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# Strategic Modernization with PHP on IBM i

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[www.SeidenGroup.com](http://www.SeidenGroup.com)

# Seiden Group and Club Seiden

Alan is a leader and expert in PHP on IBM i; leader, Zend's PHP Toolkit for IBM i: and "Performance guru of PHP on IBM i"



**Seiden Group** is a team of experts available for mentoring/troubleshooting/project advice/development.

Club Seiden, ZendCon 2015



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# Founder, Club Seiden



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**Why I like IBM i**

# DB2 database at its heart

- **DB2 built in**

- Transaction processing workhorse
- Database implemented below operating system level!
  - IBM i's "Machine Interface (MI)" between OS and hardware
- Journaling, auditing, commitment control very commonly used
- Never corrupted
  - Doesn't lose data even if knock out power plug

- **Database often taken for granted**

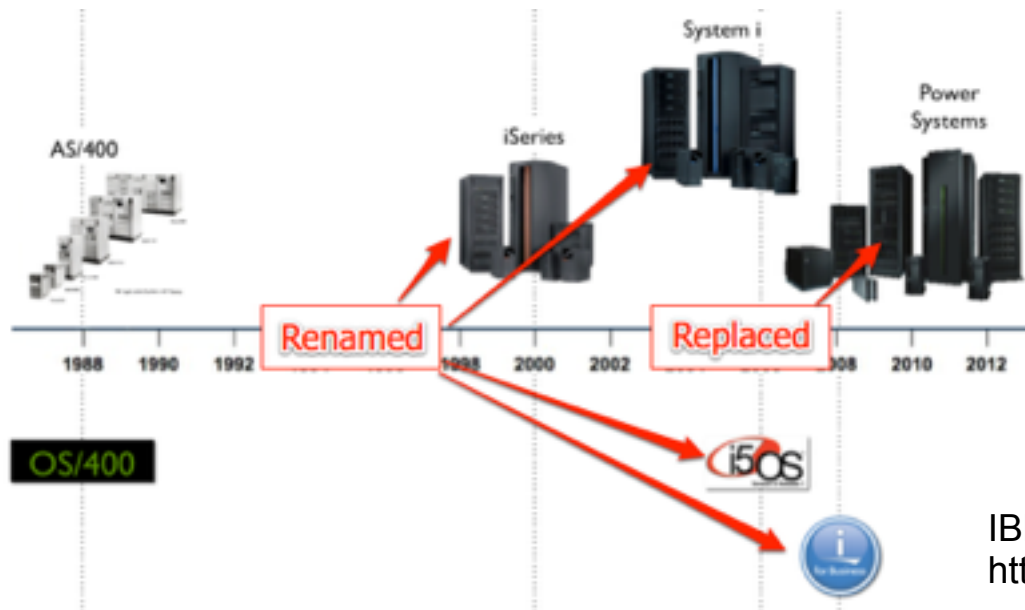
- Self-managing such that DBAs are rare

- **MySQL also supported (Zend DBi)**

- Can connect to DB2 via "DB2 Storage Engine"

# Data and programs last forever

- **IBM has been dedicated to legacy app longevity and data longevity**
  - RPG (and occasionally COBOL) running for 30-40 years
  - DB2 data evolving 30-40 years
  - Middleware insulates applications from hardware changes



IBM i Heritage chart from Trevor Perry  
<http://blog.angustheitchap.com/?p=415>

# Long-serving back ends, new front ends

- **What does this mean to you?**
  - RPG and DB2, mature and evolving for years, can be part of your data model, accessed by PHP
  - Create web GUI interfaces and web services around these venerable resources
    - Business logic is encapsulated in RPG/COBOL/DB2
    - You can keep your hands somewhat clean of business details
  - Case studies later in this presentation



# Nondisruptive business growth

- **Scales vertically**

- One system can handle large and diverse workloads
  - Total Cost of Ownership (TCO), including reduced operator costs, is said to be competitive or cheaper than assembling server farms
- Can activate additional processors without restarting system

- **Dependable**

- Resistant to viruses
  - Object-based system since the 1970s
- Journaling, commitment control, replication, high availability
- Security features galore
- Keeps on running
  - You will sleep soundly at night



**Steve Pitcher** @stevencpitcher

2 Jun

#IBM is impervious to viruses, malware, hackers, mother-in-laws and the zombie apocalypse. #powersystems

**Why I like PHP**

# PHP runs on IBM i, runs everywhere

- **Available for IBM i, Windows, Linux, Mac...**
  - Open source, widely used, millions of sites
  - Facebook, Wikipedia, too many to name
- **Runs simply on IBM i**
- **Direct access to DB2 and RPG**
  - Accesss LIVE DATA, which we value on IBM i

# Easy to start small

- **My first professional PHP code was one line to send an email message**
- **No need to know everything. Start gradually and learn**
- **PHP is mainstream. Information on php.net and elsewhere**
- **A track record of over 20 years of community +corporate collaboration**

# Integration with IBM i

- **PHP Toolkit**
  - Call RPG, COBOL, CL
  - Access data queues, data areas, etc
- **DB2 and SQL**
  - `ibm_db2` included on IBM i
  - `PDO_IBM` may soon be another option
- **Zend Framework 2 support of IBM i DB2**
  - For larger applications
  - Simulation of LIMIT/OFFSET for easy pagination
    - (Db2 has now added real LIMIT/OFFSET, though)

# Support for APIs and web services

- **Web service capabilities in PHP**
  - Native SOAP functionality
  - for REST: `json_encode()`, `json_decode()`
  - cURL (http and more...talk to the internet) now a native, included extension
- **APIs**
  - Using Apigility, PHP can serve “correct” REST APIs, handling errors, versioning, links

# Zend/IBM's commitment from 2005-6



**Zend Brings PHP to IBM's i5/OS**  
Programming - Web Languages  
Written by Alan Seiden  
Tuesday, 11 July 2006 18:00

PHP, the popular cross-platform Web development tool, shows great versatility. It offers power to the pro and simplicity to the novice. It runs on many hardware and software platforms, including Windows, Mac, UNIX, and System i. PHP offers other benefits as well:

- Requires no licensing fees
- Runs many blogs and content management systems
- Can connect disparate systems with technologies such as SOAP
- Is endorsed by IBM

**from 2006: “[Andi] Gutmans says Zend intends to port all its products to System i, treating the platform's users as first-class citizens.”**

<http://mcpressonline.com/programming/web-languages/zend-brings-php-to-ibms-i5os.html>

# PHP: Open + Enterprise

- **Community-driven open source**
- **Enterprise-ready capabilities from Zend**
  - Professional support with SLA (Rod/Shlomo)
  - Tools in Zend Server
    - Monitor
    - Code Trace
    - Z-Ray
    - Job Queue
    - Deployment
    - Remote debugger
  - Zend Studio IDE integrated with Studio
  - Developer and production “black box” tools



# IBM + Zend

- **IBM i systems ship with Zend Server (PHP)**
- **PHP on IBM i packaged and supported by Zend**



IBM booth, ZendCon 2010



IBM's Tony Cairns and Alan S.  
working on new toolkit, ZendCon 2011

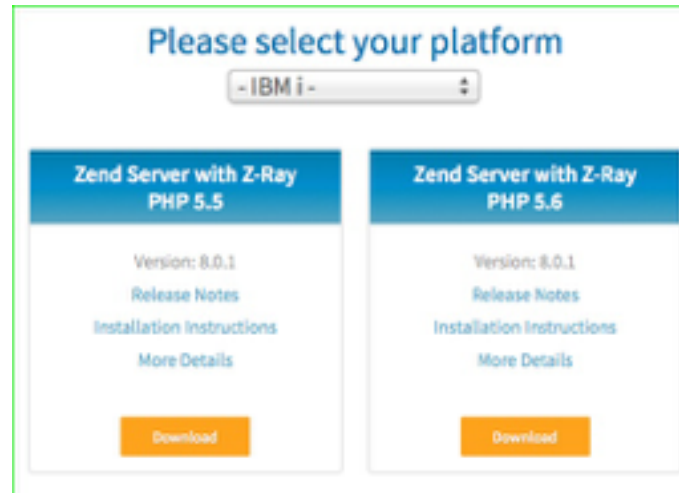
# Community



**Getting started**

# Zend Server for IBM i

- **Download Zend Server 8.x**
  - <http://www.zend.com/en/products/server/downloads-ibmi>
    - Easy upgrade from 6.x and 7.x



- **Editions**
  - <http://www.zend.com/en/products/server/editions>
  - Basic (free), Professional, Enterprise
  - Same download, different license

# Flow-ruining technical topic

CCSID

# Modernize IBM i with CCSID

- **CCSID (coded character set identifier) for conversion of EBCDIC $\longleftrightarrow$ ASCII, Unicode, etc.**
  - Required when using non-native languages such as PHP or communicating with the outside world
  - An essential component of modernization
- **DSPSYSVAL QCCSID**
  - Anything other than 65535 is OK
  - Change with CHGSYSVAL SYSVAL(QCCSID) VALUE(n)
- **or in Apache config: /www/zendsvr(6)/conf/httpd.conf**
  - DefaultFsCCSID 278  
CGIJobCCSID 278
  - For your CCSID, check the list of “Job CCSID”:
    - [http://www-03.ibm.com/systems/i/software/globalization/default\\_list.html](http://www-03.ibm.com/systems/i/software/globalization/default_list.html)

# PHP basics: Step 1

- **Learn some basic HTML**
  - Try <http://w3schools.com/html>
  - Tables (<table>,<tr>,<td>) useful for business data
  - “View Source” in browser to borrow bits of HTML
- **Then learn these as you go**
  - **Javascript**
    - Adds dynamic functionality to pages
  - **Cascading style sheets (CSS)**
    - Modern way to specify colors, fonts, style
    - Later...try **Bootstrap CSS ([getbootstrap.com](http://getbootstrap.com))**

# Step 2: Try a simple PHP script

- **PHP scripts are text files that reside in the IFS**
  - **Edit using notepad or Zend Studio**
- **Example: /www/zendsvr6/htdocs/helloworld.php**
  - **Run in browser: <http://yourIBMi:10080/helloworld.php>**

