

Scalability: Minimize Your Risk

Session 220

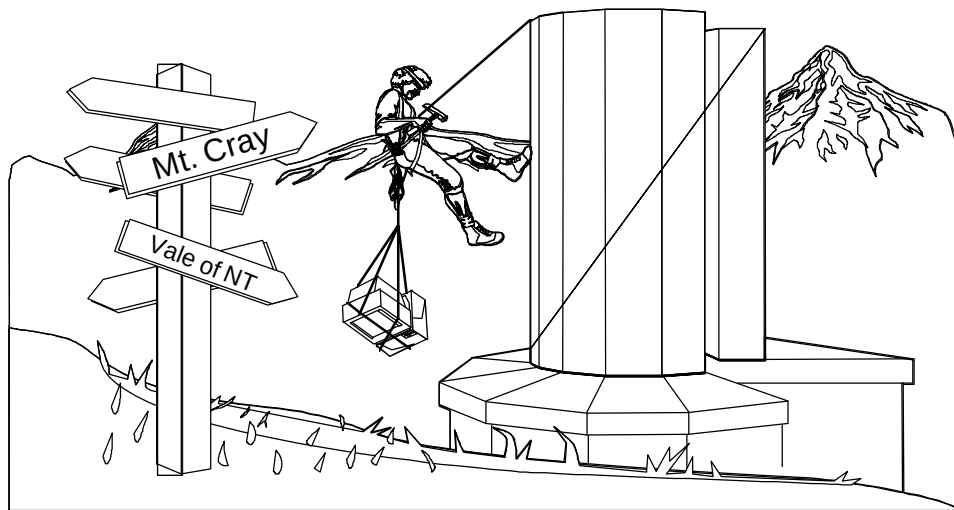
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Texas Instruments

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Scalability, Why Worry?



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Preparing for an Unpredictable Future

- Change
 - Business
 - Technology
- Growth
 - Business volumes, more transactions
 - Number of users, more departments
- Decline
 - Few remaining users of a legacy system still tied to a mainframe



Scalability

- Agenda
 - *Future proofing* application delivery
 - Scaling application execution
 - Enabling execution scalability
 - Which development approach?

