



Sony Computer Entertainment of America

Retail outlets across the country

- gather sales data directly from each location
- a flexible solution with central control

Retail Survey 8 Question 15

What is the condition of console?

no
aged in
be
ng

← T.C. →

Retail Survey 8 Question 9

Product inventory.

Item: ▼ MegaLazer Gold (Clear)

Type: Action

UPC: 02132-2154-1

Price: \$ 49.99

Quantity: 7

← T.C. →

Menu





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Gather Field Data

A Palm system provides a flexible way to gather accurate, timely field data.

The rapidly changing market for consumer electronics requires constant information on consumer habits and trends. Sony Computer Entertainment of America employs a highly mobile workforce of merchandisers who travel to retail outlets across the country to gather information on SCEA's products. The Palm system used by SCEA allows for managers to quickly create surveys to be distributed to all or part of the mobile workforce. The data collected is returned directly to a central database for the generation of report. SCEA replaced an inefficient paper based system with a Palm application with easy to use screens for displaying a dozen different retail question types. Included in the surveys are inventory questions which can use the barcode scan engine built into the Symbol's Palm platform device.

Managers can create and modify survey using an Administration application running on the server. Managers can specify user groups for different surveys, allowing them to tailor their information requests to different geographic

regions and retail chains.



The Business Problem

Need fast, accurate sales data from the field

- want flexibility, the market varies by region
- want speed, the market can change rapidly
- want accuracy, the data must be correct



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Gather Field Data - The Business Problem

SCEA needs critical retail information collected directly from the field.

Sony Computer Entertainment of America employs a highly mobile workforce to travel around the country and gather detailed information on their retail products. The market for consumer electronics is very competitive and fast moving, and managers want to be able to locate and follow trends as soon as they emerge. Consumer tastes vary by region, so it is also required that the information gathered be tailored for different locations and retail chains. Lastly, the information gathered by the mobile workers must be accurate.

 **The Old Workflow**

- 1 Product surveys mailed from headquarters
- 2 Merchandiser records data with pen and paper
- 3 Completed surveys are mailed back to headquarters
- 4 Survey responses manually entered into database



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Gather Field Data - The Old Workflow

The original system involved paper forms and manual data entry.

Originally the retail information was gathered with paper forms.

- 1 The central administrators send out new retail survey forms to their mobile workforce. They need to be able to handle the occasional lost forms and changing address information.
- 2 The merchandisers in the field complete the survey by hand. There is no way to ensure that they fill this out while actually visiting retail outlets.
- 3 The merchandisers sends the survey forms to the central administration. Even using express mail the trips through the main add a delay of a few days to the surveys. The central staff must open and record all the incoming forms. Missing or incomplete forms require contact with the merchandiser - adding more delays to the whole process.

- 4 The data is manually entered into the central database. Difficulties reading handwriting will lead to errors and more delays. Even at best the whole process takes time and requires the hiring of data entry people.

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The New Workflow

- 1 Managers create product surveys on a PC**
- 2 Users answer their individual survey at each store**
- 3 Synchronization sends back data, gets new survey**

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Gather Field Data - The New Workflow

Mobile workers gather retail information as part of a Palm solution.

Palm handhelds replace paper forms for gathering critical data.

- 1 Managers create surveys on a central server. The surveys can be customized for select groups of workers, allowing the managers to target questions to specific locations and retail chains.
- 2 In the field the mobile workers read the questions on a custom Palm application and respond to them. The surveys can be set to include jumps - so that certain responses can skip over a few subsequent questions - speeding up the process of gathering information by skipping irrelevant details.
- 3 The users synchronize their Palm organizers with the central server. This sends their latest information back to the main database and gives them a new retail survey.