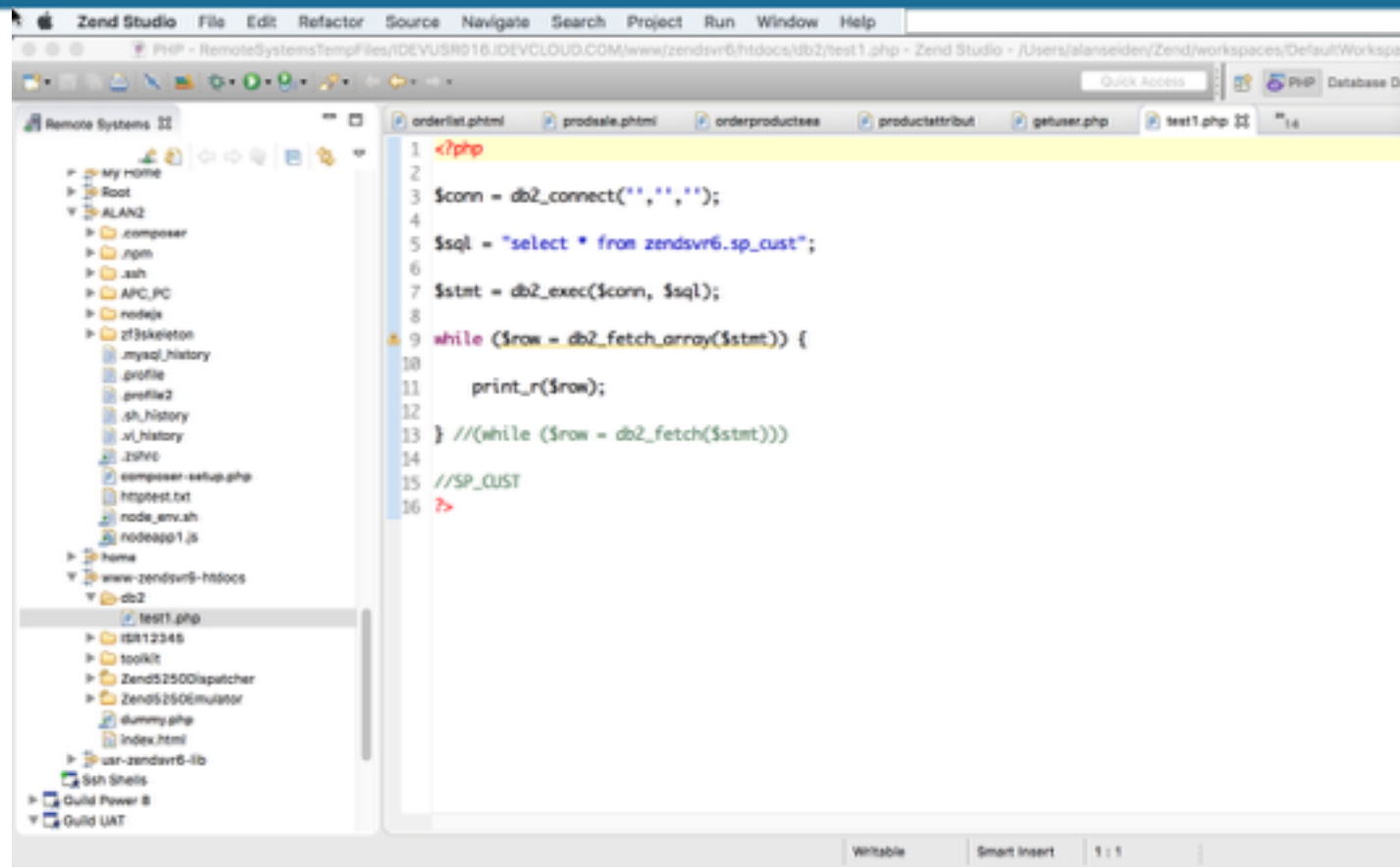
```
<?php

    // simple script to test PHP
    echo "Hello, world!";

?>
```



# Zend Studio IDE free download for IBM i



<http://www.zend.com/en/products/studio/downloads>  
Choose Mac OS, Windows, or Linux version

# Step 3: Access db2

- **See Zend Server sample application**
  - **Connect to db2 on i**
  - **Select records from a db2 table**
  - **Output the records into an HTML table**

Executing SQL statement: SELECT \* FROM ZENDSVR.SP\_CUST WHERE CUST\_ID > 1220 FOR FETCH ONLY

CUST_ID	COMPANY	FIRSTNAME	LASTNAME	CIVIL	ADDRESS	ADDR2	CITY	STATE	ZIP
1221	Kauai Dive Shoppe	LINA	Norman	2	4-976 Sugarloaf Hwy	Suite 103	Kapaa Kauai	HI	94766-1234
1231	Unisco	George	Weathers	1	PO Box Z-547		Freeport		
1351	Sight Diver	Phyllis	Spooner	1	1 Neptune Lane		Kato Paphos		
1354	Cayman Divers World Unlimited	Joe	Bailey	1	PO Box 541		Grand Cayman		
1356	Tom Sawyer Diving Centre	Chris	Thomas	1	632-1 Third Frydenhoj		Christiansted	St. Croix	00820

# What else happens when PHP is used?

- **Spurs modernized database**
- **More modular RPG**
- **New demographics in IT**
- **IT can “own” innovation again**
- **Business owners get a taste of what can be done**

# Z-Ray, to speed development

- Shows every query and time for each
- Toolkit extension for Z-Ray shows each program call, input/output, timing
  - Save time otherwise spent hunting in debug logs!

The screenshot shows a web browser window with the URL `democ8.zend.com:10080/samples/Toolk`. Below the browser, there is a table of parameters:

Parameter Name	Parameter Value
CODE	1
DESC	IBM

Below the parameters, there is a call log for the function `Send Xml`. The log shows two calls with their respective durations and file locations.

Xml In Input	TimesCalled	Duration Inclusive	Duration Exclusive	Called From File	Called From Line	XML In Output From
<?xml version="1.0...	1	162658	5844	/usr/local/zendsvr6...	893	<?xml version="1.0...
<?xml version="1.0...	2	21230	14408	/usr/local/zendsvr6...	893	

# Who can program PHP?

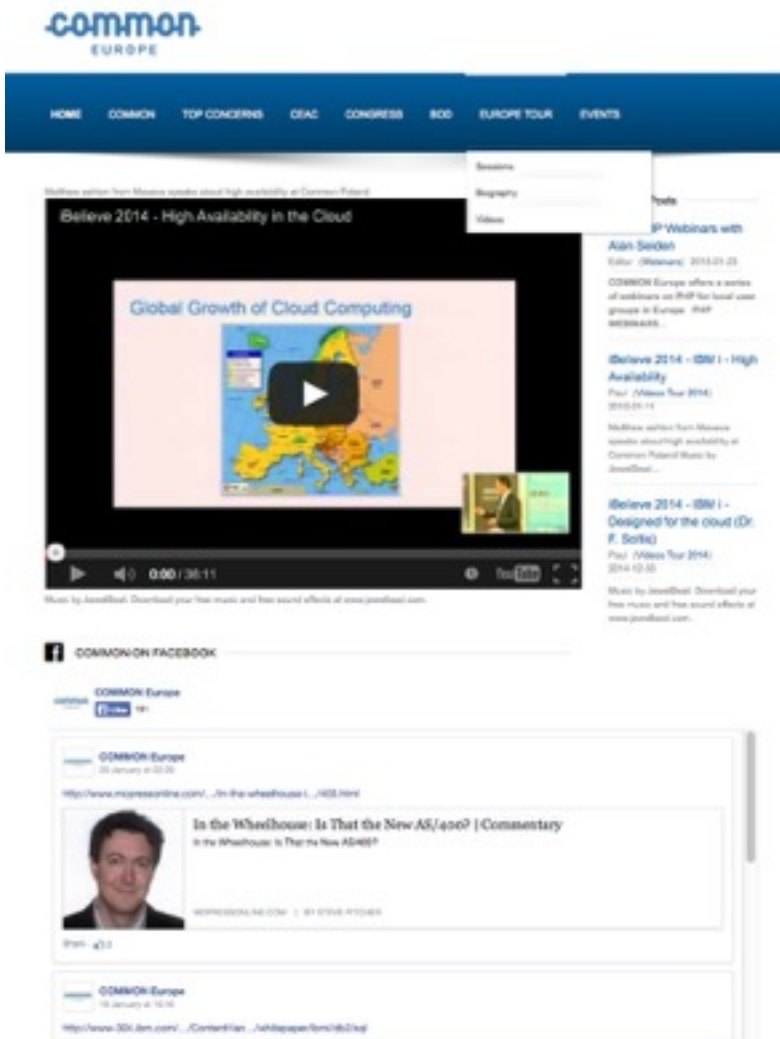
- **RPG developers who know SQL or can learn it, especially if they've used other languages, too.**
  - **(RPG Free is similar to PHP and most modern languages, though!)**
  - **Don't expect great UI, but often nice internal apps**
- **Outside or new PHP developers**
  - **Often have broader view of user interface, but still need to collaborate with RPG/DB2/IBM i person who understands the data. The combination can work well.**

# Open source applications

# Quick return on investment: open source

- **Install open source applications; change the perception of your IBM i**
- **Your IBM i will instantly seem “modern.”**
- **PHP-based content-management systems an easy place to start**
  - **Joomla, Drupal**
  - **Wordpress**
  - **Mediawiki**
- **They use MySQL database (included with Zend Server)**
  - **Can be linked to DB2 using DB2 Storage Engine**