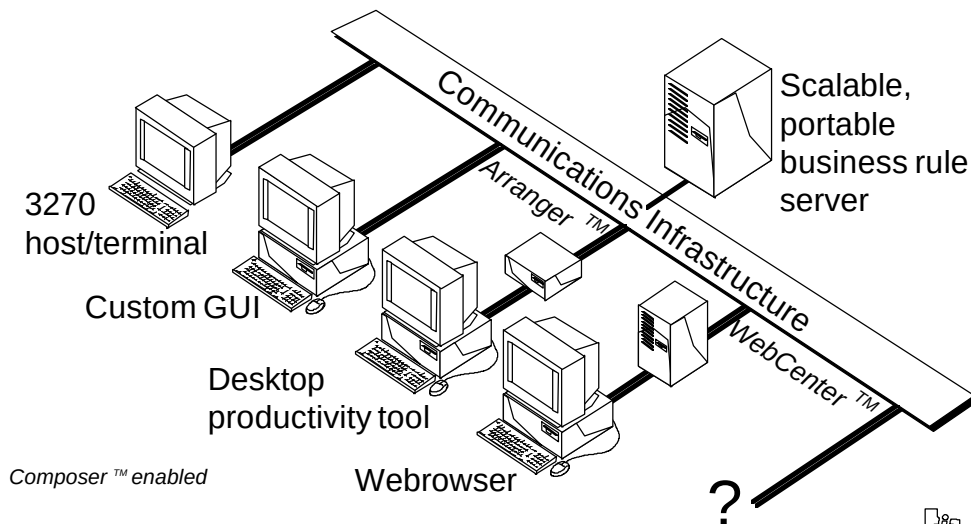


Example – Business on the WEB

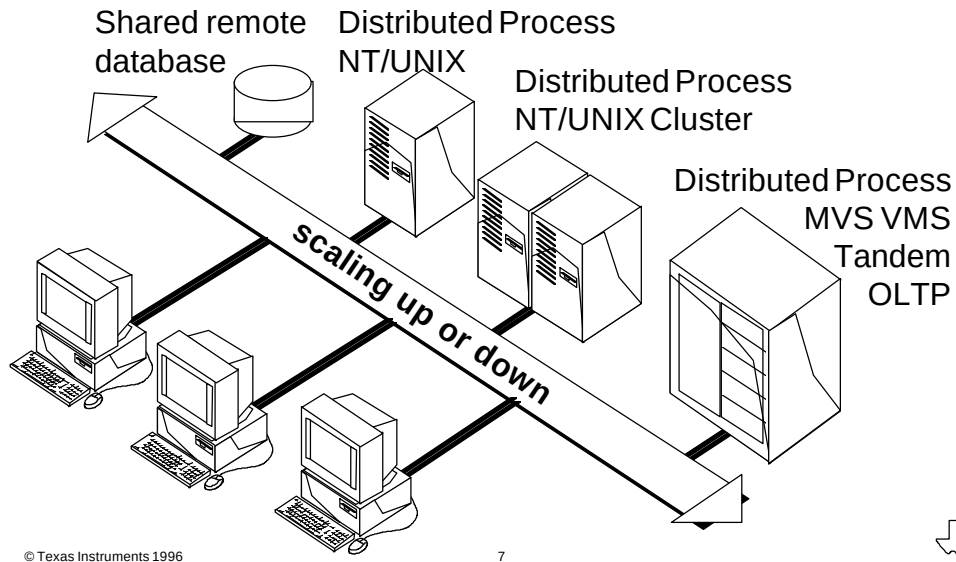
- Potentially millions of customers accessing your systems
- Currently VERY unpredictable usage
- IDC report, December 1995
 - Large centralized systems back in fashion
 - » MVS and high-end UNIX
 - » NT not yet sufficient



Future Proofing Application Delivery



Scalable Execution Environment



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Application Execution

	<u>Personal</u>	<u>Workgroup</u>	<u>Departmental</u>	<u>Enterprise</u>
<u>Scope</u>	Single user Single site	Single team Single site Stand-alone	Single dept. Few sites Stand-alone Some integration	Many dept.'s Many sites Stand-alone Often integrated
<u>Users</u>	1	<10	<200 per site	100's - 1000's
<u>Environment</u>	Single PC	PC client	PC client	PC client
<u>Server</u>	Same PC	DOS, OS/2 NT	NT, UNIX	Mainframe class OLTP
<u>Database</u>	Contained in 4GL		RDBMS	RDBMS Legacy

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Steps in Scalability

<u>Step</u>	<u>Cost</u>	<u>Ease</u>	<u>Speed</u>
1 - Throw more hardware at it			
– bigger server, processor	Low	Easy	Quick
– faster disks, I/O	Low	Easy	Quick
– faster network	Med-high	Hard	Slow
2 - Move processing to the server	Need a re-write? <i>Depends on development tool</i>		?
3 - Throw more hardware at it again			
– different server, processor	Need a re-write? <i>Depends on development tool</i>		?
4 - Re-write the code to optimize			
– 3GL instead of 4GL	Expensive		Slow
– introduce OLTP	Need a re-write? <i>Depends on development tool</i>		?

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Enabling Execution Scalability

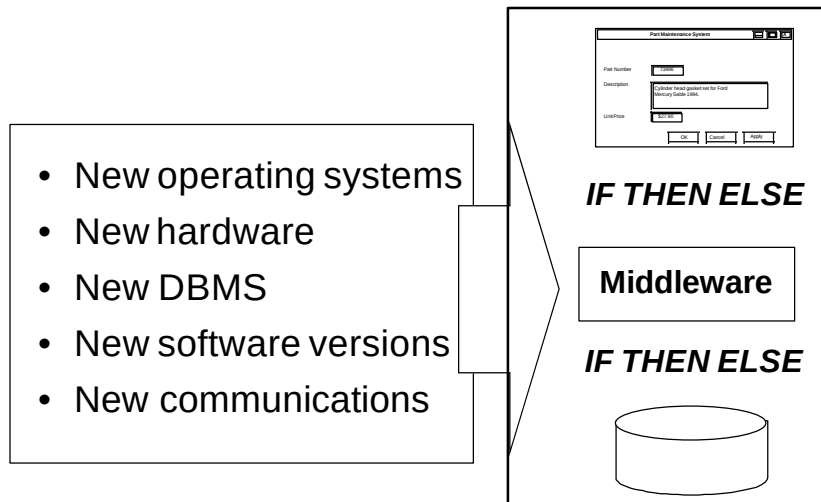
- Separation of business from technology
- General '3-tier' client/server principals
 - Isolate business rules from user interface
 - Design as distributed process even if all implemented on client at first
- Flexible application partitioning
- Platform portability
 - Isolate or avoid platform-specific features
- Design and build components, not systems

