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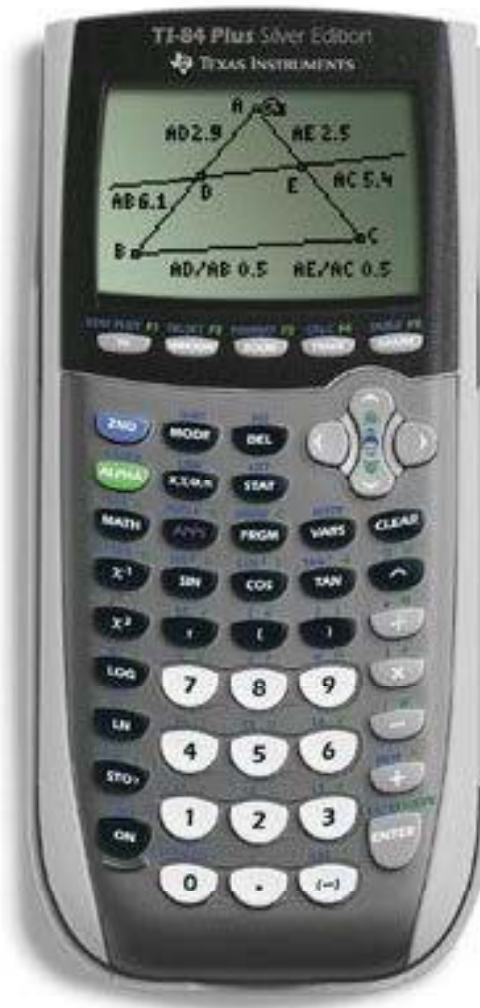
High performance. Delivered.



The Future of Software Architecture for Large Scale Business Solutions

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Chief Technology Architect, Accenture

Back to the Basics



Accenture Background



- **Consulting, Systems Integration, Outsourcing**
- **186,000 people in 49 countries**
- **Over 100,000 people in software development**
- **\$23.4bn revenues**
- **\$10bn SI revenues**



Large Scale Business Solutions



- ***Serves 91 of the Global Fortune 100 & Governments in 43 countries***
- ***Every 4 hours an Accenture system goes live***
- ***Help process 50% of the world's mail***
- ***1 in 5 of the world's telephone numbers are billed by Accenture systems***
- ***Issue 1/3 of the world's passenger airline tickets***
- ***Produce over 1 million lines of production code every business day***

What's the problem ? IT Productivity and Quality are Lagging



Despite advances in development tools and techniques, software initiatives have lagged behind in utilizing novel software engineering methods and techniques effectively to reduce the complexity of large-scale software.

IT cost overruns are still commonplace, and the cost to "keep the lights on" for fragile legacy applications typically consumes up to 60% IT budgets.



Accenture High Performance IT Survey Key Conclusions



- ***IT is not contributing as much as it could to earnings growth***
- ***We don't have an innovation problem, we have an adoption problem***
- ***Conservative IT investing is like slow water skiing***
- ***Corporate systems a long way from meeting consumer-based expectations***



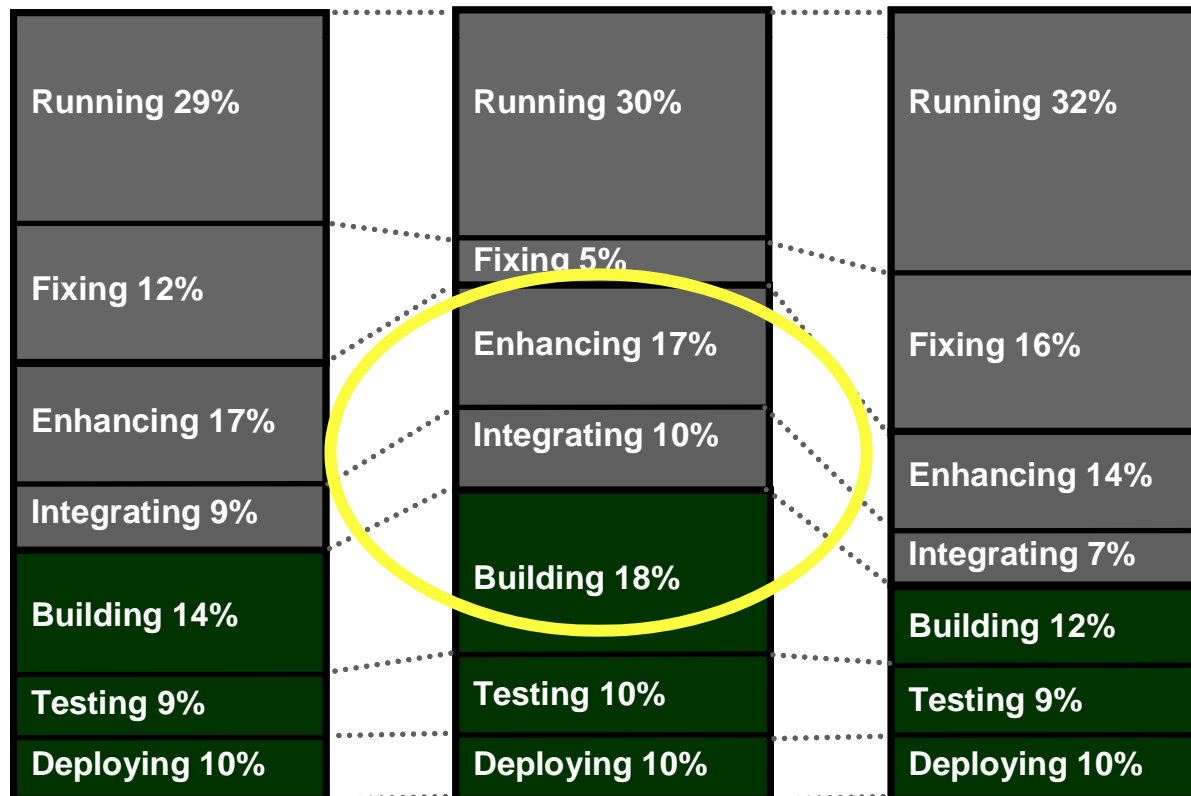
Where is the money going today ?



