledge.

What is the power of the Internet?

The best statement that I've heard about the Internet states:

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The Internet makes it as easy for two computers to communicate
in a digital fashion as two humans do on the telephone. Eventually
we will no longer have local area networks or wide area networks --
we will have just one network -- just as we have one phone
system.
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The Internet is infrastructure, the intelligent terminal is enabling technology to aid in the access of the infrastructure. There are other methods to bring together the Internet and SAP.

The issue is not one of technology, rather the issue is – how do we as SAP exploit the power of this infrastructure. I.E. – how do we enable our customers to:

- Conduct commerce on the Internet.
- Broker good/materials.
- Accept payment from intermediaries.
- Arrange for shipment, availability to promise, etc
- Accomplish all of the proper accounting/recording in a secure, robust environment.

Bill Gates speaks often about the removal of 'geography' as a constraint in the all digital Internet world. The technology of JAVA is fascinating for the stock market pundits – solving our customer's needs and

helping them architect their business practices to exploit the enabling technology of the Internet keeps us employed.

What I find interesting is that the structure of the Internet is evolving to an architecture very similar to R/3. SAP has 8+ years of working in the three tier client/server arena with a lightweight client and interpretive applications. Conceptually we will have a much easier time exploiting the power of the infrastructure than our competitors.

What about performance?

The Intelligent Terminal interface utilizes the existing SAP transactions and screens. Our access to data will be slightly faster than the time it takes to operate a transaction by hand. (We get a slight speed advantage since we don't have to 'paint' the screen). This speed appears to be more than adequate for telephony and WWW applications.

What about security?

The Intelligent Terminal API is a tool for creating alternate front ends to SAP. As such, the application developer decides on what functionality to extend. A typical scenario of an IVR application requires the use of a 'PIN'(Personal Identification Number) and password. This is identical to what we do every day with phone mail.

A similar scenario plays out with WWW access.

There is no need to make every user of a SAP IVR app have a SAP login.

The 'marriage' of telephony and WWW through the Edify software also opens up another security channel to help tighten down security. In the WWW demonstrations capability we can stall the WWW browser until a password is obtained out of band by having the telephony server contact the WWW user at a designated phone. This capability is included in the first release of the SAP IVR/WWW demonstration.

Crystal Ball for 1996

Telephony applications will start using speaker independent, continuous speech recognition to augment the use of touch-tone digits. If you don't believe me, call 1-800-WILD-FIRE and listen to a demo.

Summary

Technology advancements will continue at a rapid pace well into the next millennium. By identifying key customer scenarios the SAP development organization can and will respond to your needs. Your input and feedback is vital to our joint success.

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