



JavaOneSM

Sun's 2002 Worldwide Java Developer Conference™

Java™ Technology on the Desktop in the Enterprise

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Goals

- Many people believe that Java™ technology on the desktop is dead... I'm here to tell you that it's not!
- The goal of this presentation is to show how Extensity has successfully deployed Java technology to the desktop in medium and large enterprises
- By the end of this presentation you will understand the various issues that you can run into in deploying Java technology to the desktop and how to overcome them

Who Am I

- Chief Technology Officer and Architect at Extensity
- Have been working with Java technology for the past 5 years, from early Java 1 platform-based applets through Java 2, Web Start and EJB™ technologies
- At the 1999 JavaOneSM conference, I was a panel member on 'Where Java™ Technology is working in the Enterprise'
- Previously worked on object-oriented databases and computer-aided design of integrated circuits

Agenda

- The Extensity Product
- The Enterprise
- How we used the Java 1 platform
- Issues related to the Java 1 platform
- Using the Java 2 Platform, Standard Edition (J2SE™)
- Remaining Issues
- Summary and Conclusions

What is Extensity?

- Founded in 1996
 - One of the KPCB “Java Fund” companies
 - Scott McNealy even came to the company launch
 - Product shipping since 1998
 - IPO in January of 2000
- Based in Emeryville, California
- 220 people in the US and UK
- 400 customers in 40 countries

Extensity Provides...

Framework

Financial Employee Relationship Management applications for reduced costs and increased productivity