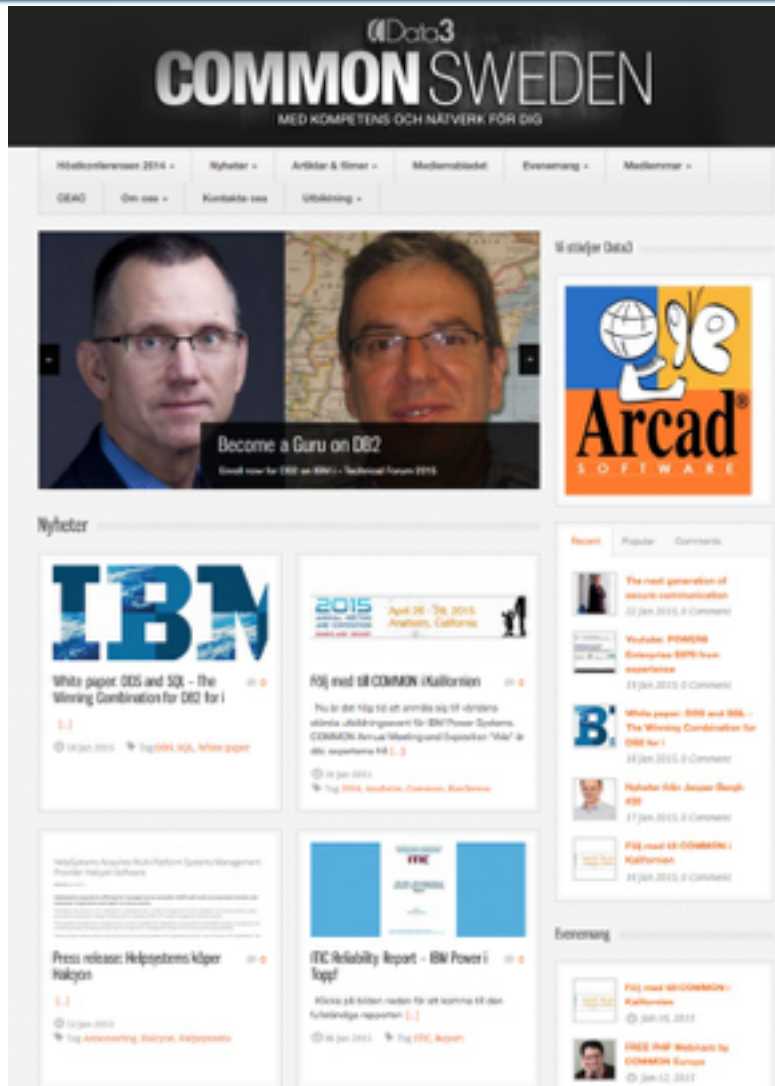
# COMMON Europe: Joomla



- Videos
- News
- Social media widgets



# Data3: Wordpress



- News-style theme
- Themes are easy to download
  - Some free, some not
- Excellent at blogs but also good at general content management

# COMMON.org: Wordpress on IBM i

**COMMON**  
A USERS GROUP

The Power Systems User Group

Uniting the Power Systems Community...

Home

2015 ANNUAL MEETING AND EXPOSITION  
Disneyland Resort  
April 26 - 29, 2015  
Anaheim, California  
Register by March 26 and Save \$200 with the Early Bird Rate!

Home

**Featured Education**

**2015 Annual Meeting and Exposition**  
The Premier Power Systems-related Educational & Networking Event

The Annual Meeting is COMMON's largest educational event of the year, with four full days of in-depth IBM i, Linux, and AIX-related education that includes all-day pre-conference workshops, open labs and a wide variety of regular-length sessions.

April 26 - 29, 2015  
Disneyland Resort  
Anaheim, California

Leading Power Systems education with over 300 sessions, labs and workshops over four days.

**COMMON Power News Blog**

Amet Joins OpenPOWER Foundation to Help Speed OpenPOWER Adoption  
Amet Joins OpenPOWER Foundation to Help Speed OpenPOWER Adoption  
Amet, a global technology distributor, has joined the OpenPOWER Foundation, which is the open development alliance with IBM's POWER microprocessor architecture[...]

Source: COMMON Power News  
Created on: 19 Jan 2015 | 6:20 pm  
COMMON Power News | 19 Jan 2015 | 6:20 pm

5 Experts on IBM i: Security, Storage, i 7.2 and More  
5 Experts on IBM i: Security, Storage, i 7.2 and More  
Last year, we asked six IBM i application development experts to

Learn about the organization

COMMON Behind the Organization

- **Zend Server on IBM i**
- **Manages a great deal of information and media**

# System i Developer: Wordpress on IBM i

The screenshot shows the homepage of the System i Developer website. At the top left is the logo for System i Developer, with the tagline "The Summit of Education Excellence". To the right of the logo are social media links for Facebook (Connect) and Twitter (Follow), along with links for Contact and Privacy Policy. Below the logo is a navigation menu with links for SID HOME, CONFERENCES, SERVICES, BLOGS, COMMUNITY, DOWNLOAD, and ABOUT. The main banner features a silhouette of a person standing on a mountain peak with arms raised, set against a blue sky. The text on the banner reads: "Take it to the Summit", "Achieve new heights with new RPG & DB2 skills", and "Join us for the next RPG & DB2 Summit March 21-23, 2017 in Orlando". Below the banner is a "Welcome" section with a paragraph of text: "Welcome to System i Developer, a consortium of top experts and educators on IBM i technology. If you develop or manage RPG/DB2 applications, we can help you keep your applications vibrant and innovative - and key to your company's success." Below this is another paragraph: "If you believe in the power and flexibility of RPG and DB2, do your part to protect your company's investment. Join us at the next [RPG & DB2 Summit](#) to keep your development skills honed and your applications modern." To the right of this text is the logo for the RPG & DB2 Summit, with the tagline "A System i Developer Event". On the left side of the page, there is a sidebar with sections for "Email Alerts" (with a button for "EMAIL ALERTS" and text "Sign up for iCode, Summit News & FREE Resources"), "News Headlines" (with a date "May 17, 2016" and a headline "20th RPG & DB2 Summit Teaches Latest OLAP, Temporal Capabilities in DB2 for i"), and a "Welcome" section.

- **Zend Server on IBM i**
- **Also custom PHP to manage conference reservations, sponsorships, more.**

**Extend green  
screens to the web**

# Call RPG/COBOL: adapt 5250 logic to the web

The image displays a web browser window for the Medrano Express website, showing an order entry page. The page includes a header with the company logo, user information, and order details. A terminal window overlay on the left side shows a green-on-black interface with fields for Minnesota, Invoice #, Bill To, and address information. A red arrow points from the terminal window to the 'Add/Update content' button in the web interface's table.

**Order Entry Page Content:**

- Entered By: YVONNES
- Order Date: 12/15/09
- Work with Order 00192913-1
- Customer: 2223492 (CALDERON RIVERA, MARGARITA)
- Ship-to: FAMILIA CALDERON RIVAS, ELSA MARINA
- Branch: 65 Medrano Express - Minneapolis
- Order Date: 2009-12-15
- Order taken by: YVONNES (Branch-65)
- Dealer: GUAMAR-LA GUADALUPANA MARKET
- Zone: GUAMAR

Line#	Item	Item Description	# of Pkgs	Declared Value	Quantity	Unit Price	Customs Fee	Insurance	Extended Amount
1	22*22*22"	Box Size: 22 X 22 X 22 Weight: .00	1	500.00	1	165.00	.00	15.00	180.00
	Status: X Qty: Package Content and Description Package 1 of 1 <input type="button" value="Add/Update content"/>								
		0 ZAPATOS		0.00					
		0 ROPA		0.00					
		0 CAMARA DE VIDEO		0.00					
		0 PAILES DESECHABLES		0.00					
		Total Content Value:		0.00					
Order Totals:			1		1		0.00	15.00	180.00

**Terminal Window Content:**

```

Minnesota
Invoice # 00000001
Bill To
CALD 754 CALD 754 EAST IL Cour Phon
Minnesota
Minnesota
Invoice #.
Bill To... 2223
CALDERON RIVERA
754 26TH ST
EAS IL EAS IL 612-1864
Country USA U
Phone 309-2
Dealer. GUAMAR
Empty Box Deliv
Request Pickup
Request Ship Date
  
```

**Order Notes:**

- 2009-12-15 Invoice scheduled for PU on 12/15/09 By YVONNES. SYSTEM
- 2009-12-15 Package Content entered/updated by YVONNES SYSTEM
- 2009-12-16 Zone changed from LAPAZM To GUAMAR by YALITZAF SYSTEM

# Screen #1, Order header

```
Minnesota                Order Entry                Entered By YVONNES
Invoice #. 00192913-01    Invoice Posted              Order Date 12/15/08
Bill To... 2223492 (F4=Search)  Ship To FAMILIA
CALDERON RIVERA, MARGARITA  Name... CALDERON RIVAS, ELSA MARINA
754 26TH ST              Addr1.. BARRIO LAS CRUCITAS
                          Addr2..
                          Addr3..
                          City... SANTA CRUZ DE YOJOA
EAST MOLINE              Region. CORTES
IL 61244-1864            Country HONDURAS
Country USA United States Phone.. 504-- -654-9412
Phone 309-292-3297       Reference#
Dealer. GUAMAR LA GUADALUPANA Delv.Time. (F4=Search)
Empty Box Delivery Date . 12/15/08
Request Pickup Date . . . 1/02/09 Pickup Time 0 (F4=Search)
                          ESTA CAJA SE RECOJERA POR FEDEX
Request Ship Date . . . . 1/05/09
Zone./ Branch . . . . . GUAMAR / 65
Enter=Continue (F4)=Search (F12)=Previous (F20)=Override Zone (F22)=Change Ship-To
```

# Screen #2, Order detail

OEORDD                    Order Inquiry                    Entered By    YVONNES/Minneap  
Region    MN    Minnesota                    Order Date    12/15/08  
Bill To    CALDERON RIVERA, MARGARITA                    Invoice #       000000000 -01  
Ship To    CALDERON RIVAS, ELSA MARINA                    Order Status    Invoice Posted  
Country    504 HONDURAS

Ord Inv		Customs Delivery		Extended				
Qty	Qty	Item/Desc	Weight	Price	Insure\$	Fee	Charges	Amount
2=Edit		4=Pkg Content		5=Adjust Comm		6=Change Posted Item		7=Coupon
1	1	22	0	165.00	15.00	.00	.00	180.00
		22"X22"X22"		Coupon				
#/Pkgs		Invoice Date/By.		12/15/08		YVONNES		
1		Declared Value...		\$500.00		Package Scanned.		1/08/09 YALITZAF
Ln# 001		Inv Seq-01		Comm 30.00		Invoice Posted...		1/08/09 YALITZAF

