



Lisp for Service Oriented Architecture (SOA) Programs

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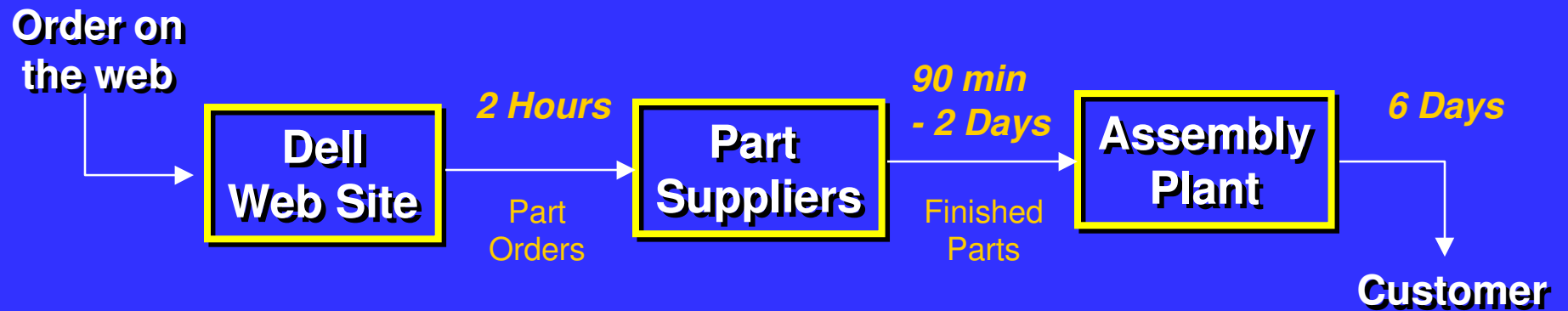


A Lesson from B2B

Who is Dell?



Dell Is A Bank!



- Free cash flow of \$3.2B of customers' money at any time
- ZERO inventory cost
- Lowest cost producer



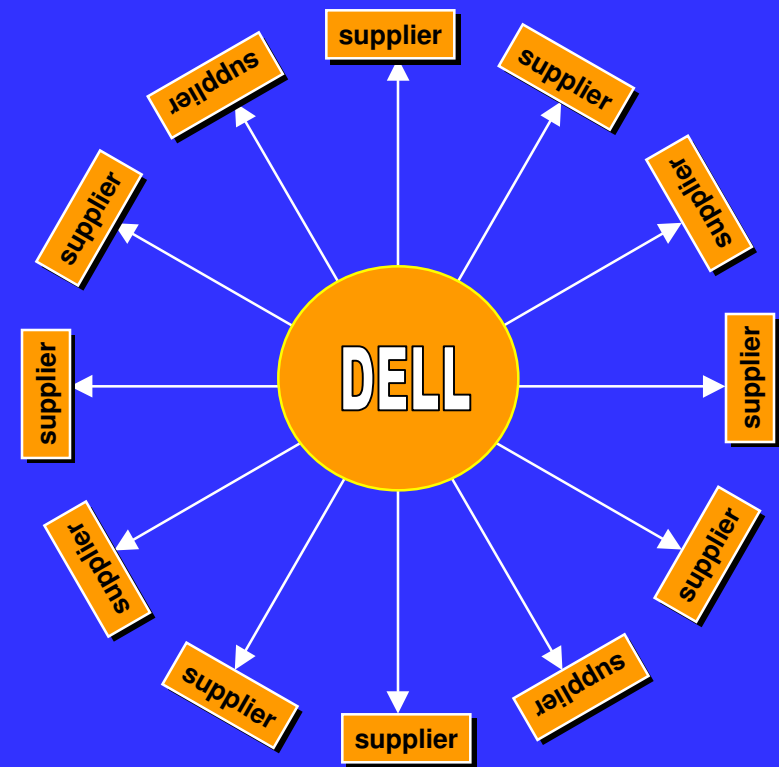
How Does Dell Do It?

- Automatic B2B transactions
- Symphony by Dell sales
- Direct EDI link by suppliers
- Build it much cheaper, faster and better



But, It's Very Expensive

- Only 5% of US companies use full B2B
- Proprietary EDI
- Hub and Spoke B2B
- \$40K per EDI adapter
- Fixed, not portable nor scalable
- “Should I embrace B2B now?”