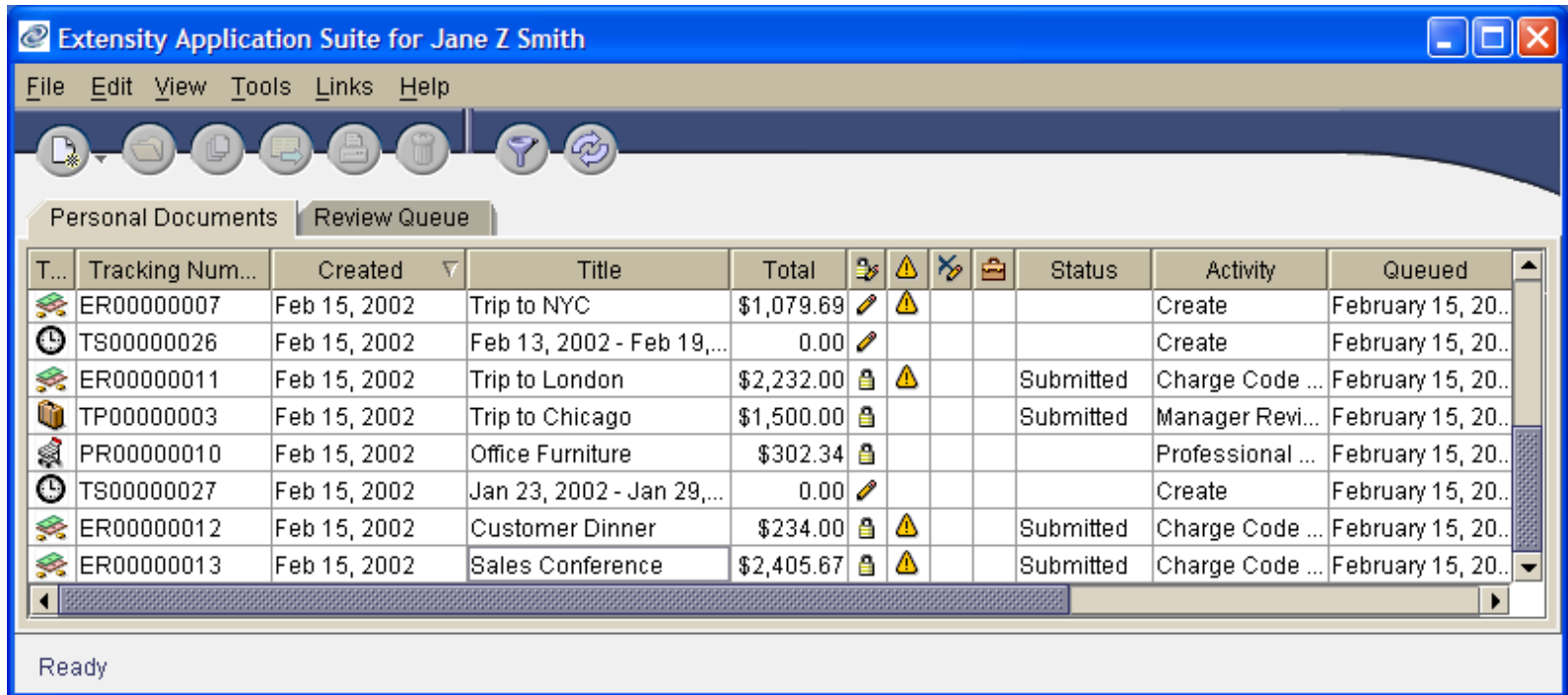
Applications

Intuitive applications that touch every employee, anytime, anywhere

Business Intelligence

Strong analytics for making timely, informed business decisions

Our Product



The screenshot displays the Extensity Application Suite for Jane Z Smith. The interface includes a menu bar (File, Edit, View, Tools, Links, Help) and a toolbar with various icons. Below the toolbar, there are two tabs: "Personal Documents" and "Review Queue". The "Review Queue" tab is active, showing a table with the following data:

T...	Tracking Num...	Created	Title	Total					Status	Activity	Queued
	ER00000007	Feb 15, 2002	Trip to NYC	\$1,079.69						Create	February 15, 20..
	TS00000026	Feb 15, 2002	Feb 13, 2002 - Feb 19,...	0.00						Create	February 15, 20..
	ER00000011	Feb 15, 2002	Trip to London	\$2,232.00					Submitted	Charge Code ...	February 15, 20..
	TP00000003	Feb 15, 2002	Trip to Chicago	\$1,500.00					Submitted	Manager Revi...	February 15, 20..
	PR00000010	Feb 15, 2002	Office Furniture	\$302.34						Professional ...	February 15, 20..
	TS00000027	Feb 15, 2002	Jan 23, 2002 - Jan 29,...	0.00						Create	February 15, 20..
	ER00000012	Feb 15, 2002	Customer Dinner	\$234.00					Submitted	Charge Code ...	February 15, 20..
	ER00000013	Feb 15, 2002	Sales Conference	\$2,405.67					Submitted	Charge Code ...	February 15, 20..

The status bar at the bottom of the window indicates "Ready".

Our Product

ER00000007 - Expense Report for Jane Z Smith - Create

Import Print Notes Attach Web Links

General Items Disbursement Summary Exceptions

Date: 02/11/2002
Expense Type:
Amount:
Currency: US Dollar
FX Rate: 1.00
Payment Type:
Merchant:
Purpose:
Location: Oakland/California/US
Description:
Cost Center: 1141
Project:
Western Sales Region
 Receipt Included Personal (non-reimbursable)

Date	Expense Type	Amount	Approved A...	Payment Type	Merchant	City	Des
Feb 10, 20...	Airfare	\$504.95		Master Card	United Airlines	New York	W23345334
Feb 10, 20...	Dinner	\$23.52		Master Card	Barney's	New York	
Feb 10, 20...	Taxi	\$25.00		Cash	Yellow Cab	New York	Airport to Ho
Feb 10, 20...	Hotel	\$443.32		Master Card	Marriott	New York	
Feb 11, 20...	Breakfast	\$14.00		Master Card	Hotel	New York	
Feb 11, 20...	Lunch	\$8.90		Cash	McDonalds	New York	

Total: \$1,079.69 Amount Due Employee: \$1,079.69

Done Cancel Help

The Enterprise Infrastructure

- Very little control over the environment
- Many server operating systems
- Many databases
- Less than optimal networks for remote offices and users

The Enterprise Desktop

- Standard and sometimes archaic configurations
- Widely varying client hardware
 - Processor, memory
- Widely varying client software
 - Operating systems, browsers

Deploying in the Enterprise

- Large number of users (100's to 100,000+)
- Different skill sets for users
- Must be easy to deploy, update, launch, and use
- Must live within the common 'portal' of access to corporate services—the browser

Application Interactivity

- Rich and dynamic user interface
 - Selection in a drop down changes labels and the contents of other drop downs
 - Selection in a grid populates other widgets
 - Real-time enforcement of field masks
- And all of this must work on slow WANs, dialups, and even when disconnected