Bottom

Order Total.                    180.00  
Invoice 01 Total.                180.00

Enter=Accept    F1=New Box    F2=Other Charges    F7=Summary    F24=More Keys

# Screen #3, Content package from detail

(Option 4 from order header)

```
Invoice# 0000000000 - 1 Package Contents JESSIE 2/02/10
Line#.... 0001 22"X22"X22"
Dist Branch..... Honduras (50400/516-279-5205)
Total# of Pkgs..... 1 Delivered by..... FERNANDO ARGUIJ
Declared Value(Ins) 500 Delivery Date..... 2/01/09
Insurance Charges.. 15.00 Delivery signed by ELSA MARINA CALDERON
Declared
Pkg# Package Content/Detail Descriptions Weight Customs$
1=Enter/Edit Content 2=Enter Claim 3=Assign Claim 4=Comment 5=Close Claim
6=Enter Customs Value
_ 1 -ZAPATOS
   -ROPA
   -CAMARA DE VIDEO
   -PAÑALES DESECHABLES
Bottom
Enter=Accept F2=Print F12=Previous
```



# Screen #4, Notes from order detail

## F9 key launches this

```
JESSIE                               Invoice Notes
                               INVOICE  00192913
_____Date_____Notes_____Created By
2=Edit  4=Delete
_ 1/04/09 Label 00192913-01 printed by YVONNES.          SYSTEM
_ 1/04/09 Invoice 00192913-01 printed by YVONNES.          SYSTEM
_ 1/04/09 Dealer changed from LAPAZM to GUAMAR by YVONNES  SYSTEM
_ 12/16/08 Price Overridden from 175.00 to 165.00 by YALITZAF  SYSTEM
           CORRECCION
_ 12/16/08 Zone changed from LAPAZM To GUAMAR by YALITZAF  SYSTEM
_ 12/15/08 Package Content entered/updated by YVONNES      SYSTEM
_ 12/15/08 Invoice scheduled for P/U on 12/15/08 By YVONNES.  SYSTEM

                                           Bottom


Add Notes █ _____
           _____
           _____

           days

Enter=Continue  F9=Exit
```

# Web page combines all 4 “green screens”

Address <http://medranoexpress.com/MedranoExpress/ISOE/oeorder.php?Invoice=...> Go Links



bienvenido! LA GUADALUPANA MARKET (GUAMAR) February 2,2010  
Branch: Medrano Express - Minneapolis Phone: 612-721-4547

[Dealer](#) [Update Profile](#) [Work with Customers and Invoices](#)

Work with Order 00192913-1

**Bill-to Customer: 2223492**  
CALDERON RIVERA, MARGARITA  
754 26TH ST  
EAST MOLINE, IL 61244-1864  
USA  
Telephone: 309-292-3297

**Ship-to: FAMILIA**  
CALDERON RIVAS, ELSA MARINA  
BARRIO LAS CRUCITAS  
SANTA CRUZ DE YOJOA,  
CORTES  
HONDURAS  
Telephone: 6549412

**Branch 65 Medrano Express - Minneapolis**  
**Order Date 2008-12-15**  
**Order taken by YVONNES (Branch-65)**  
**Dealer: GUAMAR-LA GUADALUPANA MARKET**  
**Zone: GUAMAR**

**Pickup Date/Comments: 2009-01-02** ESTA CAJA SE RECOJERA POR FEDEX  
**Shipment Date/Comments: 2009-01-05**

Line#	Item	Item Description	# of Pkgs	Declared Value	Quantity	Unit Price	Customs Fee	Insurance	Extended Amount
1	22"x22"x22" Status: X	Box Size: 22 X 22 X 22 Weight: .00 Qty Package Content and Description Value Package 1 of 1 <input type="button" value="Add/Update content"/> 0 ZAPATOS 0.00 0 ROPA 0.00 0 CAMARA DE VIDEO 0.00 0 PALES DESECHABLES 0.00 Total Content Value 0.00	1	500.00	1	165.00	.00	15.00	180.00
Order Totals:			1		1		0.00	15.00	180.00


**Order Notes**

2008-12-15	Invoice scheduled for P/V on 12/15/08 By YVONNES.	SYSTEM
2008-12-15	Package Content entered/updated by YVONNES	SYSTEM
2008-12-16	Zone changed from LAPAZM To GUAMAR by YALITZAF	SYSTEM

# Allied Beverage Group

Search Results (7 products found), order for EUROPA LIQUORS (001588) - Mozilla Firefox

Home    Advanced Search    Orders    ABG Employee Connect    Log out

 eBiz@ABG    Welcome, Angel Strong #125

Home > Search Product Catalog > Search Results (7 products found), order for EUROPA LIQUORS (001588)    PRICING MONTH: **June 2009**

[Advanced Search](#)

Search for item:  (proof)    AMERICO'S INC (001588)    Off Premise Terms: NET  
 with bottle price (\$):  to  (optional)    Search    DBA EUROPA LIQUORS    Total List: \$218.54  
 155-57 PACIFIC ST, NEWARK NJ, 07102    Total Disc: \$ 28.99  
 Phone: 973-888-2195    Est Total Net: \$ 189.54  
[Cases: 1 Bottles: 0](#)

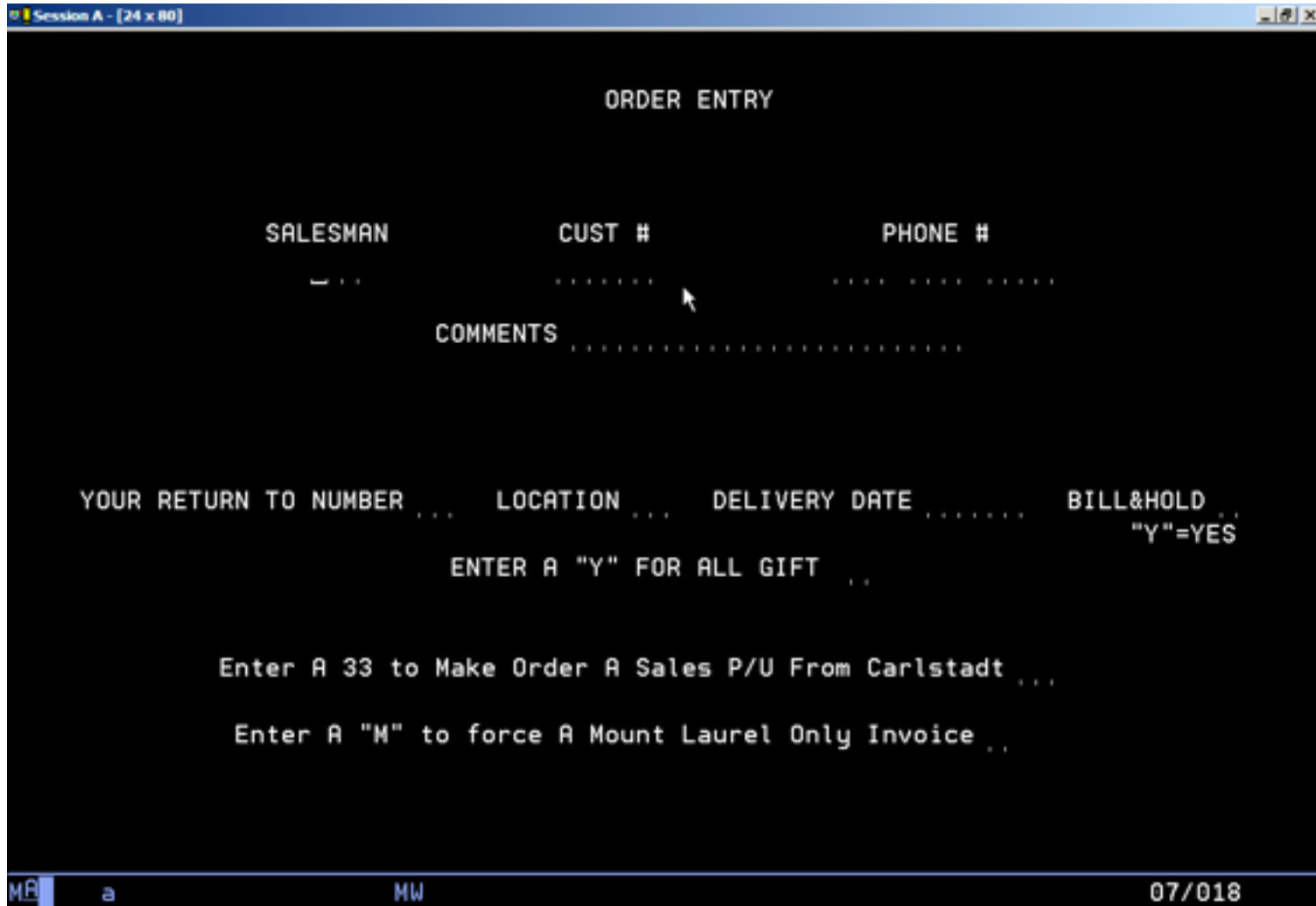
Results for **Keywords: CHARD NAPA 375ML**

Product	Code	Size	Pack	Qty	Cs/Bt	Add Items	Price		Inventory		Vintage	Info	\$ Best Buy
							\$ Case	\$ Bottle	Case	Bottle			
<a href="#">Acadia Chardonnay A By Acadia</a>	5607061	375 ML	12	<input type="text" value="3"/>	cases	<a href="#">Add</a>			26	5	NV		
<a href="#">Cakebread Cellars Chardonnay Napa Valley 07</a>	7433065	375 ML	12	<input type="text" value="1"/>	bottles	<a href="#">Add</a>			9	5	2007		
<a href="#">Grosch Hills Cellar Chardonnay</a>	5544265	375 ML	12	<input type="text"/>	cases	<a href="#">Add</a>			5	7	2006		
<a href="#">Levendi Chardonnay Red Hen 05</a>	4591060	375 ML	12	<input type="text"/>	cases	<a href="#">Add</a>			13	2	2005		
<a href="#">Merrvale Chardonnay Starmont 07</a>	4223069	375 ML	12	<input type="text"/>	cases	<a href="#">Add</a>			8	8	2007		
<a href="#">Schramsberg Blanc de Blanc</a>	4056064	375 ML	12	<input type="text"/>	cases	<a href="#">Add</a>			17	9	2005		