400 Global Organizations
100% of Budget

High Performers
100% of Budget

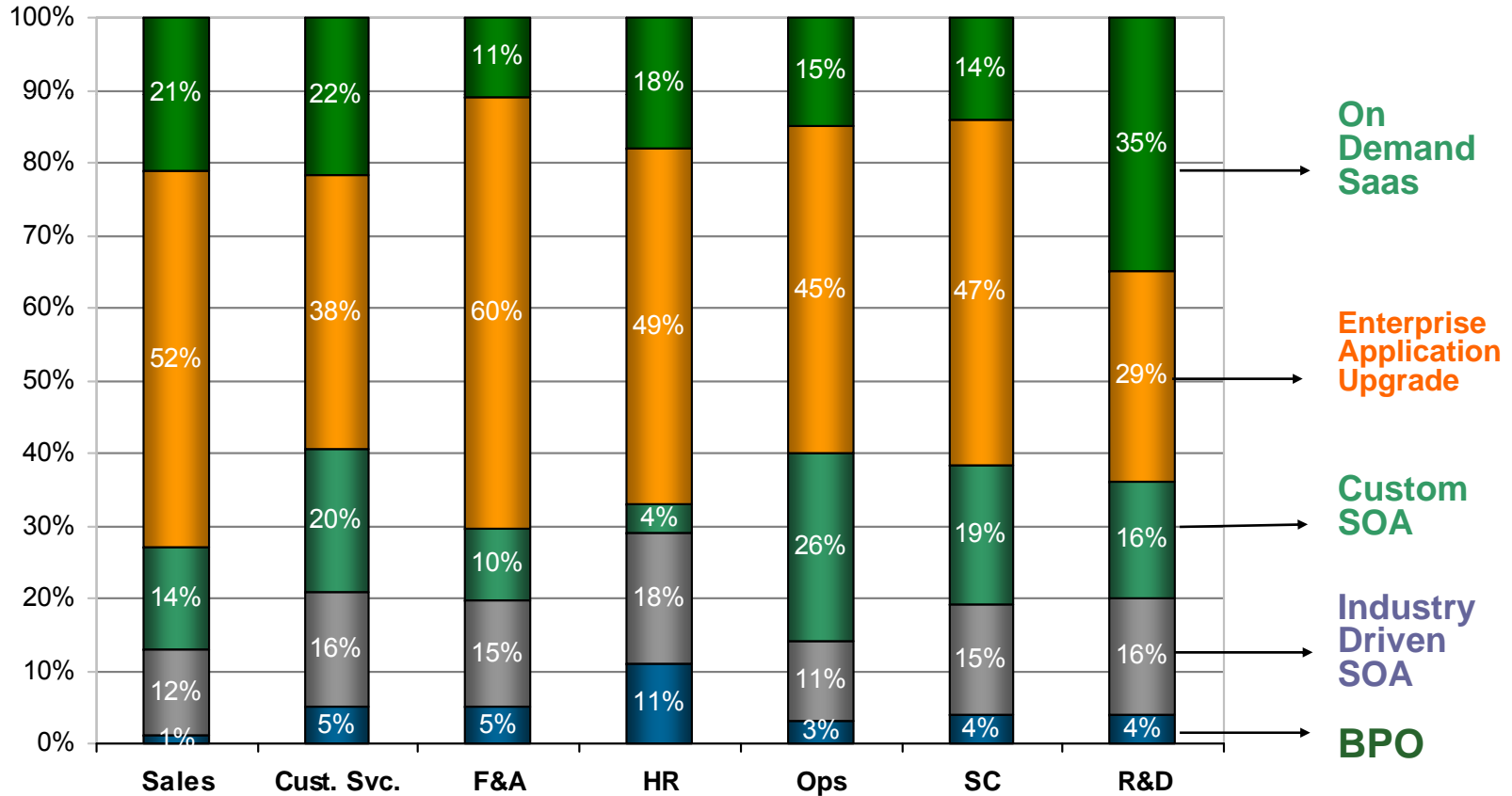
Low Performers
100% of Budget



Where do CIO's say they are going next ?



Preferred Migration Option in Next 18 Months by Business Process

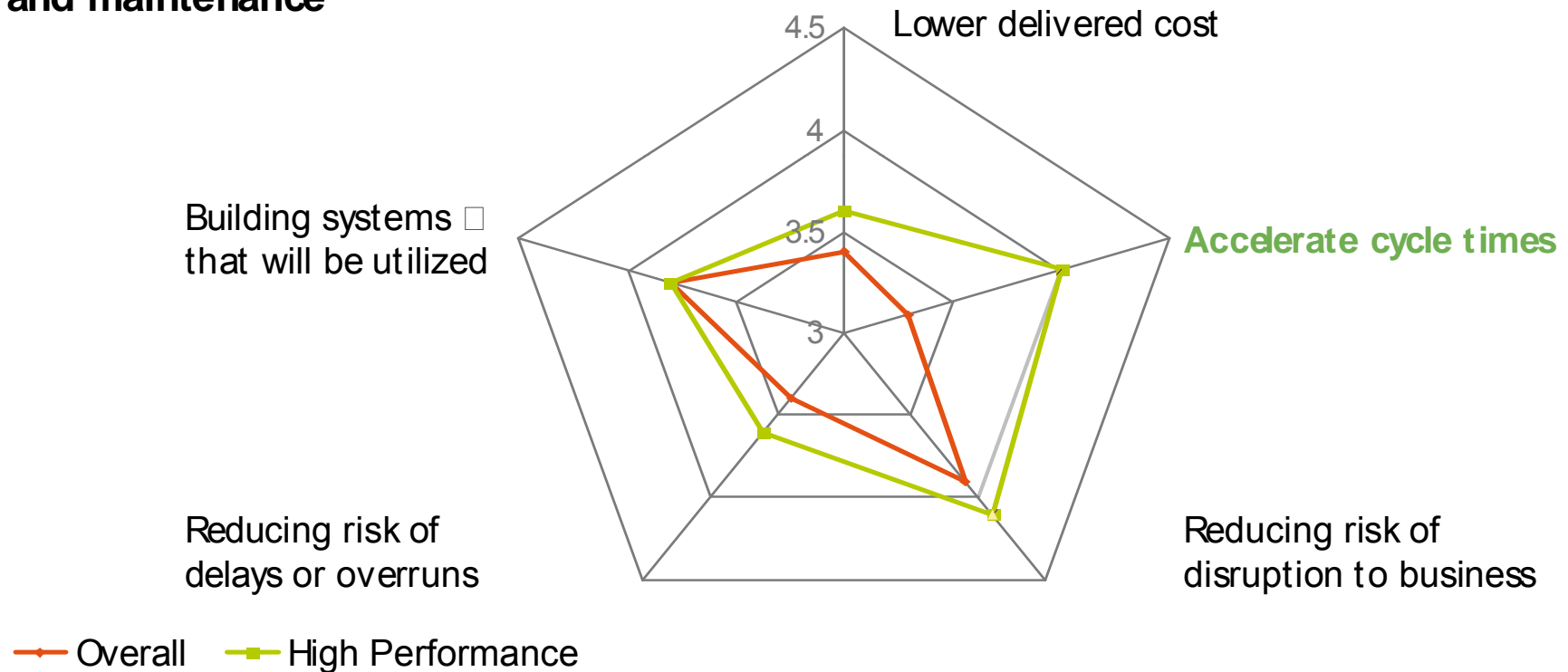


What distinguishes the High Performers ?