An example of a “jump” mentioned above. Question 10 asks “Is the demo console

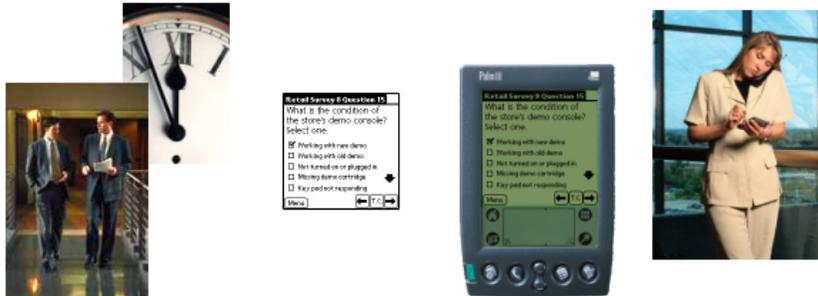
unit working?” If the workers answers Yes, the survey skips to Question 15 on a different topic, but if the worker answers No, then the survey runs through a series of questions intended to assist the worker in isolating the problem with the demo console.



The Business Benefits

Flexible data gathering from the field

- the user surveys can be rapidly changed
- the system is fast and accurate
- centralized control over questions and data



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Gather Field Data - The Business Benefits

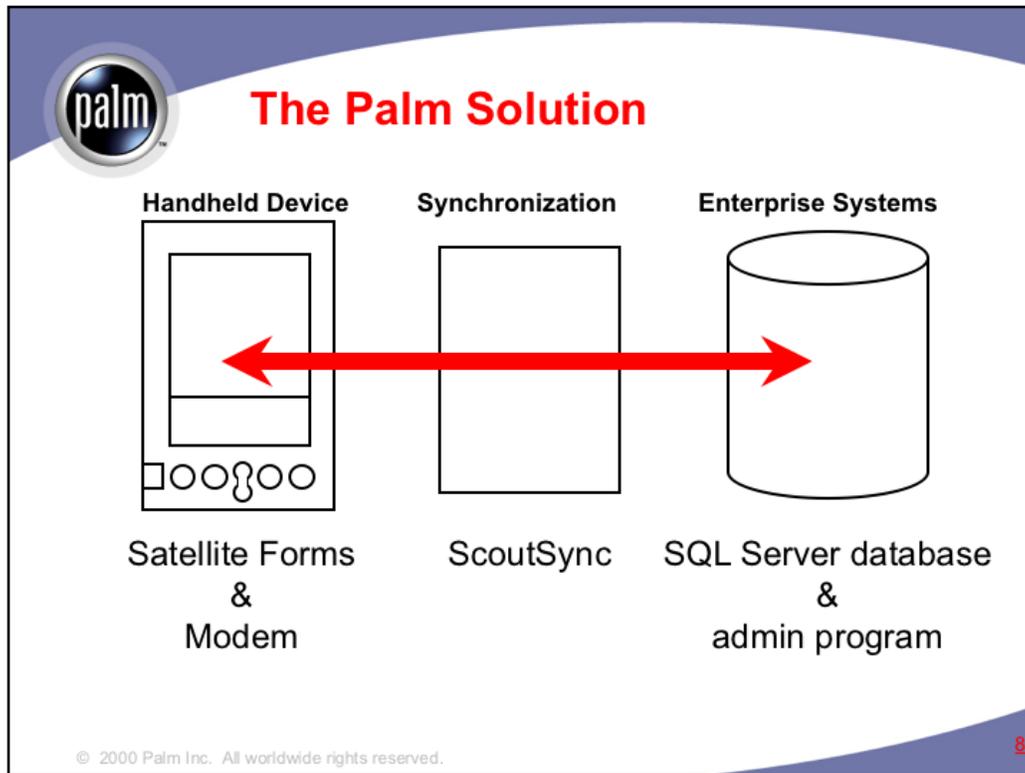
The Palm system enables rapid gathering of accurate information.

The Palm system allows SCEA to respond quickly to changes in the marketplace by gathering data quickly with a very flexible system of retail surveys for the mobile workers. The system is faster and more accurate than the older system based on paper forms.