# Original 5250-mode order entry process

- **Aimed at expert customer service users**
- **Sales reps accessed it using Jadvantage java applet in browser**
  - Better than nothing
  - S-l-o-w logon
  - Forced reps to have expert knowledge of system
- **Dicey wireless signals on the road = lost sessions**
- **RPG was powerful but too complex to be updated with major new functionality**

# Intro screen



# Intro with error message (customer)

```
Session A - [24 x 80]
ORDER ENTRY

SALESMAN      CUST #      PHONE #
  105         - .....

COMMENTS .....

INVALID CUSTOMER NUMBER

YOUR RETURN TO NUMBER 01  LOCATION 05  DELIVERY DATE .....  BILL&HOLD ..
                                     "Y"=YES

ENTER A "Y" FOR ALL GIFT ..

Enter A 33 to Make Order A Sales P/U From Carlstadt ..

Enter A "M" to force A Mount Laurel Only Invoice ..

MR  a      MW      07/034
```

# Intro with error message (“return to number”)

```
Session A - [24 x 80]
ORDER ENTRY

SALESMAN          CUST #          PHONE #
  105              .....

COMMENTS .....

PLEASE ENTER YOUR RETURN TO #

YOUR RETURN TO NUMBER _ LOCATION ... DELIVERY DATE ..... BILL&HOLD ..
                                     "Y"=YES

ENTER A "Y" FOR ALL GIFT ..

Enter A 33 to Make Order A Sales P/U From Carlstadt ...

Enter A "M" to force A Mount Laurel Only Invoice ..

MR a MW 14/025
```

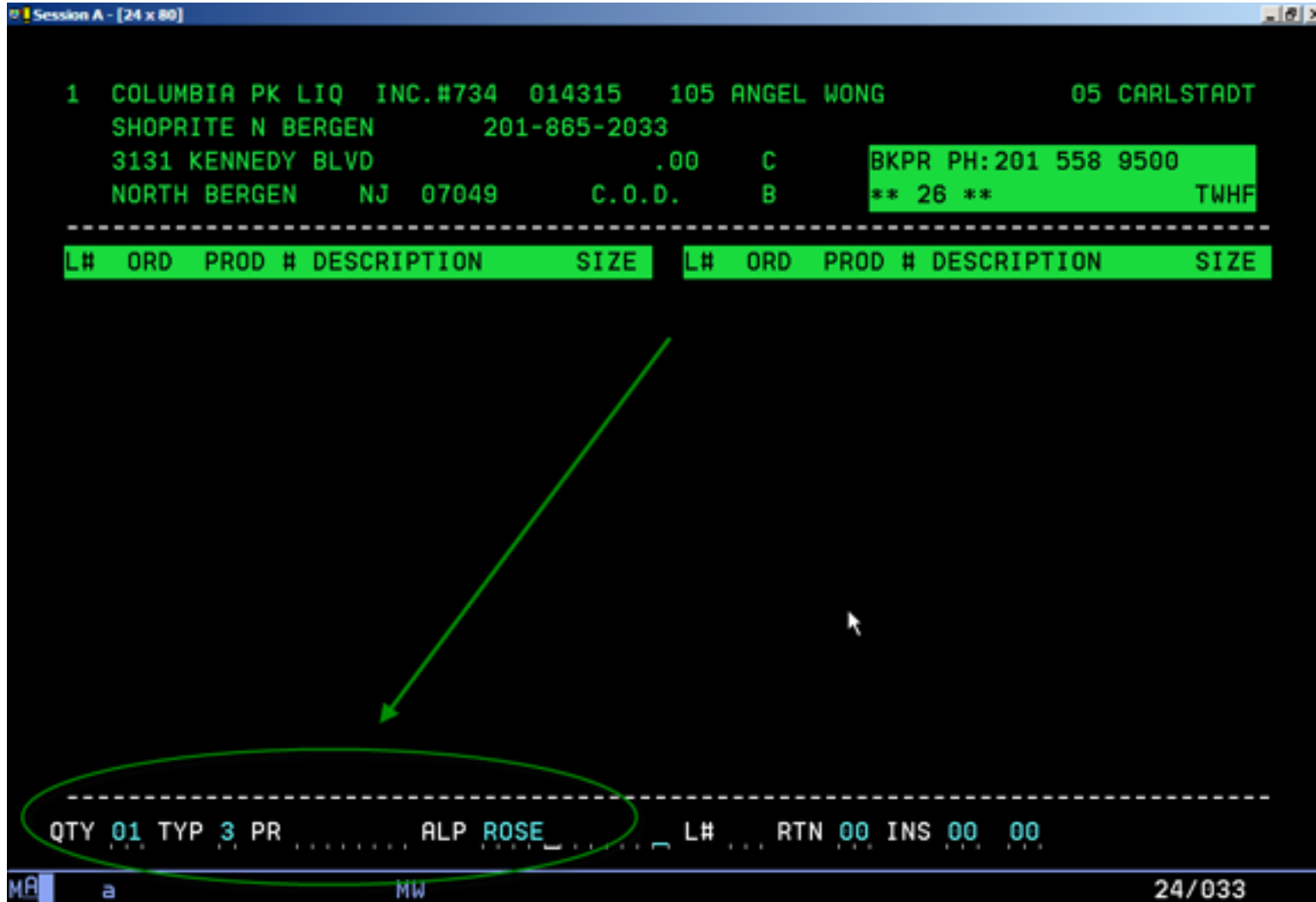
# Main screen

```
Session A - [24 x 80]
1 COLUMBIA PK LIQ INC.#734 014315 105 ANGEL WONG 05 CARLSTADT
  SHOPRITE N BERGEN 201-865-2033
  3131 KENNEDY BLVD .00 C BKPR PH:201 558 9500
  NORTH BERGEN NJ 07049 C.O.D. B ** 26 ** TWHF
-----
L# ORD PROD # DESCRIPTION SIZE L# ORD PROD # DESCRIPTION SIZE
-----
QTY _ TYP PR ALP L# RTN 99 INS 00 00
MA a MW 24/005
```



# Search for a product by description

```
Session A - [24 x 80]
1 COLUMBIA PK LIQ INC.#734 014315 105 ANGEL WONG 05 CARLSTADT
  SHOPRITE N BERGEN 201-865-2033
  3131 KENNEDY BLVD .00 C BKPR PH:201 558 9500
  NORTH BERGEN NJ 07049 C.O.D. B ** 26 ** TWHF
-----
L# ORD PROD # DESCRIPTION SIZE L# ORD PROD # DESCRIPTION SIZE
-----
QTY 01 TYP 3 PR ALP ROSE L# RTN 00 INS 00 00
MR a MW 24/033
```



# Select a product

Session A - [24 x 80]

E								CARL REG	CARL GIF	MT LAUREL	
QY	T	PRODH#	DESCRIPTION	SIZE	H	PAK		CASES	BOT	REG C	GIF C
		4620065	ROSEN BLK MSCT03 12P	375ML		12		1	7		
		4620067	ROSEN BLK MSCT05 12P	375ML		12					
		4620068	ROSEN BLK MSCT06 12P	375ML		12		50	5		
		4636140	ROSEN CAB CUVEE	750ML		12		1050	2		
01	3	4636240	ROSEN CHARD CUVEE	750ML		12		979	9		9
		9339540	ROSEN DESIREE	375ML		12		24	7		
		4630441	ROSEN KICK SYRAH 05	750ML		12			8		
		6217062	ROSEN LH VIOG 02 12P	375ML	6	12			4		
		4630361	ROSEN LH ZIN RAB 06	375ML		12					
		4620066	ROSEN MUSC 12P	375ML	8	12					
		4630142	ROSEN PET SIR HERT05	750ML		12					
		4630143	ROSEN PET SIR HERT06	750ML		12			8		
		4630144	ROSEN PET SIR HERT07	750ML		12		59	10		
		4628047	ROSEN PET SIR PICK06	750ML	6	12		1	6		
		4636340	ROSEN SV BLC CUVEE08	750ML		12		317	8		
		4669242	ROSEN VIOGNR K CUV05	750ML	6	12					
		4669245	ROSEN VIOGNR K CUV08	750ML		12		77	8		
		4630242	ROSEN ZIN APARIC 05	750ML		12		15	3		

COMMAND KEY 5 FOR ESCAPE

MA a MW 08/006

# Help!

```
Session A - [24 x 80]
1 COLUMBIA PK LIQ INC.#734 014315 105 ANGEL WONG 05 CARLSTADT
  SHOPRITE N BERGEN 201-865-2033 CAN'T SELL THIS ITEM OFF PREMISE
  3131 KENNEDY BLVD .00 C BKPR PH:201 558 9500
  NORTH BERGEN NJ 07049 C.O.D. B ** 26 ** TWHF
-----
L# ORD PROD # DESCRIPTION SIZE L# ORD PROD # DESCRIPTION SIZE
-----
QTY 1 TYP 3 PR 4636240 ALP L# RTN 00 INS 00 00
MA a MW 24/029
```

Big blinking error message

# What Allied wanted in web-based order entry

- **Good for sales reps and customers**
  - Keep speed while making it easier for newcomers
  - Reps can copy from past orders
  - Lots of information at fingertips (fewer clicks)
- **Users can save drafts of orders**
  - Drafts are brand-new functionality
  - We use the old RPG logic, but we're not tied to it
- **No problem if temporarily disconnected**
  - Stateless web connection can easily resume later
- **Overcome 90-item limit**
  - So we didn't have to treat that as an error
  - Internally we split order into 90-item bunches and sent multiple orders to RPG

# Web ordering intro page

Orders - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://ebizdev.alliedbeverage.com/order

Home Advanced Search Orders ABG Employee Connect Info Log out

eBiz@ABG Welcome, Angel Wong #105

Home > Orders PRICING MONTH: February 2010

Account# \*  [?]

