



Cambashi

Industry Knowledge for Business Advantage

**Beyond Compliance:
Leveraging Regulatory Guidance and Commercial
Technology to Drive Healthier Business Outcomes**

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DSCC Las Vegas, NV USA

Cambashi overview

- 25 years of passion for bringing together buyers and sellers of IT
- Industry analysts, market researchers and consultants
- Focused on mission-critical aspects of discrete, batch, process, construction, energy, distribution, and utilities
- Wide range of services from strategy to action
- Headquarters in Cambridge, UK; US office in MA
- Work worldwide

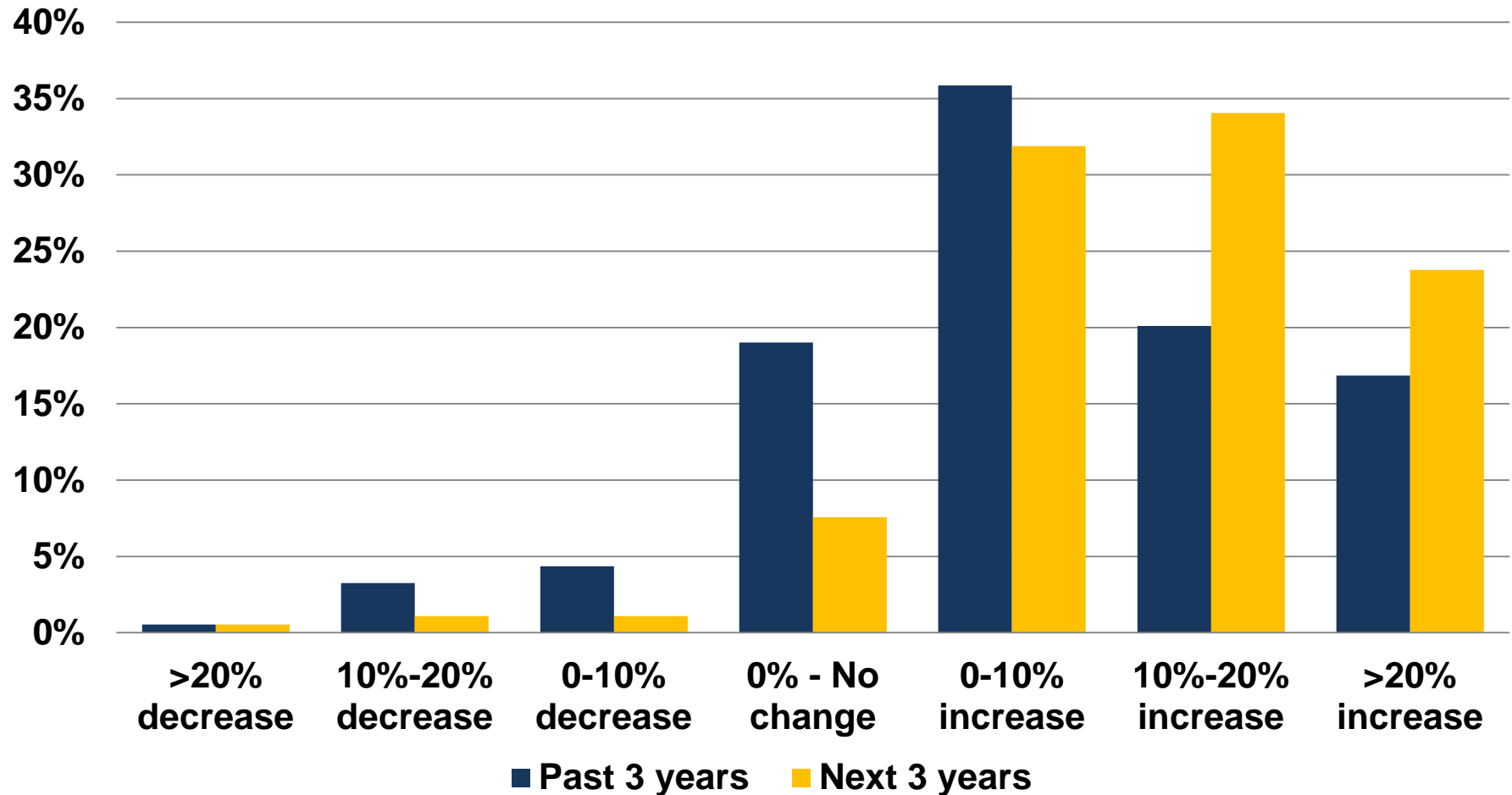


Industry Knowledge for Business Advantage

Topics

- Industry issues and trends
- Regulatory guidance
- A new more profitable way of working
- Commercial technology to support best practices
- Recommendations to improve company health

Innovation rate: Increasing not same



Source: *Total Product Lifecycle Management: Lowering Costs while Increasing Quality* © 2009 Axendia & Cambashi

Industry opportunities

- **Opportunities**
- Emerging markets
- Small population & personalized products
- Market response
- New technologies
- Global expansion
- New partnerships

Industry opportunities & challenges

➤ Opportunities

- Emerging markets
- Small population & personalized products
- Market response
- New technologies
- Global expansion
- New partnerships

Challenges

- Shifting need to file changes
- R&D pipelines
- Drug patent expirations
- High costs
- Pricing pressures
- Varying regulations per region
- Regulators pushing change

