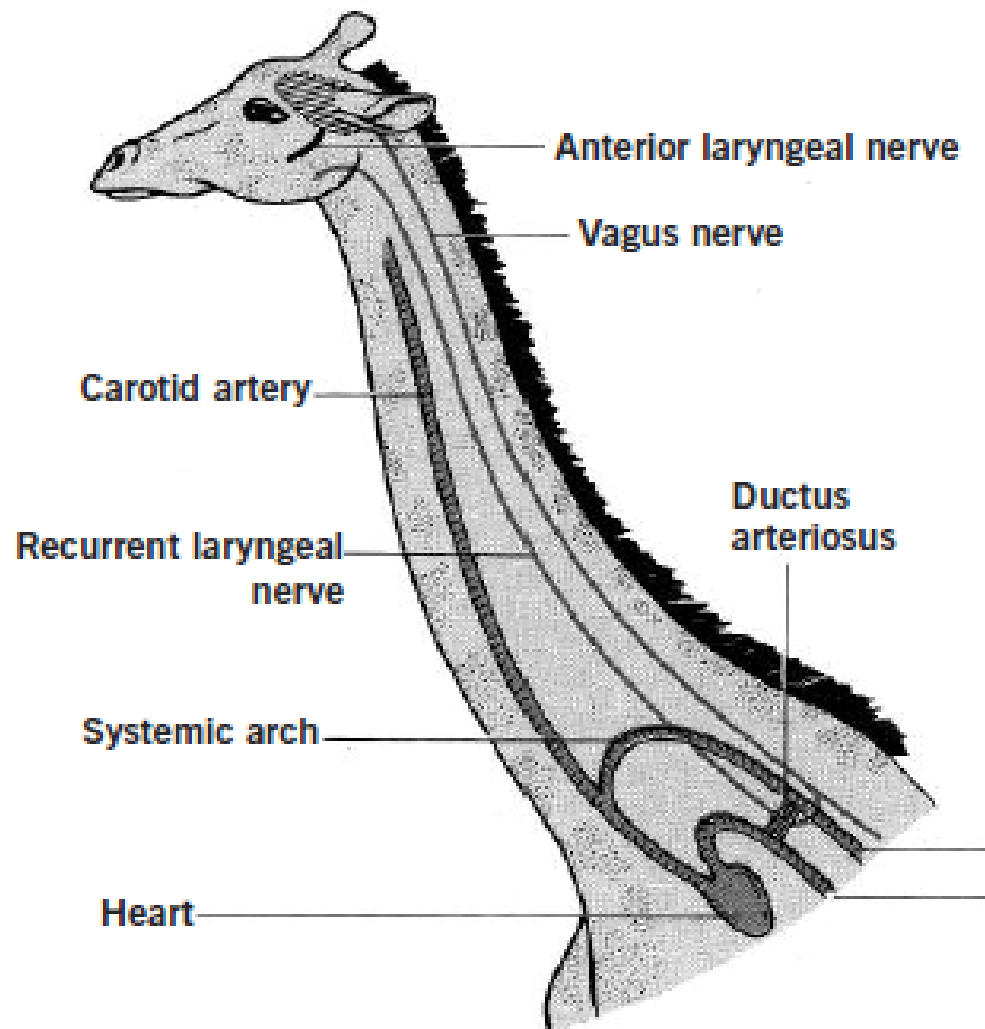


Evolution of the Indian IT Market: The Virtues of Intelligent Design