Ability to accelerate development cycle times



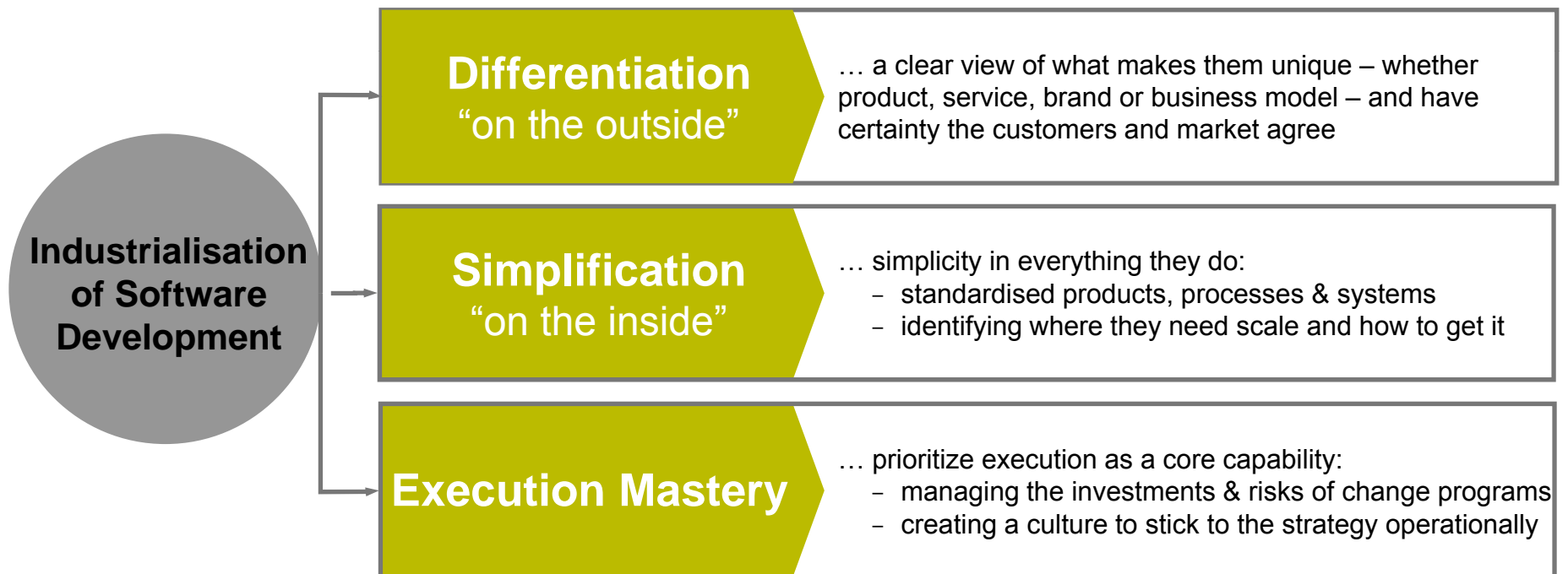
Performance ratings of objectives in improving delivery of applications development and maintenance



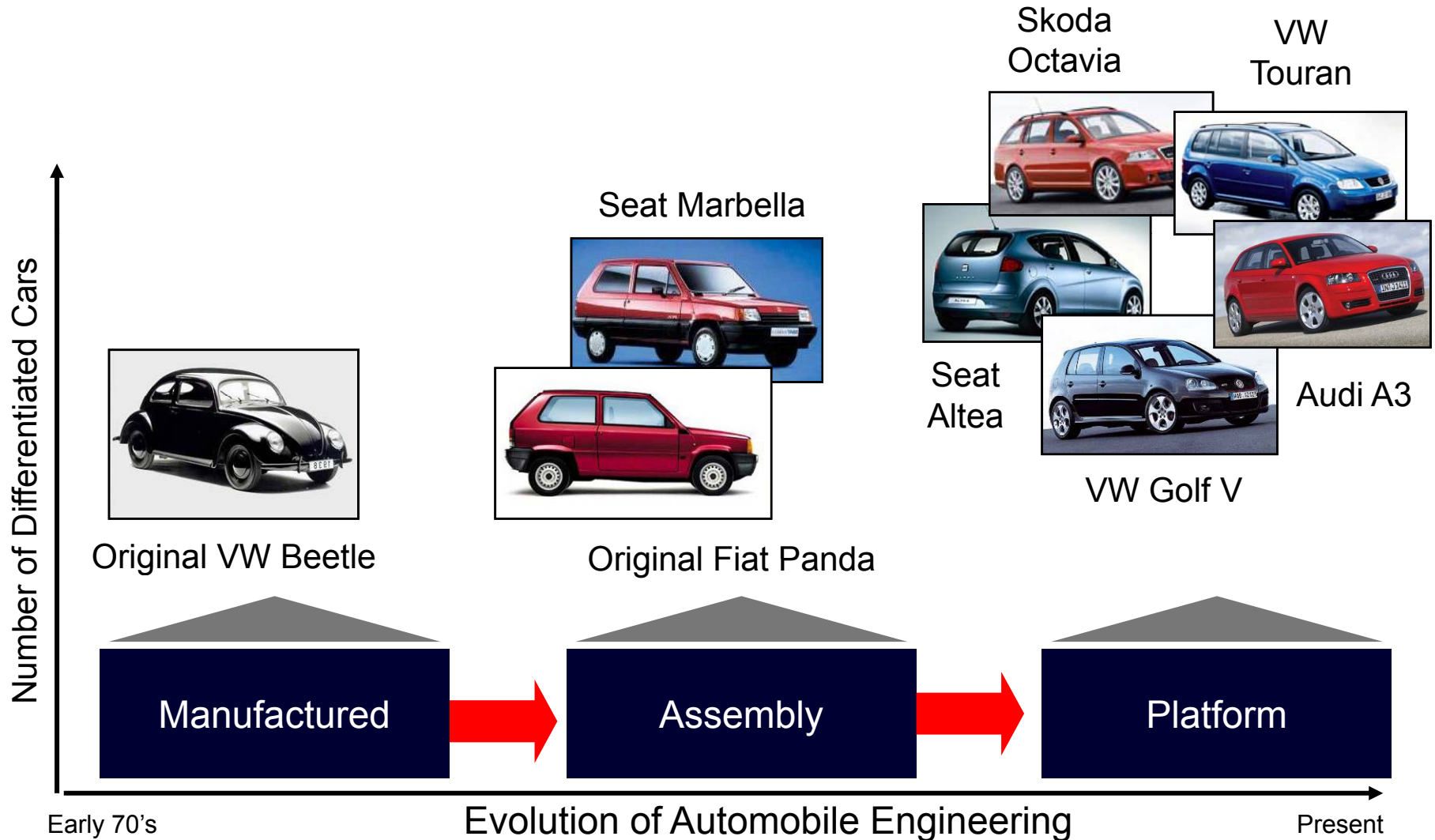
So, What to Do About This?



Industrialisation Agenda: Attacking cost and time to market



Learning from Industrialization in Other Industries . . .