The new system is superior because of:

- flexibility, the managers can create new retail surveys quickly and target them for a subset of workers in a specific region or retail chain.
- speed, by sending data directly to the central server during a synchronization the critical market data is obtained almost immediately after it is gathered. Likewise, synchronization greatly speeds the process of sending new surveys to the fields. The result is that market trends can be found quickly and easily.
- accuracy, the use of many pick-lists makes data entry quick and easy, but the Palm application includes built-in checks to test against wildly inaccurate entries
- efficient, the new system eliminates a great deal of paper handling, including the manual entry of information from forms. All retail data is sent directly to a single

database, making it easier to generate timely reports.



The Palm Solution

A complete enterprise Palm solution is more than just the handheld

The power of a successful Palm solution for the enterprise lies in the tight integration of the handheld devices with the corporate infrastructure. For the SCEA Merchandizing the deployed system consists of:

1 handheld device

- a Symbol SPT-1500 or SPT-1700 barcode enabled Palm device
- a Palm modem to connect the handheld with the server
- a Palm application written in the Satellite Forms scripting language

2 synchronization

- ScoutSync server synchronization software

3 enterprise systems

- a SQL Server database
- a custom Administration program written in Visual Basic



Handheld Device - the hardware

A Symbol device - a Palm organizer with a barcode scanner was chosen

The SCEA Merchandising system selected the Palm platform over its competitors primarily on the strength of its battery life. Windows CE devices of comparable size do not have the power to remain active for the extended periods of time needed by the merchandisers. The ease of use was also an important consideration and the custom application developed for this system was designed to be easy to operate.

A Symbol unit was selected because of the barcode scanner. Retail surveys included questions about inventory which could be quickly answered by scanning product barcodes. Barcode scanning is fully integrated in the hardware and software of the Symbol device. Software integration is critical as it removes any need for third party drivers or configuration difficulties. Programs written for a Symbol unit are like any other for the Palm OS[®], but simply include special API calls to access data from the barcode unit.

The Palm application includes questions about product inventories which can be

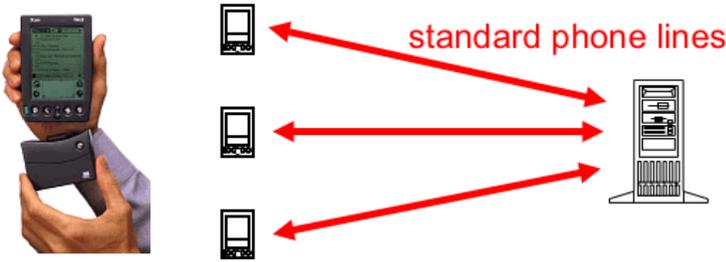
answered by scanning barcodes. Symbol units have fully integrated the barcoding with the Palm API, and survey questions can directly use barcode scans for data input.



Handheld Device

Modem connects directly to corporate server

- extended mobility as phone jacks are everywhere
- modem allows for large data transfers
- little extra training or maintenance required



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Handheld Device - the hardware

A modem is used to connect the Palm device to the server

The SCEA Merchandising system uses a Palm modem to make a direct connection to the central server. The use of a modem gives the merchandisers a great deal of freedom in choosing where to synchronize from without tying them down to a single PC or laptop proxy - the merchandisers simply need to locate a standard phone jack.

The connection is made using the Scout client on the Palm device, which makes a RAS connection into a server running Windows NT. The merchandisers supply their standard passwords in order for the synchronization to commence.

A wireless solution would not be a good option for this project because of the large amount of data being transferred during each synchronization. Wireless is best for

small data sets.

Handheld Application

Custom merchandizing application
– a wide range of survey questions

Yes/No, multiple choice, date, string, numbers, currency, inventory, & more

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Handheld Device - the application

The Palm application includes a wide range of specialized question types.