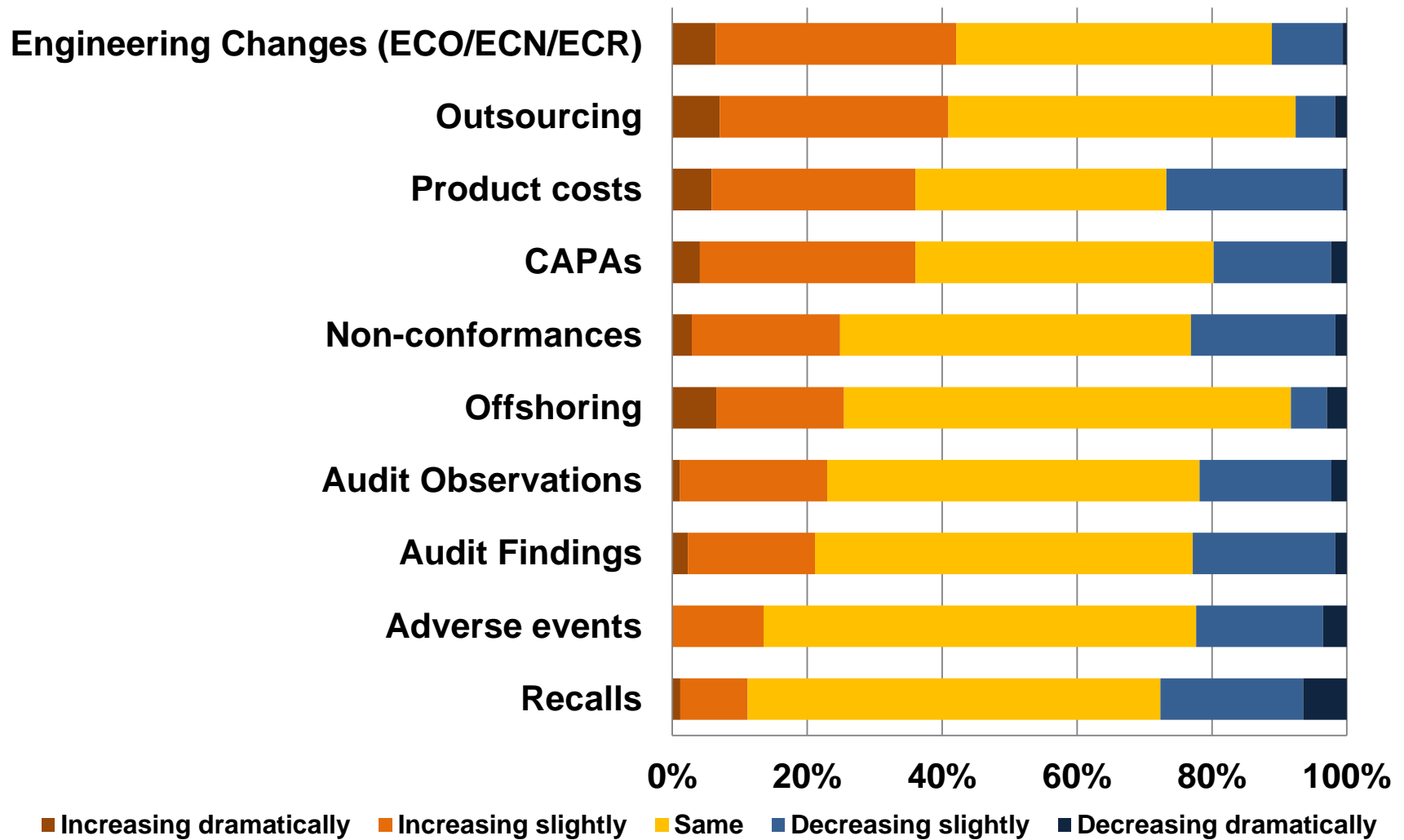
Goal: improve performance to address both!

Most common priority initiatives



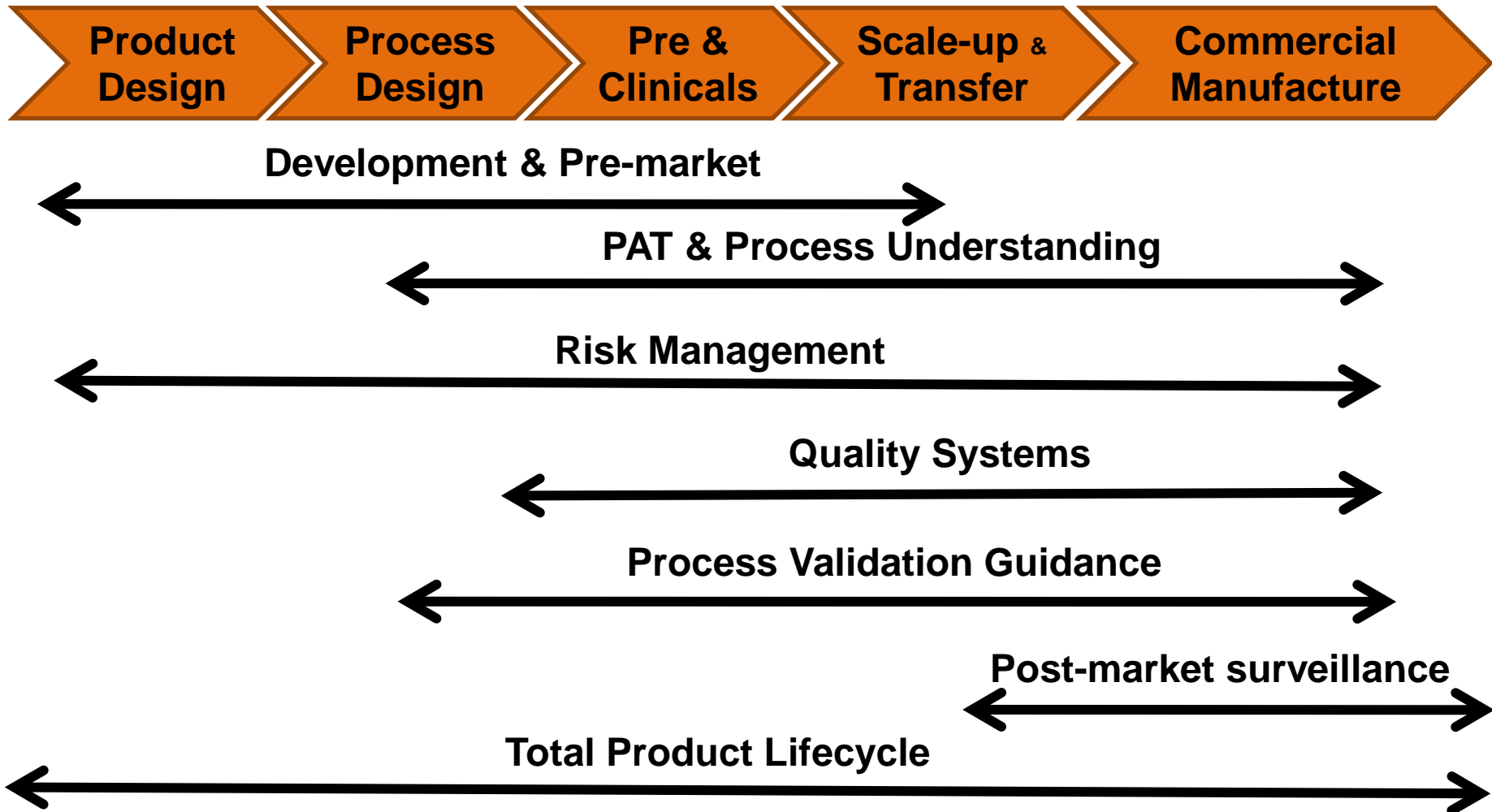
Source: *Total Product Lifecycle Management: Lowering Costs while Increasing Quality* © 2009 Axendia & Cambashi

Industry shifts – or staying same?