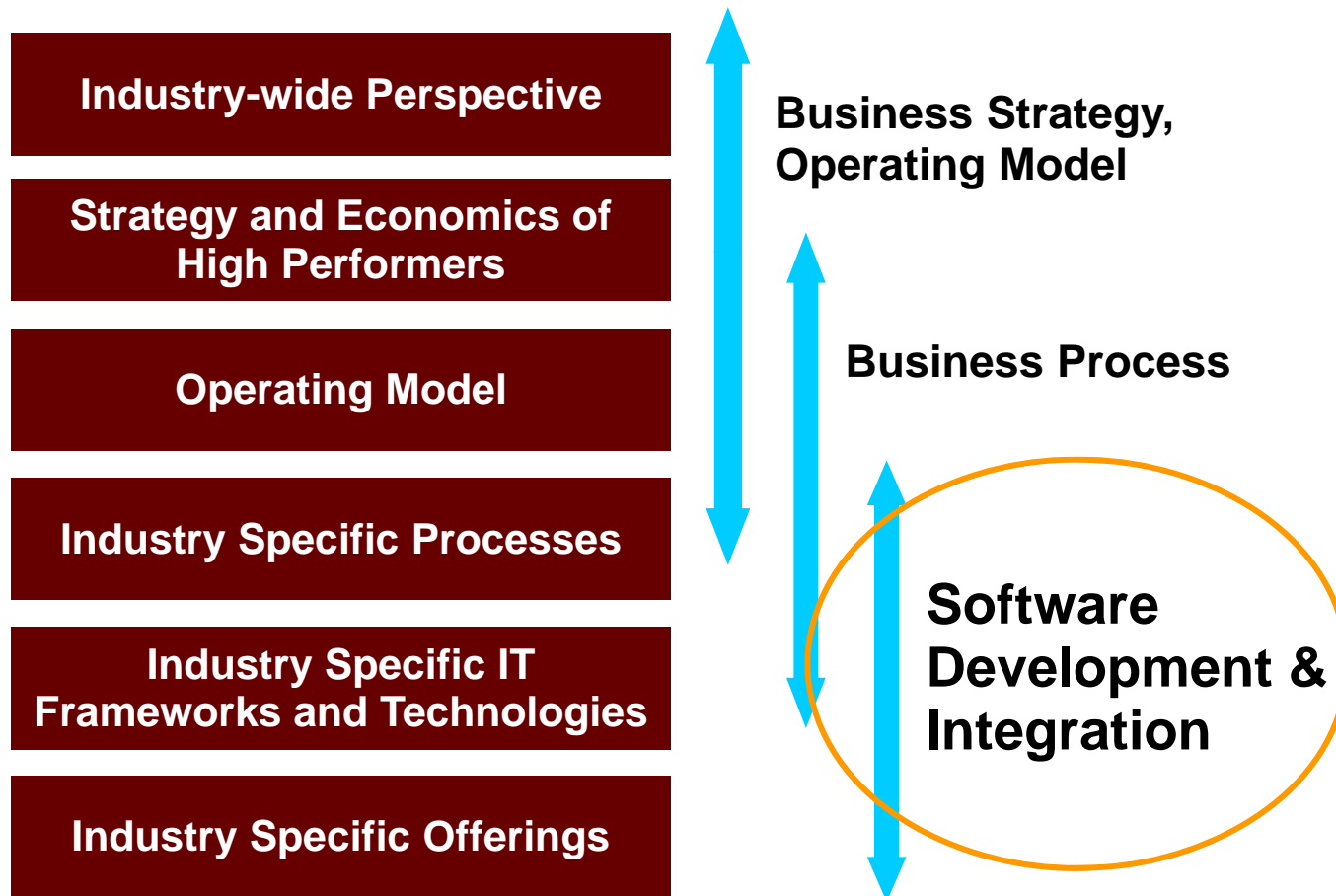


Where Will We Focus To Get There?

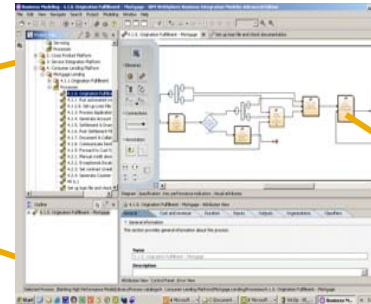
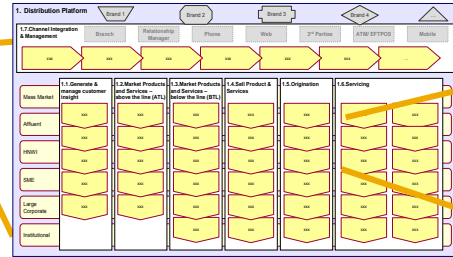
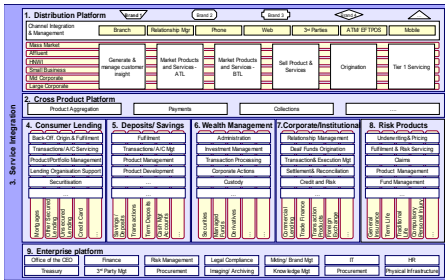


- **Enable Process-Driven Systems Integration**
- **Embrace Disruptive Technology Trends**
- **Evolve Architecture of Large Business Solutions**
- **Pursue Industrialization Agenda for Software**

High Performance Business Agenda: Seeking Process-Driven Systems Integration



Linking Business Value to Software Implementation



- Industry-wide Perspective
- Strategy and Economics of High Performers
- Operating Model
- Industry Specific Processes
- Industry Specific IT Frameworks and Technologies
- Industry Specific Offerings (Solutions & Services)

Application Architecture

Solution Design

Solution Configuration

Example Artifacts

- Best Practice Application Architecture
- Industry Software Package Maps
- Industry IT Metrics
- Industry IT Best Practices

Example Project Activities Supported

- Package selection
- Application Rationalization
- IT Cost Improvement
- Integration design

- Information & Data Models
- Component and Web Service Models
- Business Process to Automated Process Maps

- Custom systems
- Composite (Process) application
- Portals
- Real-time BI Dashboards and BAM
- SOA

- Linkage to SAP Solution Manager
- Connection to new SAP Galaxy
- Linkage to Oracle AIA
- Generation of OracleBPEL .

- Process analysis in package implementation
- Gap analysis
- Implementation
- Testing

Where Will We Focus?



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Accenture Technology Vision: Major, Disruptive Wave of Technology Innovation



Data & Decisions



Internet
Computing

Influencers



Security



Sustainability



Millennials



m is the new *e*



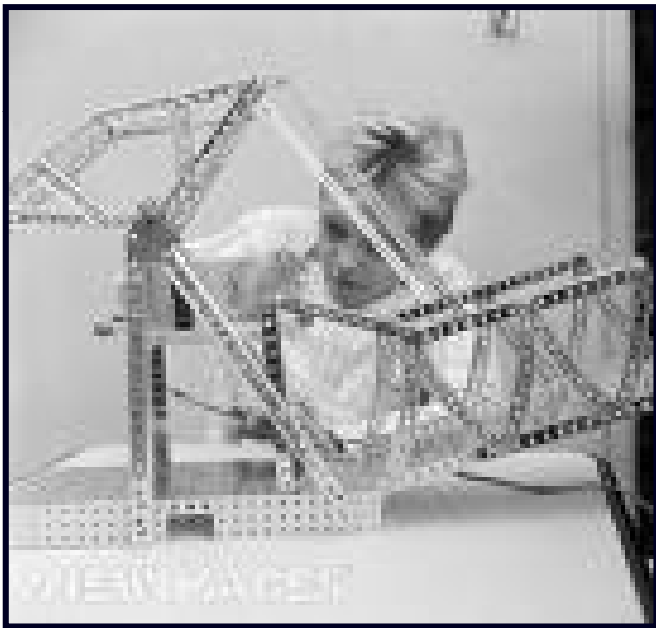
4C's: Communication, Collaboration,
Communities & Content

Where Will We Focus?