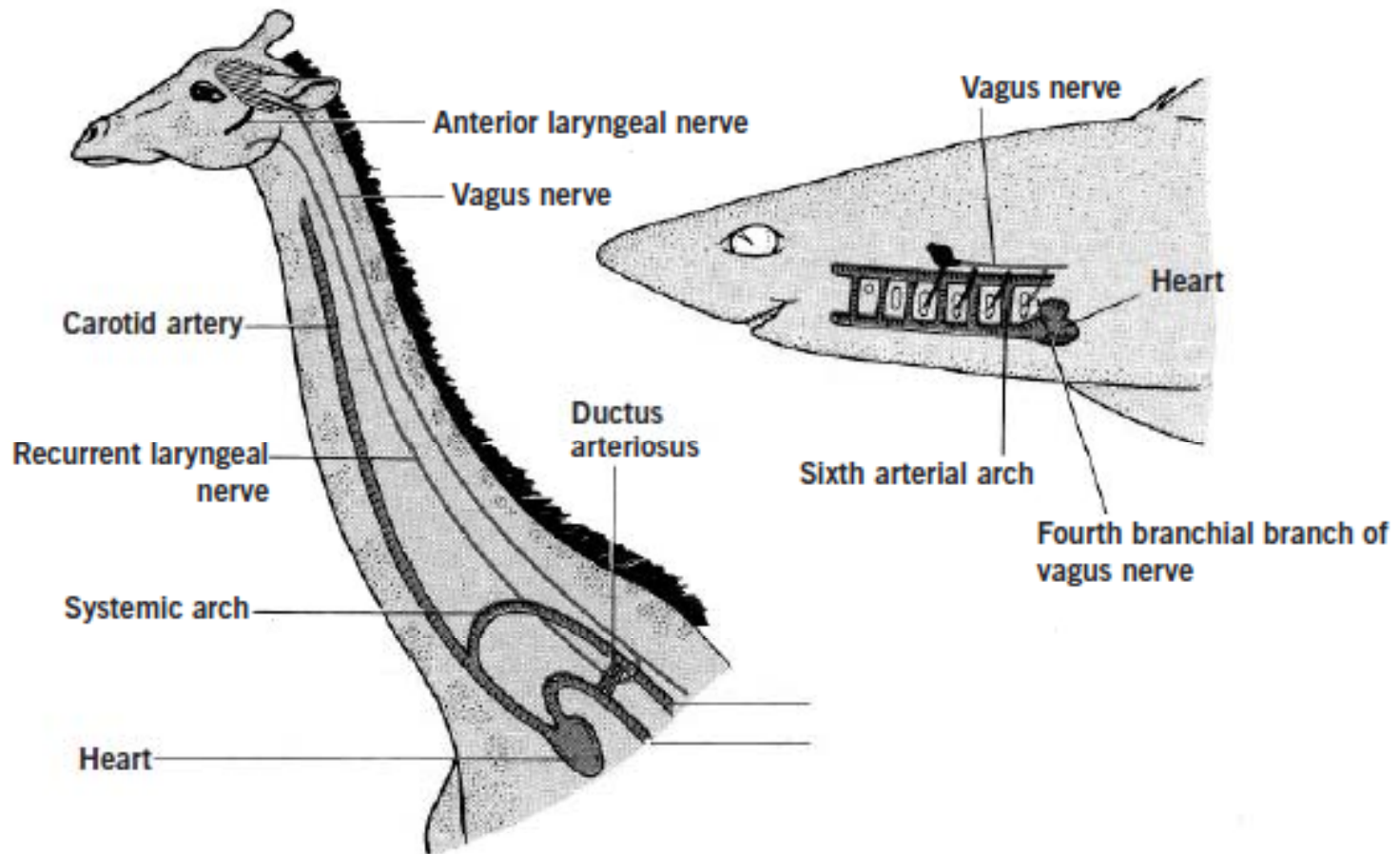
Jeff Gould
March 2010

Peerstone Research & OpenMainframe
(www.openmainframe.org)