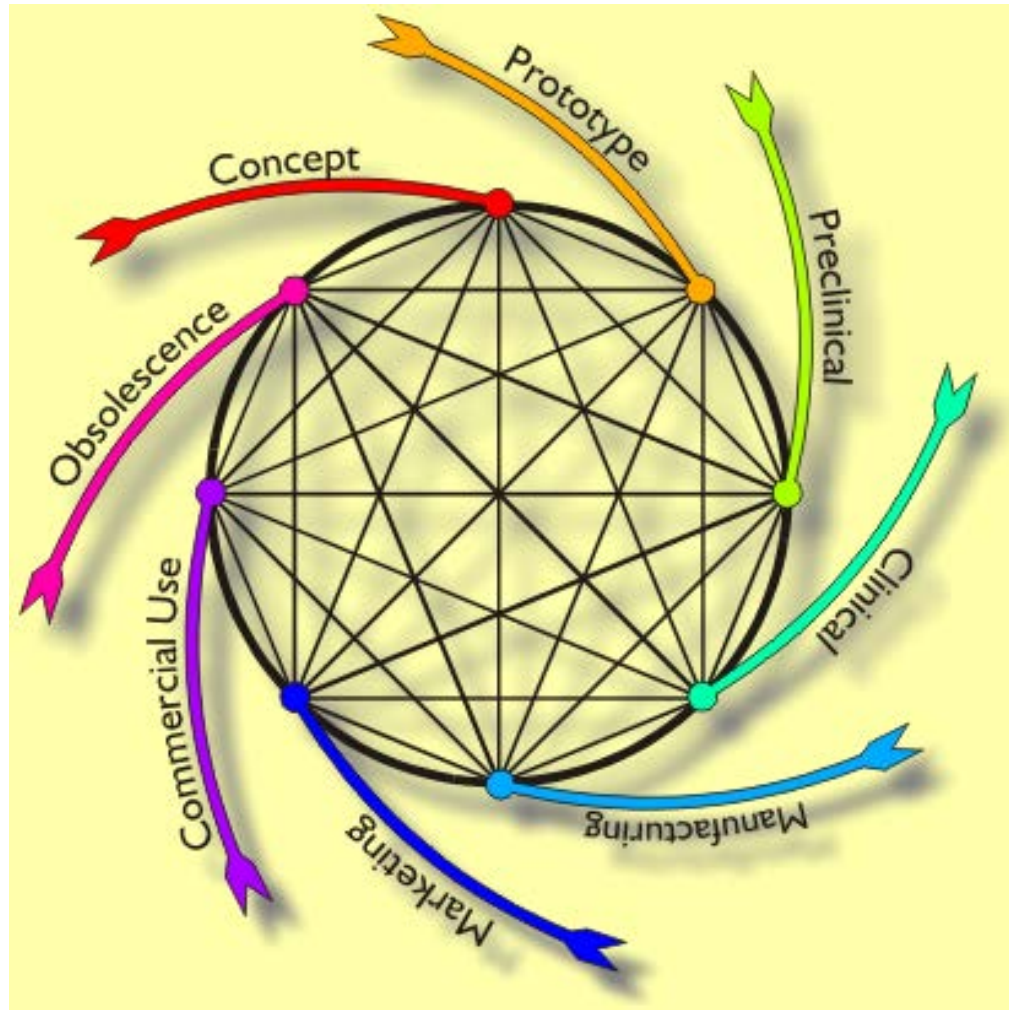
Source: *Total Product Lifecycle Management: Lowering Costs while Increasing Quality* © 2009 Axendia & Cambashi

Guidance on design and manufacturing: Country, GHTF, ICH



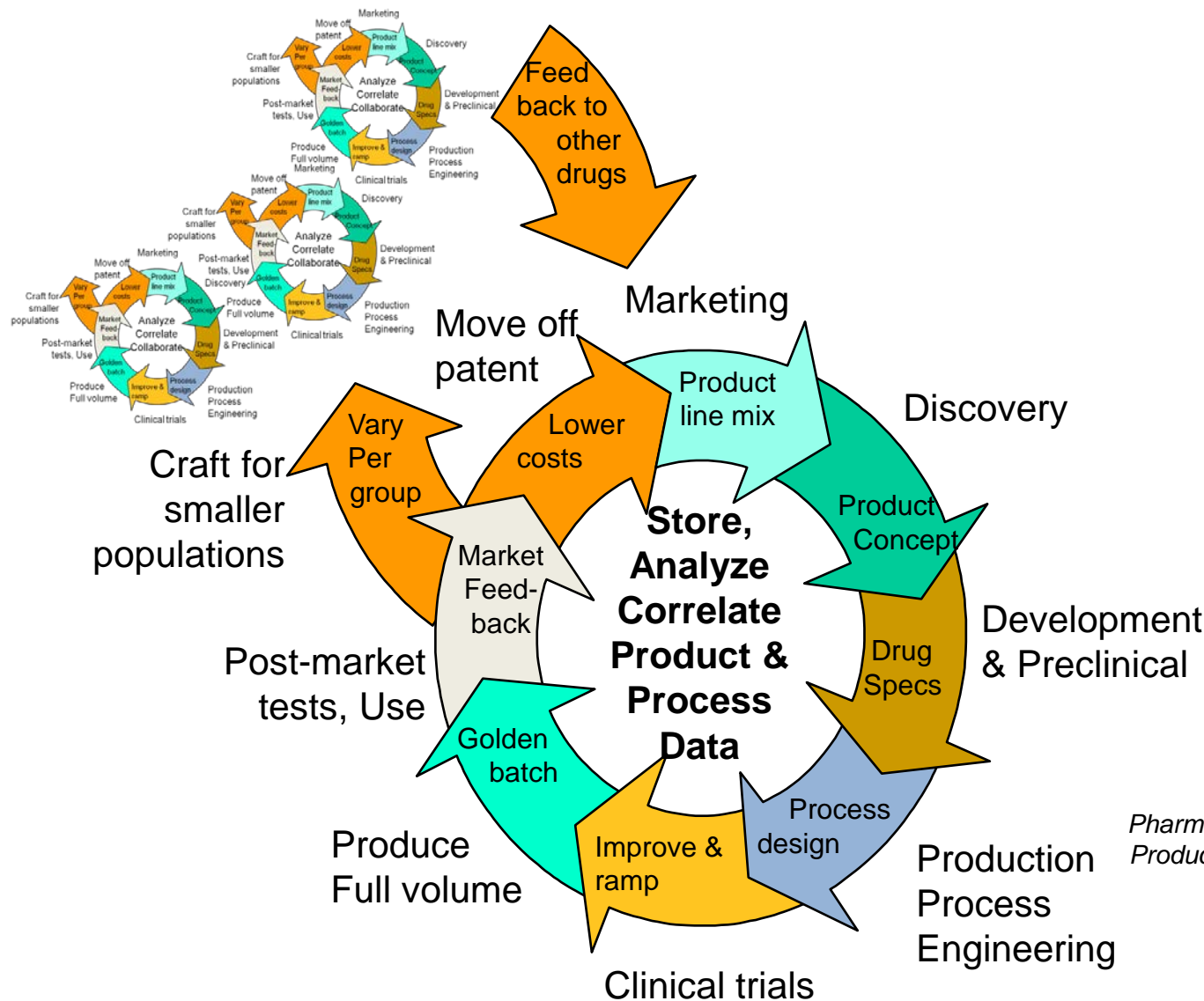
The Holistic Approach to Pharmaceutical Manufacturing: Product Lifecycle Management Support for High Yield Processes to Make Safe and Effective Drugs © 2011 Cambashi Inc.