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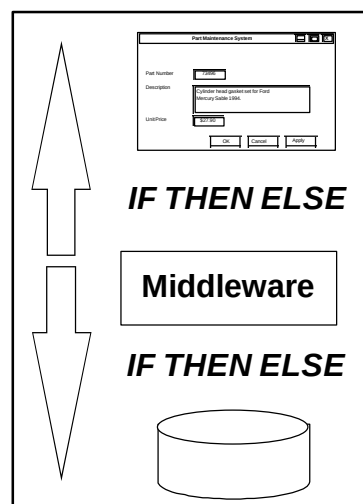


Layering Isolates Technology Changes

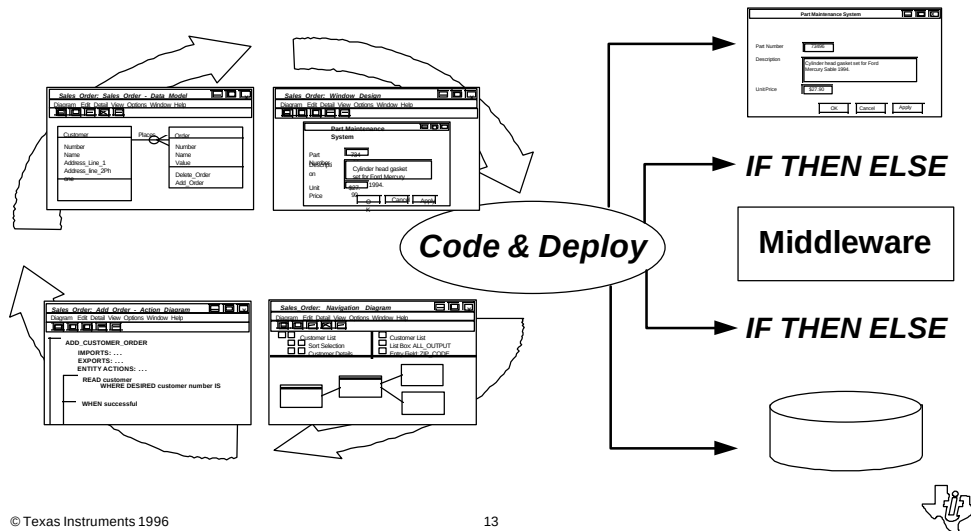


Layering Does Not Solve Everything!

- Changes to business rules
- Re-distribution or separation of business rules between client and server
- Portability is not guaranteed



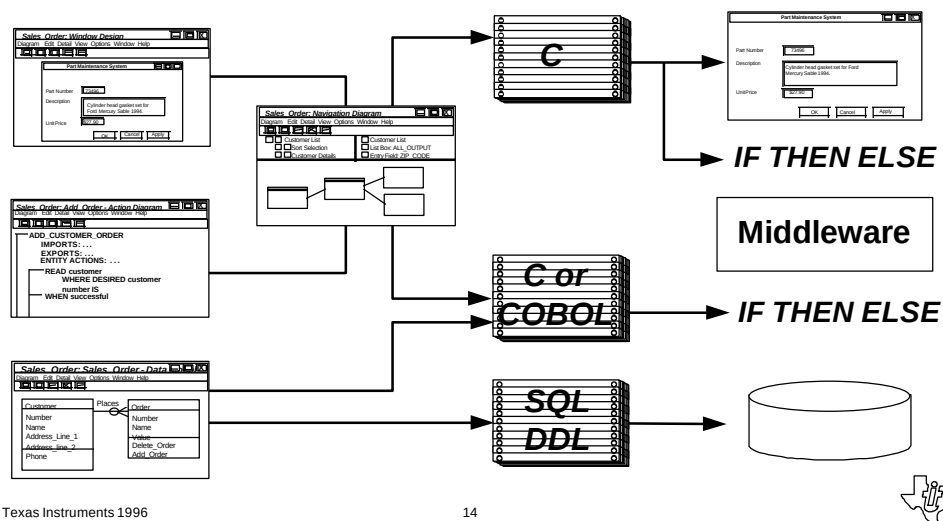
Isolate Business, Design, and Implementation