Implementing the Client

- There are a number of cross-platform possibilities
 - Plain HTML
 - Dynamic HTML
 - Java technology-based Applets and Applications

Plain HTML

- Pros
 - Easy to deploy
 - Compatible browsers on almost all desktops
- Cons
 - Static interface with no interactivity
 - Too many roundtrips to the server
 - No good disconnected solution
 - Scalability issues

Dynamic HTML

- Pros
 - Easy to deploy
 - Many desktops have a compatible browser
 - Dynamic interface with better interactivity
- Cons
 - Dynamic interface and interactivity via lots of ugly JavaScript™ scripting language and CSS
 - Buggy and incompatible browser implementations

Java™ Technology-based Applets (“Java Applets”) and Applications

- Pros
 - Allows development of rich and dynamic user interfaces
 - Supports disconnected use
 - Applets easy to deploy
- Cons
 - At the time, some issues with buggy VMs
 - Long download times for large applets

Solution Using the Java 1 Platform

- Three tier application using the Java 1 platform
 - This was 6 years ago!
- Java technology on the client
 - Applet for most, Application for disconnected users
 - Using Pointbase for offline data storage
- Java technology on the server
 - Weblogic 3.0!
 - JDBC™ API for access to the RDBMS

Issues With Java Technology and the Java 1 Platform

- Java technology not always on the desktop
- Write Once, Run Anywhere™ was not quite true in practice...
 - AWT
- Early security fears associated with Java technology
- Uneven vendor support
 - “It’s fixed in Java 2 technology just doesn’t cut it when all browsers at the time only supported Java 1 technology”



Issues With Java Applets

- Buggy Virtual Machines in browsers
- Long initial downloads
 - 1.7MB @ 28.8k, you can do the math
- Keeping the applet in the cache
- Certificates
- Updating the applet
- Application server support

But It Worked!

- With a lot of effort
 - Code size reduction
 - Platform specific code (only on the client)
 - Working with vendors to fix bugs
 - Testing and more testing
 - Use of the disconnected client for very slow links
- Successfully deployed
 - 1,000,000+ seats
 - 400 enterprises
 - 40 countries

Java™ 1 Platform Implementation

Expense Report for Rick Spickelmier - Accounts Payable (READ ONLY)

Title: JPMC trip Purpose: Customer Visit Expense Report Total: \$902.58
Amount Due Employee: \$902.58

Cost Center: 200 Project: Tracking Number: ER00023555

Date: 02/10/2002 Expense Type: Hotel Payment Type: Master Card
Amount: \$626.88 Currency: US Dollar = \$626.88
FX Rate: 1.00
Cost Center: (Itemized Allocations) Project: Hotel
Purpose: Customer Visit
Location: New York/New York/USA

Receipt Included Personal Expense

Date	Expense Type	I	N	Amount	App. Amount	Payment Type	Merchant	City	Description
10-Feb-02	Hotel			\$626.88	\$626.88	Master Card	The Barclay	New York	
10-Feb-02	Taxi			\$44.00		Cash		New York	JFK to Hotel
10-Feb-02	Dinner			\$40.00		Master Card	The Barclay Resta	New York	
10-Feb-02	Lunch			\$5.00		Cash	Airport	New York	food for flight, no meals on JetBlue
11-Feb-02	Taxi			\$10.40		Cash		New York	Customer Site to Hotel
11-Feb-02	Breakfast			\$7.00		Cash	Starbucks	New York	
11-Feb-02	Dinner			\$40.00		Master Card	Al Bustan	New York	
12-Feb-02	Parking			\$48.00		Cash	Airport Parking	Oakland	
12-Feb-02	Taxi			\$44.70		Cash		New York	Hotel to JFK
12-Feb-02	Taxi			\$11.60		Cash		New York	Hotel to Customer Site
12-Feb-02	Breakfast			\$7.00		Cash	Starbucks	New York	
12-Feb-02	Lunch			\$8.00		Cash	Burraer King	New York	

Buttons: Exceptions, Web Links, Notes..., Import, Summary..., Print, Cancel, Help, Done

Soon We Entered the Dark Ages...