The Total Product Life Cycle (TPLC)



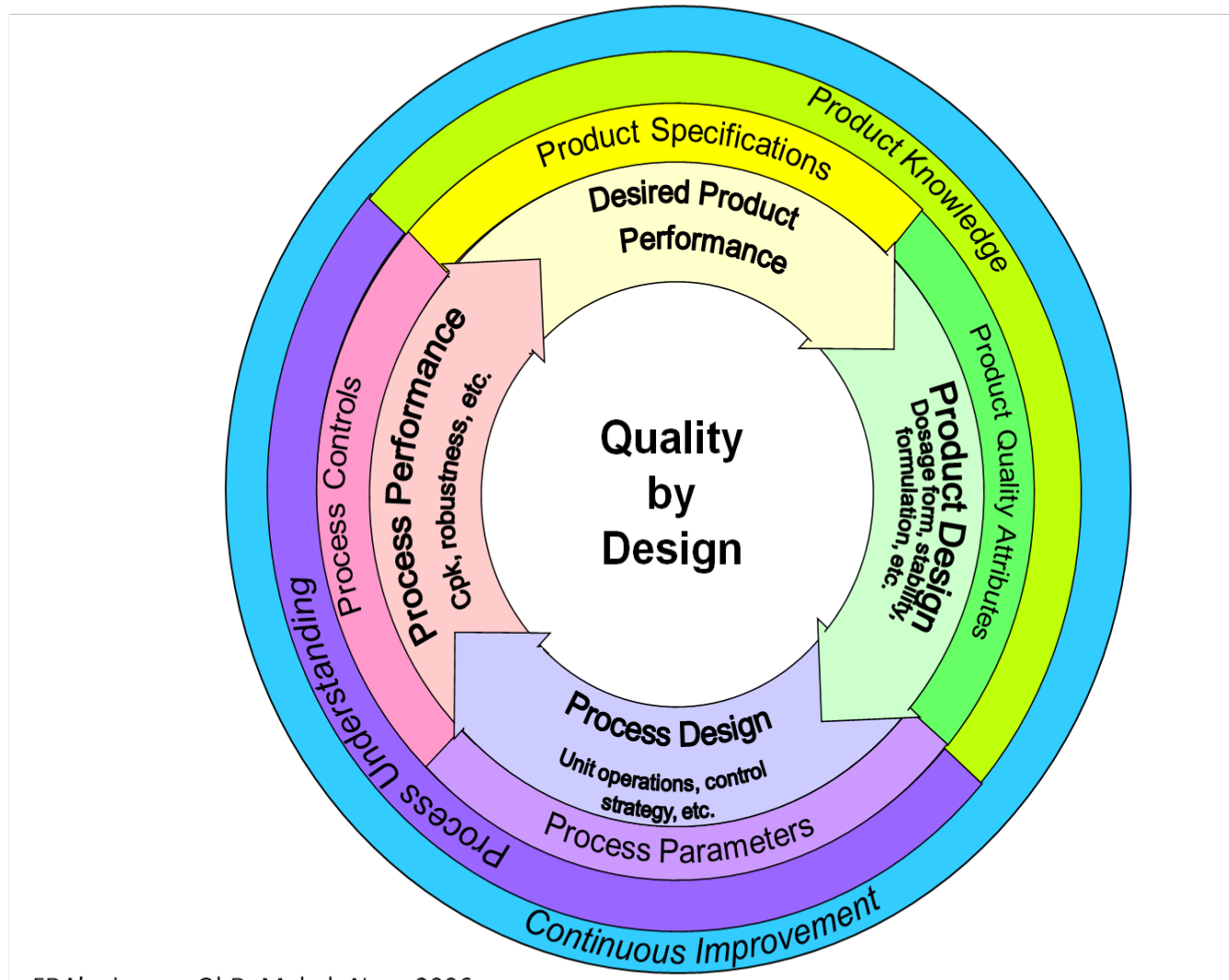
Source: U.S. Food and Drug Administration

Personalized treatment lifecycle



The Holistic Approach to Pharmaceutical Manufacturing: Product Lifecycle Management Support for High Yield Processes to Make Safe and Effective Drugs
 © 2011 Cambashi Inc.

Quality by design (QbD) concept



FDA's view on QbD, Moheb Nasr, 2006

FDA on QbD: manufacturing issues

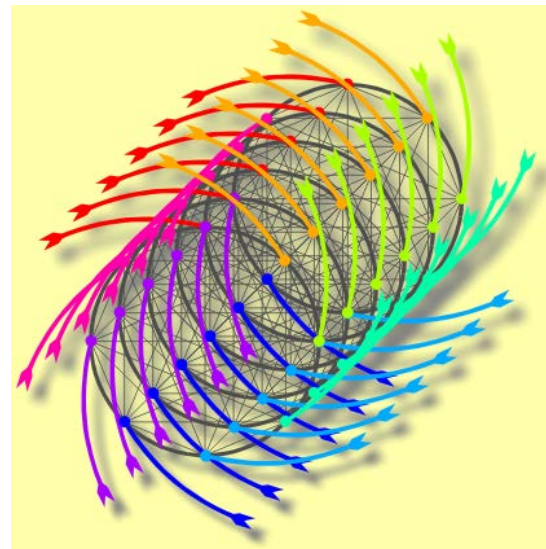
Current Approach	QbD Approach
Quality assured by testing and inspection	Quality built into product & process by design, based on scientific understanding
Data intensive submission – disjointed information without “big picture”	Knowledge rich submission – showing product knowledge & process understanding
Specifications based on batch history	Specifications based on product performance requirements
“Frozen process,” discouraging changes	Flexible process within design space, allowing continuous improvement
Focus on reproducibility – often avoiding or ignoring variation	Focus on robustness – understanding and controlling variation

Source: Chi-wan Chen, Ph.D. and Christine Moore, Ph.D. Office of New Drug Quality Assessment CDER/FDA, 2006
 Presentation: Role of Statistics in Pharmaceutical Development Using Quality-by-Design Approach – an FDA Perspective

How to get to the objective?