The custom designed data gathering application on the Palm device includes questions of many different types including: Yes/No and multiple choice, as well as those requesting a number, currency, time, date, and text entry. Inventory questions tie directly into the built-in scan engine of the Symbol devices allowing for the workers to scan products in response to those questions. The barcode reading ensures that the correct products have been counted, which can be a problem for a business where many items have similar names.

All of the many different question types were custom designed to maximize the utility of the application for SCEA's mobile workforce.

The application actually includes two types of inventory questions. They have the same form, but are tied to different data sets, one for large products and one for smaller Point-of-Purchase items.

palm **Handheld Application**

Custom merchandizing application

- built in data integrity checks
- questions can be optional or mandatory

Retail Survey 8 Question 12
How many POP displays have been set up?
3
Enter a number
Menu

Retail Survey 8 Question 23
What time does the store close on Saturday?
10 PM
Enter a time or tap the icon
Menu T.C.

Retail Survey 8 Question 8
What is the sales price of the MegaLazer Bonus Pac?
\$ 17.89
Enter a monetary value
Menu

Retail Survey 8 Question 21
What day is scheduled for a visit by the MegaLazer mascot?
5/27/00
Enter a date or tap the icon
Menu T.C.

application can verify that the user has entered a value within an valid range

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Handheld Device - the application

Simple data integrity checks can be added to different questions.

The custom Palm application also includes some built in checks to protect the accuracy of the data. This is one advantage of creating different question types to look for number, text, or string input etc., as opposed to using fewer types which treat all inputs alike. The user's inputs can be checked against a predetermined the range of acceptable answers to guard against obvious errors. For example, a question asking the the price on a pack of trading cards may only allow responses less than 10 dollars. This check is intended to prevent very large errors that might occur from user mistakes.

Questions can also be designated as "required." Required questions must be answered for the application to complete. An example of a required question would be the name of the manager on duty during a visit by a retailer. This simple check helps ensure that the most critical information is answered.

Managers have the capability of setting the range of acceptable values and the required designation when they create a survey. This gives them yet more

flexibility to ensure that they get the retail data they need.

palm **Handheld Application**

Custom merchandizing application
 – branching questions: survey responds in the field

What is the answer to this Yes/No question?

if **Yes** this question is next

if **No** this question is next

Retail Survey 8 Question 15
 Are the new Megalazer posters on display?
 Yes No
 Menu T.C.

Retail Survey 8 Question 8
 What is the sales price of the Megalazer Bonus Pac?
 \$17.99
 Enter a monetary value
 Menu T.C.

Retail Survey 8 Question 9
 Product inventory.
 Item: Megalazer Bonus Clear
 Type: Action
 UPC: 02132-1421-3
 Price: \$29.99
 Quantity: 18
 Menu T.C.

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Handheld Device - the application

The custom survey on the Palm includes branching questions.

The custom application on the Palm also includes branching questions, where the answers lead to a different set of follow up questions. For example, a branching question may ask “Is the demo unit working?” If the user responses with a Yes then they are directed to the next set of questions, perhaps about product inventories. If, however, they respond “No” the survey will then display a series of questions about the broken demo unit.

Managers can designate if a question will branch after being answered. This allows them to construct surveys which save user’s time by skipping over irrelevant details.

Note the the example of a branching question mentioned in the text is NOT what is being illustrated above.

Handheld Application

Custom merchandizing application
 – branching questions: multiple branches

What is the answer to this multiple choice question?

option 1

option 2 or 3

option 4

option 5

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Handheld Device - the application

Multiple choice questions can lead to multiple branches.

The custom application also allows from branching from multiple choice questions. As shown in the example above, the option that the user selects determines which question appears next. This capability can allow managers to create questions which focus in on issues or products which they are not certain are relevant in each store. The alternative would be to include many questions which would just need to be skipped by users.