- “Java technology on the client doesn’t work, and we at Netscape have done an about turn on client-side Java technology in recent months.” —Marc Andreessen, June 1998
 - Picked up by others to assault Java on the client
- The 1999 and 2000 JavaOneSM conferences stressed Java technology on the server

But Why...

- The desktop was owned by Microsoft
- Microsoft/SUN battle
- The Java 1 platform was seriously limited in it's client support
- Uneven support from the Java technology vendors
- Applet model better suited for small pieces of code

And Then We Entered the Golden Age

- Introduction of the Java™ 2 Platform, Standard Edition (J2SE™) and the Java 2 Platform, Micro Edition (J2ME™)
- Apple became a big supporter of the J2SE platform
- The analysts started to talk positively about Java technology on the client
 - “The real work with Java technology for building applications for the Web is what’s important. And for a rich browser experience for the client, J2SE technology has a lot to offer”
—Tracy Corbo, Hurwitz Group, June 2000

Current Solution Using J2SE Technology

- Heavy use of the Java™ Foundations Classes (JFC/Swing) API
- Use of J2EE technology ‘client’ components for operations that don’t need Java technology on the client
 - Printing and preview
 - Status checks
- Java Web Start software
 - “The Holy Grail”
 - Finally a standard model for deployment, updating, and launching

The J2SE Technology Solution

ER00000007 - Expense Report for Jane Z Smith - Create

Import Print Notes Attach Web Links

General Items Disbursement Summary Exceptions

Date
02/11/2002

Expense Type
[Dropdown]

Payment Type
[Dropdown]

Amount
[Text Box]

Currency
US Dollar

Merchant
[Dropdown]

Use Euro

FX Rate
1.00

Purpose
[Dropdown]

Cost Center
1141
Western Sales Region

Project
[Dropdown]

Location
Oakland/California/US

Description
[Text Box]

Receipt Included Personal (non-reimbursable)

Enter
Copy
Restore
Delete
Itemize...
Notes...

Date	Expense Type	Amount	Approved A...	Payment Type	Merchant	City	Des
Feb 10, 20...	Airfare	\$504.95		Master Card	United Airlines	New York	W23345334
Feb 10, 20...	Dinner	\$23.52		Master Card	Barney's	New York	
Feb 10, 20...	Taxi	\$25.00		Cash	Yellow Cab	New York	Airport to Ho
Feb 10, 20...	Hotel	\$443.32		Master Card	Marriott	New York	
Feb 11, 20...	Breakfast	\$14.00		Master Card	Hotel	New York	
Feb 11, 20...	Lunch	\$8.90		Cash	McDonalds	New York	

Total: \$1,079.69 Amount Due Employee: \$1,079.69

Done Cancel Help

And on Mac OS 10.1

ER00000010 - Expense Report for John Q Jones - Create

Import Print Notes Attach Web Links

General Items Disbursement Summary Exceptions

Date / /

Amount

Use Euro

Expense Type

Currency US Dollar =

FX Rate 1.00

Project

Payment Type

Merchant

Purpose

Location

Description

Cost Center 1141

Western Sales Region

Receipt Included Personal (non-reimbursable)

Date	Expense Ty...	Amount	Approved...	Payment Type	Merchant	City	Descripti

Total: \$0.00 Amount Due Employee: \$0.00

Done Cancel Help

Issues With the Java 2 Platform

- Java 2 technology is currently not on most desktops
 - Unless you are a Mac OS 10.1 user
- Microsoft is not supporting the Java 2 platform
- Too many versions of the Java 2 platform

Issues With Java™ Web Start Software

- Some issues with JSP generated JNLP files
- Incomplete offline support
- No application control over shortcuts (desktop integration)
- Limited security models
- No CD install
- Applications and Java runtime environment (JRE) can be updated, but not the plug-in
- However, the JWS team has been very receptive

Summary

- It's been a long journey with a few bumps along the way
- The enterprise is different, you have very little control
- The J2SE™ platform finally delivers on the promise of Java™ technology for the client
- Java Web Start software addresses many of needs of deploying Java technology in the enterprise

Conclusions

- Environments are not homogeneous across enterprises and even within
- Java technology on the desktop is not quite 'Write Once, Run Anywhere™'
 - You really need to test across all environments
- If you understand the above, Java technology can be successfully deployed to the desktop in the enterprise



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BOUNDARIES