Objectives

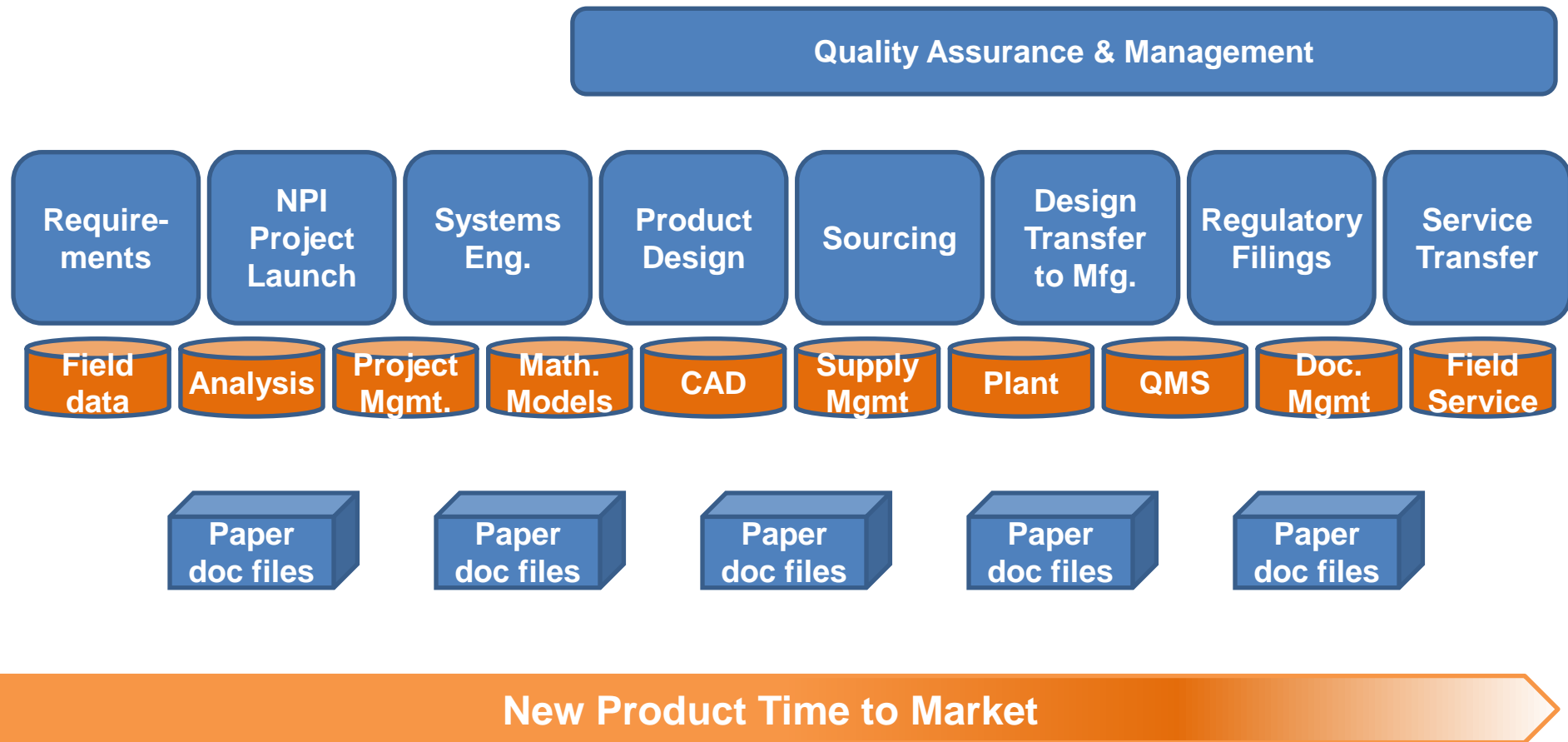
- Quality built in
- Product knowledge
- Process understanding
- Specifications for product performance
- Flexible process
- Continuous improvement
- Robustness
- Understand and control variation



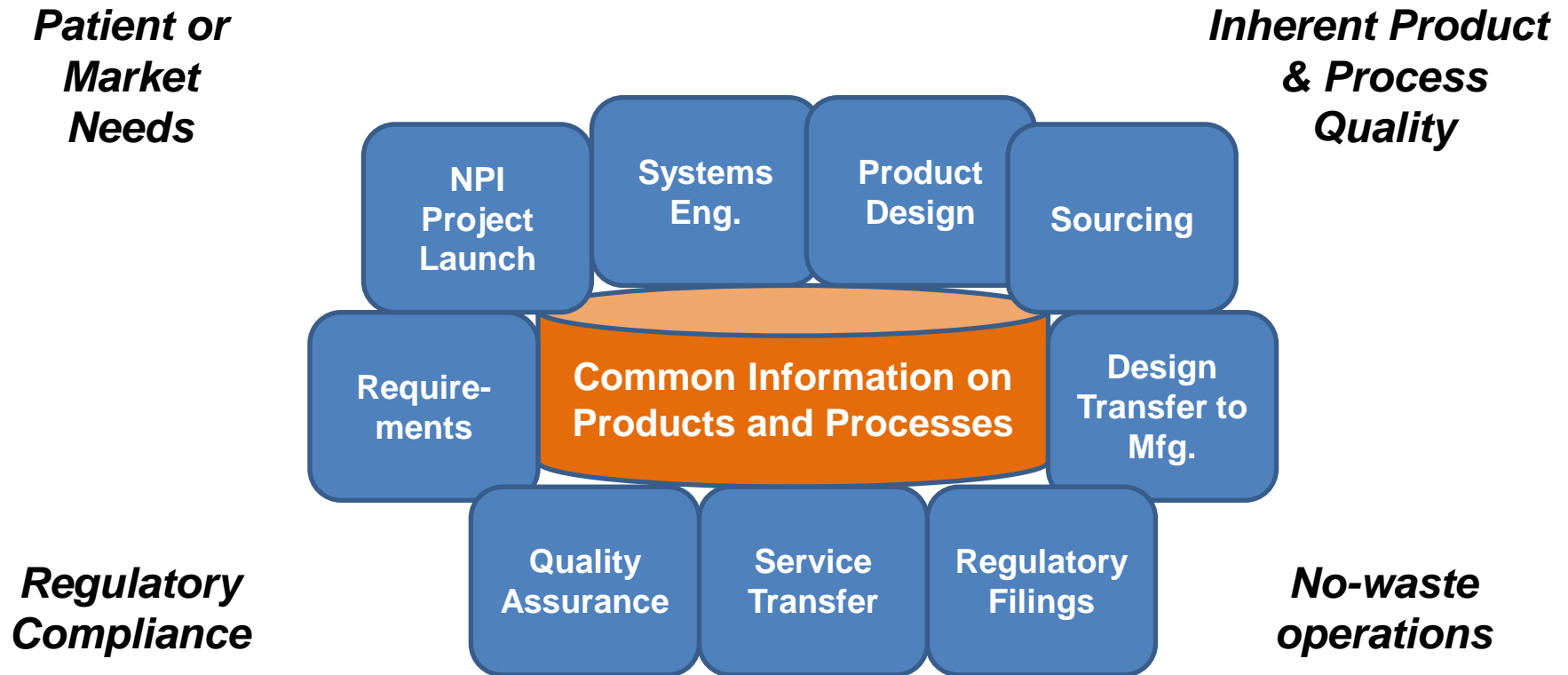
Current Approach	QBU Approach	Current Approach	QBU Approach	Current Approach	QBU Approach
Quality measured by testing and inspection	Quality measured by testing and inspection	Quality measured by testing and inspection	Quality measured by testing and inspection	Quality measured by testing and inspection	Quality measured by testing and inspection
Data driven submission - Disparate information without "big picture"	Knowledge rich submission - sharing product knowledge & process understanding	Data driven submission - Disparate information without "big picture"	Knowledge rich submission - sharing product knowledge & process understanding	Data driven submission - Disparate information without "big picture"	Knowledge rich submission - sharing product knowledge & process understanding
Specifications based on batch history	Specifications based on product performance requirements	Specifications based on batch history	Specifications based on product performance requirements	Specifications based on batch history	Specifications based on product performance requirements
Transparency - "Benchmarking" changes	Public process - often design space always continuous improvement	Transparency - "Benchmarking" changes	Public process - often design space always continuous improvement	Transparency - "Benchmarking" changes	Public process - often design space always continuous improvement
Focus on reproducibility - often leading to opening variation	Focus on robustness - understanding and controlling variation	Focus on reproducibility - often leading to opening variation	Focus on robustness - understanding and controlling variation	Focus on reproducibility - often leading to opening variation	Focus on robustness - understanding and controlling variation