Multiple choice questions and Yes/No questions do not have to branch. In some instances the answers all lead to the same follow-up questions.

Handheld Application

Custom merchandizing application
 – full integration with barcode scanner

track: item, UPC, price, quantity

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Handheld Device - the application

The custom application is tightly integrated with the barcode scanner.

Symbol's barcode scanning Palm devices include a barcode scanning engine which is fully integrated into the Palm hardware and software. This allows the survey to include questions where the answer requires scanning. Typically these are product inventory questions which ask the user to scan the number of a specific product, or do a survey of a number of different products. The inclusion of the barcode scanner is a great aid to data accuracy since it makes the user's job easier and also insures that the correct products are counted. The latter is of concern in an industry with a rapidly changing lineup of items, many of which have similar titles.

This application was developed with Satellite Forms. Symbol freely distributes Satellite Forms extensions (native C modules which can be called from within a Satellite Forms application) that directly access the scan engine. It is also possible, of course, to develop a program natively in C using Symbol's native libraries.

Handheld Application

Palm program written with Satellite Forms

- Rapid Application Development for the Palm OS®
- a Visual Basic like development environment

Activity	Start	End
Store Call	8:52	9:14
Store Call	10:05	10:54
Store Call	2:14	3:45
POP Ordering	3:47	3:56
Special Event	5:24	7:12
Total	6:41	

Satellite Forms™

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Handheld Device - the development environment

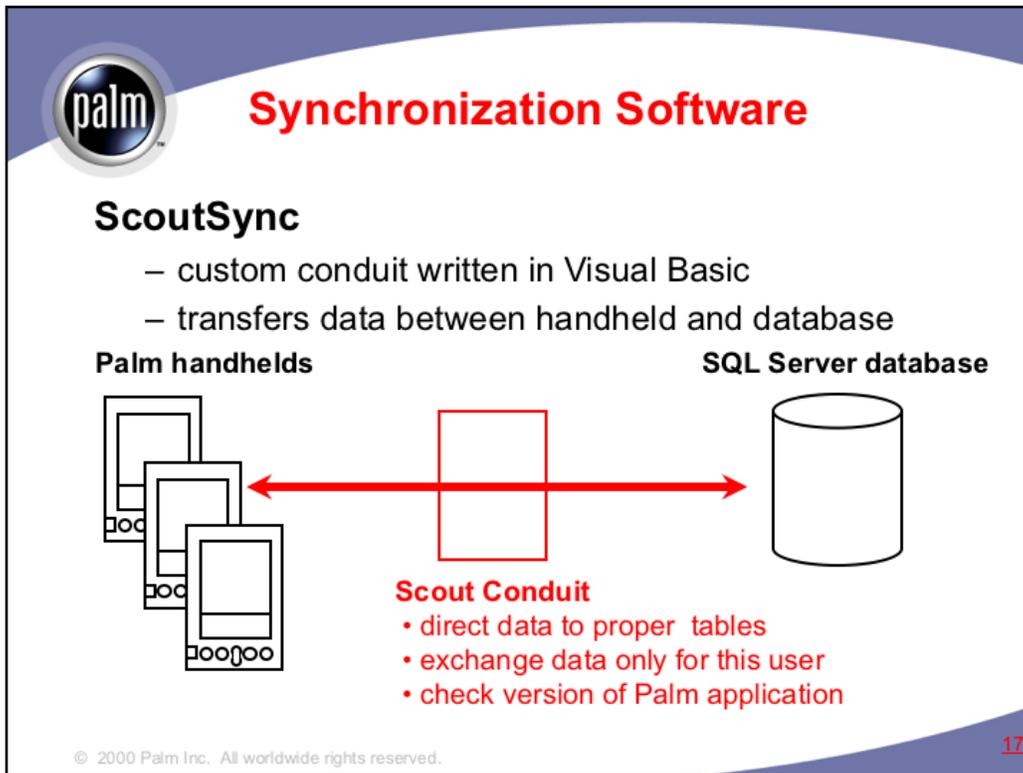
The Satellite Forms scripting language was used to develop the Palm program

The Palm application for the SCEA Merchandising system was written using the Satellite Forms development environment, from Puma Technologies. Satellite Forms is a scripting language with an easy to use tool for quickly creating the user interface for a Palm form.