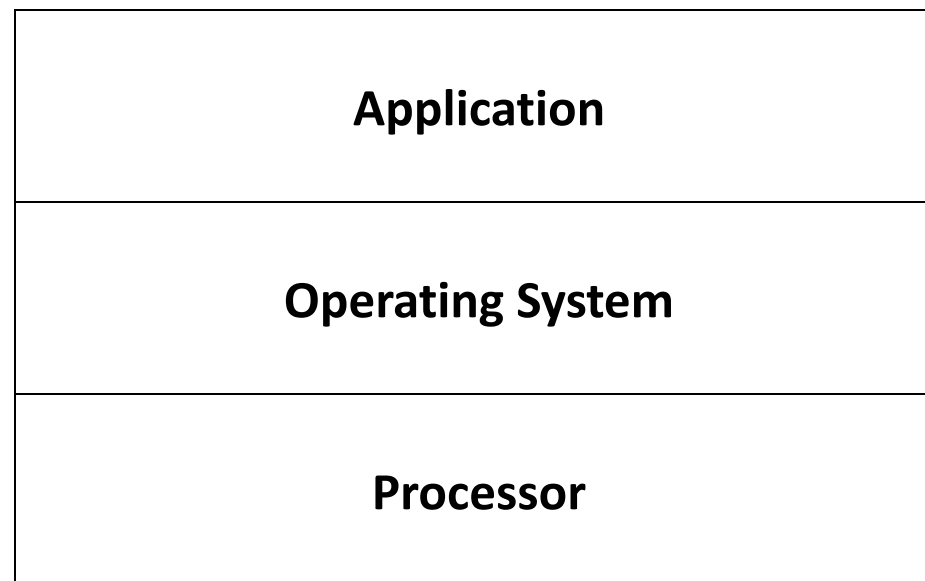
Evolution, not always intelligent



How evolution can go wrong



What is a stack?



What is a stack? (examples)

Application: SAP, Oracle, custom Java, .Net, COBOL...

Operating System: Linux, Unix, Windows, z/OS...

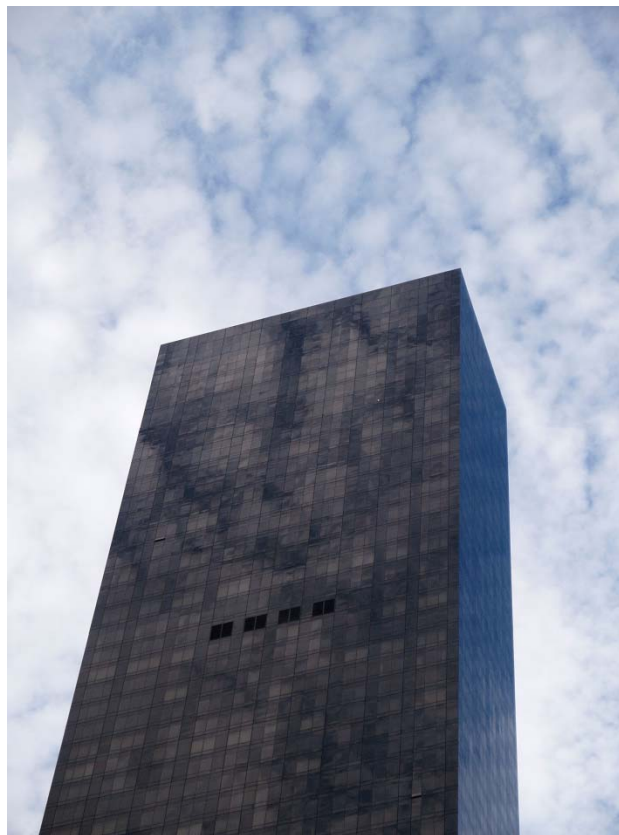
Processor: Intel/AMD x64, IBM Power, Sun SPARC, IBM z10...