This seems daunting through today's fragmented lens!

Fragmented lens of separate data leads to long NPI cycles

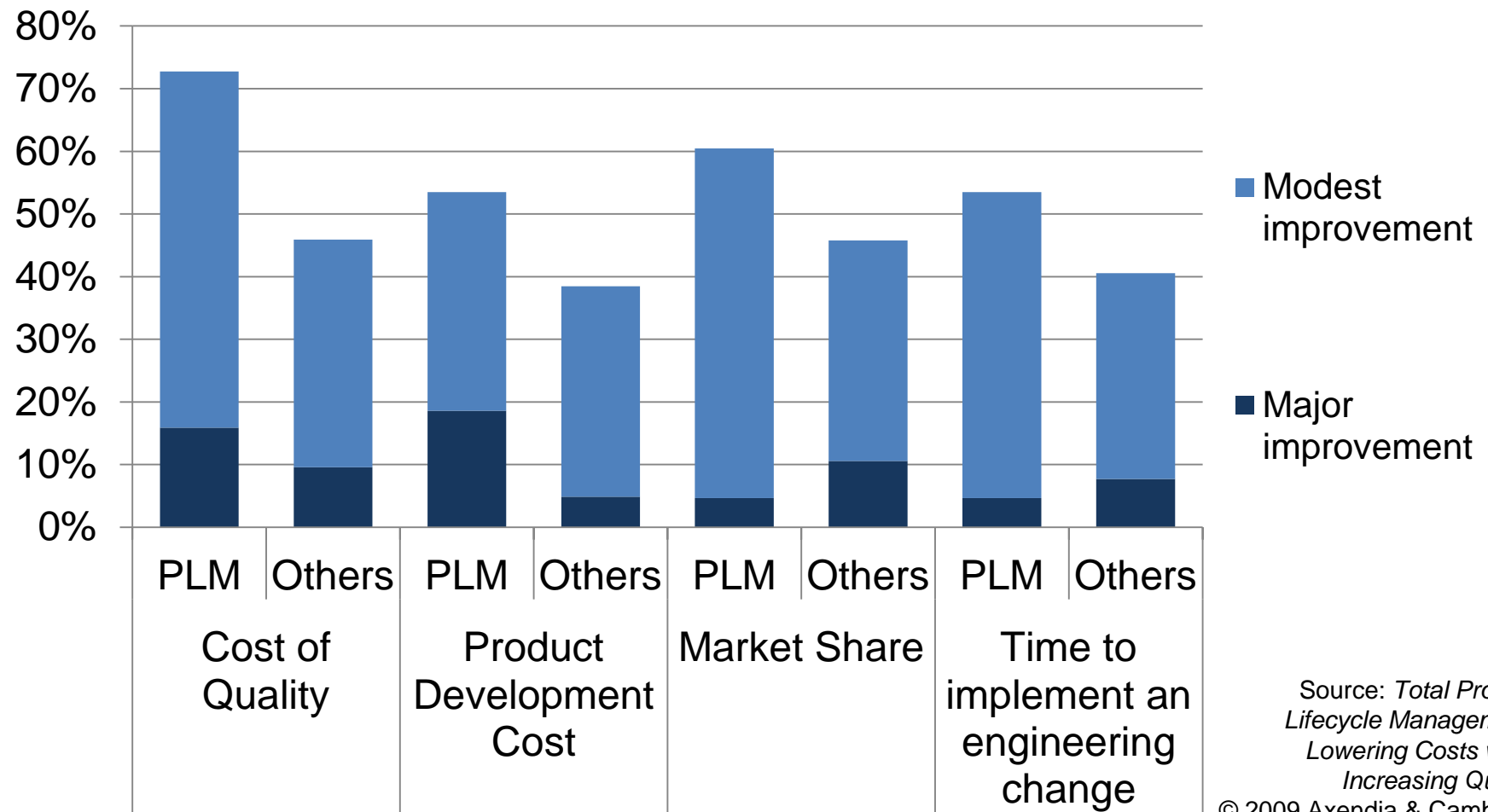


Common Information Source allows Clear View for TPLC, QbD, Low Risk



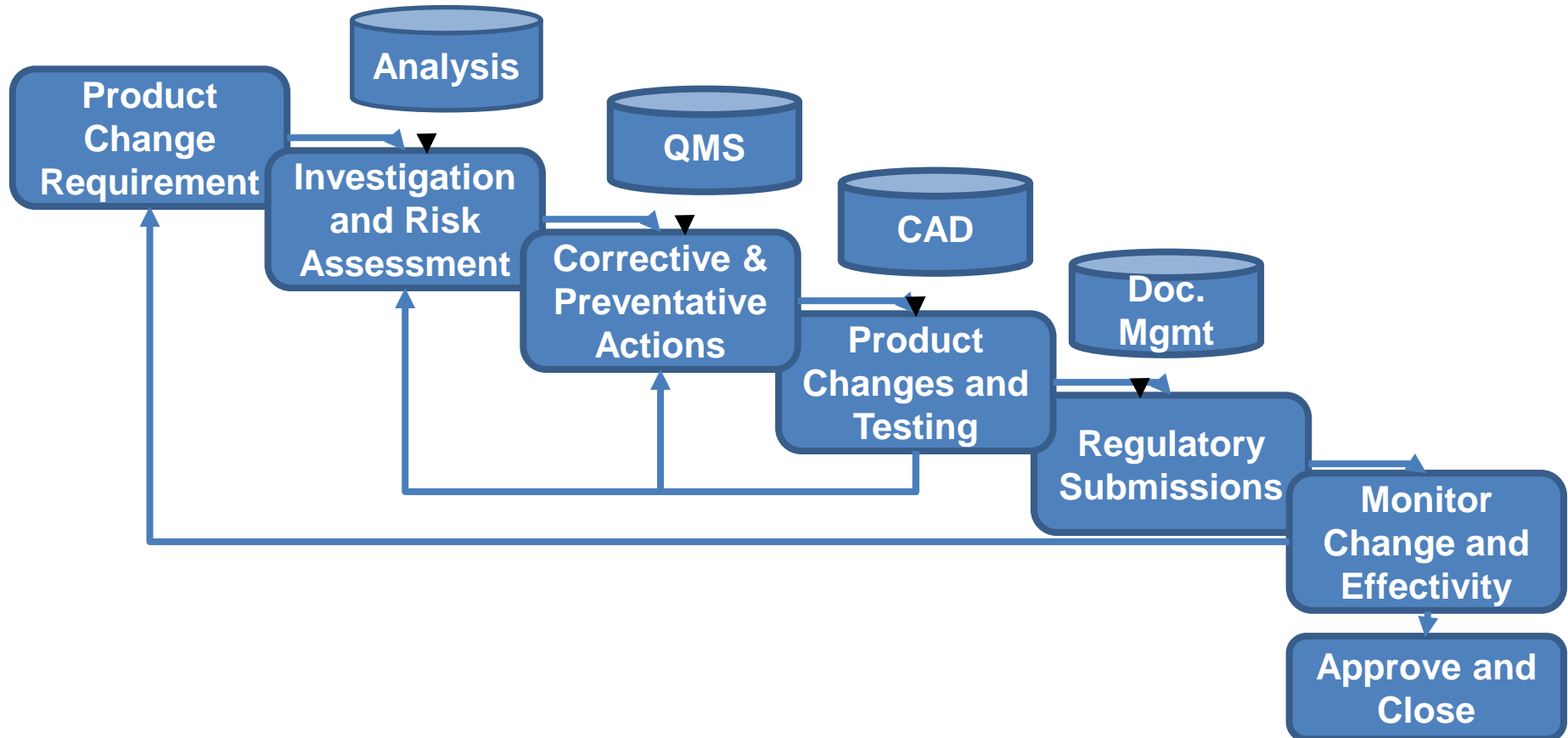
New Product Time to Market

More companies using PLM improve costs, speed, and market success



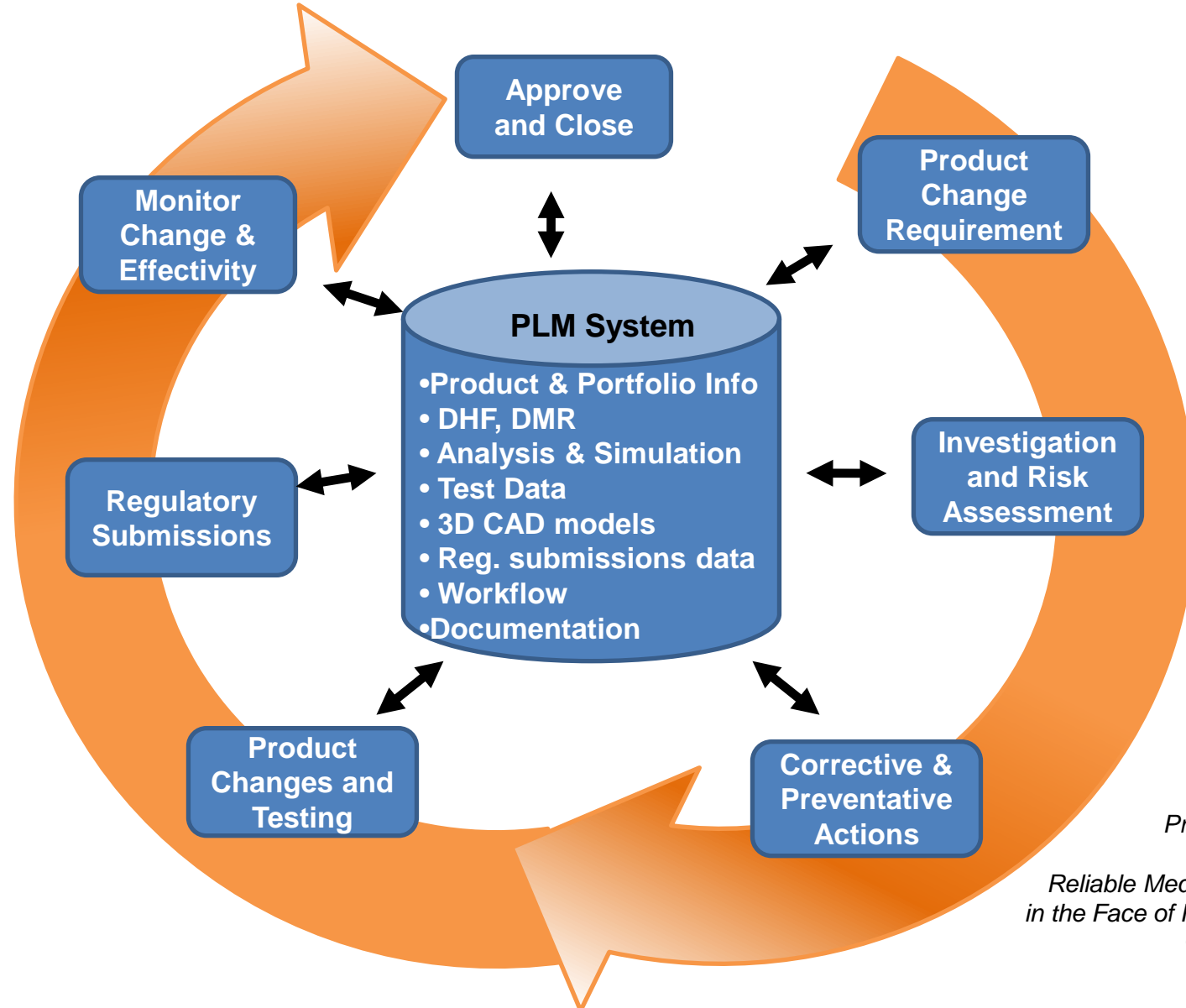
Source: *Total Product Lifecycle Management: Lowering Costs while Increasing Quality*
 © 2009 Axendia & Cambashi

Product engineering change processes are time-consuming



*A Holistic Approach to Product Introduction and Change Processes:
 Reliable Medical Device Innovation in the Face of Regulatory Uncertainty © 2010 Cambashi Inc.*

Changes streamlined with PLM



*A Holistic Approach to Product Introduction and Change Processes:
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Operator problems? Or not really?