Central Business Dilemmas on Technology

- When to embrace a new technology to improve business performance?
- Which technology to embrace?
- How much longer to stick with the current technology?



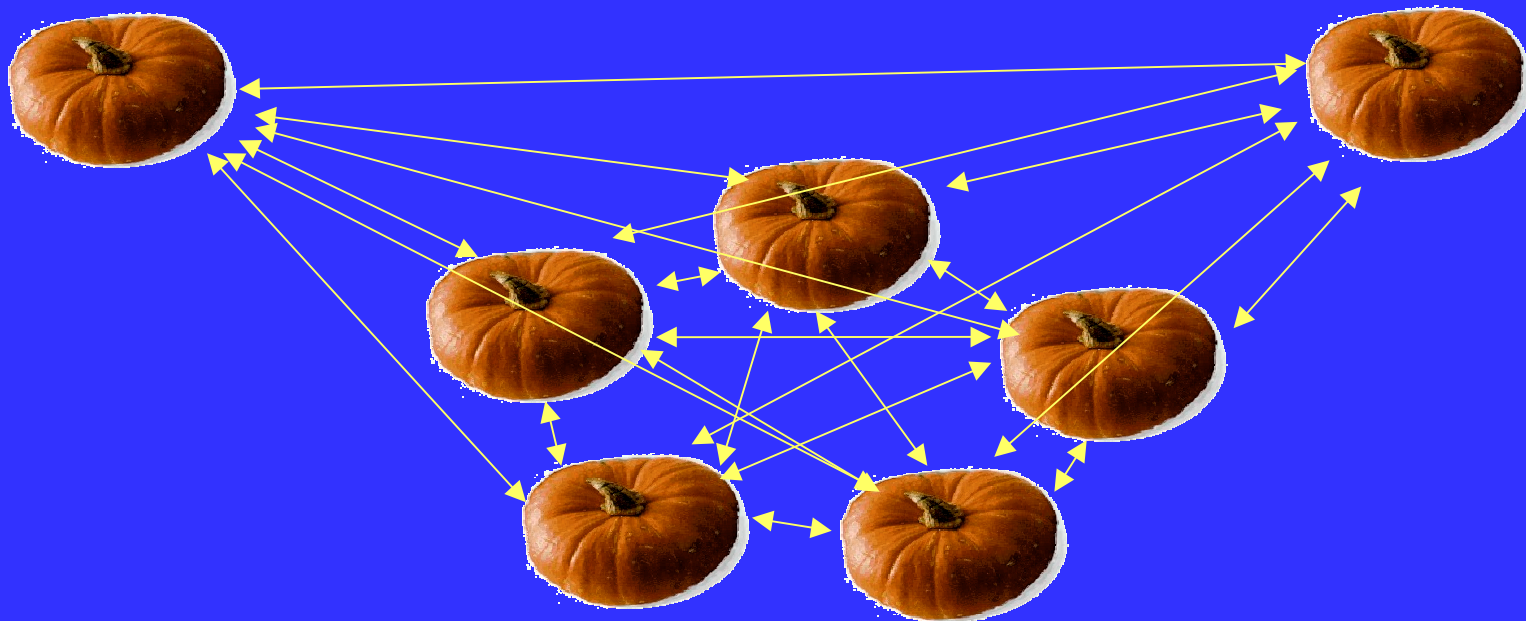
The Perfect *Storm*

- **Technology:** Internet
- **Market:** Globalization and outsourcing
- **Wal-Mart:** Economy of scale
- **Companies have no choice but to truly embrace B2B e-Commerce NOW!**



But, How?