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The Promise: Agility, Flexibility, Modularity

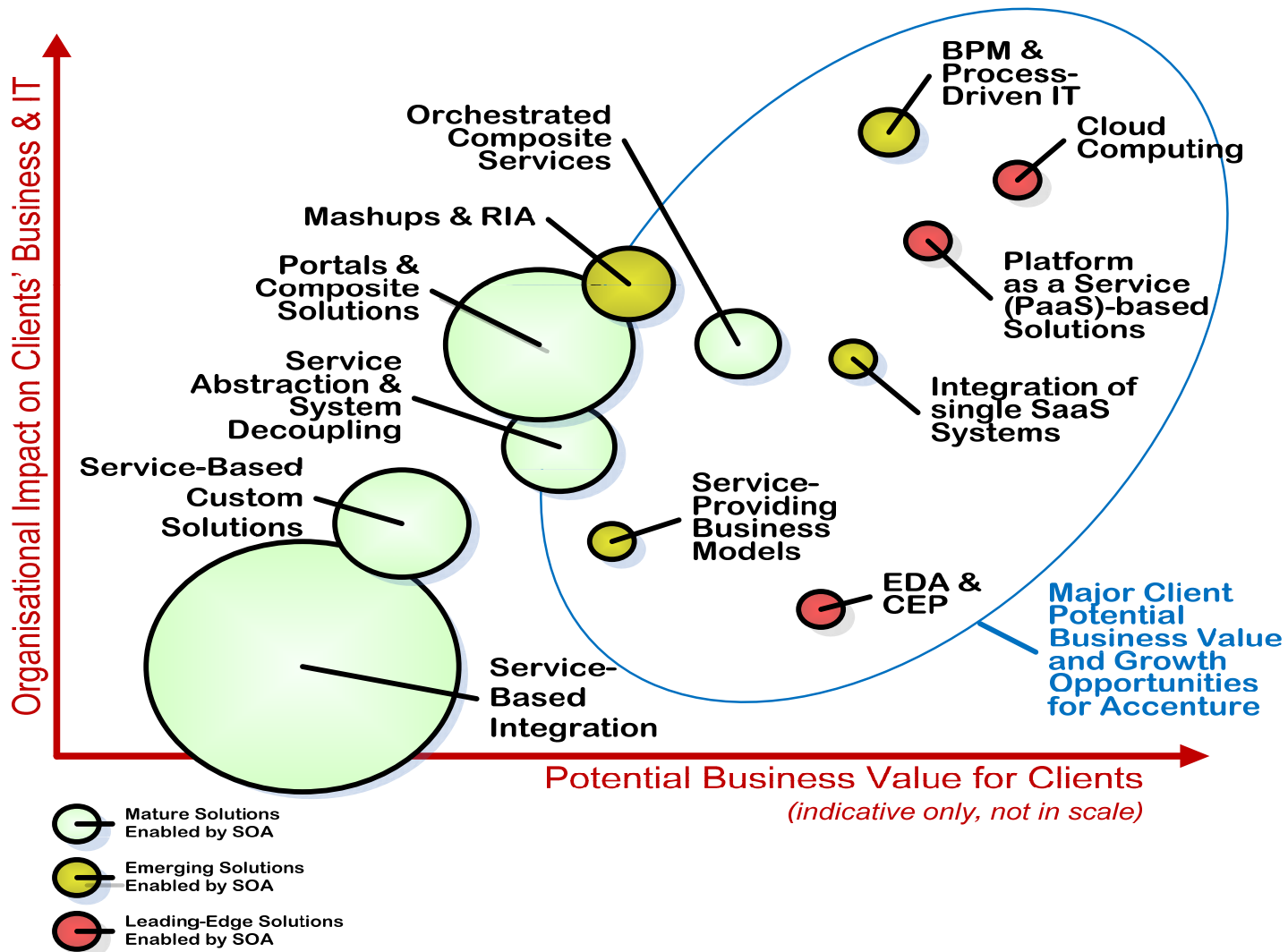


Vs



Evolution of Large Business Solutions

The rise of SOA, SaaS and Cloud





Increased Emphasis on Separation of Concerns

Interoperability, Services, Process Abstraction, Activity and Insight

Standards-based (WS-*) Communication

HTTP/REST

Web Services XML, SOAP, UDDI

Standardized Communication between systems through widely accepted open standards.

Client Code
gerbiographics
Interface Contract (NSDL)

Request Message
HTTP XML SOAP

Response Message
SOAP XML HTTP

We
Interface
queryWatchList
logic
Can also call
Database
Operating System
Message Queue
Active Directory
Etc...

Services & ESB

Allows a network of disparate systems to interact as one unified enterprise system by resolving differences in system HW, SW, networks, and location. Lightweight And heavier (ESB) approaches Need to co-exist

Service Consumers

Enterprise Service Bus
Layer of Abstraction and Consistency

Exposed Services

Leveraging Existing Systems

CCD Vita
EID Entertainment
IDENT Biometrics
TECS Biographics
ADIS Crossing History

Process Abstraction (BPM)

Business processes and Rules abstracted separately In BPM patterns (BPEL) and Rules engine technologies

Human Workflow examples and business process Responses to complex events detected in Event Driven Architectures