“Anything can be a root cause of a non-conformance, but infrequently is the operator truly the cause.

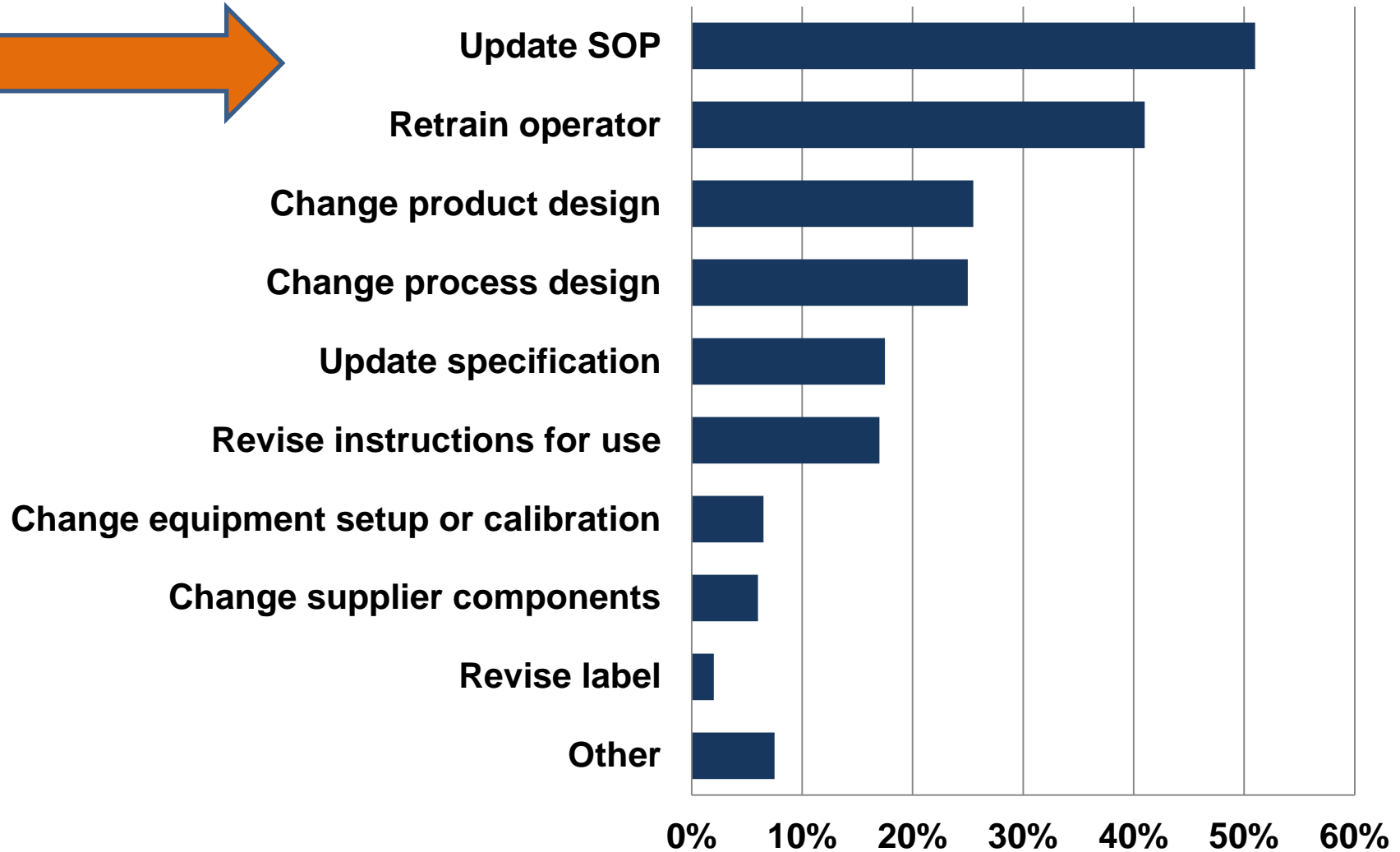
The design of the process is generally the culprit:

- the process is too difficult to do repeatably**
- the steps might not be in the right order, it might needs jigs, or any number of issues.”**

Lee Fox
Director of Quality
Mack Molding Company

Source: Total Product Lifecycle Management: Lowering Costs while Increasing Quality © 2009 Axendia & Cambashi

Actions to correct CAPAs need to shift to the real root causes



Source: *Total Product Lifecycle Management: Lowering Costs while Increasing Quality* © 2009 Axendia & Cambashi

“Quality management is not about meeting regulations...

... it’s about not being able to make bad stuff.

If you have that mindset and follow through on it, meeting the regulations is not an issue.

Compliance becomes the result, not the goal, of quality management”

Constance Ace, Ph.D.
Vice President, Research & Development
Xylos Corporation

Source: *Total Product Lifecycle Management: Lowering Costs while Increasing Quality* © 2009 Axendia & Cambashi

Recommendations

- Create closed Loop TPLC – all phases and disciplines
- See opportunity in process understanding
- Shift from CAPA to PACA – proactive quality
- Value-chain visibility – involve key suppliers as appropriate
- Single version of truth: integrate product and process information



Ideas for DSCC

- Bring information from all disciplines together in context
- Design products and processes intelligently
- Use simulation and verification of design results
- Find all relevant data for decisions and collaboration
- Characterize and optimize the manufacturing process
- Set up electronic batch records
- Use data to identify best practices





Time to act is now!

Urgency as the tide turns...

- Performance pressure
 - Regulators
 - Shareholders
 - Payers
- New market opportunities
- Yield for high or low volumes
- Increasing complexity
- Price pressure



The regulatory bodies are getting ready...

The technology is ready...

Are your facilities ready?



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Thanks for participating!

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