What stacks really look like

Software Vendor	IBM	Sun	Oracle	BEA	SAP	Microsoft	Open Source
Applications	<ul style="list-style-type: none"> •3rd party packages •Custom •Legacy 	<ul style="list-style-type: none"> •3rd party packages •Custom Java 	<ul style="list-style-type: none"> •Oracle •PSFT, SEBL... •3rd party packages 	<ul style="list-style-type: none"> •3rd party packages 	<ul style="list-style-type: none"> •SAP •Partners 	<ul style="list-style-type: none"> •Dynamics •Exchange •3rd party packages •Custom 	<ul style="list-style-type: none"> •SugarCRM, Compiere ERP, Alfresco CMS... •Closed source apps
BI & DW	<ul style="list-style-type: none"> •IBM DB2 •Cognos •3rd party BI 	<ul style="list-style-type: none"> •ORCL & DB2 •MySQL possible •3rd party BI 	<ul style="list-style-type: none"> •Oracle DB •Hyperion, Siebel •3rd party BI 	<ul style="list-style-type: none"> •3rd party DB •3rd party BI 	<ul style="list-style-type: none"> •SAP BW •Business Objects •3rd party BI 	<ul style="list-style-type: none"> •SQL Server •MS BI tools •3rd party BI 	<ul style="list-style-type: none"> •Pentaho, JasperSoft
Developer Tools	<ul style="list-style-type: none"> •Java •Eclipse 	<ul style="list-style-type: none"> •Java •NetBeans •Eclipse 	<ul style="list-style-type: none"> •Java •JDeveloper •Eclipse •PL/SQL & Forms 	<ul style="list-style-type: none"> •Java, PHP, Ruby •Workshop •Eclipse •C++ (Tuxedo) 	<ul style="list-style-type: none"> •ABAP •Java •Proprietary SAP •Eclipse 	<ul style="list-style-type: none"> •C#, Visual Basic •Visual Studio 	<ul style="list-style-type: none"> •PHP, Ruby, Java, Perl, Python...
Integration Middleware (SOA, BPM, Portals,)	<ul style="list-style-type: none"> •WebSphere family 	<ul style="list-style-type: none"> •SeeBeyond •Java Enterprise System 	<ul style="list-style-type: none"> •Fusion middleware 	<ul style="list-style-type: none"> •AquaLogic 	<ul style="list-style-type: none"> •Netweaver family 	<ul style="list-style-type: none"> •.Net extensions •BizTalk Server 	<ul style="list-style-type: none"> •Mule ESB, Java frameworks...
Application Server	<ul style="list-style-type: none"> •WebSphere 	<ul style="list-style-type: none"> •Glassfish 	<ul style="list-style-type: none"> •Oracle AS 	<ul style="list-style-type: none"> •WebLogic •Tuxedo 	<ul style="list-style-type: none"> •Netweaver 	<ul style="list-style-type: none"> •.Net 	<ul style="list-style-type: none"> •JBoss, Glassfish, Tomcat, Ruby, PHP
Database	<ul style="list-style-type: none"> •DB2 	<ul style="list-style-type: none"> •MySQL •Oracle •DB2 	<ul style="list-style-type: none"> •Oracle 	<ul style="list-style-type: none"> •Oracle •SQL Server •MySQL •Sybase 	<ul style="list-style-type: none"> •Oracle •SQL Server •DB2 •Sybase 	<ul style="list-style-type: none"> •SQL Server 	<ul style="list-style-type: none"> •MySQL •Postgres, EnterpriseDB •Ingres
Server OS	<ul style="list-style-type: none"> •AIX •Linux •Windows •MF & iSeries 	<ul style="list-style-type: none"> •Solaris •Linux 	<ul style="list-style-type: none"> •Linux •Solaris, AIX, HP-UX •Windows 	<ul style="list-style-type: none"> •Solaris, AIX, HP-UX •Windows •Linux 	<ul style="list-style-type: none"> •Windows •Solaris, AIX, HP-UX •Linux 	<ul style="list-style-type: none"> •Windows Server 	<ul style="list-style-type: none"> •Linux •BSD