Sales Pickup  [?]

Product Type  both  cases  bottles [?]

Comments (optional)  [?]

Bill and Hold  [?]

Separate order  [?]

Delivery Date  [?]

Gift  [?]

Entry Mode  [?]

Create

**Drafts and committed orders**

Action	Status	Account	Comments	Order Dates		Cs	Bt	Totals (Estimated)		
				Created	Delivery			\$ List	\$ Discount	\$ Net
	draft	014315: SHOPRITE N BERGEN		01/15/10	next avail	5	1	1180.44	2.40	1178.04
	draft	041722: KING'S BAR & LIQUOR		01/15/10	next avail			.00	.00	.00
	draft	001684: VMNY'S DISCT LIQ		02/10/10	next avail	2		1205.67	196.56	1009.11
	draft	000262: PORTLAND W & L		02/10/10	next avail	2		990.33	.00	990.33
	draft	040130: KRYSTAL WINE & LIQUO		12/16/09	sales p/u	2		641.98	88.90	553.08
	committed (web)	045070: CASA BELLA RISTORANT		11/18/09	next avail	1				<a href="#">View Order</a>
	committed (web)	000262: PORTLAND W & L		08/26/09	41/44/07	1				<a href="#">View Order</a>
	committed (web)	012164: J & J DRUGS		08/21/09	next avail	1	1			<a href="#">View Order</a>
	committed (web)	012164: J & J DRUGS		07/24/09	next avail	6	3			<a href="#">View Order</a>

# Web with account type/search box

The screenshot shows a web browser window titled 'Orders - Mozilla Firefox' with the URL 'http://ebizdev.alliedbeverage.com/order'. The page features a navigation menu with 'Home', 'Advanced Search', 'Orders', 'ABG Employee Connect', 'Info', and 'Log out'. A header banner includes the 'eBiz@ABG' logo and a welcome message for 'Angel Wong #105'. The main content area is titled 'Home > Orders' and includes a 'PRICING MONTH: February 2010' indicator. A search box is open, showing a list of account numbers and names. Below the search box, there are form fields for 'Comments (optional)', 'Bill and Hold', 'Separate order', 'Delivery Date', 'Gift', and 'Entry Mode'. A 'Create' button is visible. A table of orders is displayed below the form, with columns for 'Comments', 'Order Dates', and 'Totals (Estimated)'. The table contains several rows of order data, including account numbers, dates, and monetary values.

Comments	Order Dates		Totals (Estimated)				
	Created	Delivery	Cs	Bt	\$ List	\$ Discount	\$ Net
EN	01/15/10	next avail	5	1	1180.44	2.40	1178.04
JOR	01/15/10	next avail			.00	.00	.00
	02/10/10	next avail	2		1205.67	196.56	1009.11
draft 000262: PORTLAND W & L	02/10/10	next avail	2		990.33	.00	990.33
draft 040130: KRYSTAL WINE & LIQUO	12/16/09	sales plu	2		641.98	88.90	553.08
committed (web) 045070: CASA BELLA RISTORANT	11/18/09	next avail	1				
committed (web) 000262: PORTLAND W & L	08/26/09	41/44/07	1				
committed (web) 012164: J & J DRUGS	08/21/09	next avail	1	1			
committed (web) 012164: J & J DRUGS	07/24/09	next avail	6	3			

# Web Mode #1: Quick Order Entry

Enter Product Codes - Mozilla Firefox  
 http://ebizdev.alliedbeverage.com/Order/edit/sequence/30063

Home | Advanced Search | Orders | ABG Employee Connect | Info | Log out

Welcome, Angel Wong #105

Home > Orders > Enter Product Codes PRICING MONTH: February 2010

CENTAINNI INC (012213) On Premise Terms: NET  
 DBA CENTAINNI INC Total List: \$207.84  
 11-35 RIVER ROAD, NORTH ARLINGTON NJ, 07032 Total Disc: \$ .00  
 Phone: 201-248-0100 Est Total Net: \$ 207.84  
 Messages: (none) Cases: 7 Bottles: 0

Ship From: NORTH Delivery Date: next available (days: H) Mode: Expert Comments (optional):

product search Cancel Recalc Save Draft Preview Final prices determined when invoiced. Commit Order

Dlt	Qty	Cs/Bt	Code	Msg	Description	\$ List	\$ Disc	\$ Net	\$ Ext	Info	Sales Rep/House
✖	2	cases	5118020		KOURTAKI ROSE TABLE (1.5 L/6)	11.19	0.00	11.19	22.38		105: Angel Wong/30
✖	3	cases	0222222		PRODUCT NOT FOUND						105: Angel Wong/30
This product cannot be ordered - This is not a valid product. (system msg: WP00041)											
✖	2	cases	5118020		KOURTAKI ROSE TABLE (1.5 L/6)	11.19	0.00	11.19	22.38		105: Angel Wong/30
DUPLICATE: This line item is a duplicate. (system msg: WP00062)											
✖		cases									105: Angel Wong/30
✖		cases									105: Angel Wong/30
✖		cases									105: Angel Wong/30
✖		cases									105: Angel Wong/30
✖		cases									105: Angel Wong/30
✖		cases									105: Angel Wong/30
✖		cases									105: Angel Wong/30
✖		cases									105: Angel Wong/30
✖		cases									105: Angel Wong/30
✖		cases									105: Angel Wong/30
✖		cases									105: Angel Wong/30
✖		cases									105: Angel Wong/30

New York: Mon 15:28 Done



# Search results

Search Results (45 products found), order for CENTANNI INC (012213) - Mozilla Firefox

http://ebizdev.alliedbeverage.com/advancedsearch/result/globalsearch/rose/minprice/10/maxprice

Home | Advanced Search | Orders | ABG Employee Connect | Info | Log out

Welcome, Angel Wong #105

Home > Search Product Catalog > Search Results (45 products found), order for CENTANNI INC (012213) PRICING MONTH: February 2010

Advanced Search

Search for item:  (proof)  **CENTANNI INC (012213)** On Premise Terms: NET  
 DBA: CENTANNI INC Total List: \$ 00  
 11-35 RIVER ROAD, NORTH ARLINGTON NJ, 07032 Total Disc: \$ 00  
 Phone: 201-246-0100 **Est Total Net: \$ .00**  
 Cases: 0 Bottles: 0

Results for Keywords: ROSE Minimum bottle price: 10 Maximum bottle price: 15

Product	Code	Size	Pack	Qty	Cs/Bt	Add Items	Price		Inventory		Vintage	Info	\$ Best Buy
							\$ Case	\$ Bottle	Case	Bottle			
<a href="#">Kourakis Rose Roditis</a>	5118020	1.5 Lit	6	<input type="checkbox"/>	cases	<input type="button" value="Add"/>	\$1.96	\$0.32	8	2	NV		
<a href="#">Jadot Beaul Rose 2006</a>	5384242	750 ML	6	<input type="checkbox"/>	cases	<input type="button" value="Add"/>	\$8.96	\$1.49	21	2	2006		1 cs: 49.96 / 8.33
<a href="#">Volteo Gamacha 08</a>	5277440	750 ML	12	<input type="checkbox"/>	cases	<input type="button" value="Add"/>	\$16.28	\$1.35	12	4	2008		1 cs: 104.28 / 8.69
<a href="#">Canela Prosecco Di Conegliano</a>	9311840	750 ML	12	<input type="checkbox"/>	cases	<input type="button" value="Add"/>	\$16.28	\$1.35	7	8	NV		1 cs: 104.28 / 8.69
<a href="#">Luis Felipe Edwards Rosa Blanco Cabernet Sauvignon 06</a>	5930940	750 ML	12	<input type="checkbox"/>	cases	<input type="button" value="Add"/>	\$24.96	\$2.08	33	2	NV		1 cs: 96.00 / 8.00
<a href="#">Caimontini Luna Di Luna Premium Pink Merlot</a>	4144380	187 ML	6	<input type="checkbox"/>	cases	<input type="button" value="Add"/>	\$8.28	\$1.38	19	4	NV		1 cs: 52.29 / 8.72

New York: Mon 15:27 Done



# Web Mode #2: Standard Order Entry

Build Order - Mozilla Firefox  
http://ebizdev.alliedbeverage.com/Order/edit/sequence/30063

Home Advanced Search Orders ABG Employee Connect Info Log out

eBiz@ABG Welcome, Angel Wong #105

Home > Orders > Build Order PRICING MONTH: February 2010

CENTANNI INC (012213) On Premise Terms: NET  
DBA: CENTANNI INC Total List: \$207.84  
11-35 RIVER ROAD, NORTH ARLINGTON NJ, 07032 Total Disc: \$ .00  
Phone: 201-246-0100 Est Total Net: \$ 207.84  
Messages: (none) Cases: 7 Bottles: 0

Ship From: NORTH Delivery Date: next available (days: H) Mode: Standard Comments (optional):

Cancel Recalc Save Draft Preview

Add a product: Or select from Search: Customer Sales History:  
cases Add product search 60 days

Dlt	Qty	Cs/Bt	Code	Msg	Description	\$ List	\$ Disc	\$ Net	\$ Ext	Info	Sales Rep/House
X	2	cases	5118020		KOURTAKI ROSE TABLE (1.5 L/6)	\$1.95	.00	\$1.95	183.82		105: Angel Wong/30
X	3	cases	0222222		PRODUCT NOT FOUND	.00	.00	.00	.00		105: Angel Wong/30
<b>This product cannot be ordered - This is not a valid product. (system msg: WP00041)</b>											
X	2	cases	5118020		KOURTAKI ROSE TABLE (1.5 L/6)	\$1.95	.00	\$1.95	183.82		105: Angel Wong/30
<b>DUPLICATE: This line item is a duplicate. (system msg: WP00052)</b>											

Customer Service North: (800) 272-1323 South: (800) 841-1948  
© Copyright Allied Beverage Group LLC. All Rights Reserved.