START

INITIALIZE

PROCESS

DECISION

ACTIVITY

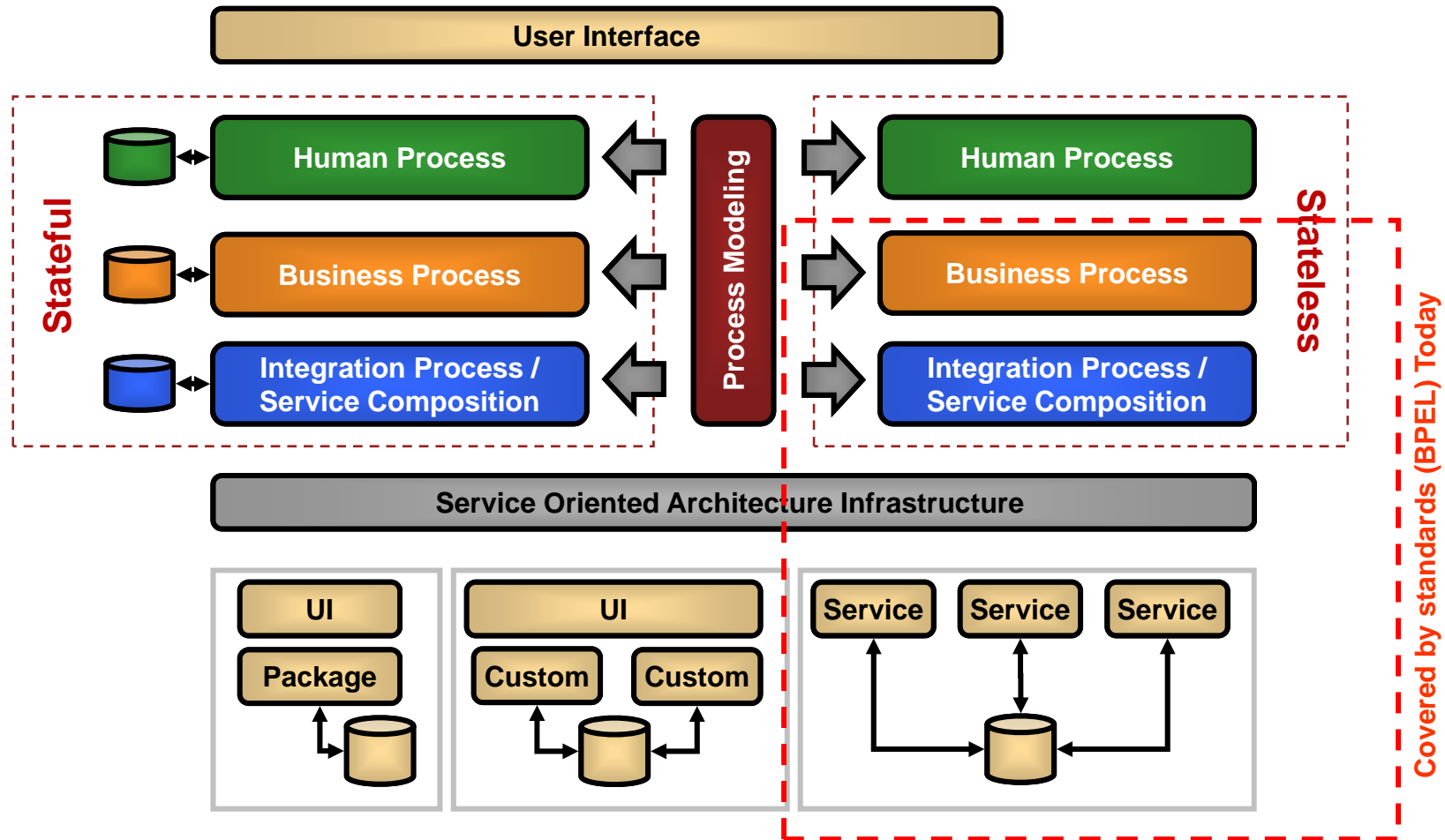
STOP

BAM

Business Activity Monitoring

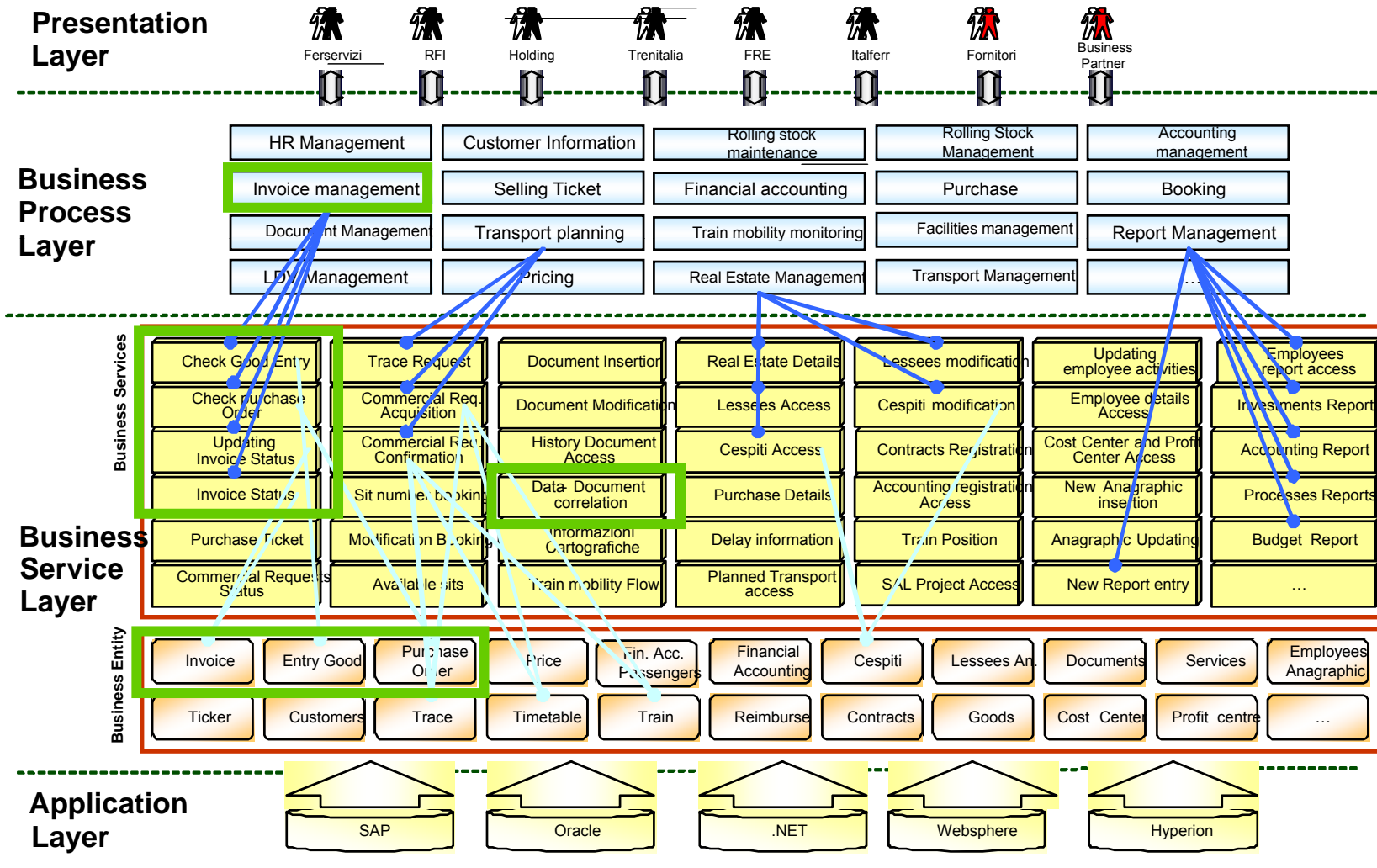
Provides End-to-End process performance monitoring
Real-time insight and control of business.

Separation of Concerns in Large Scale Solution





Example: Large Transportation Company



Where Will We Focus?



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Traditional industry responses to date



- **Command and control**
- **Client centric, 1:1 approaches**
- **Quality programs and Capability Maturity (CMM)**
- **Labor Arbitrage / Offshoring**
- **Agile/light weight methods applied on limited basis**

Necessary, but not Sufficient

Why do we keep doing this ?