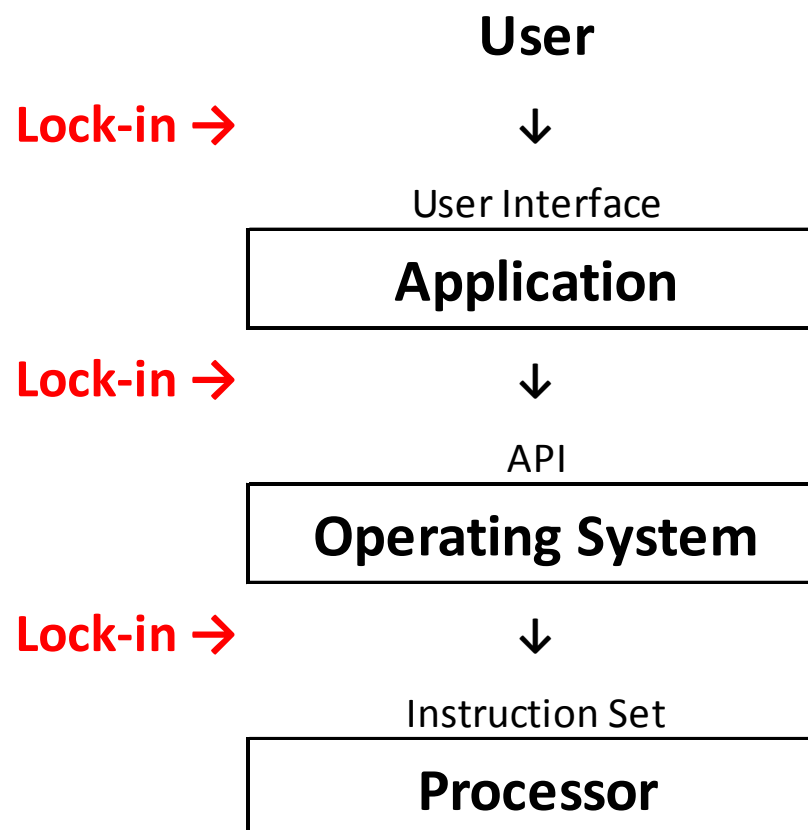
What is a stack?

Vendor Point of View



(a monolith)