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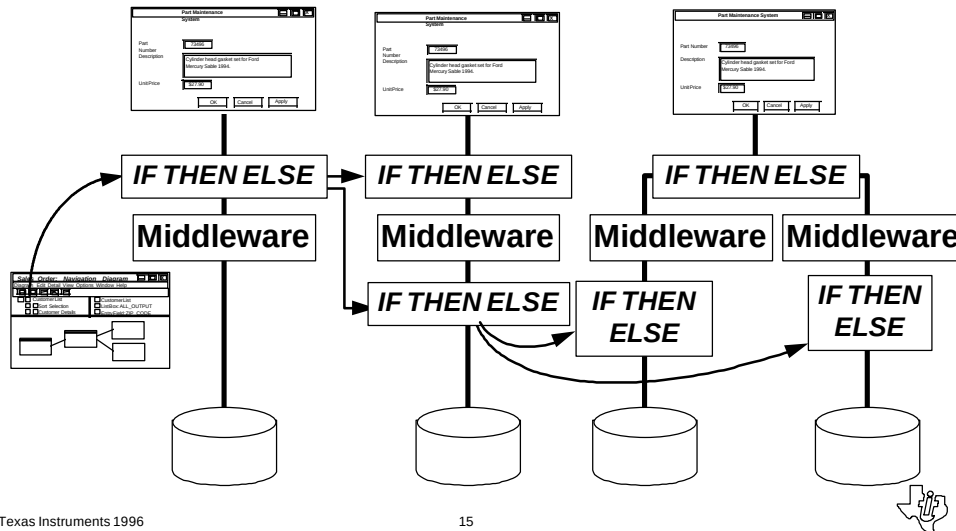
Business Models to Client/Server Systems



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Partitioning According to Changing Needs



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Enabling Development Scalability

- Team size
 - Subset/version control
 - Scalable hardware platform for repository
 - Multiple person project coordination
 - Multiple project coordination
- Project scope
 - From rapid prototyping to formal planning/analysis

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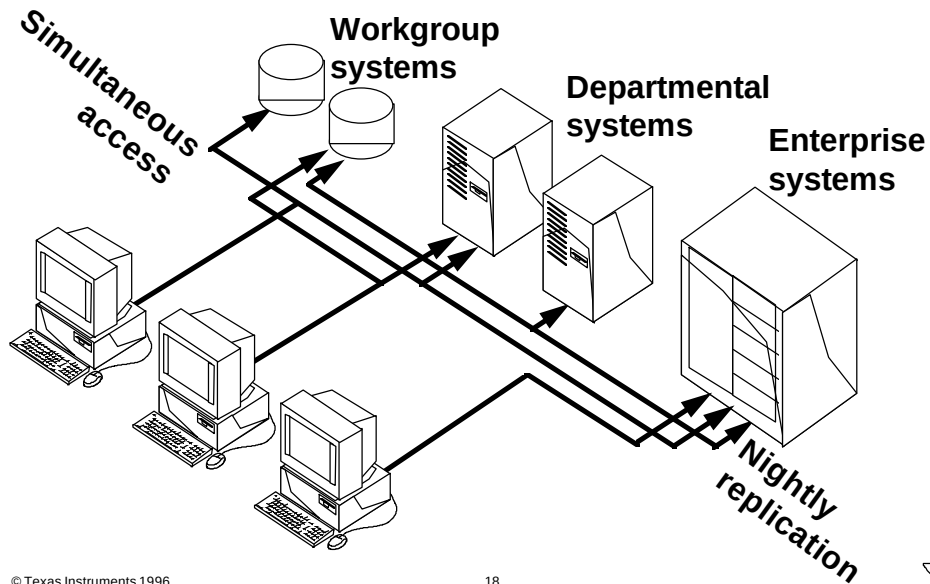


Typical Development Project Ranges

	<u>Personal</u>	<u>Workgroup</u>	<u>Departmental</u>	<u>Enterprise</u>
<u>Developer</u>	user	user	< 5 professionals single team some specialists	>5 professionals many teams some specialists
<u>Approach</u>	Spontaneous	Informal	Informal RAP	Formal RAD, RAP JAD
<u>Control</u>	None	None	Shared libraries Config Mngmt	Repository Config Mngmt Data dictionary
<u>Language</u>	Point & click VB	VB 4GL	Class libraries C/S 4GL C++	Sub-routines Specification 4GL 3GL



Are Systems Isolated?



Development Project Ranges – Issues

- Execution scalability as system usage grows
- Enterprise system/data access by personal, workgroup, and departmental often required
- Consistency across the enterprise
- Reuse across the enterprise
- Maintainability
 - Users pass systems to IS department to maintain
- Movement of personnel between development projects using different tools



Texas Instruments Software Products Scalability Made Easy

- Generate to all styles of execution environments
 - Straightforward re-partitioning
 - Easy portability
 - High performance code
- Support all types of development projects from small informal to large multi-team formal



Texas Instruments Software Products Scalability Made Easy (cont.)

- Able to support and work along desktop personal and workgroup solutions through Arranger
 - Visual Basic
 - Powerbuilder
 - OLE-enabled



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