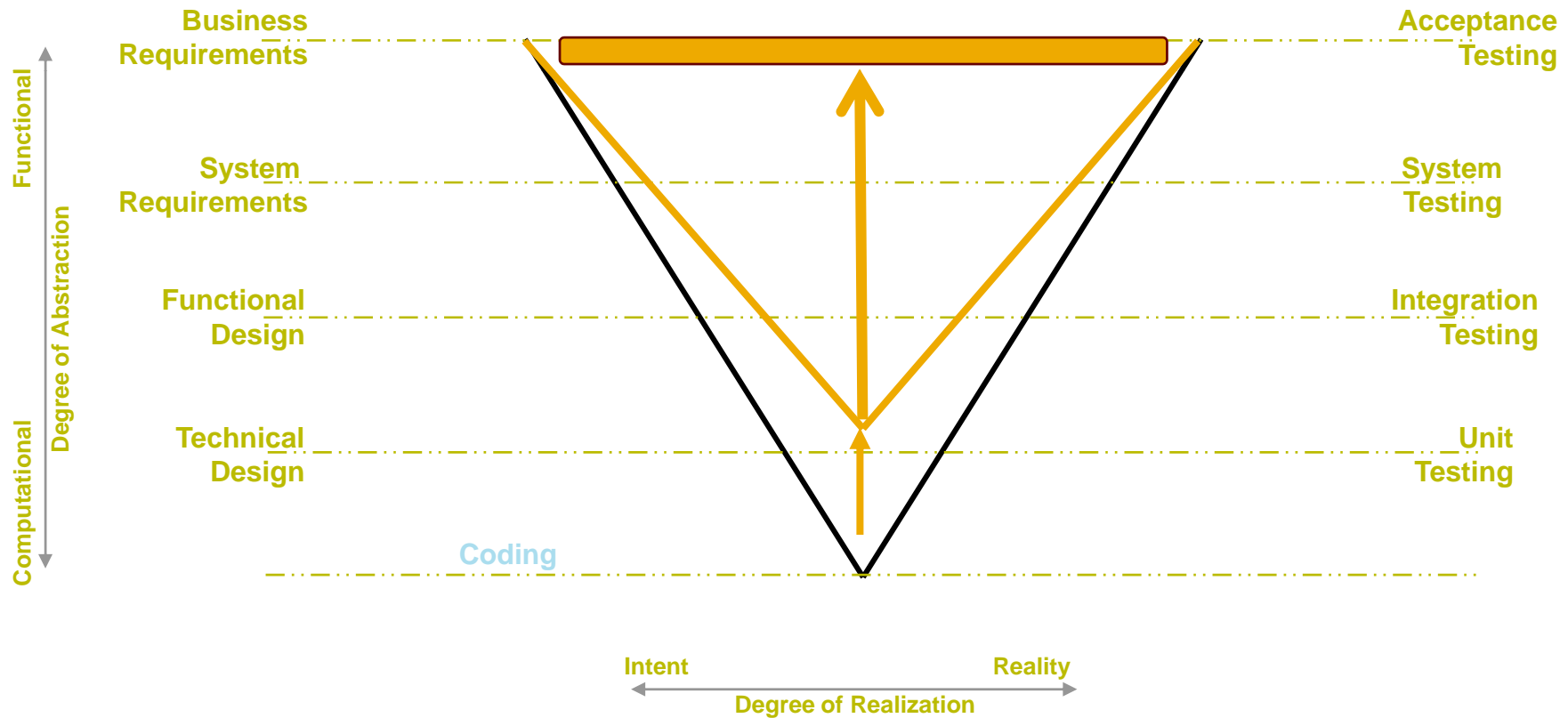


- **Lexicon**
- **Foundation CASE Tools**
 - IBM mainframe, DEC, Unix
 - Client/Server
- **Eagle**
 - Object-Oriented / Smalltalk
- **Universal construction tools**
 - Unix, C, Cobol, Sybase, Oracle
- **J2EE**
 - GRNDS for Java
 - Web and now SOA
- **Microsoft Component / Entlib**
 - Microsoft platform
COM DNA then .NET
 - Client server then Web and now
SOA
- **Large scale projects and client commercial models**
- **Achieving predictable delivery**
- **To leverage scarce, expensive architecture building skills**
- **Productivity - to use a less experienced globalised cheaper workforce for application configuration and development**
- **Our primary methodology (ADM) is rooted in the same culture**
- **Common language and interchangeable skills goals to maintain flexibility in our workforce**

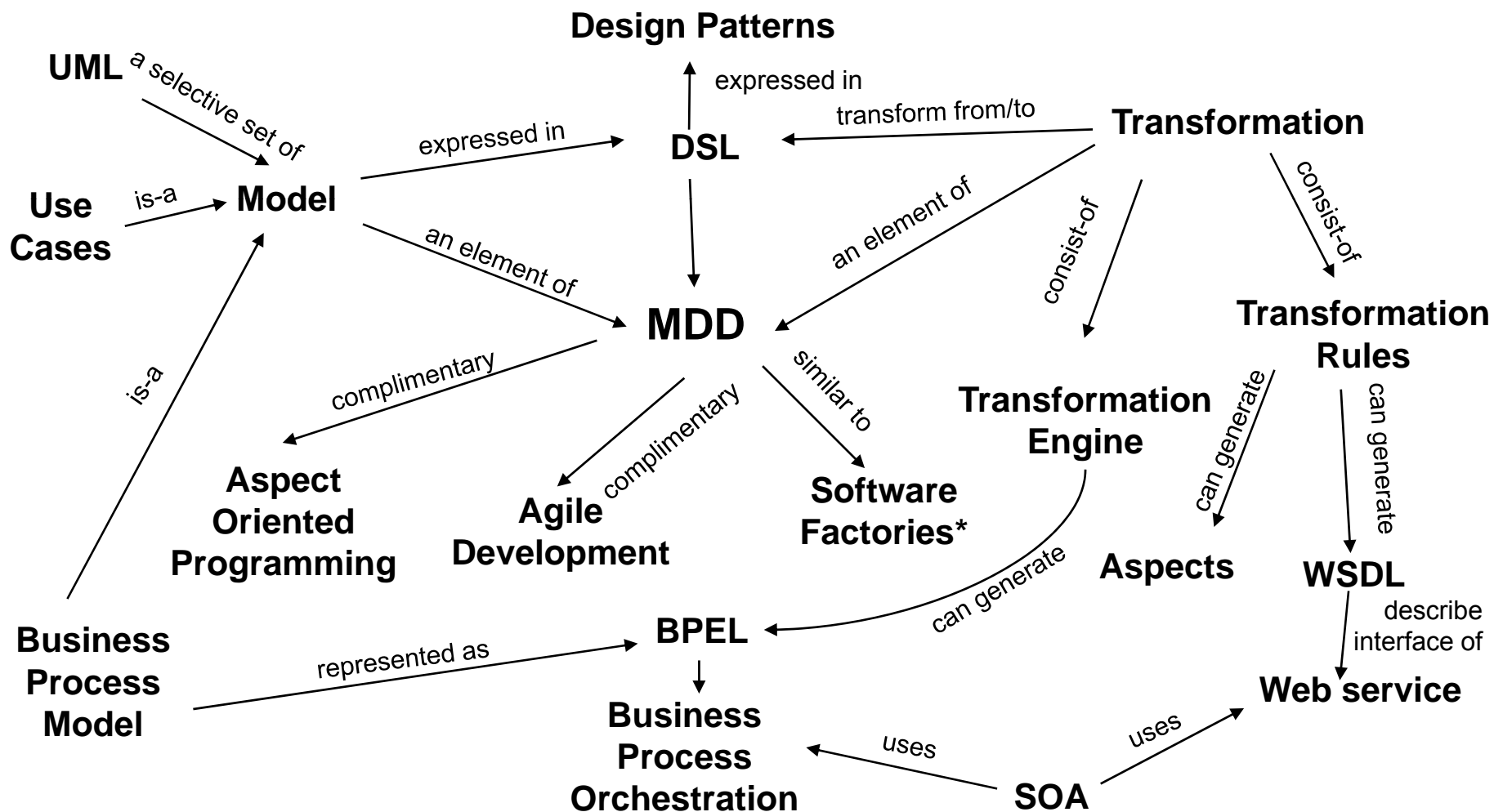
Industrialization Focus: The “V” Model



V-Model of Software



No Silver Bullets, but Many Useful Approaches



What Software Architecture Challenges Must be Addressed?



