Quality by Design
QbD

FDA Study on State of Adoption

Contents

- State of Adoption
- Challenges
- Business Case
- Next Steps

Survey Study Conducted

- What is adoption across the industry?
- What is the business case for QbD?
- What are the barriers to adoption of QbD?
- How can QbD adoption be accelerated?

From

- Familiarity with QbD and little understanding
- Limited experimentation
- Inconsistent regulatory framework
- Skepticism and doubt regarding technical limitation

To

- Maturity regarding QbD understanding
- Increased acceptance among more companies
- More experience and regulator demands
- More recognition of non-regulatory benefits
- Continued doubt regarding QbD application to Generics and Biologics

Enthusiasm

- Clear value --- hard to quantify
- Should be a standard practice
- It is the same as saying “Good Science”
- Want to apply it everywhere in the organization
- Take time to understand it and work with it for a while and you’ll be passionate about it

Business Case

- Half believe the payback is multi-year
- About one tenth believe it is quick enough to see in one year
- About one third are uncertain
- The remainder see no case

Comments

- No additional effort to get benefit
  - Different but not more
- Benefits
  - Speed
  - Quality
  - Cost
- Skeptics
  - Not sure it can change safety or efficacy
  - Without harmonization there is no value

Segments Found

- Fully Implemented
- Rollout
- Pilot
- None

Fully Implemented

- Completely convinced about impact of QbD and have seen benefits
- Use QbD in every development program
- Systematic comprehensive review and redesign of in-line products

Rollout

- Convinced about impact of QbD
- Use QbD regularly but not universally
- Lifecycle management use
- Integrated platform use

Pilot

- Trying QbD but still on the fence about the value
- Application of QbD to a small subset of projects
- Limited or no platform utilization

None

- Skeptical about value
- Use Conventional development
  - No QbD approach
- No platform utilization

Numbers by Company

Group	Novice	Pilot	Rollout	Full
New Drug	22%	33%	22%	22%
Generic	40%	20%	40%	
Biologic	17%	67%	17%	

Challenges Within Company

- Internal misalignment
- Lack of belief in business case
- Lack of technology to execute
- Lack of alignment with outside parties

Challenges Within FDA

- Inconsistency across FDA
- Lack of tangible guidance
- Regulators not always prepared
- Regulatory benefits seem weak
- International misalignment
- Current business practice does not help implementation of QbD

New Drug Company

- R&D is driven by new products not QbD
- Reviewer inconsistency is big problem
- Lack of Harmonization

Generic Companies

- Pipeline driven by new products not QbD
- Lack of belief in business case
  - First to file is more important than QbD

Biologics Companies

- Lack of technology
  - Don’t understand molecular attributes well enough to drive QbD

Business Case

- Dismissed Cost
  - QbD leads to marginal increase in cost while implementing
  - Cost goes away quickly
  - Long run savings starts quickly

Business Case

- Dismissed long development time
  - Generally expected to be several days of planning for clinical phase
  - No effect on critical path
  - Reduces time to tech transfer and scale-up

Source of Value

- Lower cost of goods from supply chain reliability
  - Reduced risk of regulatory citation
- Lower development cost through reliable tech transfer and scale up
  - QbD used in product development
  - Better launch and product design
- Lower staffing cost through more reliable manufacturing
  - Cycle time, yield and QA

Enabling Factors

- Operating Model
  - Alignment from R&D through operations across processes, incentives and platforms
  - Willingness to remove QC steps
  - Culture focused on entire company
- Enablers from FDA
  - Delivery of promised regulatory benefits
  - Incentives for reviewer
  - Stronger, clearer guidance and advice

Before Starting

- Leadership Alignment
- Alignment between R&D and operations
- Move talent to the right places
- Lay out policy framework
  - These are the tools for QbD decisions
- Culture aligned for continual improvement

Supporting Mechanisms

- QbD development processes
- QbD built into regular regulatory CMC
- Stage-gate process for CMC program
- Incentive alignment with QbD
- Talent acquisition alignment with QbD
- Participation with industry and regulatory groups
- Training for capability
- Standardization of equipment platforms

Three Processes

- Technical
  - Standards
  - Participation with groups
- Management System
  - Leadership with Alignment
- Culture and Capabilities
  - Talent acquisition
  - Capability training

Next Steps

- How to best address consistency across FDA
- Change Management
- Meetings between FDA and Applicants
- Harmonization