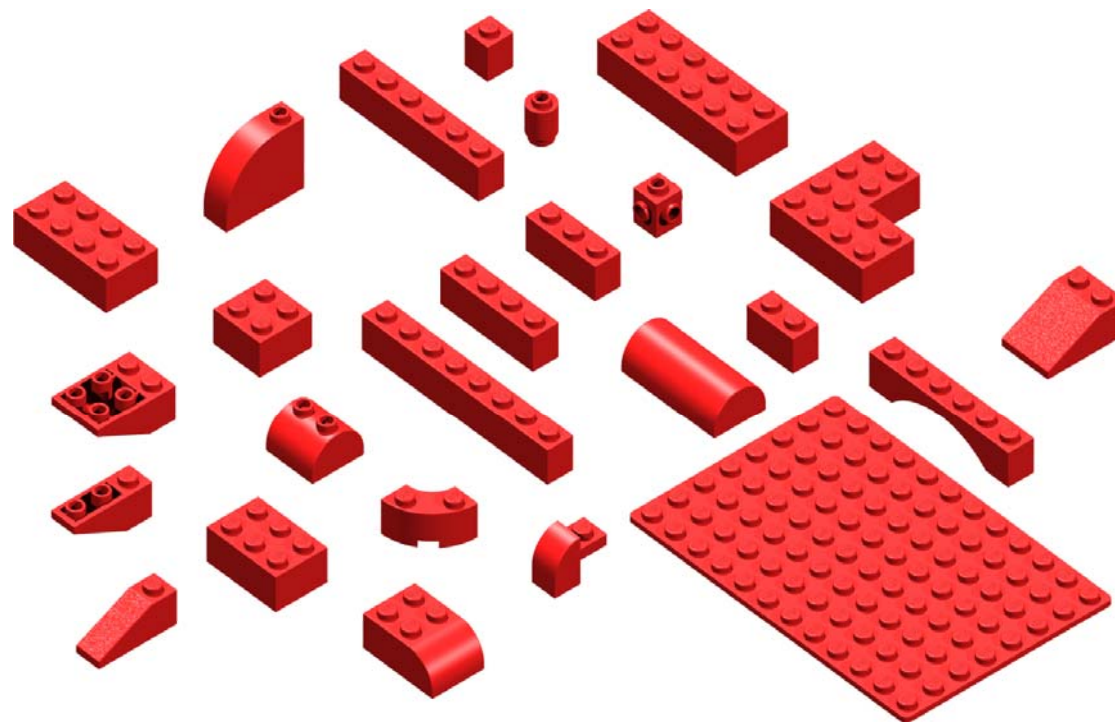
How a stack becomes a monolith



Lock-in = forced vertical integration among stack layers

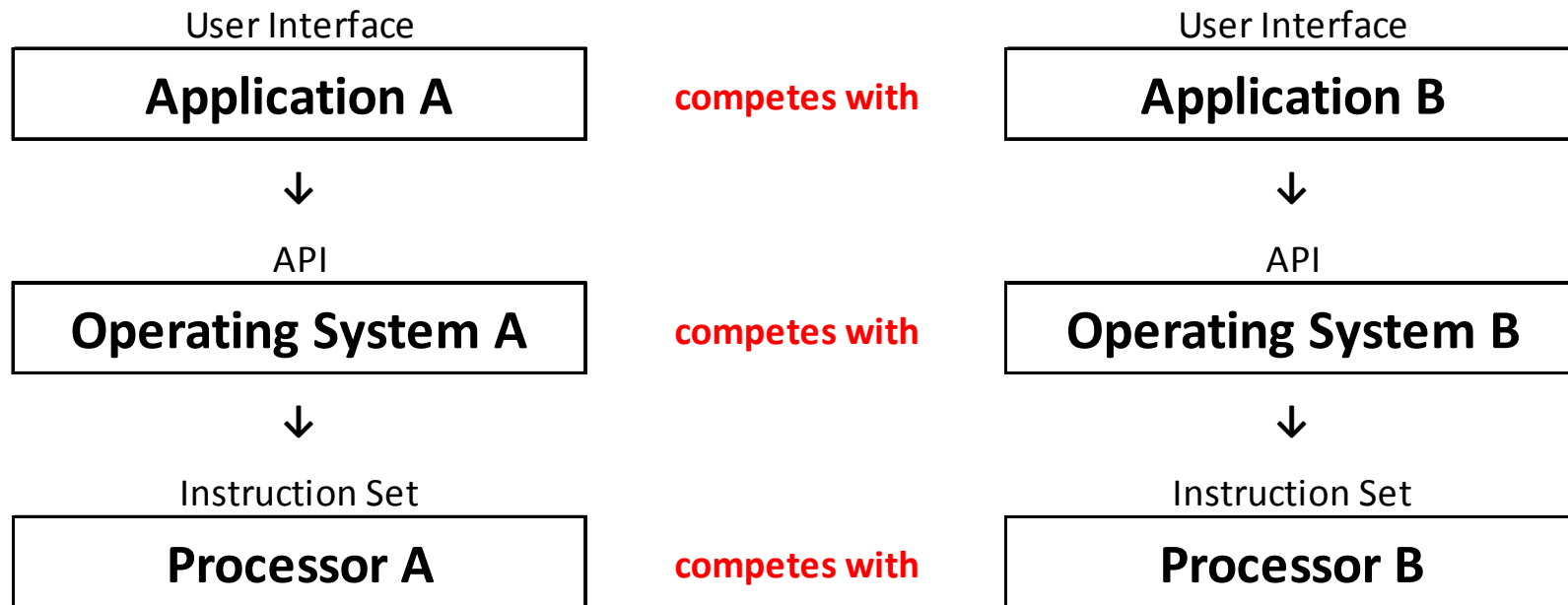
What is a stack?

Customer Point of View



**(a marketplace of interoperable pieces,
infinitely recombinaable)**

How a stack becomes a marketplace



Marketplace ≠ Disorder

- A marketplace might look chaotic, but there is a hidden order
- ... the order of the “invisible hand”
- In other words, markets can handle coordination tasks...
- More specifically, integration is a marketable service that adds value to components in a multi-vendor stack
- A single-vendor monolithic stack is not the *only* answer to the coordination problem...

Moore's Law: more & more...

Processor	Max Cores	Fab Process	Transistors	Clock GHz	Typical OS	Mainframe Equivalent MIPS (1-way)
IBM z10	4	65 nm	991 million	4.4	z/OS, Linux	920
Intel Xeon XE (Beckton)	8	45 nm	2.3 billion	2.66	Windows Server, Linux, Solaris	1107
Sun UltraSPARC T3	16	45 nm	1 billion	1.67	Solaris, Linux	1389
IBM Power7	8	45 nm	1.2 billion	3-4.14	AIX, Linux	1722
AMD Opteron (Magny-Cours)	12	45 nm	2.3 billion	3.2	Windows Server, Linux, Solaris	1997

Intel Nehalem EX 8-core