- **Platform Competency**
- **Architectural Standards and Interoperability**
- **Data Architecture**
- **Infrastructure and Operations**
- **Application Rationalization**
- **IT Organization and Enterprise Architecture**
- **Methods and Tools**
- **Testing**
- **Security**
- **Training**

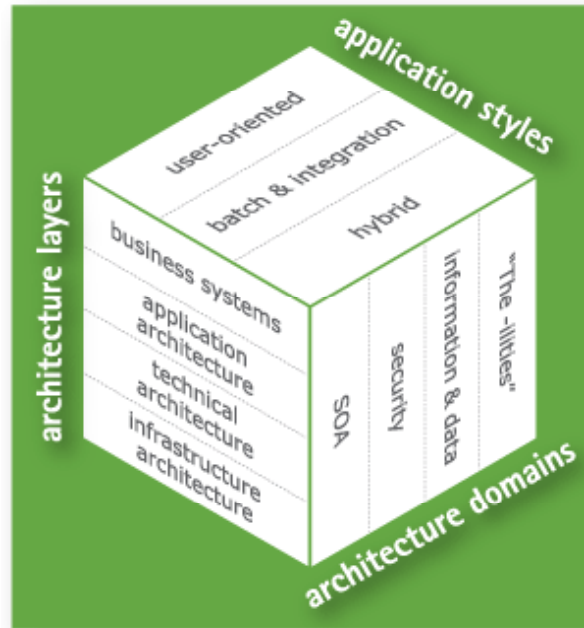
Our Agenda: Strategic Industrialisation



- **Increased Automation**
 - All Lifecycle stages
 - Further rollout of existing proven capabilities
- **Standardized Platforms & Improved Asset Re-use**
 - Increased structure vs. bottom up re-use
 - Architecture assets
- **Quality and Continuous Improvement**
 - Methods, Metrics
 - Operational management
 - CMM, Six-Sigma, etc
- **Handling specialisation**
 - People
 - Approaches



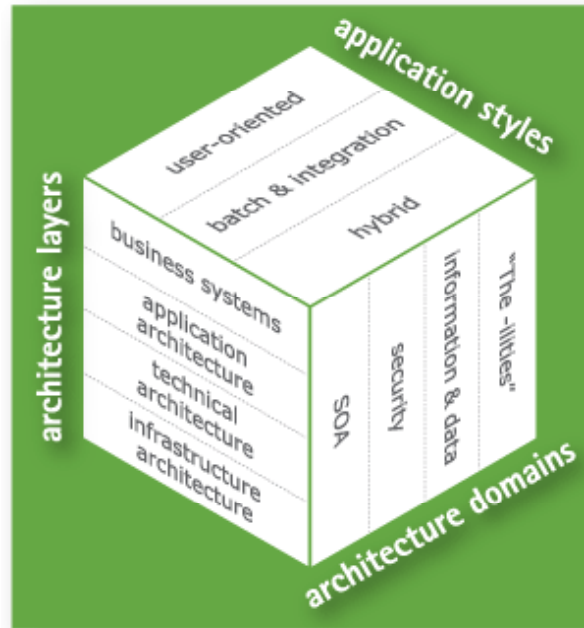
Industrialize Across Technology Platforms



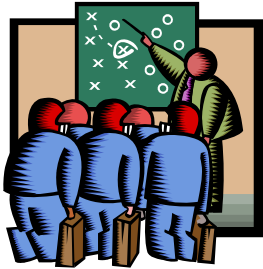
Microsoft®



Industrialize Into Technology Implementations



Sample: Accenture Foundation Platform for Java



Java Reference Application

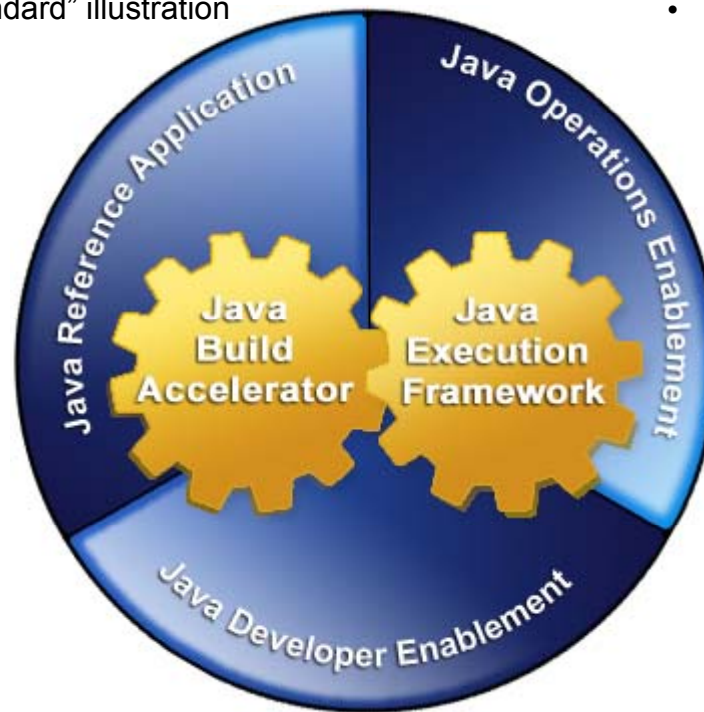
- “Gold Standard” illustration of AFP-J

Operations Enablement

- Prescriptive guides to facilitate integration with operations and monitoring tools

Java Build Accelerator (JBA)

- OSS development tools integrated into Eclipse
- Generation capabilities for “application scaffold” and “project scaffold”



Java Execution Framework (JEF)

- Run-time services
- Application shell and meta-model



Java Developer Enablement

- “micro methodology” extensions to ADM
- “How To” Guides and example documentation

Parting Thoughts: Industrialization of Software - Research Areas



- Platforms – **Integration, Proscription, Standardization & Reuse**
- Multiple Techniques – **MetaData, Aspect, MDD, DSL, SOA & Agile**
- Building the Right Talent – **Process, Data, Semantics, Parallel**
- Overcoming Cultural Issues – **Reuse, Open Source, Inner Source, Agile vs Control**
- Cracking Key Design Principles - **Loose Coupling, Modularity, Abstraction, Multitenant, Distributed**
- Longevity
- “Developer” vs “User”
- Things to Keep an Eye On – **SaaS, PaaS, Cloud**



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