Satellite Forms was chosen for the SCEA Merchandizing system because of its Visual Basic-like ease of use, and ability to make rapid changes to the user interface. Once the system is completed by an outside contractor SCEA's own IT staff will be able to make additional changes and upgrades without having to learn the complete Palm OS® API.

Satellite Forms also allows for small native programming application to be integrated into the main program to supply additional capabilities. For the SCEA system extensions were used to read the Palm's internal device number as an added security option as well as to use the barcode scanner.

Applications written in scripting languages like Satellite Forms are slower than those developed from a native C/C++ compiler like CodeWarrior. The trade off is that more time and specialized expertise is needed for the latter.



Synchronization Software

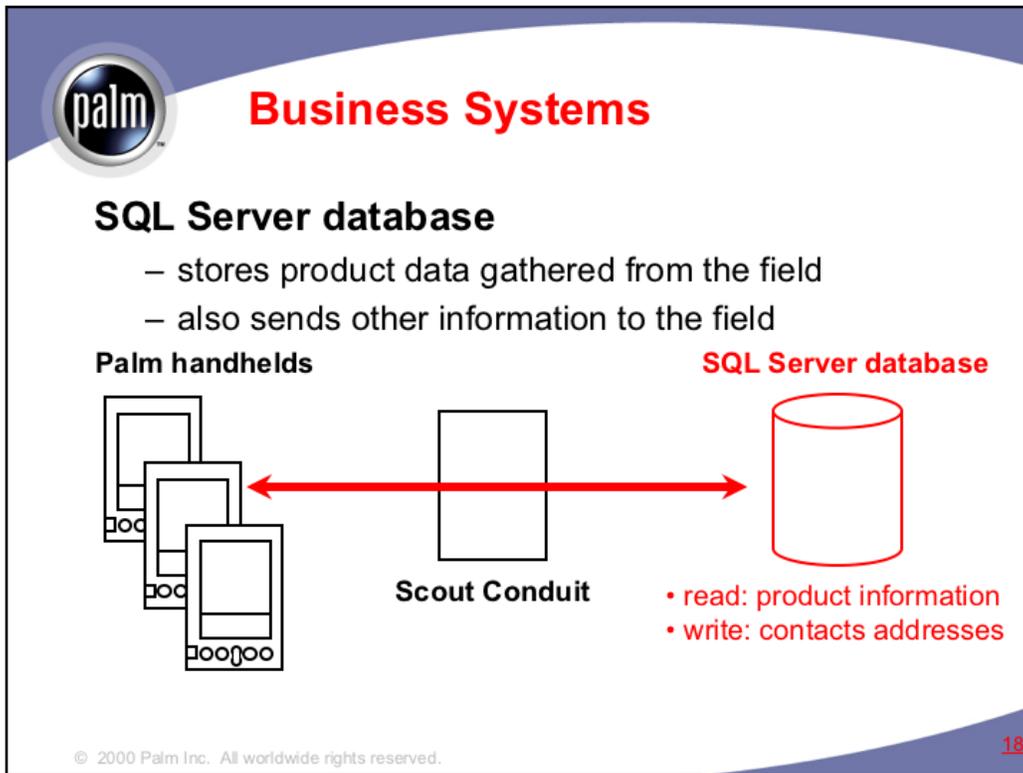
ScoutSync is used as the server synchronization solution.

There are a wide variety of server synchronization products and approaches. For the SCEA Merchandising system Scout was selected in order to allow for the greatest flexibility.