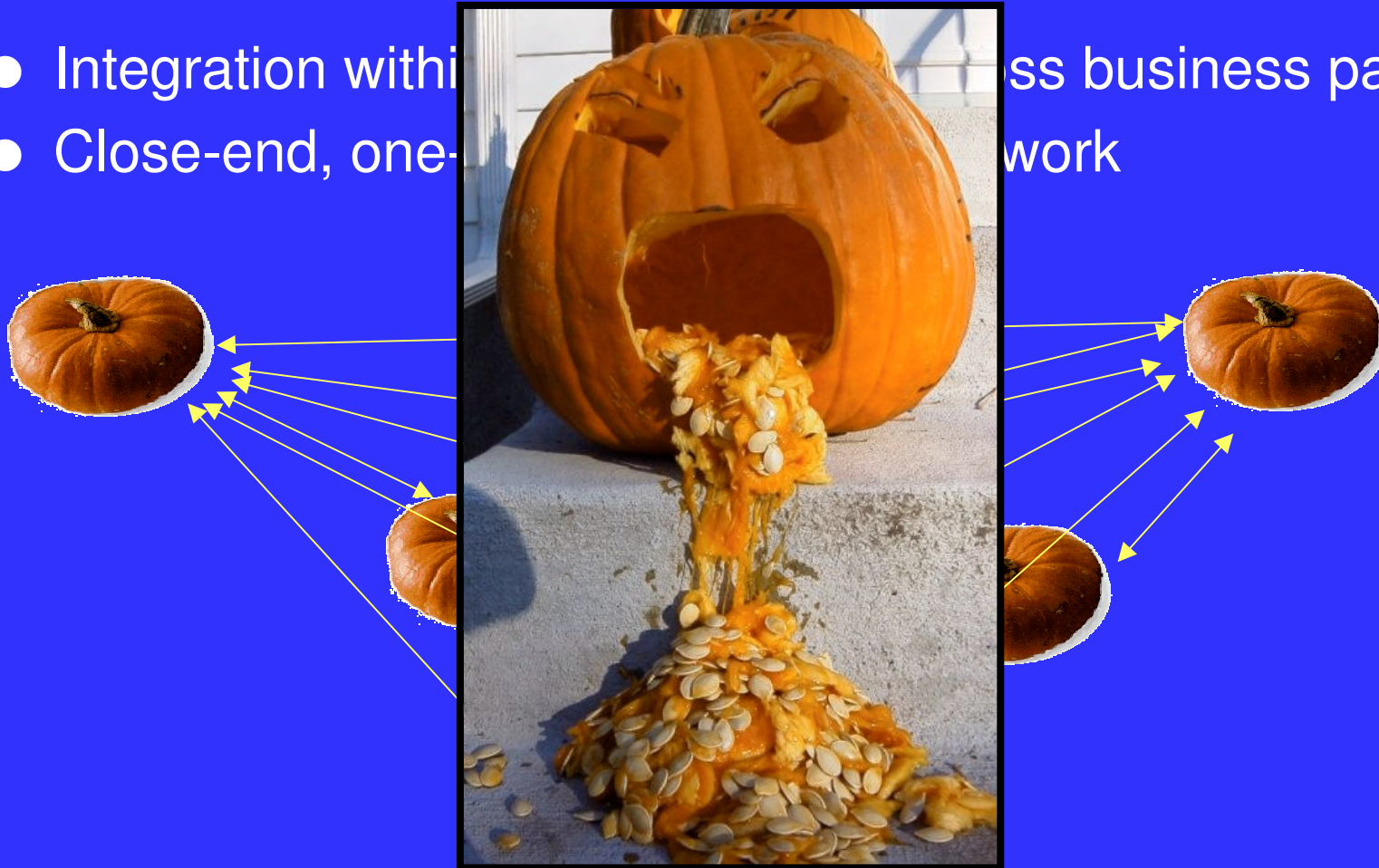
- Integration within enterprise and across business partners
- Close-end, one-to-one system won't work





But, How?