Notice message file messages WP00041 and so on!

# AJAX loads dynamic info

Build Order - Mozilla Firefox

http://ebizdev.alliedbeverage.com/Order/edit/sequence/30063

Home | Advanced Search | Orders | ABG Employee Connect | Info | Log out

Welcome, Angel Wong #105

PRICING MONTH: February 2010

CENTANNI INC (012213) On Premise Terms: NET

DBA CENTANNI INC Total List: \$207.84  
11-35 RIVER ROAD, NORTH ARLINGTON NJ, 07032 Total Disc: \$ .00  
Phone: 201-248-0100 Est Total Net: \$ 207.84  
Messages: (none) Cases: 7 Bottles: 0

Ship From: NORTH Delivery Date: next available (days: H) Mode: Standard Comments (optional):

Cancel Recalc Save Draft Preview

Add a product: cases Add Or select from Search: product search Customer Sales History: 60 days

Del	Qty	Cs/Bt	Code	Msg	Description	\$ List	\$ Disc	\$ Net	\$ Ext	Info	Sales Rep/House
*	2	cases	5118020		KOURTAKI ROSE TABLE (1.5 L/6)	\$1.96	.00	\$1.96	193.92	<a href="#">Click for availability</a>	
		Inventory	Regular	Gift							
		Case	Bottle	Case	Bottle						
		Carlstadt	8	2	0	0					
There's no shipment information for this product.											
*	3	cases	0222222		PRODUCT NOT FOUND	.00	.00	.00	.00		105: Angel Wong/30
<b>This product cannot be ordered - This is not a valid product.</b> (system msg. WP00041)											
*	2	cases	5118020		KOURTAKI ROSE TABLE (1.5 L/6)	\$1.96	.00	\$1.96	193.92		105: Angel Wong/30
DUPLICATE: This line item is a duplicate. (system msg. WP00062)											

Customer Service North: (800) 272-1323 South: (800) 841-1948  
© Copyright Allied Beverage Group LLC. All Rights Reserved.

# New web apps

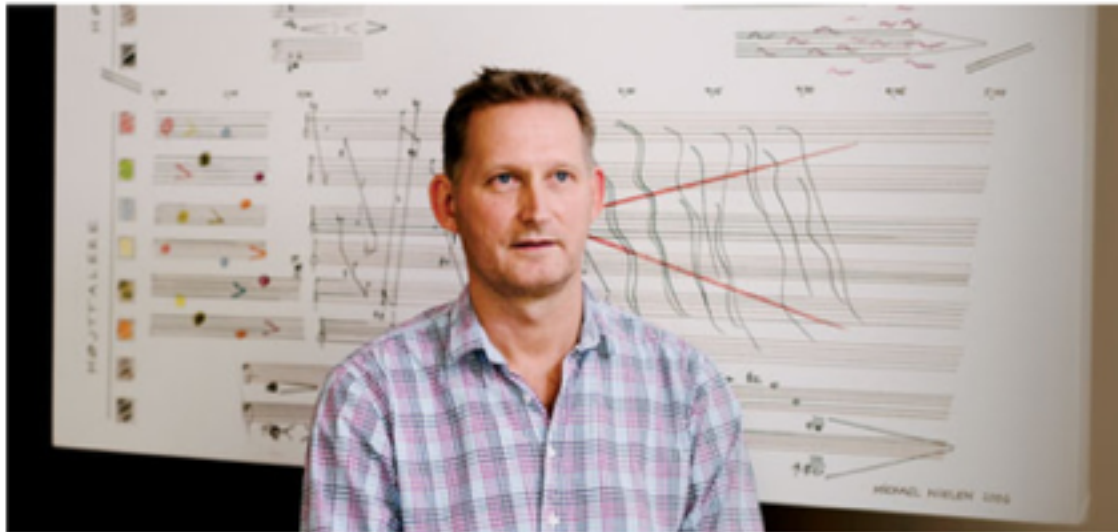
# ICE award-winner

POWER > CASE STUDIES > SERVICES

## Case Studies

# International Copyright Enterprise Stays Atop the Music Industry by Looking Toward the Future

October 2014 | by Jim Utsler



Mats Lidstrom, ICE chief technical architect - Photo by Stefan Tell



# Scotsburn Dairy Group: visitor kiosk



VISITOR SIGN IN

VISITOR SIGN OUT



- **Front desk kiosk-mounted touch monitor**

# Scotsburn Dairy Group: visitor kiosk

**Visitor Sign-in**

Full Name

Visiting

Representing

Notes

[« Back](#) [Sign In »](#)

- **“Visiting” box has autocomplete**
- **Saving money on supplies**
- **Reducing paper use a company goal**

# H-P Products: executive decision tool

Tooling WC		Setup STD. Actual	Run Hours STD. Actual Remaining	Expected Completed Scrap Open	Scheduled Start Completed	Actual Comp
00837		.25	21.305	150		01/19/15
		.25	2.96	150.000		01/19/15
			0.345	.000		
				0		
Date	Time	Bodge	Transaction	Setup Run	Complete	
01/22/15	72103	400	OF	R	1	
01/22/15	62322	400	ON	R		
01/22/15	62311	400	OF	S	0	
01/22/15	60811	400	ON	S		
	400			1		150.800
	400			0		.000
00224		.37	12.245	150		01/21/15
00812		.00	.00	150.000		01/21/15
			12.245	.000		
				0		
Date	Time	Bodge	Transaction	Setup Run	Complete	
01/23/15	105917	1385	OF	R	1	
01/23/15	91232	1385	ON	R		
01/23/15	91224	1385	OF	S	0	
01/23/15	81640	1385	ON	S		
00839		.20	3.4	150		01/22/15
		.00	.00	.000		01/22/15
			3.4	.000		
				150		

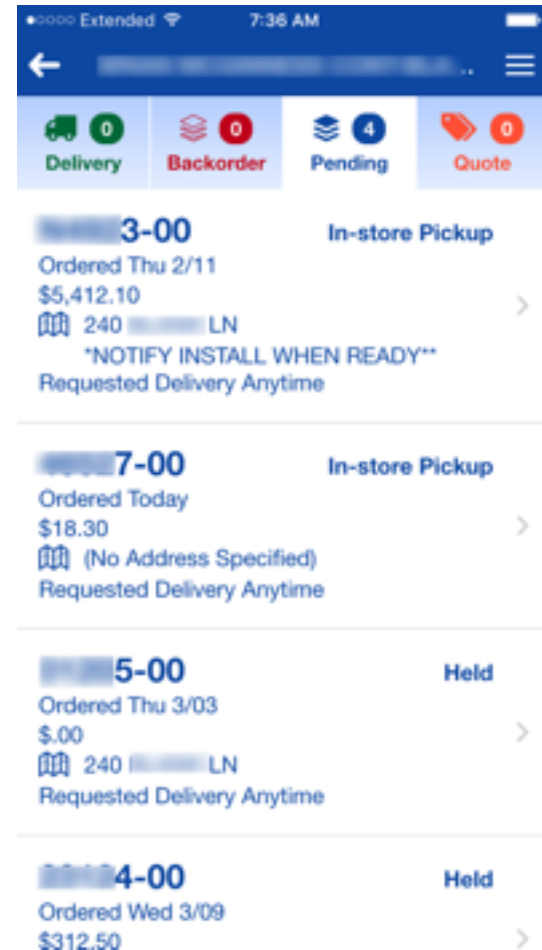
- Not pretty—but—
- Enables company to measure time spent on each customer
- Can better set prices appropriate to each customer

# Mobile applications



# Mobile delivery tracker

- **Delivery tracker for a building supply company**
- **Web application optimized for mobile phones**
  - For construction contractors at a job site
- **Live IBM i data from DB2, RPG**
- **PHP, Apigility, ZF2, AngularJS/Ionic**