A Scout conduit was written in Visual Basic to control the details of the data exchange between the Palm and the back-end SQL Server database during a synchronization. The primary task of the conduit is to direct data from specific database tables on the Palm device to specific tables within the SQL Server database. The conduit determines which user is synchronizing and supplies them with the appropriate information. For example, merchandisers in New York will only receive information on retail outlets in the North East.

The conduit is also vital to maintaining version control. Newer versions of the Palm application can have slightly different data requirements (perhaps a new field, such as a web address, is added to a store contact). The conduit must be able to work with multiple versions until all users have upgraded.

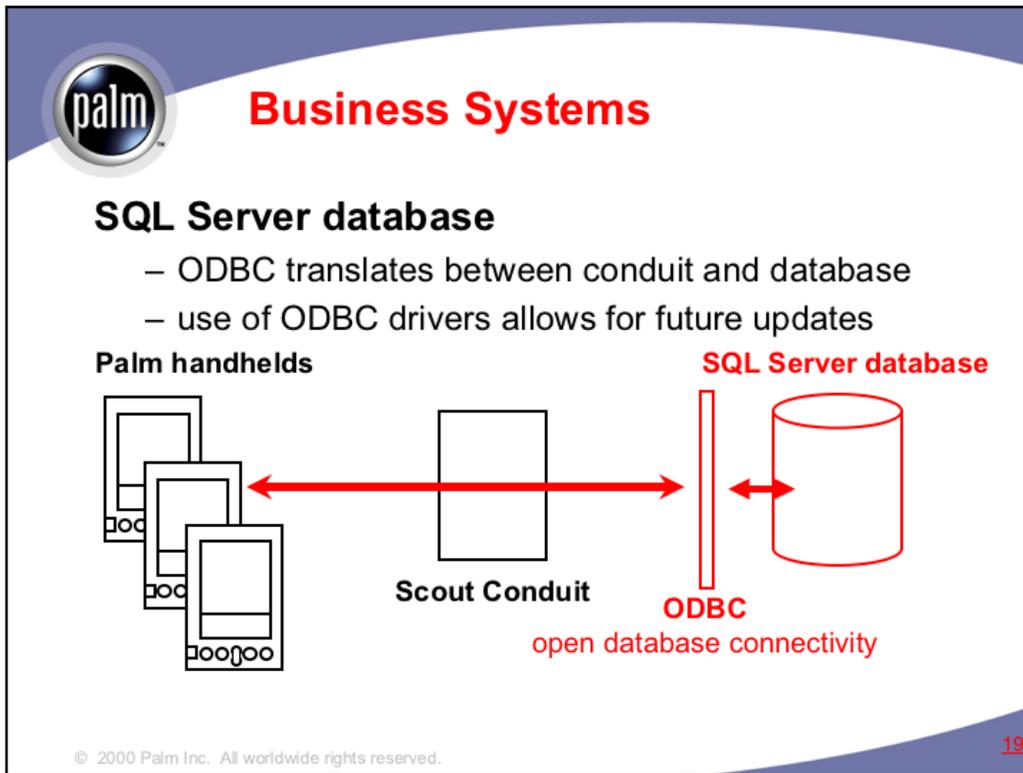
Scout is now used as the core of Palm Computing's new server synchronization product HotSync[®] Server.



Business Systems - the central database

The system uses a SQL Server database on the enterprise server

The information collected by the merchandisers is ultimately synchronized into a single SQL Server database running on the main server. The database is used to store information gathered from the field, such as prices and quantities of items in different stores. Reporting done using this database then yields timely and accurate information for the companies marketing specialists. The main database also stores information that is sent back to the field, such as the addresses of retail stores, allowing the central IT people to constantly update and add to critical data needed in the field.