- Integration with existing business partners
- Close-end, one-time work



- IBM's 36,000 customers spent 40% of IT budget on EAI

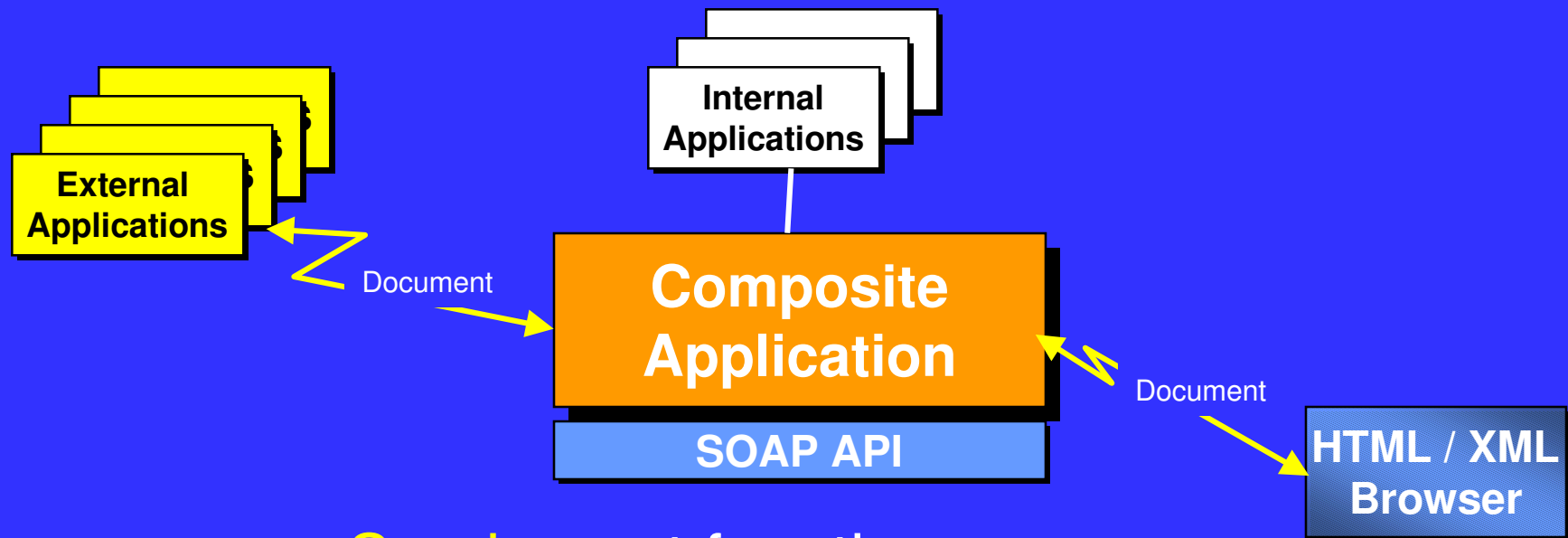


Old Component Technology Won't Do it!

- COM/DCOM, CORBA, Java/RMI
- Heavy weight solution
- Not leverage on HTTP Internet
- Difficult to integrate across enterprise boundaries
- Not platform neutral



Service Oriented Architecture (SOA)

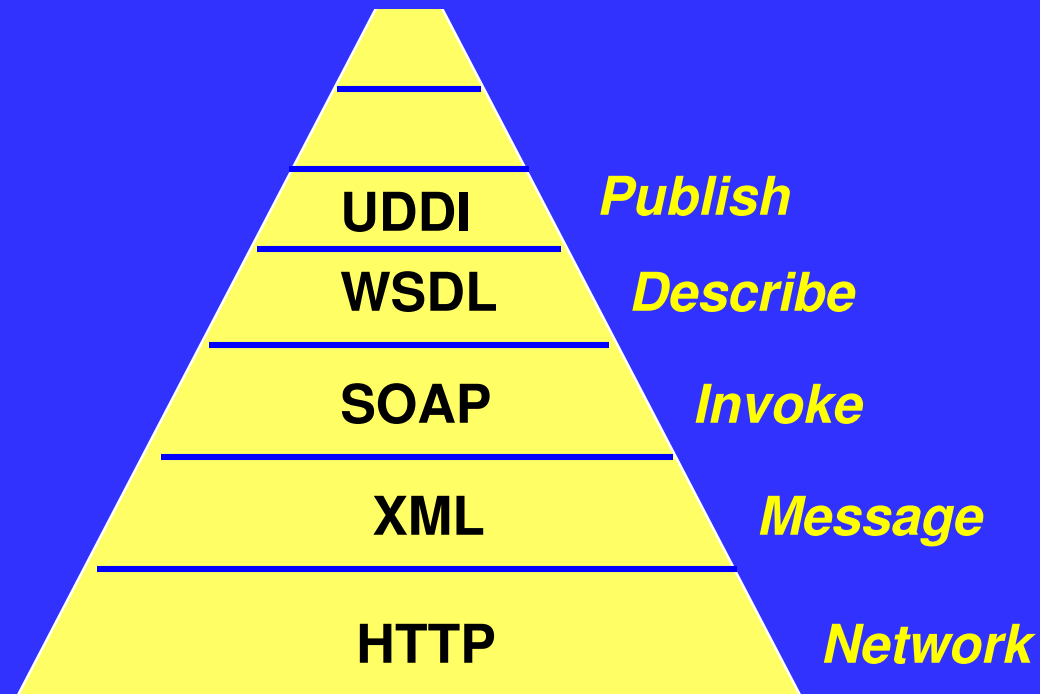


- Service not function
- Using text messages
- Web Service (WS)