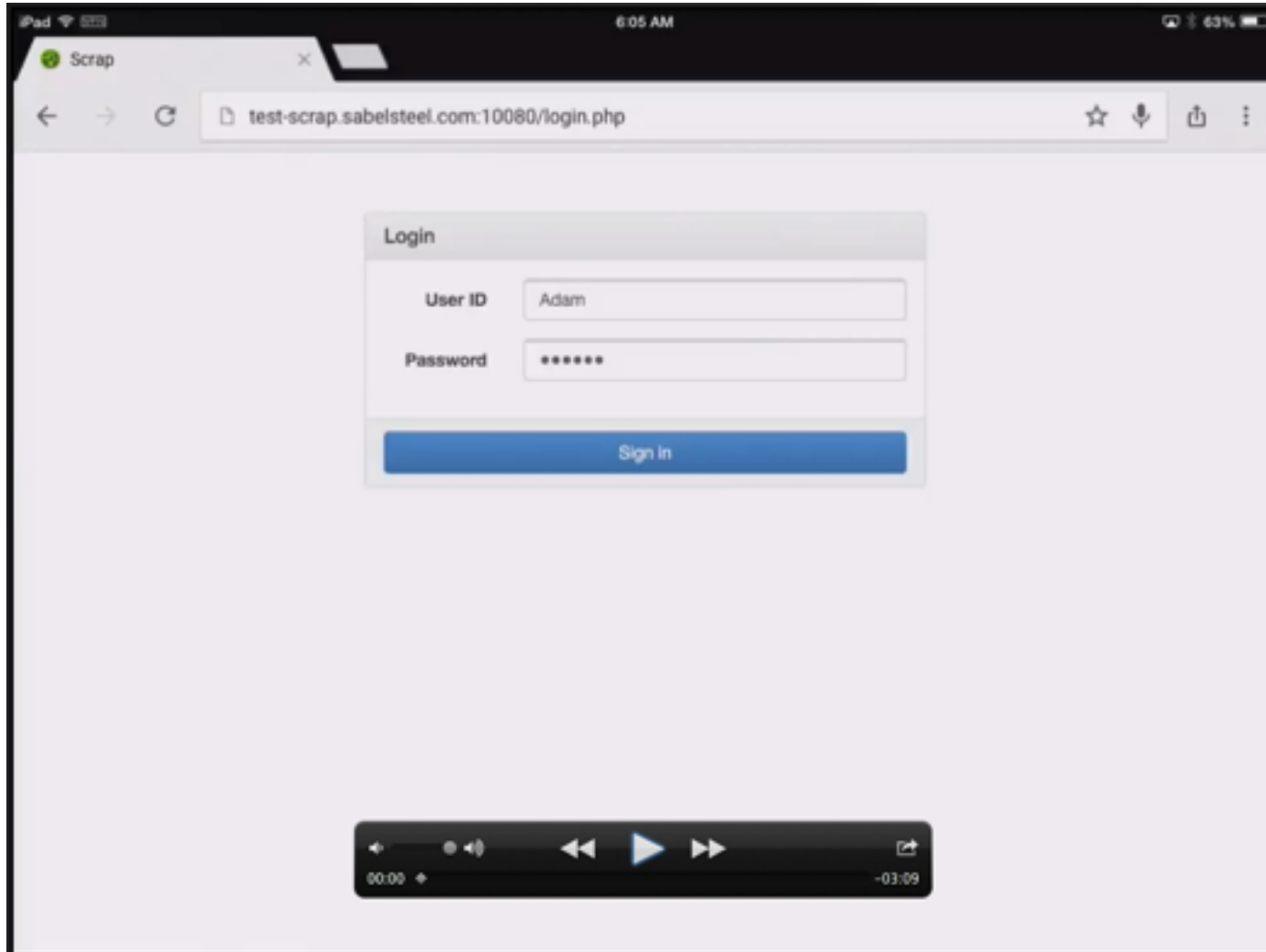


# Scrap metal ordering system on iPad

- **Exciting blend of RPG, DB2, PHP, HTML5, mobile device capabilities**
- **Developer: Adam Shirley, Sabel Steel, Alabama, USA**
- **Spurred by government regulations for record-keeping**
- **See video**
  
- **Slides to follow:**



# Scrap metal system: log in



# Scrap metal system: read license card



# Scrap metal system: autofill ID

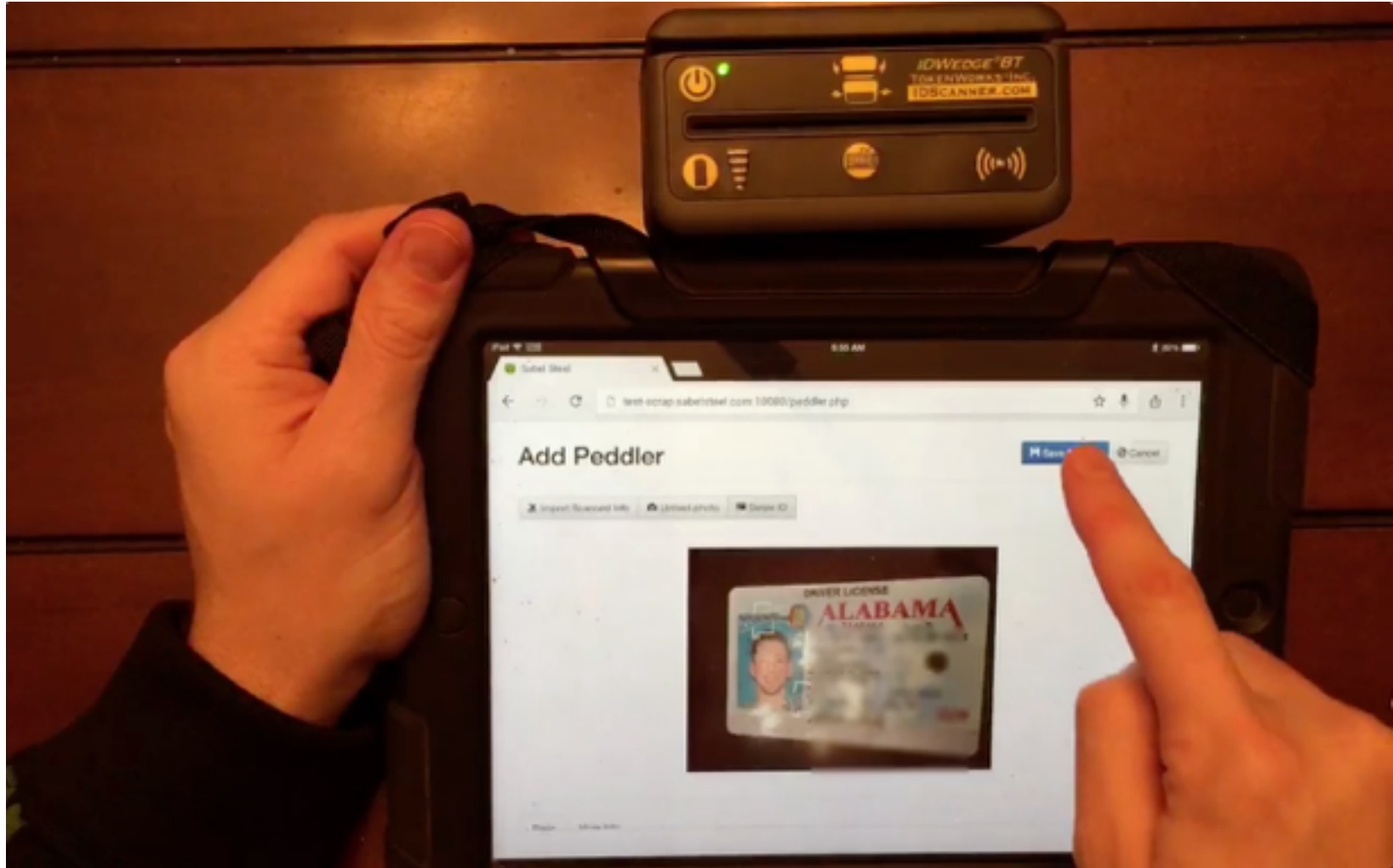


# Scrap metal system: take photo of card





# Scrap metal system: save photo to IFS/DB2



# Web services



# PHP can provide and consume

- **Many examples of web services with PHP (See <http://alanseiden.com/presentations> for more)**
- **Here is a recent example**

# PHP + JSON: Pennock Floral

- **Challenge: connect RPG applications to third-party e-commerce web services using JSON**
  - IT wanted to use IBM i but did not know how
  - Simplest solution would keep RPG in control
- **Executives doubted IBM i**
  - Were about to seek a solution outside of IT
  - IT needed quick success to prove IBM i could handle HTTP + JSON

```
{  
  "authenticationToken": "token_info_goes_here",  
  "name": "Fuel Surcharge",  
  "code": FS"  
}
```



# PHP + JSON: Pennock Floral (slide 2)

- **Solution: Use PHP as “glue” to connect RPG to the JSON-based web services**
  - RPG remained simple, easy to manage
  - RPG called PHP, which handled the JSON easily
  - Pennock’s head RPG developer was then able to add new service consumers himself with RPG and PHP
- **“You turned lead into gold”—IT Director**



# Enhance RPG

# PHP can even enhance RPG green screens

- **Graphs, PDF files, Excel spreadsheets**
  - **RPG can call PHP**
  - **PHP can generate and email these graphical items**
- **Details and code in “PHP Tricks for RPG Programmers”**

```
? 1
  DSPLY  How many consumed by Vaughn?
? 1
  DSPLY  We will ask PHP to email a pie chart.
  DSPLY  PHP script says Sent email successfully.
  DSPLY  End of results
```

# E-mail pie chart from RPG

## Message from OMNI

**From:** omni@alanseiden.com  
**To:** alan@alanseiden.com  
**Subject:** Message from OMNI  
**Date:** Tuesday, May 20, 2014 7:56 PM  
**Size:** 24 KB

---

Please see attached pie chart

OMNI pizza party consumption. Total slices: 50



# E-mail PDF from RPG

American Apple Pie Company

May 23, 2014

Equity summary sample: member 9123

Year	Declared Unit Retains	Qualified Unit Retains	Non-Qualified Unit Retains	PIK
2005	.00	0.21	0.34	
2006	.00	1.21	1.34	
2007	.00	2.21	2.34	
2008	.00	3.21	3.34	
2009	.00	4.21	4.34	
2010	.00	5.21	5.34	
2011	.00	6.21	6.34	
2012	.00	7.21	7.34	
2013	.00	8.21	8.34	
2014	.00	9.21	9.34	
2015	.00	10.21	10.34	
2016	.00	11.21	11.34	
2017	.00	12.21	12.34	
2018	.00	13.21	13.34	
2019	.00	14.21	14.34	
2020	.00	15.21	15.34	

# Advanced and future



# PHP grows with you

- **“Procedural style” PHP works, generally easiest for RPG programmers to learn**
  - We all start with procedural PHP
- **Object-Oriented (OO) syntax: more advanced**
  - Structure for reusing code, maintenance
- **Frameworks, APIs**
  - Zend Framework, Apigility help structure applications
  - Learn after becoming comfortable with OO style

# “PHP Renaissance” and PHP 7

- Speed boost (at least with popular apps and CMSes...let's see about business apps)
- Spurred by competition with Facebook's “Hack”

Time and number of machine instructions for 100 requests against Wordpress-3.6.0 front page



# Summary

# How to start

- **Get PHP by downloading Zend Server for IBM i**
  - No charge for Basic license; prefer pro/enterprise if mission critical app
- **Use RPG and DB2 as solid foundation for business logic.**
  - **Works best if the logic is modular (smaller programs or procedures)**
- **Training and help are available. Free and paid resources**

# Be creative—change perceptions of IBM i

- **Adopt open source, no-cost software**
  - Joomla, Wordpress, many others
- **Extend green screens with a GUI**
  - Web and mobile applications engage a wider audience (e.g. customers)
  - Re-use business logic. RPG still valuable
  - PHP Toolkit enables this
- **New applications: choose IBM i**
  - Automate manual processes
  - Executive dashboards to improve business decisions
  - Working with open source demonstrates commitment to your chosen platform and your career as a whole

# Contact and tips

## Alan Seiden

Seiden Group

Ho-Ho-Kus, NJ

Free newsletter:

<http://seidengroup.com/tips>



---

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