Business Systems - database systems

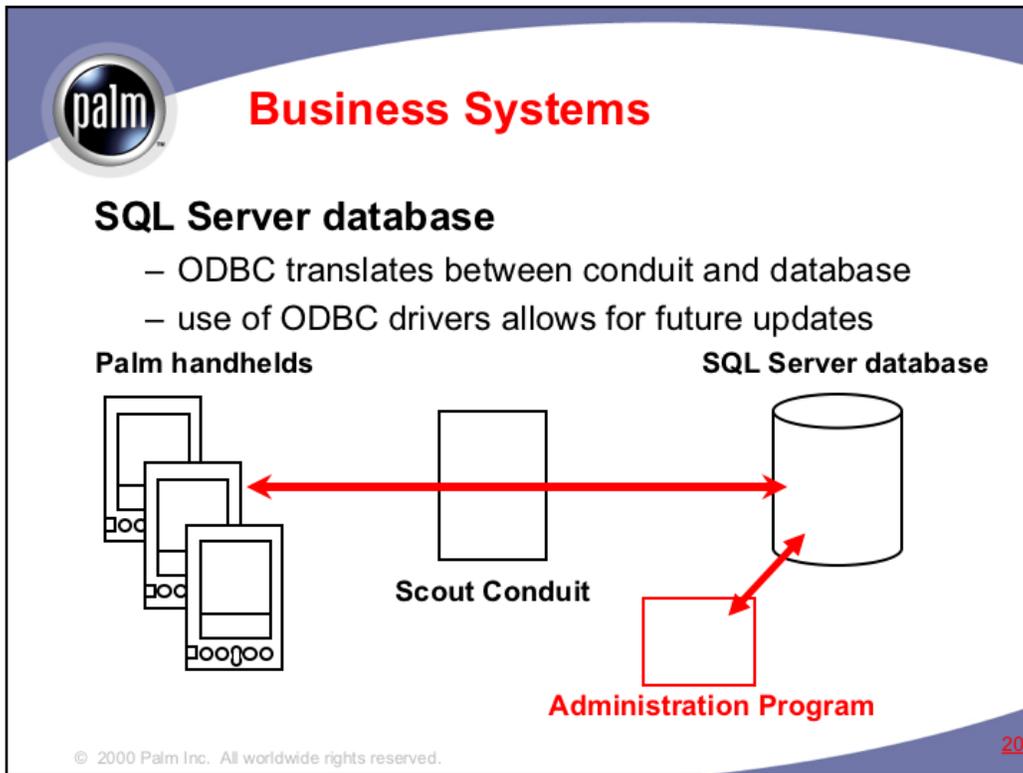
The conduit uses ODBC, allowing for almost any database to be used

The information from the fleet of Palm devices is sent back to a single database. By using a special layer of software commands the Scout conduit is able to “speak” a database language that is understood by all the major vendors. This retains the flexibility to change or upgrade the back-end systems without having to rewrite the conduit or make other drastic changes.

SCEA uses a SQL Server 6.5 database, although they wanted to retain the capability to change to a different solution in the future. The Scout conduit uses an ODBC (Open Database Connectivity) driver on the server to actually send and receive information from the database. All major database vendors have products that will work with the ODBC standards. Therefore, the IT staff will be able to change the back-end database to something from Oracle, Sybase, IBM, etc. with minimal effort.

Be aware that it is possible that minor changes will be needed in case a new

database does not operate exactly the way the current ODBC driver expects.



Business Systems - administration program

A custom administration program is used to modify synchronization details

The central database also stores information about the retail outlets and the merchandisers themselves. This data is used to filter the data that is synchronized by only sending merchandisers records pertaining to retail outlets in their territories. The details of this sort of filtering is controlled by a custom designed Administration program running on the server.

The Administration program used by this system allows an IT person to establish different user groups and to move users between groups. The Administration program does this by making changes in special tables within the database. During a synchronization the conduit reads these table to determine which data a particular user gets.

There are other choices for device management that might be applicable in other situations. All the major synchronization products now ship with device management utilities of one sort or another.



Thank you!

Any questions?



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