SOA Web Services

- A light-weight software component architecture



- Will be ubiquitous!



Why SOA?

SOA

- Document centric exchange model
- Loosely coupled
- Middleware transparency
- Dynamic composition

Old Component

- Procedural call model
- Tightly coupled
- Middleware compatibility
- Static development



A Scalable B2B e-Commerce Architecture

Account
Receivable

Account
Payable

Sales
Automation

Inventory
Control

Shop Floor
Control

Order
Management

HR
Management

Other
MIS

Web Services Infrastructure & SOAP API

**Business
Partners**

Suppliers

Customers

**Internal
Enterprise**

- Separation of business processes from business functions
- Uniform service “APIs” for all internal and external consumers of the services



Today's Applications Must Change Constantly

- Market condition changes
- New technology, materials, tools, etc
- Collaboration with ever more new partners
- The only constant is change and the pace of changes is accelerating
- SOA makes frequent changes possible
- Right software tools make it practical
- Speed, speed, and speed



Lisp is Ideal Tool for SOA

- Single programming and deployment model
- Dynamism
- **Rapid Application Development *and* Evolution** to deal with the accelerating changes



Lisp Programmers Hardly Ever

- Leave their programming environment
 - Code edited, compiled and loaded incrementally at run time; no need to stop an application to debug, edit, compile, patch and test
- Recompile an entire set of programs
- Worry about memory management
- Concern about type-checking until program works



Lisp is Ideal for WS-based e-Commerce

- B2B e-Commerce entails sequences of peer-to-peer, stateful, long-running, dynamic interactions
- Need a protocol (e.g., BEPL4WS) to script and execute these sequences
- Lisp (with macros) best for scripting and executing complex business process



CL Tools: Networking

- Allegroserve

- HTTP server: Static and dynamic pages, access control, logging, SSL/TLS

- Webactions

- Model/View/Controller paradigm (a la Struts)
- Session and State Support
- CLP dynamic pages (a la ASP or JSP)
- Database integration (ODBC, native MySQL & ORACLE)

- POP/IMAP/FTP/Sendmail/SSL/TLS/NFS



CL Tools: XML

- Very fast (SAX) XML Parser
- XHTML
- CL-Schema*
 - Compile XML-Schema directly into CLOS class hierarchies
 - Read in XML directly as CLOS objects
 - Reason over it with Lisp and Prolog
- RDF & OWL*

* To be released soon



CL Tools: Web Service

- SOAP client and server interfaces
- WSDL compiler and generator
 - Compiled against Xmethods.com
- Other Web Services infrastructure tools*
built on XML, SOAP and WSDL



Why aren't there More Lisp Web Programmers?

Truth	Reality
Lisp is fast	Compile directly into machine instructions running at C speed
Lisp is small	Lisp has a smaller memory footprint than Java
Lisp is more than AI	Many non-AI mission-critical apps deployed in Lisp



Where Lisp is Used Today (Samples)

- MCAD: Boeing 777 airframe, Airbus Super Jumbo A380
- Search: Orbitz.com, Amadeus.com
- Scheduling: Hubble Telescope, Mars Pathfinder, London/Heathrow airport
- Game: Super Mario 64, Crash Bandicoot, Jak and Daxter: the Precursor
- Telecom: France Telecom Recife DSS, Lucent Technology switching system
- BioInformatics: Harvard SNPPer, SRI Ecocyc, Stanford Biolingua, MDLI HT Chemistry
- **Roomba uses Lisp too!**





Summary

- Need to embrace Service Oriented Architecture now
- Compose SOA applications in “real time”
- SOA applications must evolve constantly
- Lisp is ideal for SOA application development



Thank You

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